

Industrial Networking and Connectivity

System Technology



PROFINET **PROFINET** CC-link

EtherNet/IP DeviceNet EtherCAT





As a leading sensor specialist and systems provider with a company tradition extending over 90 years Balluff GmbH has for decades been a recognized partner in factory automation. The global player has a strong presence with 61 sales branches and representative offices as well as nine production sites on all continents. The corporate headquarters in Neuhausen a.d.F. is located right by Stuttgart.

Benefit from comprehensive sensor expertise from a single source. Achieve solutions suited to your requirements.

Balluff products represent the entire technological spectrum with varied operating principles, including high-quality sensors and systems for position and measurement and identification, as well as sensors for detecting objects and measuring fluids. The full-range assortment includes optimal network and connection technology and a comprehensive line of accessory products.



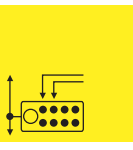
We offer innovative, first-class products tested in our own accredited laboratory and maintain certified quality management in accordance with DIN EN 9001:2008. Our technology speaks for itself in international applications. It also meets regional standards.



Balluff is synonymous with application-specific customer solutions, comprehensive services, individual consultation and prompt service. Our staff of more than 2,750 employees is committed to providing outstanding service worldwide.



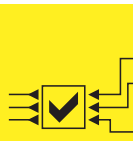
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 Unmanaged Switch, fieldbus connectors and -valve
 connectors



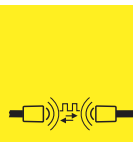
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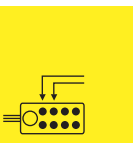
Dynamic Sensor Control 196



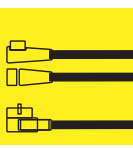
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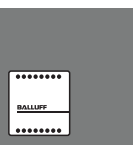
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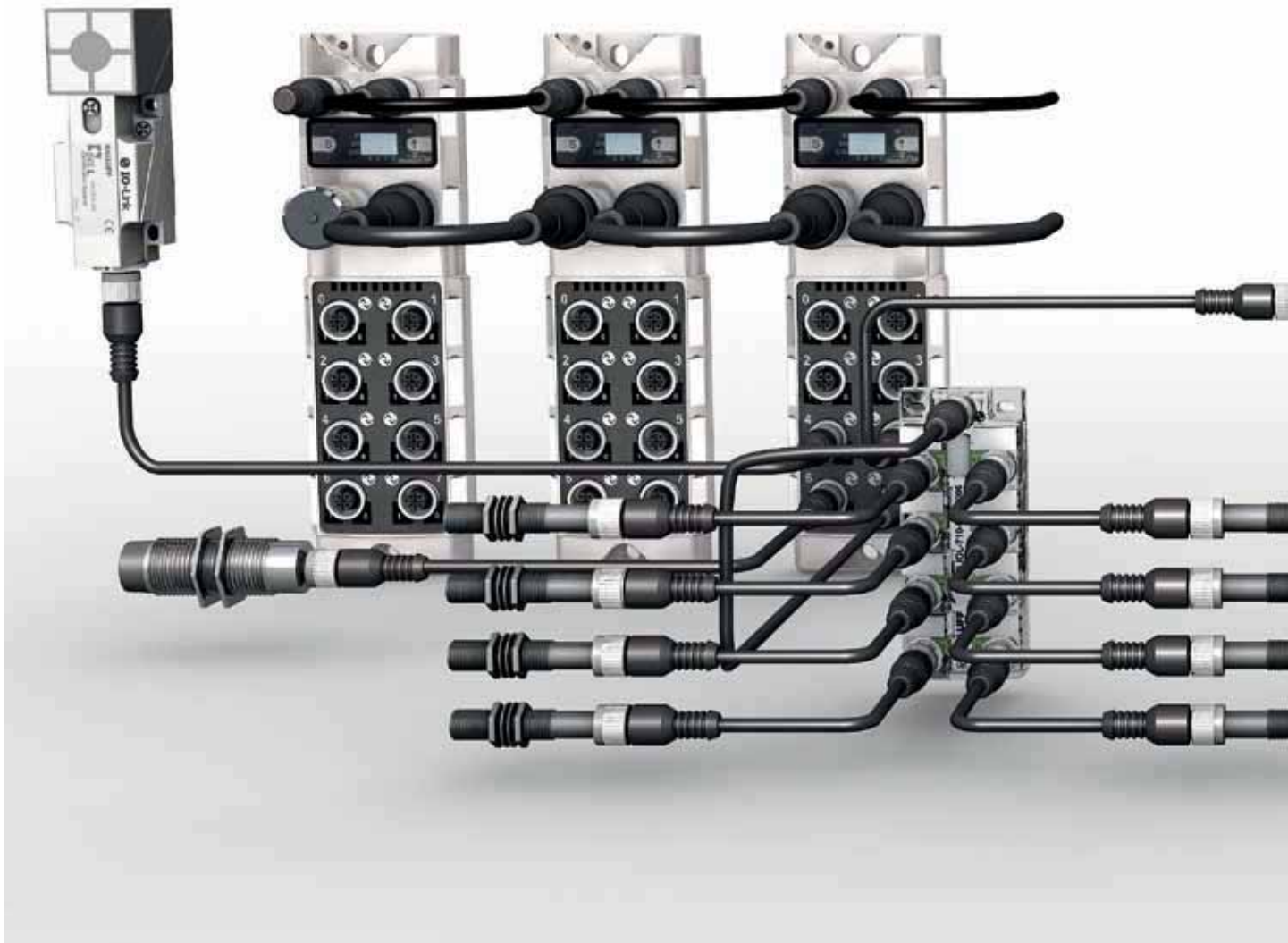
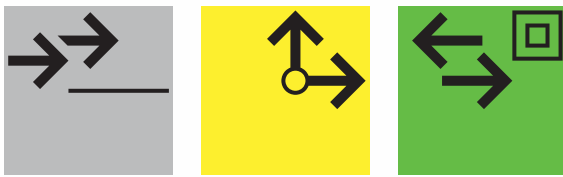


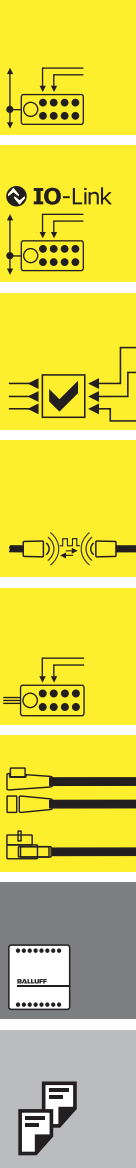
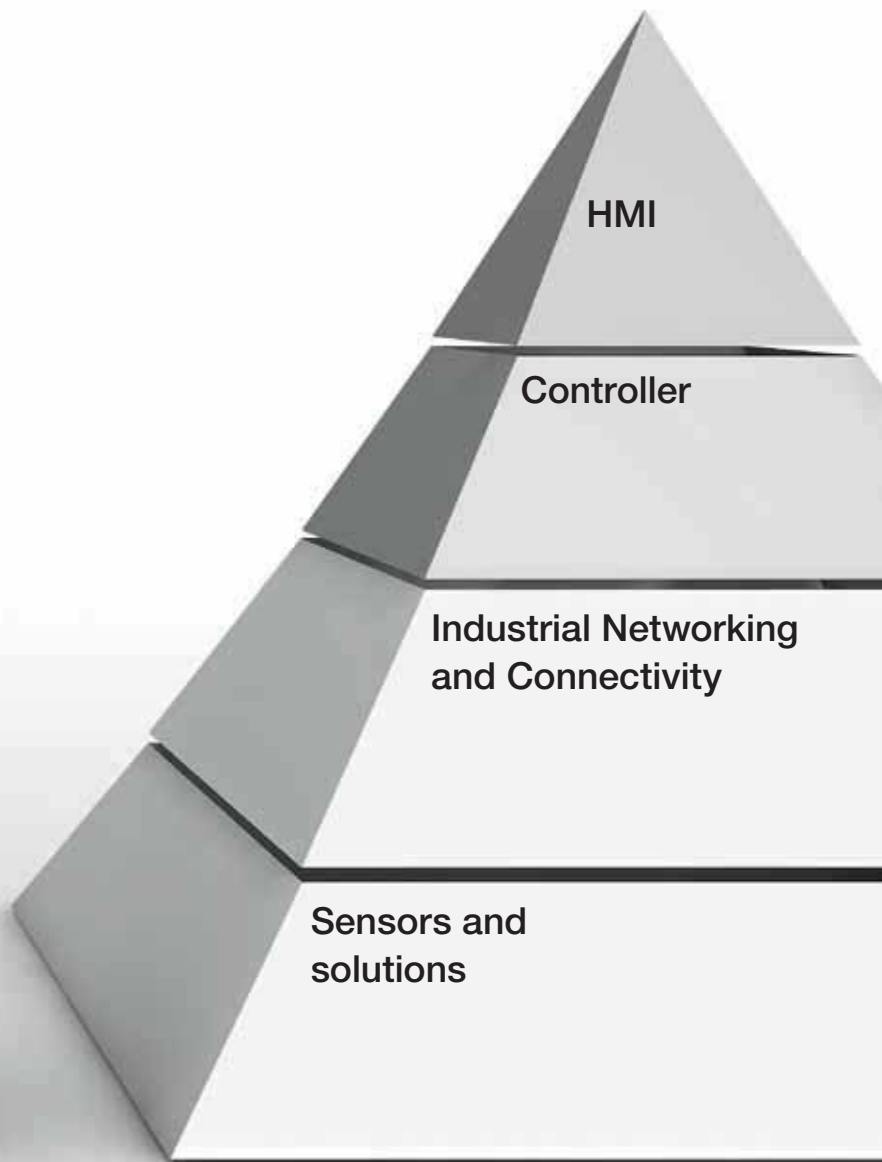
Customer-specific services

Balluff stands for comprehensive systems from a single source

Systems and Service, Industrial Networking and Connectivity, Industrial Identification:

*Industrial RFID systems, vision sensors, fieldbus modules, passive splitters, inductive couplers, IO-Link, connectors and connection cables



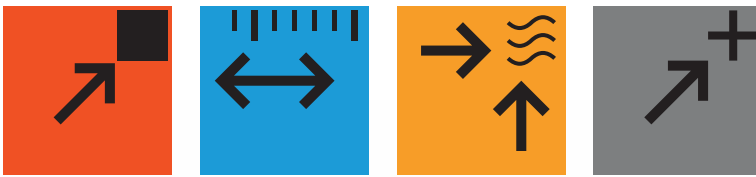


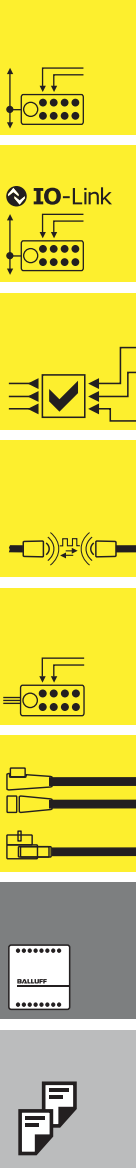
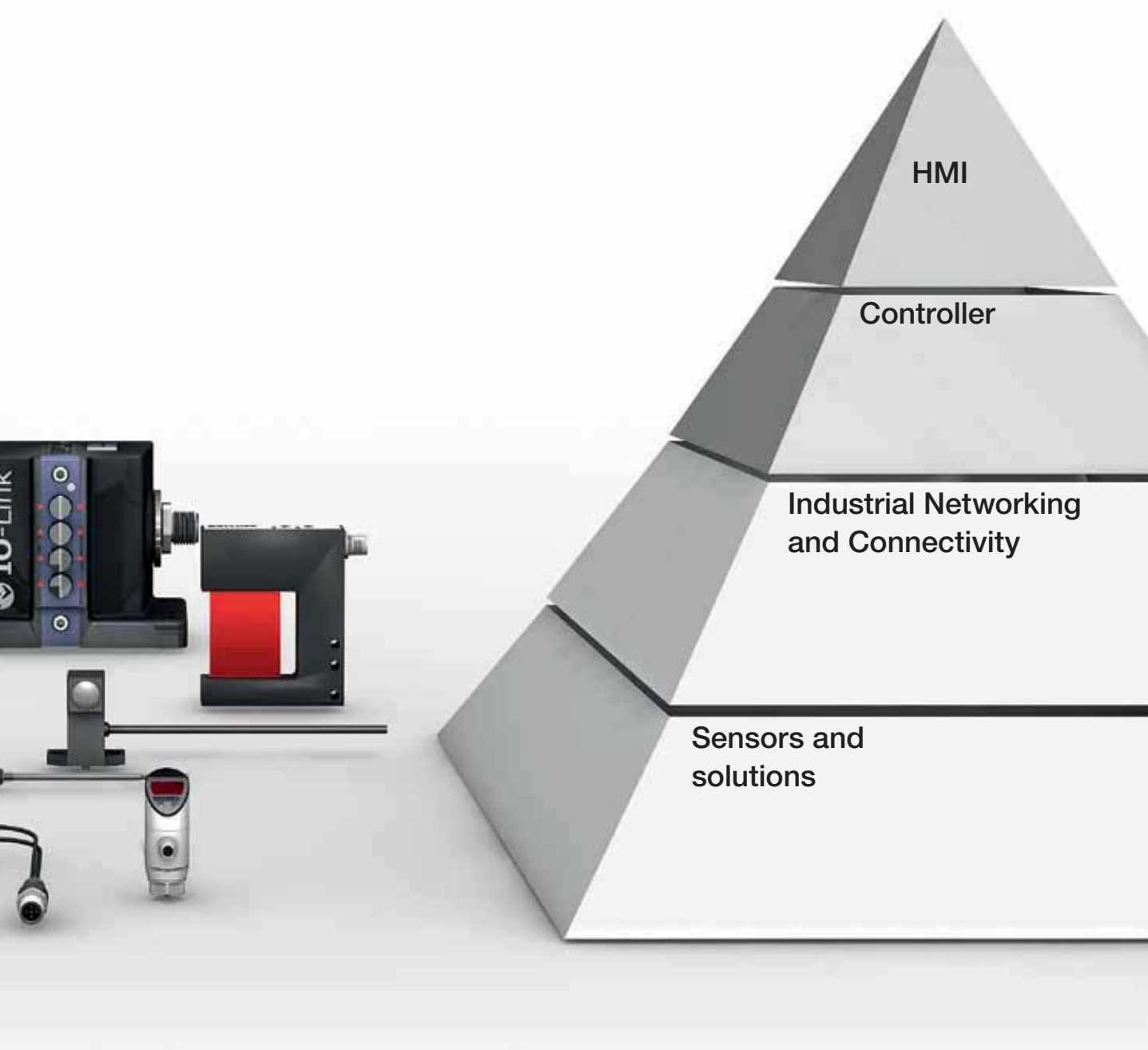
Sensor Solutions

For every application

Object Detection, Linear Position Sensing and Measurement, Condition Monitoring and Fluid Sensors, Accessories:

Inductive sensors, capacitive sensors, magnetic sensors, photoelectric sensors, mechanical sensors, ultrasonic sensors, inductive distance sensors, magneto-inductive displacement sensors, Micropulse transducers, photoelectric distance sensors, magnetically coded position and angle measurement systems, inductive positioning systems, inclination sensors, pressure sensors, mechanical accessories, electrical accessories





Up-to-date data

Global online availability

■ Product overview



■ 2D and 3D product data



■ Current information at a glance



■ The company

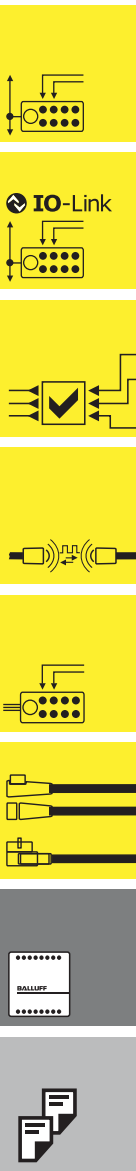


■ Service and support



■ We are happy to help





Matrix



Special features	8 ports 4x IO-Link				8 ports 8 ports 8 ports 8 ports		8 ports 4x P111 interface 8 ports 4x P111 interface		5 ports 4x RFID interface 1x IO-Link		4 ports 4x IO-Link		4 ports 4x IO-Link					
Modules	BNI005R BNI0047 BNI005C BNI0057				BNI0064 BNI0065		BIS00T3		BNI004N		BNI004P							
No. of ports	8				8				4		4							
Max. inputs	16				16				8		4							
Max. outputs	16				16				8		4							
Configurable max. inputs/outputs	16				16													
Analog input U/I					4													
IO-Link ports, max.	4								1		4		4					
IO-Link version	1.1								1.1		1.1		1.1					
Page	22		23		23		23		24		24		185		26		27	



Special features	8 ports 4x IO-Link					8 ports 8 ports 8 ports 8 ports 8 ports						8 ports 8 ports 8 ports 8 ports 8 ports 8 ports 4 ports												
Modules	BNI005A BNI0001 BNI0002 BNI0003 BNI0004					BNI0077						BNI004A BNI006A BNI004F BNI004M BNI005J BNI0044												
No. of ports	8					8						8												
Max. inputs	16					16						16												
Max. outputs	16					16						16												
Configurable max. inputs/outputs	16					16						16												
IO-Link ports, max.	4					8						8												
IO-Link version	1.1					1.1						1.1												
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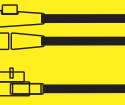
PROFI
NET



CC-Link



IO-Link



	8 ports 8x IO-Link	8 ports 4x IO-Link	8 ports	8 ports	8 ports	16 ports 16x IO-Link	8 ports 8x IO-Link, bus connection copper	8 ports 8x IO-Link, bus connection fiber optics	8 ports 4x IO-Link	8 ports	8 ports	8 ports	8 ports	8 ports	
	BNI005H	BNI004U	BNI0052	BNI0053	BNI005F	BNI005K	BNI007M	BNI007K	BNI007J	BNI0040	BNI0049	BNI002F	BNI002A	BNI002C	BNI002E
	8	8	8	8	8	8	16	8	8	8	8	8	8	8	8
	16	16	16	16	8	8	32	16	16	12	16	16	16	8	
	16	16	16		8	8	32	16	16	12		16	16	8	8
	16	16	16							12		16	16		
	8	4					16	8	8	4					
	1.1	1.1					1.1	1.1	1.1	1.1					
	34	35	35	35	35	35	37	39	39	44	44	45	45	45	45



Unmanaged
Switch



	8 ports	16 ports	16 ports	8 ports	8 ports	8 ports	Unmanaged	Unmanaged	Unmanaged	Unmanaged
	BNI0014	BNI0018	BNI0019	BNI0015	BNI0016	BNI0017	BNI000F	BNI005E	BNI0067	
	8	16	16	8	8	8	0	5	8	
	16	32	16			8				
			16	8	16	8				
	66	67	66	67	67	67	82	83	83	

Matrix



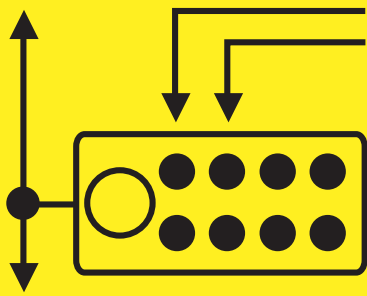
IO-Link

Special features	M8, 3-pin, input	M8, 3-pin, input	M8, 3-pin, input	M8, 3-pin, input	M8, 4-pin, input	M8, 4-pin, input	M12, metal, input	M12, metal, NPN, input	M12, metal, input	M12, metal, input	M12, metal, NPN, output	M12, metal, NPN, output	M12, metal, configurable	M12, metal, configurable	M12, metal, configurable	M12, metal, configurable		
Sensor hubs	BNI000P	BNI001W	BNI000R	BNI001Y	BNI0021	BNI0022	BNI0032	BNI0063	BNI005P	BNI0039	BNI003T	BNI0062	BNI0061	BNI003C	BNI003U	BNI003A	BNI0048	BNI0035
No. of ports	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Max. inputs	4	4	8	8	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Max. outputs														16	16	16	16	16
Configurable max. inputs/outputs														16	16	16	16	16
Analog input I																		
Analog input U																		
Analog output I																		
Analog output U																		
IO-Link version	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0
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IO-Link

Type	USB IO-Link master	Device tool software	SmartLight	IO-Link valve terminal connection	Universal IO-Link connection	Valve terminal connectors	Through-beam fork sensors	Diffuse sensors	Laser distance sensors
IO-Link version	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
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Fieldbus Systems

Fieldbus systems in industrial automation



PROFI®
BUS

PROFI®
NET

CC-Link

DeviceNet™

EtherNet/IP™

EtherCAT®

Overview of Fieldbus Systems

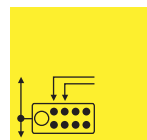
Profibus

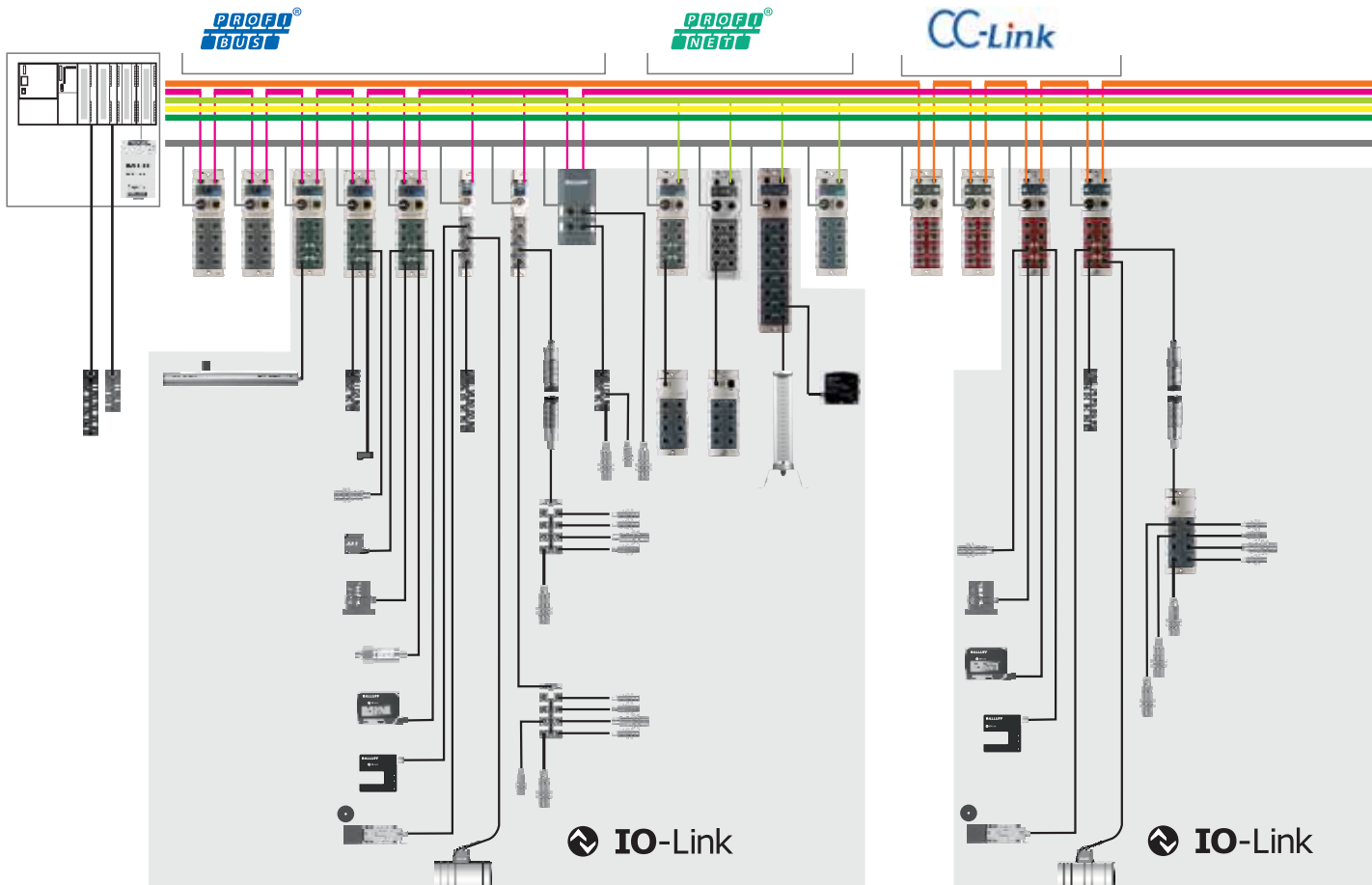
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IO-Link Modules
Modules

Profinet

Product Topology
IO-Link Modules
Module
Master BNI 16 IO-Link-Ports
Push-Pull-Module

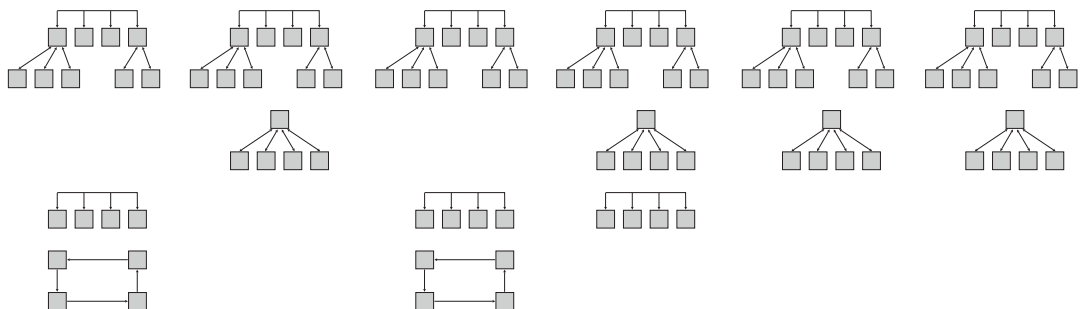
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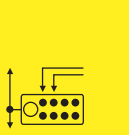
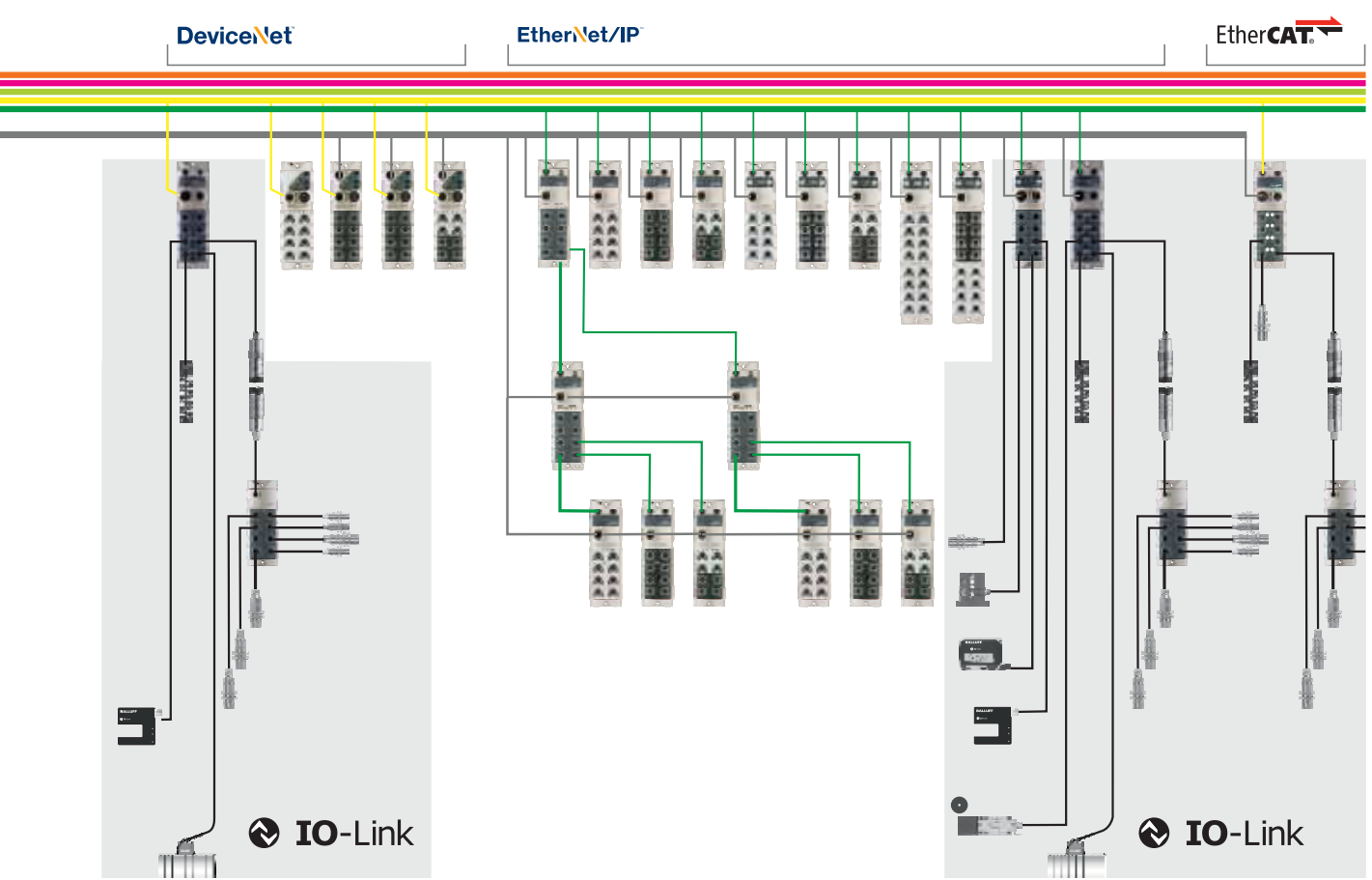




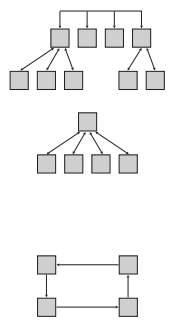
Bus systems in industrial automation

Network	Profibus	Profinet	CC-Link	DeviceNet	Ethernet	Ethernet/IP
Number of nodes	126	No limit	64	64	No limit	No limit
Cable	2-wire	4-wire, twisted	3-wire	5-wire	4-wire, twisted	4-wire, twisted
Transmission rate	9.6 kbs to 12 Mbs	10 Mbs 100 Mbs 1000 Mbs	156 kbs 625 kbs 2500 Mbs	125 kbs 250 kbs 500 kbs	10 Mbs 100 Mbs 1000 Mbs	10 Mbs 100 Mbs 1000 Mbs
Termination	2 terminating resistors on one of the two ends	Not necessary	1 terminating resistor at each end	1 terminating resistor at each end	1 terminating resistor at each end	Not necessary
Power supply	Separate	Separate	Separate	Via network cable	Separate	Separate
Maximum length	1200 m	100 m	1200 m	500 m	100 m	100 m

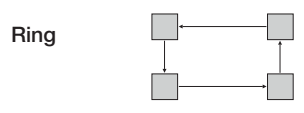
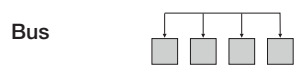
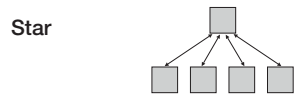
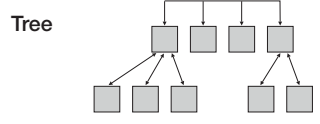




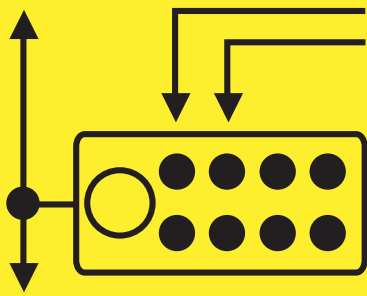
EthernetCAT
No limit
4-wire, twisted
10 Mbs
100 Mbs
1000 Mbs
Not necessary
Separate
100 m



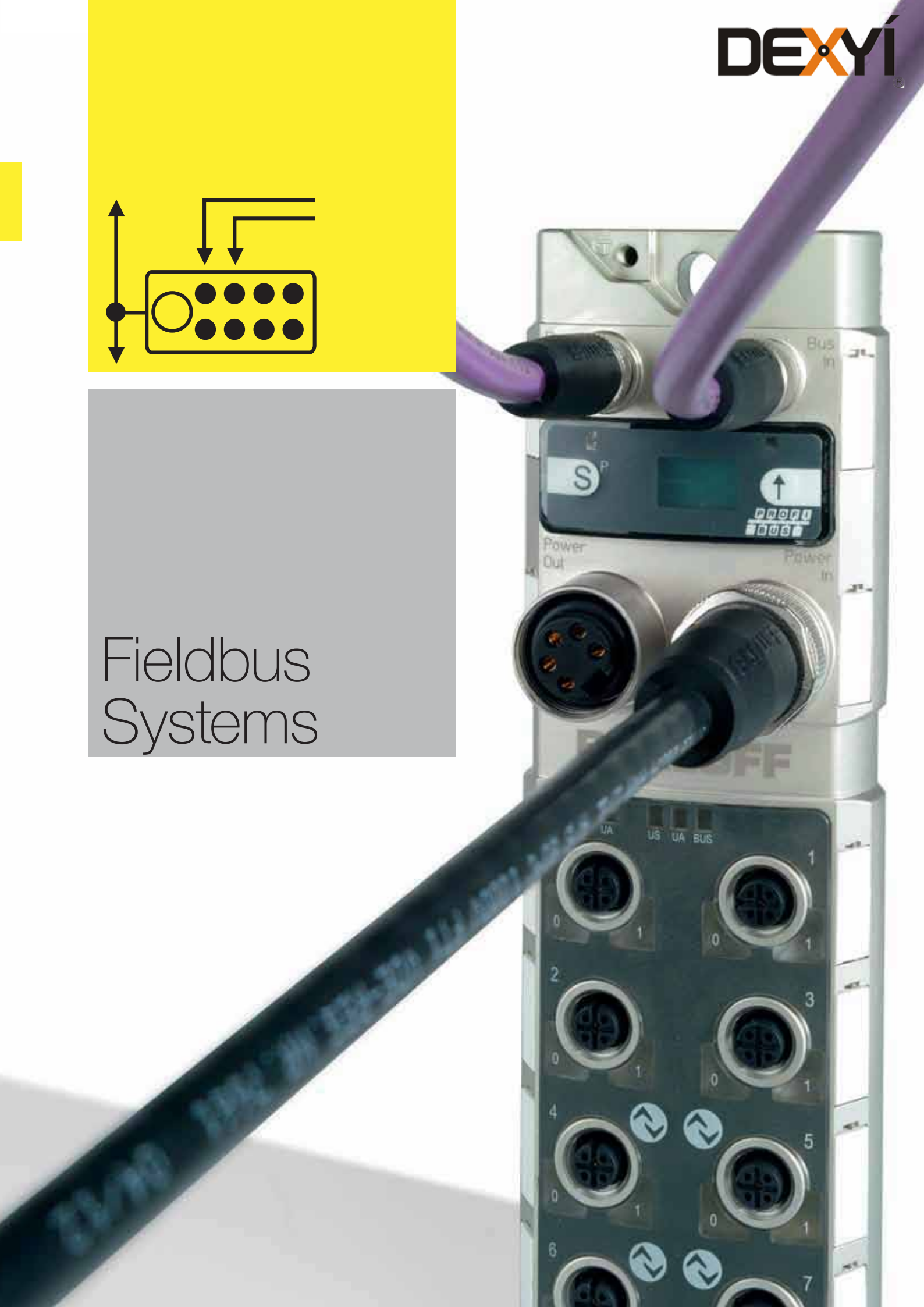
Bus topologies

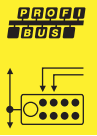


Benefits +	Disadvantages -
<ul style="list-style-type: none"> ■ Minimum wiring effort ■ Each node has its own connection ■ Good visual implementation ■ Simple wiring ■ Extended networks possible 	<ul style="list-style-type: none"> ■ Active/passive couplers may be necessary ■ Total length may be excessive in some cases ■ Complex star couplers ■ Communication only via star coupler ■ Electrical compromise when bus termination used ■ Limited number of bus nodes and bus length ■ Failure of one node means complete failure of the network



Fieldbus Systems





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Fieldbus System: Profibus

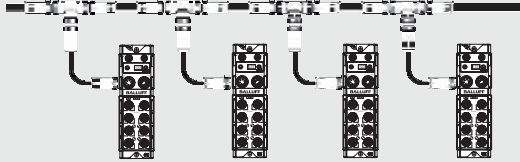
In use for years, Profibus stands for well-engineered fieldbus technology and reliably supports modern manufacturing. As a full-service provider, Balluff offers a wide range of components for optimum Profibus use. Regardless of controller manufacturer, Balluff has the perfect solution in store for you: for efficient field and process communication with simple wiring and fast integration through direct installation in your system and the possibility of fast modifications. Even in harsh environments.

Balluff Profibus solutions are IO-Link capable, allowing you to take advantage of solid IO-Link benefits. Wiring is made even simpler. Integrated diagnostics prevent system failure, and the central configuration quickly returns systems to operation. You save time and benefit from real cost advantages.

In addition, Profibus offers investment security, since standard IEC 61158/EN 50170 simplifies expansion of your system. With mature connection technology, Balluff contributes to increased efficiency and growing cost savings.

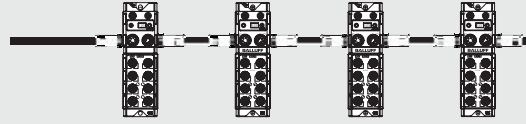
Trunk and drop

- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs



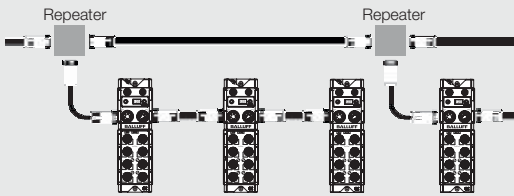
Connected in series

- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer wiring components



Mixed topology

- Creation of logical groups results in relatively simple troubleshooting
- Popular method – ideal cost/benefit ratio



The best I/O modules in the industry

Impressive features. Impressive functionality. Impressive performance

Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.



Powerful and reliable outputs

With an output current of up to 2 A, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.



Display

A firmly entrenched part of the module is a display that can be locked via the PLC, which prevents unauthorized access. Two LEDs controlled by the PLC allow you to visualize results that are not specific to the module or port at the location where they occur.

Inputs with high density

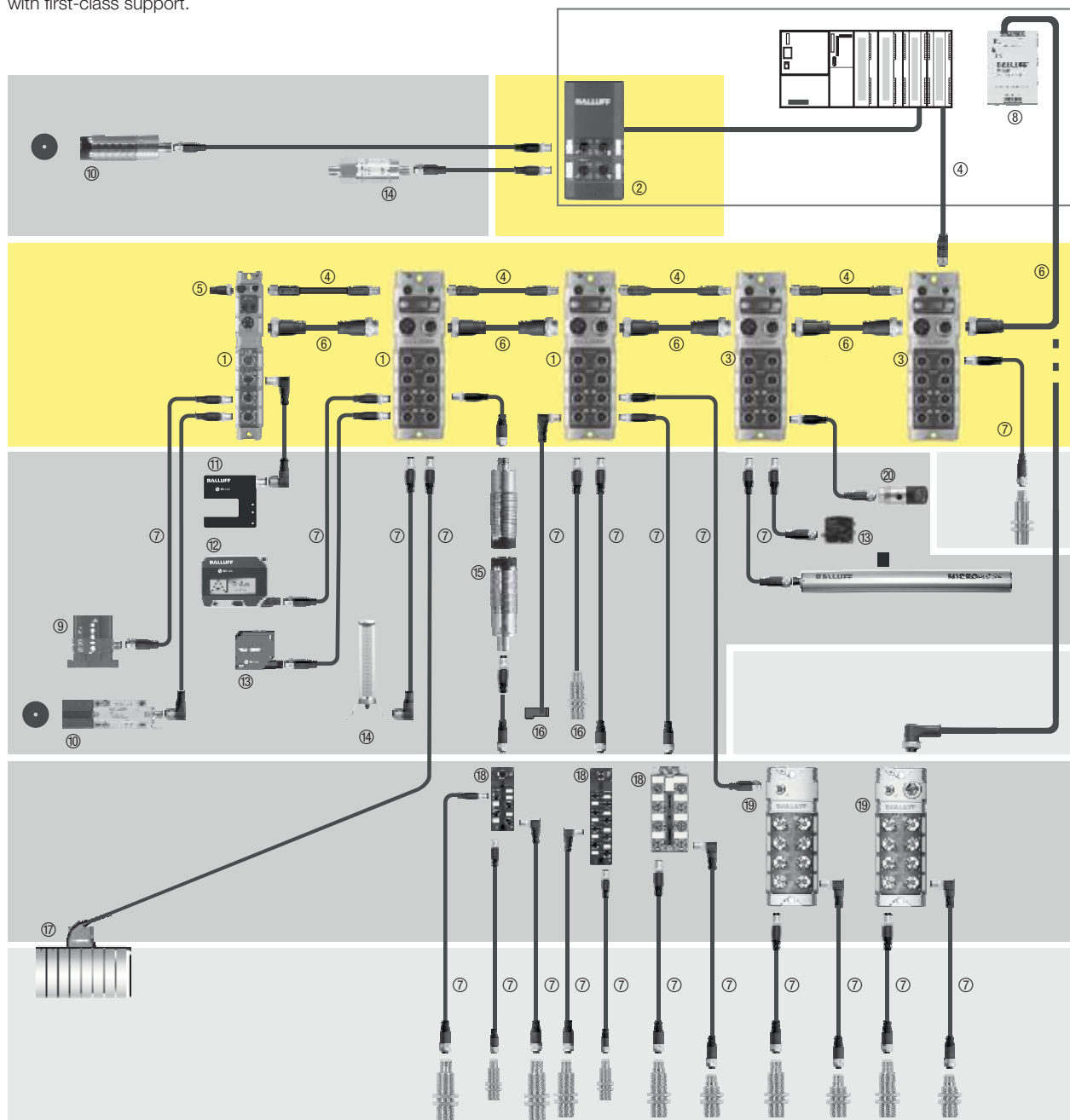
All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter.

Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.



High-quality connectors and compatible accessories are required to create an efficient Profibus system. Balluff offers all the components you need for optimally setting up a Profibus network and providing it with first-class support.



Fieldbus Systems

Profibus
Product
Topology
IO-Link Modules

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

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- ② Profibus IO-Link Panel Module BNI Page 27
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- ④ Bus Cable BCC Page 87
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IO-Link

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More user-friendly

The Balluff Profibus interface ensures optimum operation of IO-Link modules as well as acyclical operation of Profibus DP V1.

The module includes four IO-Link master ports that can be configured and used fully independently of one another. All IO-Link ports support COM1, COM2, COM3 (3-wire only) as well as SIO mode.

The IO-Link ports also include an additional input or input/output via pin 2. This means that SIO mode also enables the connection of complementary NO/NC and DESINA sensors.

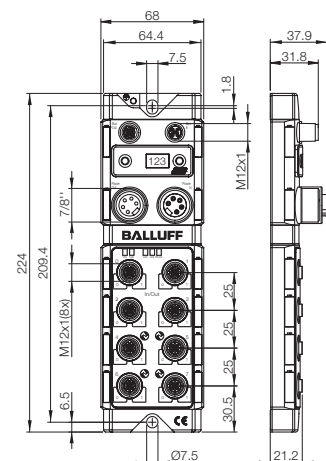
You get four additional standard IO ports with eight inputs or eight freely configurable inputs/outputs for standard sensors and actuators up to 2 A.

In addition to time savings and considerable cost savings, it provides even greater ease of operation. Balluff provides Profibus modules with a display that you can use to set station numbers or call up module information such as the hardware and software status. This increases security and simplifies maintenance.



Fieldbus	Profibus
Type	4x IO-Link, 16x DI/DO
	BNI005R
Supply voltage U_B	18...30 V DC
Indicator/input	BUS/RUN
Function indicator	Display/pushbutton
Module status indicator: Mod LED	yes
Network status indicator: Net LED	yes
Port status indicator	Black, red, yellow
Fieldbus connection	M12, B-coded, socket/plug
AUX power connection	7/8", male, 5-pin
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	8
Number of inputs	max. 16 PNP
Number of outputs	max. 16 PNP
Configurable inputs/outputs	yes
Max. load current, sensors/channel	200 mA
Max. load current, output	1.6 A/2 A
Port status indicator (signal status)	Yellow LED
Port diagnostic indicator (overload)	Red LED
Total actuator current	≤ 9 A
Total sensor current	≤ 9 A
Enclosure rating per IEC 60529	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C
Storage temperature	-25...+70 °C
Fastening	2 mounting holes
Dimensions (LxWxH)	224x68x37.9 mm
Housing material	Nickel-plated GD-Zn

IO-Link		Version 1.1
No. of IO-Link master ports		4x master
Operating modes (3-wire)		SIO, COM 1, COM 2, COM 3
Displays	Communication	Green LED
	Error	Red LED
Max. load current IO-Link device		1.6 A



All modules include four screw plugs and a label set.



Fieldbus
Systems

Profibus
Product
Topology
IO-Link Modules
Modules

Profinet

CC-Link

DeviceNet

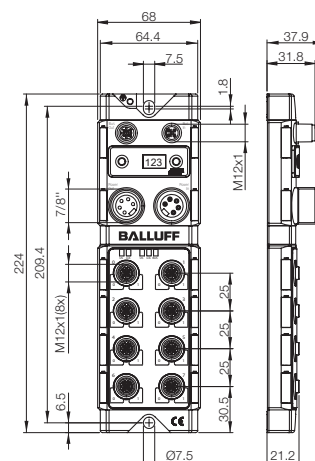
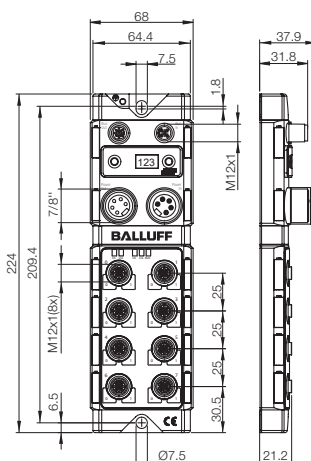
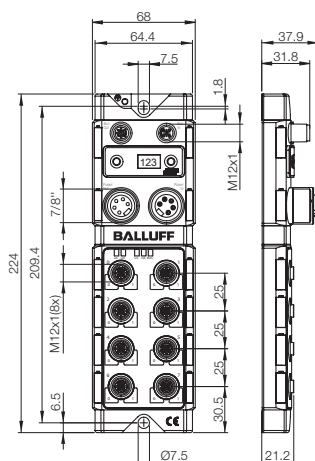
Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

Profibus	Profibus	Profibus
16x DI/DO, configurable	16 DI	8 DO
BNI0047	BNI005C	BNI0057
18...30 V DC	18...30 V DC	18...30 V DC
BUS/RUN	BUS/RUN	BUS/RUN
Display/pushbutton	Display/pushbutton	Display/pushbutton
yes	yes	yes
yes	yes	yes
Black, red, yellow	Black, red, yellow	Black, red, yellow
M12, B-coded, socket/plug	M12, B-coded, socket/plug	M12, B-coded, socket/plug
7/8", male, 5-pin	7/8", male, 5-pin	7/8", male, 5-pin
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8
max. 16 PNP	16 PNP	8 PNP
max. 16 PNP		8 PNP
yes	no	no
200 mA	200 mA	
2 A		2 A
Yellow LED	Yellow LED	Yellow LED
Red LED	Red LED	Red LED
≤ 9 A		≤ 9 A
≤ 9 A	≤ 9 A	
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes
224x68x37.9 mm	224x68x37.9 mm	224x68x37.9 mm
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn



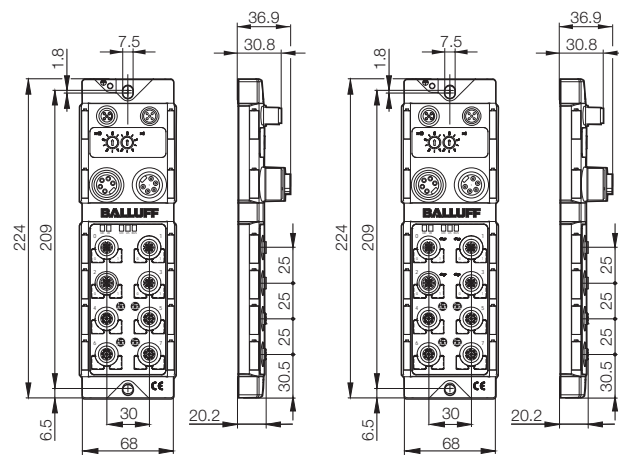
In metal housing

Profibus modules P111 are designed for connecting Micropulse transducers, the robust position measurement systems for extreme ambient conditions that can be used universally. Thanks to their durable metal housing, Profibus modules P111 meet the highest mechanical requirements and are ideally suited for use in the harsh industrial environment. The modules are fitted with four interdependent ports for Micropulse transducers BTL. A maximum of 16 position encoders can be used per BTL port. With a maximum rated length of 7620 mm. Four additional ports can be configured with digital or analog sensors, depending on the version.

You can achieve maximum functionality and cost efficiency for fieldbus integration by combining Micropulse transducers BTL with Profibus modules P111.



Fieldbus	Profibus	Profibus
Type	4x P111, 8x DI	4x P111, 4x AI (0...10 V/4...20 mA)
	BNI0064	BNI0065
Supply voltage U_b	18...30 V DC	18...30 V DC
Function indicator	BUS RUN	BUS RUN
Fault function indicator	Red LED	Red LED
Power-on indicator	U_A , U_S , undervoltage	U_A , U_S , undervoltage
Fieldbus connection	M12, B-coded	M12, B-coded
Supply voltage connection	7/8", 5-pin, female and male	7/8", 5-pin, female and male
Connection: I/O ports	M12, A-coded, 5-pin, female	M12, A-coded, 5-pin, female
Connection: P111 port	M12, A-coded, 8-pin, female	M12, A-coded, 8-pin, female
No. of I/O ports	8	8
No. of digital inputs	8 PNP	
No. of analog inputs		4 (0...10 V/4...20 mA)
Resolution		16-bit
No. of P111 inputs	4	4
Max. load current, sensors/channel	1 A	1 A
Port status indicator (signal status)	Yellow LED	Yellow LED
Port diagnostic indicator (overload)	Red LED	Red LED
Total sensor current	9 A	9 A
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	0...+70 °C	0...+70 °C
Weight	Approx. 735 g	Approx. 735 g
Fastening	2 mounting holes	2 mounting holes
Dimensions (LxWxH)	224x68x36.9	224x68x36.9
Housing material	Nickel-plated GdZn, matt finish	Nickel-plated GdZn, matt finish



All modules include four screw plugs and a label set.



Profibus
**P111 module for the cost-effective integration of
 Micropulse transducers BTL**

**PROFI
 BUS**



Fieldbus
 Systems

Profibus
 Product
 Topology
 IO-Link Modules
 Modules

Profinet

CC-Link

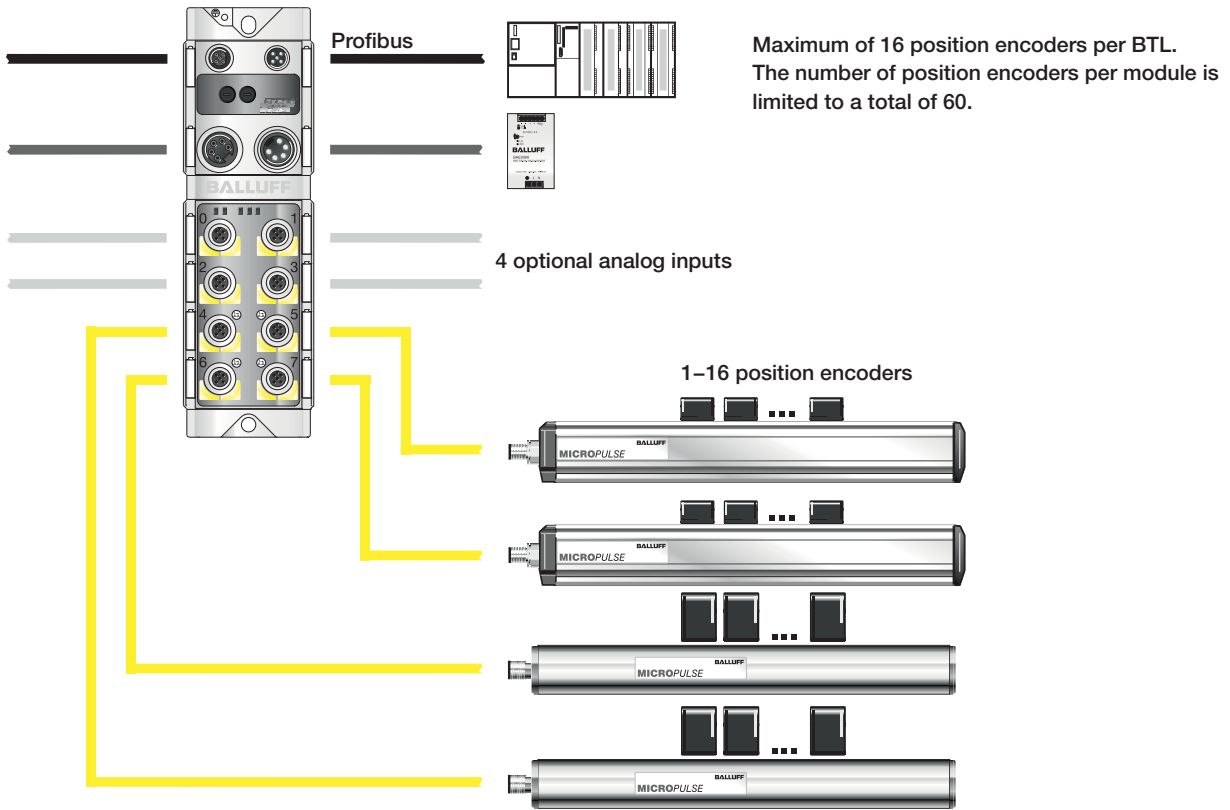
DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
 Switches

Connectors and
 Accessories



IO-Link master for tight spaces – robust and compact

The Profibus IO-Link master is the first choice for tight spaces and applications where there is dust, water, oils, or a risk of mechanical damage. The slim splitter in the rugged metal housing is particularly durable.

With its small size and versatility, it is well-suited for IO-Link-capable sensors, such as pressure or distance sensors. Or if you want to connect sensor hubs, operating panels or actuators (valve cluster units). For the perfect connection of mini-masters we provide compact, molded mini-plug connectors.

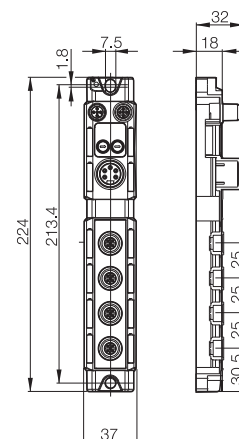
The Profibus IO-Link master is available with two or four IO-Link interfaces. which means you can connect up to 68 sensors in combination with IO-Link sensor hubs.

Unused IO-Link ports can be used as standard inputs or outputs. Thus, the system is used to its fullest when space is at a premium.



Fieldbus	Profibus DP
IO-Link	Master
Type	4× IO-Link ports, max. 8 DI/DO
BNI004N	
Supply voltage U_B	18...30 V DC
Function indicator	BUS RUN
Power-on indicator	U_A , U_S , undervoltage
Fieldbus connection	M12, B-coded
Supply voltage connection	7/8"
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	4
No. of IO-Link ports	Max. 4
Number of inputs	max. 8 PNP
Number of outputs	max. 8 PNP
Configurable	yes
Max. load current, sensors/channel	200 mA
Max. load current, output	≤ 1.6 A
Port status indicator	Yellow LED
Port diagnostic indicator	Short-circuit/overload: red LED
Total actuator current	≤ 9 A
Total sensor current	≤ 9 A
Enclosure rating per IEC 60529	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C
Storage temperature	-25...+70 °C
Weight	Approx. 355 g
Fastening	2 mounting holes
Dimensions (L×W×H)	224×37×32 mm
Housing material	Nickel-plated GD-Zn

IO-Link	Version 1.1
No. of IO-Link ports	4× master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Communication indicator	Green LED
Error indicator	Red LED
Max. load current IO-Link device	≤ 1.6 A

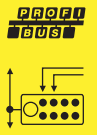


The outer diameter of field-attachable connectors may not exceed 19 mm!
We recommend using:
1 field-attachable connector and
1 molded plug connector or 2 molded plug connectors.

All modules include four screw plugs and a label set.

IO-Link panel module for simple commissioning

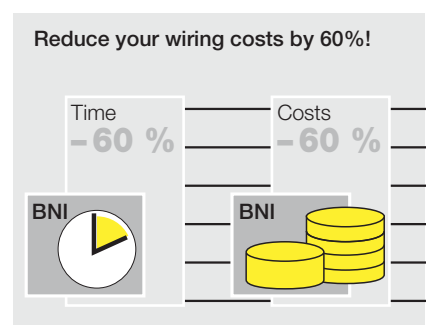
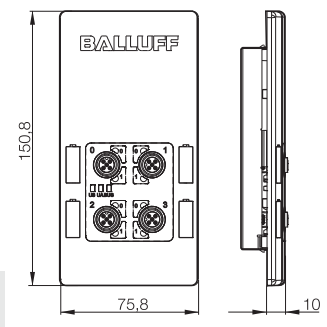
Not only are installation and commissioning simplified with the Profibus IO-Link panel module, but wiring is also cost-effective. Developed for small to mid-sized machines and systems, it is ideal for centralized wiring concepts and, with IO-Link sensor hubs, satisfies the demand for modular construction. Now the machine and equipment can be checked before they leave the plant and commissioned on-site with no additional wiring. The IO-Link panel module is particularly interesting where expensive connectors would otherwise be needed for routing the cables. The module provides four IO-Link ports on the outer panel. Simply connect IO-Link sensor hubs or IO-Link capable sensors here to create efficient, cost-effective connections using standard cables. The power supply and Profibus interface are connected to the inner panel. Another feature: a separate actuator power supply. This allows actuators such as hydraulic valves / pneumatic valve cluster units to be turned off separately.



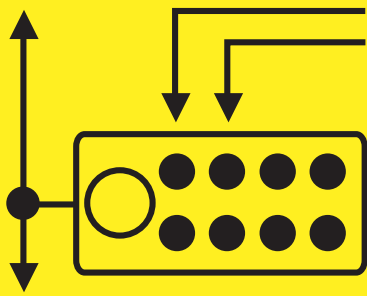
- Fieldbus Systems
- Profibus Product Topology
- IO-Link Modules**
- Profinet
- CC-Link
- DeviceNet
- Ethernet/IP
- EtherCAT
- Unmanaged Switches
- Connectors and Accessories

Fieldbus	Profibus DP
Type	4x IO-Link, max. 4 DI
	BNI004P
Supply voltage U_B	18...30.2 V DC
Net function indicator	Green LED
Fault function indicator	Red LED
Power-on indicator	Sensor module
Fieldbus connection	SUB-D, 9-pin
Supply voltage connection	Spring terminals
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	4
No. of IO-Link ports	Max. 4
Number of inputs	Max. 4 PNP
Number of AUX power ports	Max. 4
Configurable	yes
Max. load current, sensors/channel	1.6 A
Max. load current auxiliary power/channel	3 A
Port status indicator (signal status)	Yellow LED
Port diagnostic indicator (overload)	Red LED
Total sensor current	≤ 9 A
Enclosure rating per IEC 60529	IP 54 (fitted in panel)
Operating temperature T_a	-5...+55 °C
Storage temperature	-25...+70 °C
Weight	Approx. 130 g
Fastening	4 mounting holes
Dimensions (WxH)	150.8x75.8 mm
Lead-in dimensions	112x46 mm

IO-Link	Version 1.1
No. of IO-Link ports	4x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Communication indicator	Green LED
Error indicator	Red LED
Max. load current IO-Link device	≤ 1.6 A



All modules include four screw plugs and a label set.



Fieldbus Systems

Fieldbus System: Profinet

With Profinet, industrial automation has made a significant advancement. Profinet operates on an Ethernet basis and is considerably faster than Profibus. Other advantages: Profinet can be fully integrated from the control level to the drive. Even in harsh environments. With Profinet, you also directly link drives and safety technology to the network environment.

You can also combine Profinet with Profibus with no additional work. Connecting is also extremely simple with IO-Link. This ensures freedom of installation and guarantees simplified wiring, integrated diagnostics and central configuration. Time savings and tangible cost benefits included. Thus, you help to ensure improved process quality through connectivity.



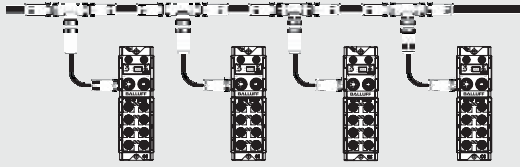


Product Topology	30
IO-Link Modules	34
Modules	35
Master 16 IO-Link-Ports	36
Push-Pull Module	38



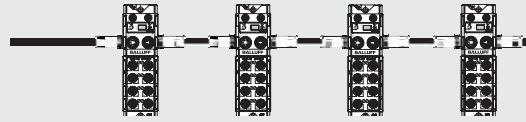
Trunk and drop

- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs



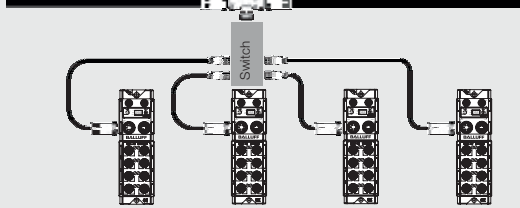
Connected in series

- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer wiring components



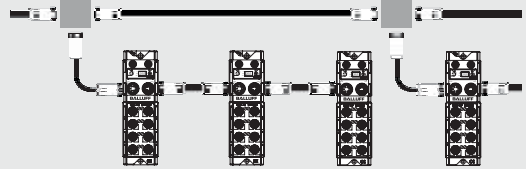
Star

- Simple troubleshooting
- Ideal for large I/O clusters
- Less expensive – only one splitter box needed



Mixed topology

- Creation of logical groups results in relatively simple troubleshooting
- Popular method – ideal cost/benefit ratio



Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.

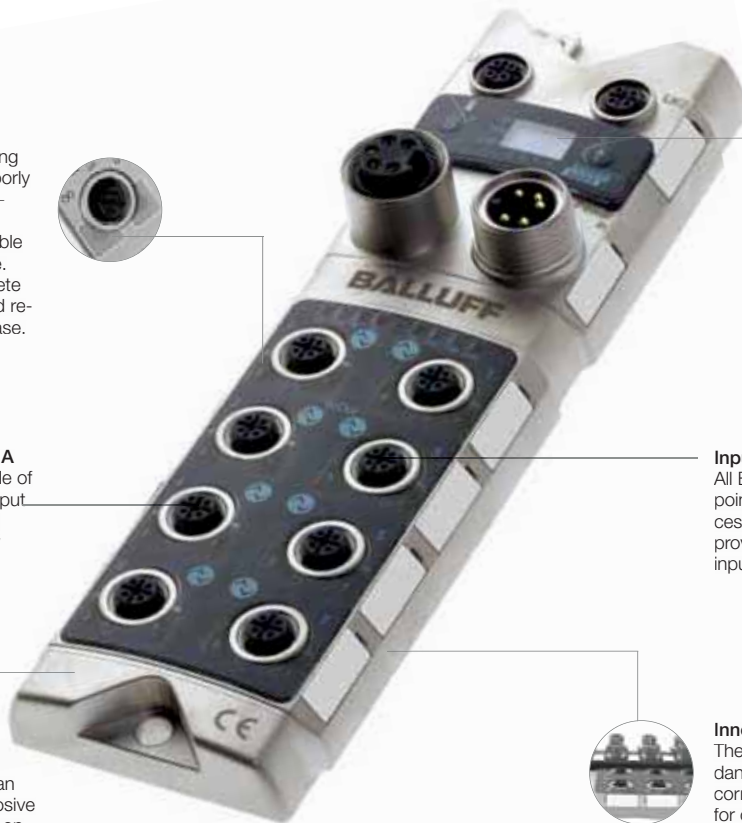


Powerful and reliable outputs

With an output current of up to 2 A Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.



Display

The display is a fixed component of the module. Two LEDs controlled by the PLC allow you to visualize results that are not specific to the module or port at the location where they occur.

Inputs with high density

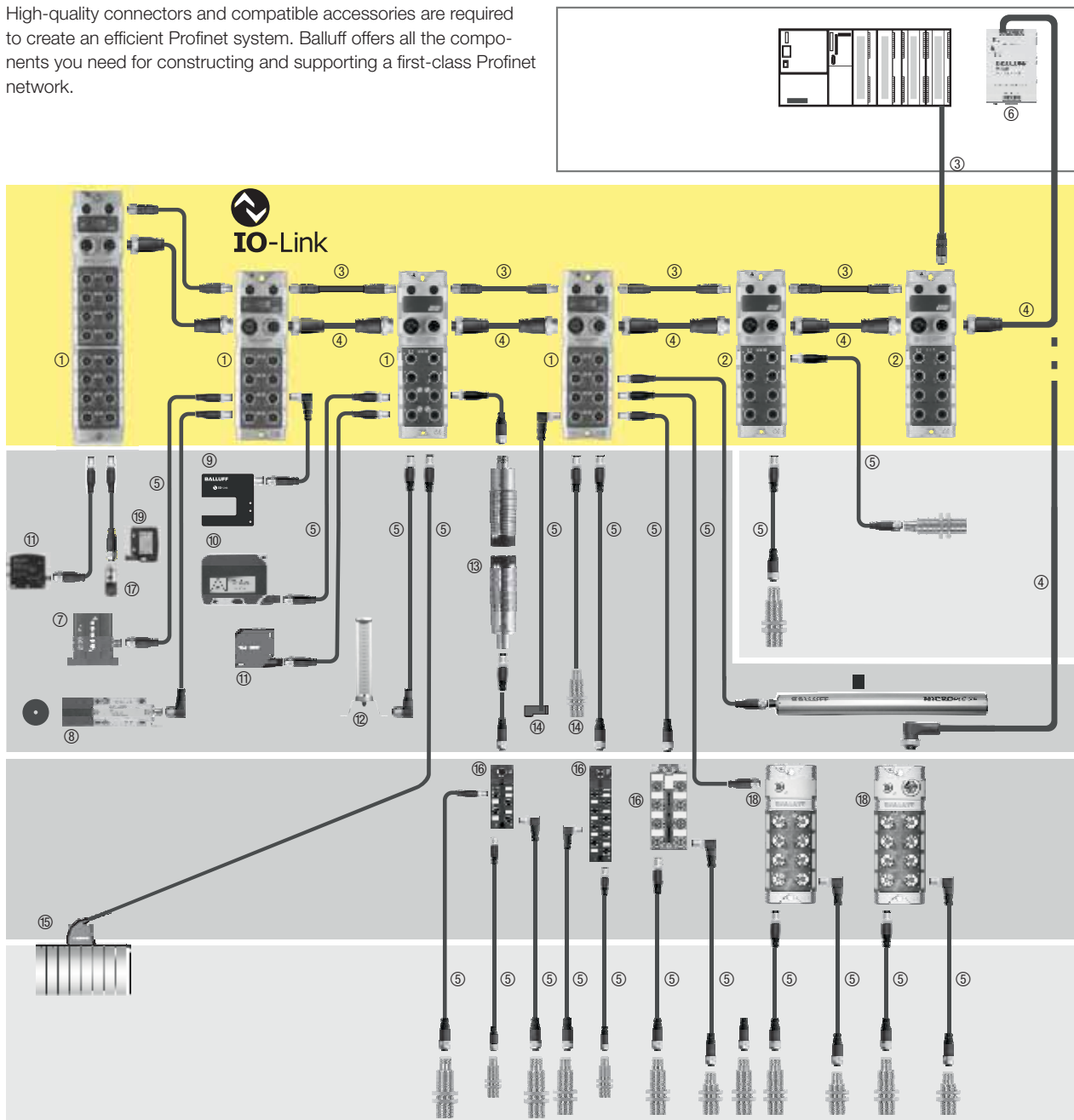
All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter. Pin 2 can also provide a DESINA input.


Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.



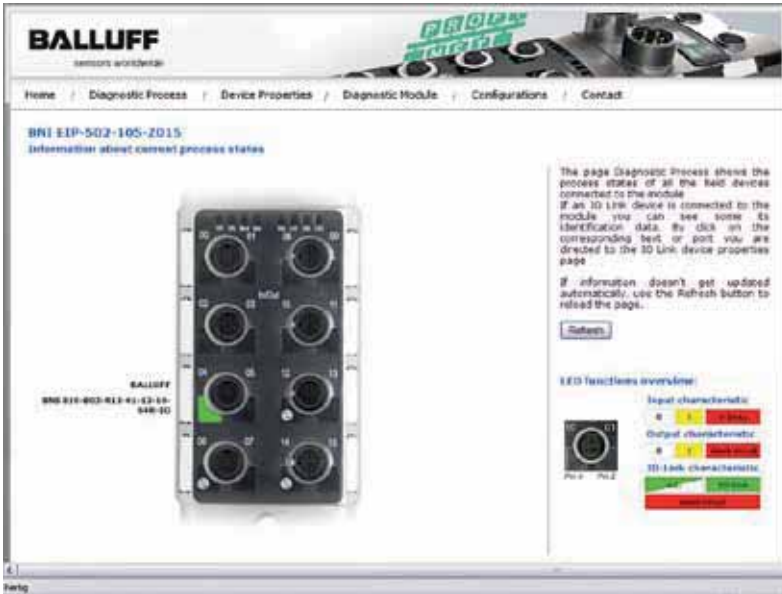
High-quality connectors and compatible accessories are required to create an efficient Profinet system. Balluff offers all the components you need for constructing and supporting a first-class Profinet network.



-  Fieldbus Systems
- Profibus
- Profinet
Product Topology
IO-Link Modules
Modules
- CC-Link
- DeviceNet
- Ethernet/IP
- EtherCAT
- Unmanaged Switches
- Connectors and Accessories

IO-Link

- | | | | |
|-------------------------------|-------------|--|---------------|
| ① Profinet-IO-Link Module BNI | Page 34, 36 | ⑦ IO-Link Multiple Position Switches BNS | Page 173 |
| ② BNI Profinet Modules | Page 35 | ⑧ IO-Link RFID System BIS | Page 186 |
| ③ Bus Cable BCC | Page 95 | ⑨ IO-Link Through-beam Fork Sensor BGL | Page 165 |
| ④ Power Cable BCC | Page 351 | ⑩ IO-Link Laser Distance Sensor BOD | Page 167 |
| ⑤ Connection Cable BCC | Page 318 | ⑪ IO-Link Color Sensor BFS | Page 168, 169 |
| ⑥ Power Supplies BAE | Page 427 | ⑫ IO-Link SmartLight BNI | Page 135 |
| | | ⑬ IO-Link Inductive Couplers BIC | Page 238 |
| | | ⑭ IO-Link Inductive Distance Sensor BAW | Page 176 |
| | | ⑮ IO-Link Valve Terminal Connector BNI | Page 163 |
| | | ⑯ IO-Link Sensor Hub, plastic | Page 138, 150 |
| | | ⑰ IO-Link Pressure Sensor | Page 193 |
| | | ⑱ IO-Link Sensor Hub, metal | Page 143 |
| | | ⑲ IO-Link BOS | Page 166 |

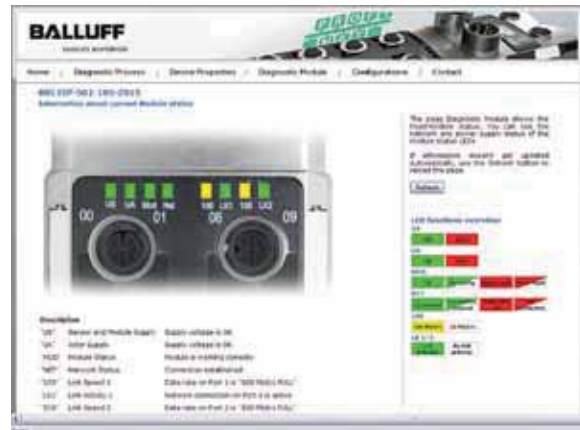


Web server

For anyone that prefers a web interface, the Profinet modules from Balluff have an easily integrated web server. This web page can be used to program the module addresses and configure several of the user-defined functions.



A simple browser provides immediate access to the integrated web server, which has been implemented in all Profinet modules.



Extensive diagnostics functions are available here, such as displaying all module LEDs, including all representations in plain text.



In the "Device Properties" area you have the option, for example, of configuring devices connected to the IO-Link port.



The module configuration, such as assigning or displaying the IP address, is concealed behind the "Configurations" function.

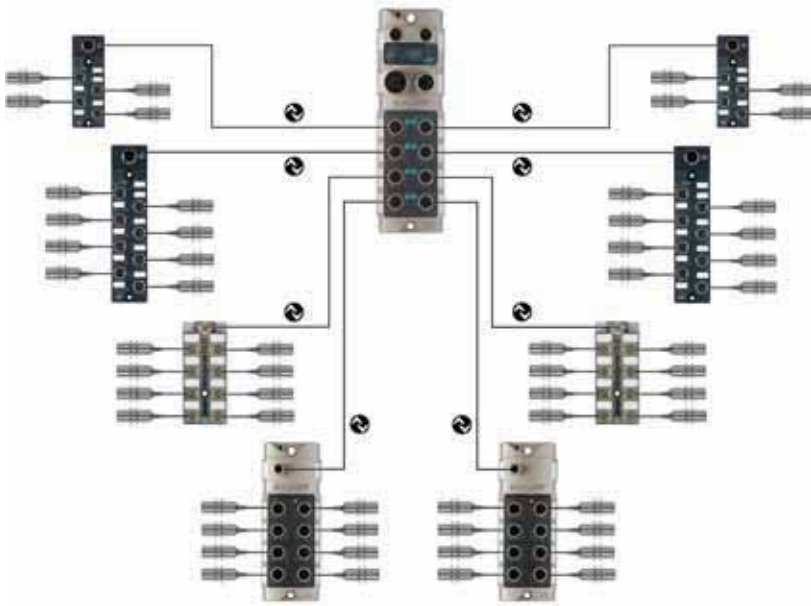
136 IOs on a module

Balluff IO-Link solutions save money

Previously, at least nine fieldbus modules had to be used for the capability of activating 136 IOs. Today, a single Profinet module is all you need.

In connection with the extremely cost-effective sensor/actuator hubs from Balluff, now up to 136 IO signals are offered which can be processed very efficiently. In this way, compared to the standard

fieldbus modules, there is a high cost savings of 15 to 20% per input. If you add the savings from the fieldbus and power cables to that, you get 30 to 40%. A cost-effective M12 standard cable BCC is sufficient to switch on a sensor/actuator hub. Furthermore, sensor hubs need just one bus address, can variably group sensor signals together within an area of 20 m and ensure exceptional efficiency.



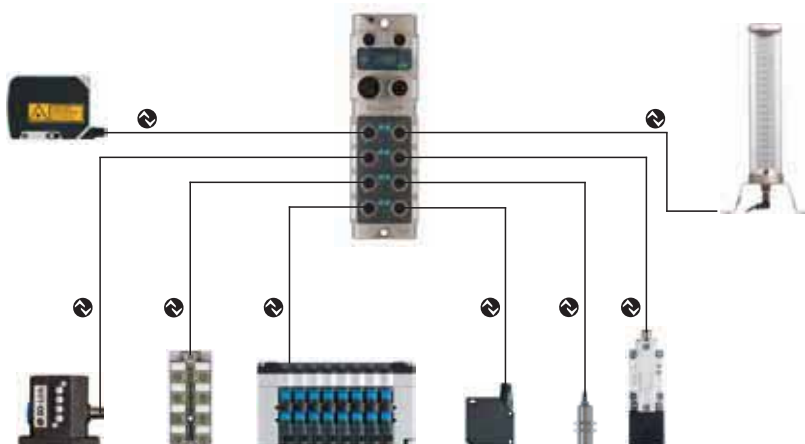
1000 tasks, one module:

The Profinet module with eight IO-Link ports

Whether position measurement, object detection, identification, fluid sensor applications, temperature or pressure measurement: through IO-Link, the Profinet module is suitable for every job.

IO-Link not only has advantages for installing standard sensors, but also can integrate intelligent devices via the same interface. With that, the module provides a uniform interface from the signal to the control level.

There are frequently high costs associated with field installation of intelligent devices, since shielded cables and intelligent interface cards such as analog input cards are used in the controllers. IO-Link not only makes error-prone analog inputs unnecessary, but also reduces the wiring, inspection and hardware effort. With simple plug-and-play of unshielded, cost-effective M12 lines, the system is quickly and securely brought into operation.



- PROFINET
- Fieldbus Systems
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- IO-Link Modules
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Fieldbus
Systems

Profibus

Profinet

Product
Topology

IO-Link Modules

Modules

CC-Link

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Ethernet/IP

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Accessories



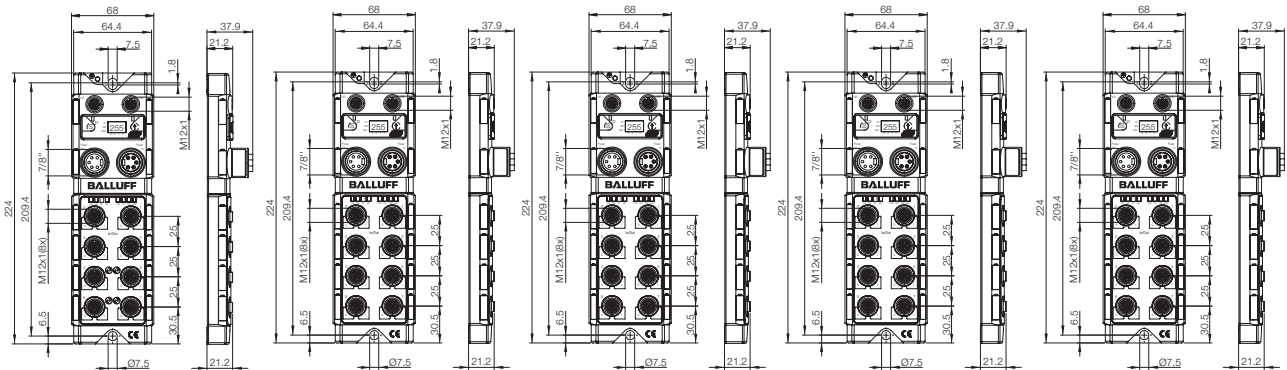
IO-Link



Profinet	Profinet	Profinet	Profinet	Profinet
4x IO-Link, 16x DI/DO	16x DI/DO, configurable	16 DI	8 DO	8 DI/8 DO
BNI004U	BNI0052	BNI0053	BNI005F	BNI005K
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
BUS/RUN	BUS/RUN	BUS/RUN	BUS/RUN	BUS/RUN
Display/pushbutton	Display/pushbutton	Display/pushbutton	Display/pushbutton	Display/pushbutton
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
Black, red, yellow	Black, red, yellow	Black, red, yellow	Black, red, yellow	Black, red, yellow
M12, D-encoded, female	M12, D-encoded, female	M12, D-encoded, female	M12, D-encoded, female	M12, D-encoded, female
7/8", male, 5-pin	7/8", male, 5-pin	7/8", male, 5-pin	7/8", male, 5-pin	7/8", male, 5-pin
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8	8	8
max. 16 PNP	max. 16 PNP	16 PNP	8 PNP	8 PNP
max. 16 PNP	max. 16 PNP		8 PNP	8 PNP
yes	yes	no	no	no
200 mA	200 mA	200 mA		200 mA
1.6 A/2 A	2 A		2 A	2 A
Yellow LED	Yellow LED	Yellow LED	Yellow LED	Yellow LED
Red LED	Red LED	Red LED	Red LED	Red LED
≤ 9 A	≤ 9 A		≤ 9 A	≤ 9 A
≤ 9 A	≤ 9 A	≤ 9 A		≤ 9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
224x68x37.9 mm	224x68x37.9 mm	224x68x37.9 mm	224x68x37.9 mm	224x68x37.9 mm
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn

Version 1.1

- 4x master
- SIO, COM 1, COM 2, COM 3
- Green LED
- Red LED
- 1.6 A



A Balluff exclusive: 16-fold IO-Link master

The first Profinet IO-Link master with 16 IO-Link ports is now on the market. With this module, Balluff has doubled the previous number of available ports and increased the capacity of each individual port, allowing for higher bandwidth and faster data transfer rates.

More output per port: 32 bytes

Each IO-Link port transmits up to 32 bytes of process data in cyclical form. At the same time, parameter or diagnostic data can be transmitted acyclically at each port. If adding up the output of all ports, the 16-fold IO-Link master provides 1 kByte of process data.

Digital and analog signals

IO-Link succeeds in transmitting both digital and analog signals at each port. In contrast, conventional fieldbuses can do only one or two signals per port.

Process up to 272 I/O signals

If sensor/actuator hubs are connected to the IO-Link master, up to 272 I/O signals can be processed. A 3-core standard sensor cable is sufficient. The bottom line: Users now have the ability to make full use of Profinet's capacity, all the way to the intelligent devices in the field.

Additional features: display, integrated switch and web server

Like all Profinet modules from Balluff, the 16-fold master has an integrated display for information and additional diagnostics. Its integrated switch serves to establish a Profinet line structure. The built-in web server shows the status of the module with all current information for advanced diagnostics.





Fieldbus Systems

Profibus

Profinet

Product

Topology

IO-Link Modules

Modules

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged

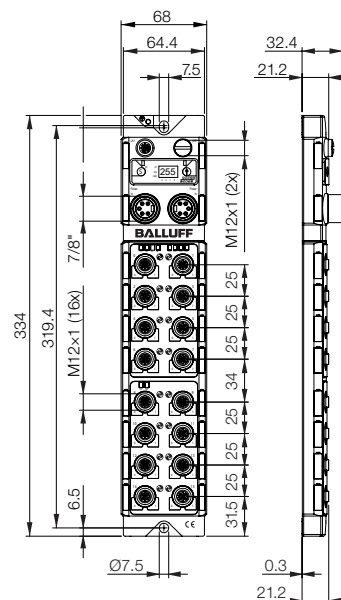
Switches

Connectors and

Accessories

Fieldbus	Profinet
Type	16x IO-Link, 32x I/O
	BNI007M
Supply voltage U_B	18...30 V DC
Function indicator	BUS/RUN
Indicator/input	Display/pushbutton
Module status indicator: Mod LED	yes
Network status indicator: Net LED	yes
Port status indicator	Black, red, yellow
Fieldbus connection	M12, D-encoded, female
AUX power connection	7/8", male, 5-pin
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	16
Number of inputs	Max. 32
Number of outputs	Max. 32
Configurable inputs/outputs	yes
Max. load current, sensors/channel	200 mA
Max. load current, output	1.6 A/2 A
Port status indicator (signal status)	Yellow LED
Port diagnostic indicator (overload)	Red LED
Total actuator current	< 9 A
Total sensor current	< 9 A
Enclosure rating per IEC 60529	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C
Storage temperature	-25...+70 °C
Fastening	2 mounting holes
Dimensions (LxWxH)	450x68x36.9 mm
Housing material	Nickel-plated die-cast zinc

IO-Link	Version 1.1
No. of IO-Link master ports	16x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Displays	Communication
	Error
Max. load current IO-Link device	1.6 A



Fiber-optic or copper

Balluff has expanded the Profinet module family by adding push-pull variants. These are available with a fiber-optic cable or copper cable connection. Both versions have the push-pull connection technology for fieldbus and power cables that is specified in the AIDA (Automation Initiative of German Automobile Manufacturers). This makes the wiring extremely simple.

Fiber-optic and copper

Additionally, there is a module that unites both worlds. It provides both a fiber-optic (SCRJ) and a copper (RJ45) push-pull connection. Another plus: This I/O module requires no additional, external module to convert from copper to fiber-optic cables.

About the fiber-optic cable connection

The fiber-optic cable connection is suitable for high-availability and data-intensive applications. Equalizing currents and overvoltages can be effectively prevented through the automatically given potential isolation.

Additional features: display, integrated switch and web server

Like all Ethernet-based IO-Link masters from Balluff, the push-pull modules also have an integrated display for information and additional diagnostics. The integrated switch serves to establish a Profinet line structure. The built-in web server shows the status of the module with all current information for advanced diagnostics.

IO-Link 1.1

All functions of IO-Link 1.1 are made available by the 8 IO-Link ports of the push-pull modules.

For suitable connectors see Page 101

About using fiber-optic cables

Fiber-optic cables have now become established in industrial data communication. This is because potential differences and electromagnetic influences on the data line are excluded when using fiber-optic cables. Polymer optical fibers (POF) additionally provide a large transmission bandwidth and large ranges.





Fieldbus
Systems

Profibus

Profinet

Product
Topology

IO-Link Modules

Modules

CC-Link

DeviceNet

Ethernet/IP

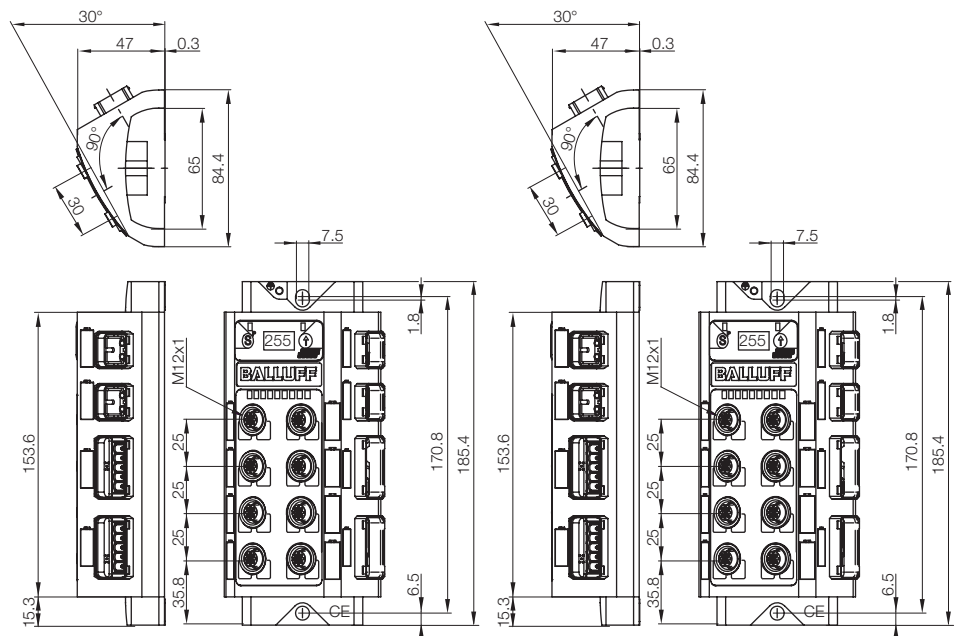
EtherCAT

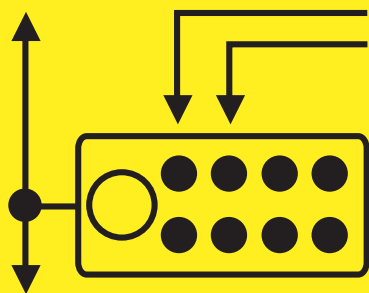
Unmanaged
Switches

Connectors and
Accessories

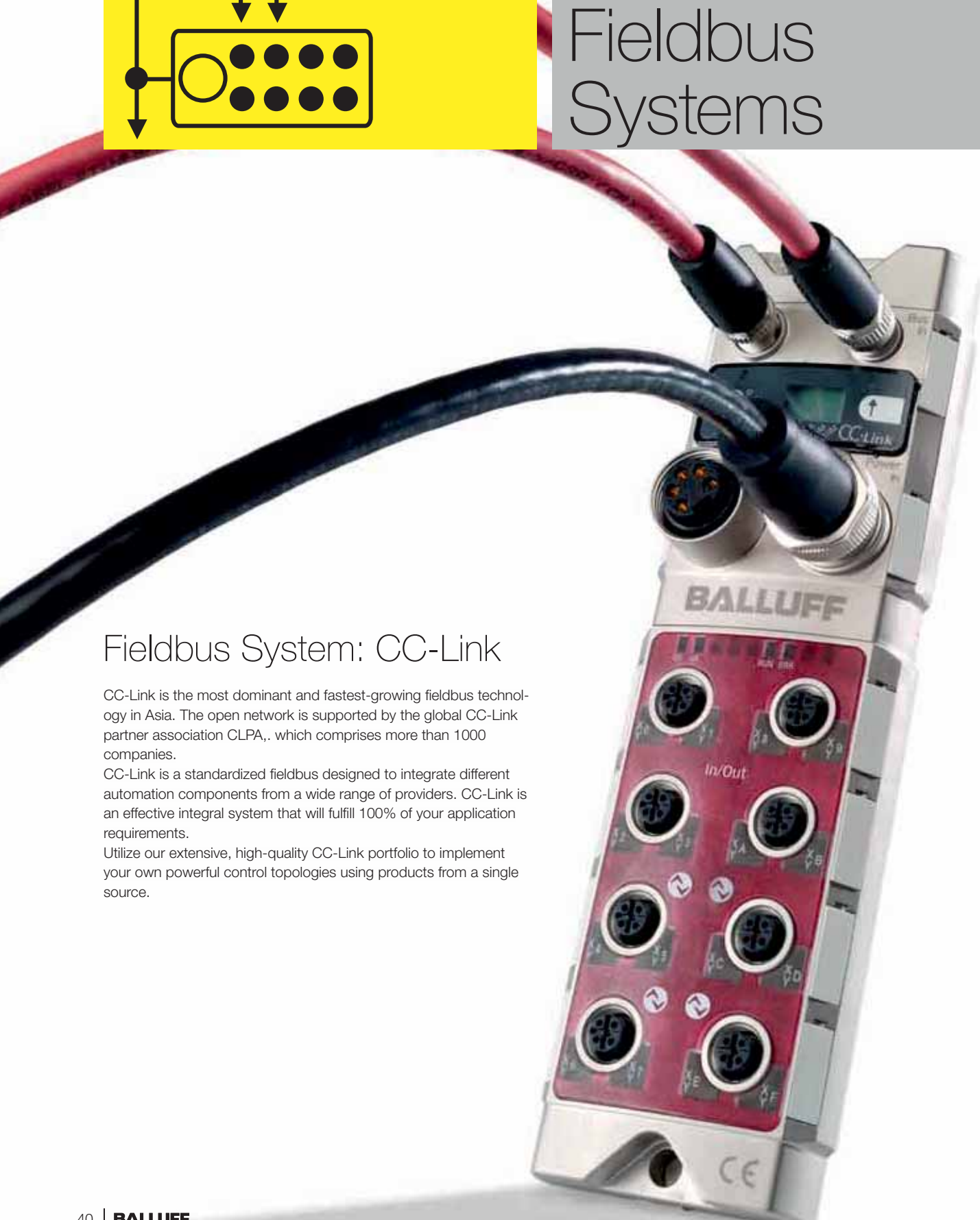
Fieldbus	Profinet	Profinet
Type	8x IO-Link, 16x I/O	8x IO-Link, 16x I/O
	BNI007K	BNI007J
Supply voltage U _B	18...30 V DC	18...30 V DC
Function indicator	BUS/RUN	BUS/RUN
Indicator/input	Display/pushbutton	Display/pushbutton
Module status indicator: Mod LED	yes	yes
Network status indicator: Net LED	yes	yes
Port status indicator	green, red, yellow	green, red, yellow
Fieldbus connection	2x Push-Pull RJ45	2x Push-Pull SCRJ
AUX power connection	Push-Pull Power	Push-Pull Power
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8
Number of inputs	max. 16	max. 16
Number of outputs	max. 16	max. 16
Configurable inputs/outputs	yes	yes
Max. load current, sensors/channel	200 mA	200 mA
Max. load current, output	1.6 A / 2 A	1.6 A / 2 A
Port status indicator (signal status)	Yellow LED	Yellow LED
Port diagnostic indicator (overload)	Red LED	Red LED
Total actuator current	< 16 A	< 16 A
Total sensor current	< 16 A	< 16 A
Enclosure rating per IEC 60529	IP 67	IP 67
Operating temperature T _a	-5...+70 °C	-5...+70 °C
Storage temperature	-25...+70 °C	-25...+70 °C
Fastening	2 mounting holes	2 mounting holes
Dimensions (LxWxH)	185.5x84 mm, 4x47 mm	185.5x84 mm, 4x47 mm
Housing material	Nickel-plated die-cast zinc	Nickel-plated die-cast zinc

IO-Link	Version 1.1	Version 1.1
No. of IO-Link master ports	8x master	8x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3	SIO, COM 1, COM 2, COM 3
Displays	Communication Error	Green LED Red LED
Max. load current IO-Link device	1.6 A	1.6 A





Fieldbus Systems

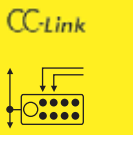


Fieldbus System: CC-Link

CC-Link is the most dominant and fastest-growing fieldbus technology in Asia. The open network is supported by the global CC-Link partner association CLPA, which comprises more than 1000 companies.

CC-Link is a standardized fieldbus designed to integrate different automation components from a wide range of providers. CC-Link is an effective integral system that will fulfill 100% of your application requirements.

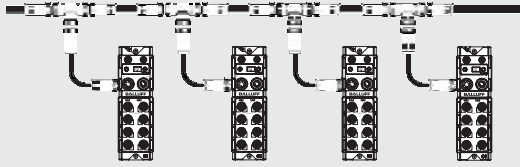
Utilize our extensive, high-quality CC-Link portfolio to implement your own powerful control topologies using products from a single source.



Product Topology	42
IO-Link-Module	44
Modules	45

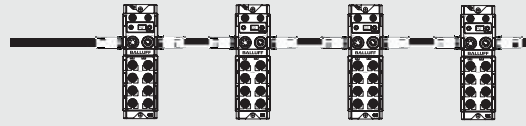
Trunk and drop

- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs



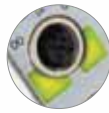
Connected in series

- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer wiring components



Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.

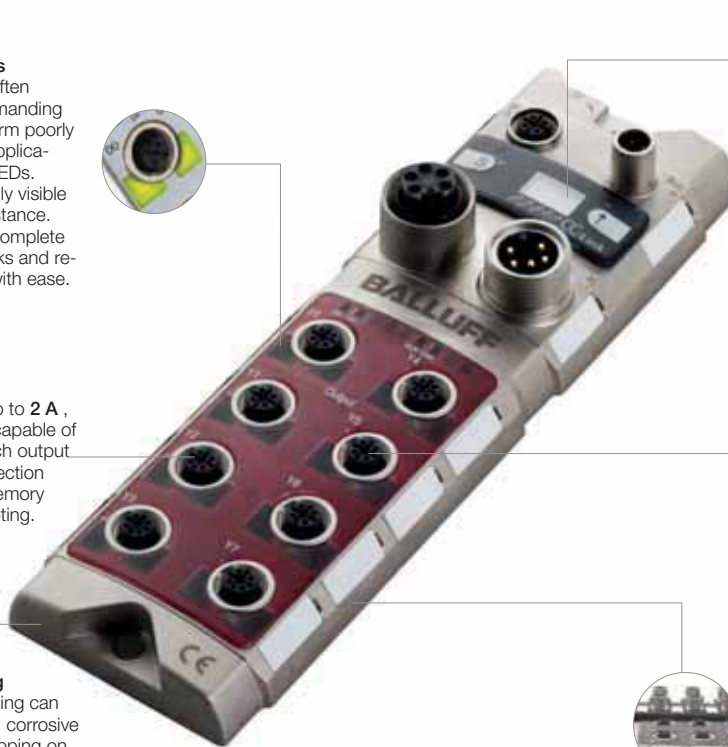


Powerful and reliable outputs

With an output current of up to 2 A, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.



Addressable display

IP address, subnet mask and gateway address appear on the illuminated display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).



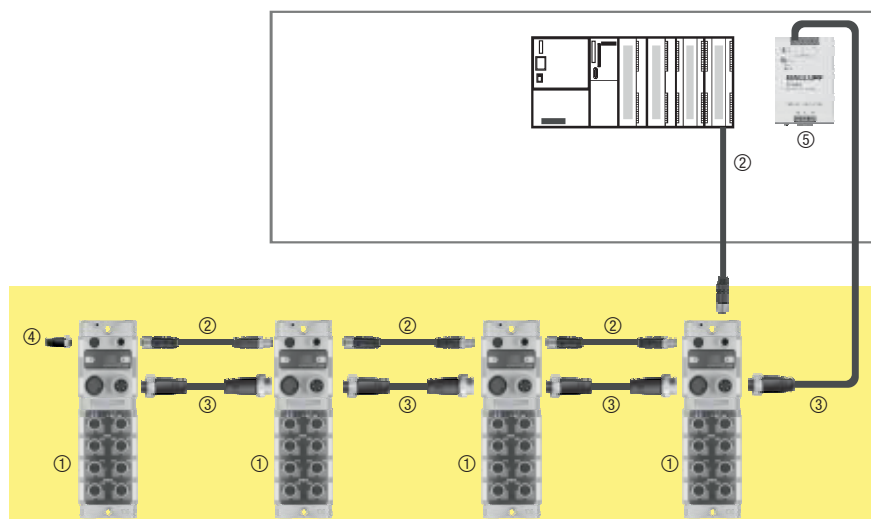
Inputs with high density

All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter. A DESINA input is also optionally available via pin 2.

Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.





- | | |
|------------------------|----------|
| ① CC-Link Module BNI | Page 44 |
| ② Bus Cable BCC | Page 102 |
| ③ Power Cable BCC | Page 351 |
| ④ Terminating Resistor | Page 92 |
| ⑤ Power Supplies BAE | Page 427 |

CC-Link



Fieldbus Systems

Profibus

Profinet

CC-Link
Product
Topology

IO-Link Modules
Modules

DeviceNet

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Switches

Connectors and
Accessories

CC-Link IO distributors are exceptionally well-suited for use in harsh industrial environments and enable the consistent, cost-optimized fulfillment of requirements for decentralized installation technology.

CC-Link advantages

- Constant data throughput, even when processing large data volumes
- Deterministic response for reliable realtime control
- Controllers programmed over the network
- Powerful diagnostic system for clear identification of problem areas
- Network stations switched on and off during operation
- Network stations restored automatically
- Standby master function
- Optional configuration software

Industries

- Semiconductor industry
- Automotive industry
- Food and beverage industry
- Pharmaceutical industry

CC-Link with IO-Link functionality

A module with four IO-Link ports is now available in addition to the CC-Link fieldbus modules.

The IO-Link master ports can be configured and used entirely independently of one another, which means there are four additional freely configurable standard I/O ports available, which provide you with another eight inputs/outputs for standard sensors and actuators.

Benefits

- Clearly visible status LEDs
- Addressable display
- Powerful and reliable outputs
- Innovative housing design

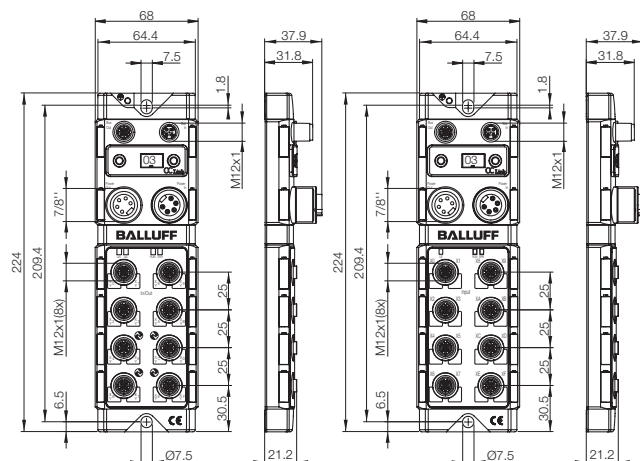


	BNI0040	BNI0049
Fieldbus	CC-Link	CC-Link
Type	4x IO-Link, 12 DI/DO PNP	16 DI NPN
Supply voltage U _B	18...30 V DC	18...30 V DC
Function indicator	Green LED	Green LED
Fault function indicator	Red LED	Red LED
Power-on indicator	Green LED	Module/actuator/sensor supply
Fieldbus connection	M12, 5-pin, socket and plug	M12, 5-pin, socket and plug
Supply voltage connection	7/8", 5-pin, socket and plug	7/8", 5-pin, socket and plug
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8
Number of inputs	Max. 10 PNP	16 NPN
Number of outputs	Max. 10 PNP	
Configurable inputs/outputs	yes	no
Max. load current, sensors/channel	200 mA	200 mA
Max. load current, output	1.6 A/2 A	
Port status indicator (signal status)	Yellow LED	Yellow LED
Port diagnostic indicator (overload)	Red LED	Red LED
Total current U _{Actuator}	≤ 9 A	≤ 9 A
Total current U _{Sensor}	≤ 9 A	
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T _a	-5...+70 °C	-5...+70 °C
Storage temperature	-25...+70 °C	-25...+75 °C
Weight	Approx. 577 g	Approx. 577 g
Fastening	2 mounting holes	2 mounting holes
Dimensions (LxWxH)	224x68x37.9 mm	224x68x37.9 mm
Housing material	Nickel-plated GD-Zn	Nickel-plated GD-Zn

IO-Link

Version 1.1

No. of IO-Link master ports	4x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Displays	Communication: Green LED Error: Red LED
Max. load current IO-Link device	1.6 A



All modules include four screw plugs and a label set.



CC-Link



Fieldbus
Systems

Profibus

Profinet

CC-Link

Product

Topology

IO-Link Modules

Modules

DeviceNet

Ethernet/IP

EtherCAT

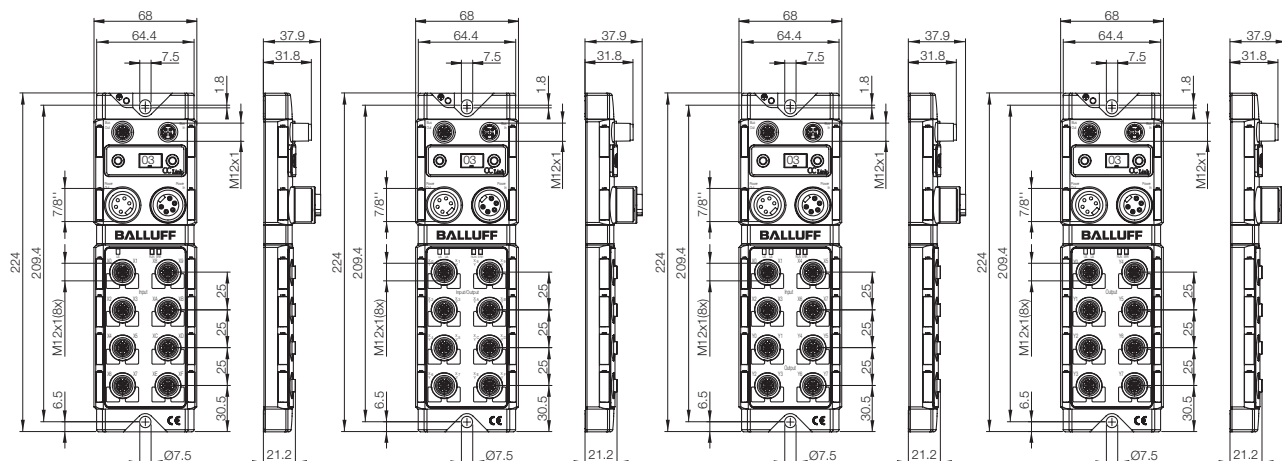
Unmanaged

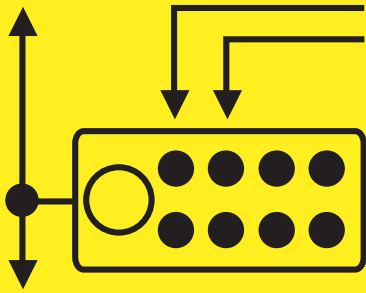
Switches

Connectors and

Accessories

CC-Link	CC-Link	CC-Link	CC-Link
16 DI PNP	16 DI/DO PNP	8 DI + 8 DO PNP	8 DO
BNI002F	BNI002A	BNI002C	BNI002E
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED	Green LED
Red LED	Red LED	Red LED	Red LED
Module/actuator/sensor supply	Module/actuator/sensor supply	Module/actuator/sensor supply	Module/actuator/sensor supply
M12, 5-pin, socket and plug	M12, 5-pin, socket and plug	M12, 5-pin, socket and plug	M12, 5-pin, socket and plug
7/8", 5-pin, socket and plug	7/8", 5-pin, socket and plug	7/8", 5-pin, socket and plug	7/8", 5-pin, socket and plug
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8	8
16 PNP	max. 16 PNP	8 PNP	8 PNP
no	yes	no	no
200 mA	200 mA	200 mA	200 mA
	2 A	2 A	2 A
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Red LED	Red LED	Red LED	Red LED
≤ 9 A	≤ 9 A	≤ 9 A	≤ 9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+75 °C	-25...+75 °C	-25...+75 °C	-25...+75 °C
Approx. 577 g	Approx. 577 g	Approx. 577 g	Approx. 577 g
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
224×68×37.9 mm	224×68×37.9 mm	224×68×37.9 mm	224×68×37.9 mm
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn





Fieldbus Systems

Fieldbus System: DeviceNet

For a simple choice of outstanding network components, Balluff offers the entire spectrum of high-performance network technology. For applications in the USA, such as with Rockwell Automation and other controller manufacturers, we can provide you with all of the modules for efficient DeviceNet implementation. For simple installation, speedy integration through direct mounting as well as the possibility of fast modifications. And all of this completely independent of the controller manufacturer. You save time and lower costs.

Choose an efficient field and process combination using our components. We give you the choice of a combination regardless of controller manufacturer, letting you easily choose based on your requirements and utilize our comprehensive, fully developed Networking and Connectivity product line that leaves nothing to be desired beyond the control cabinet.





DeviceNet™



Product Topology	48
IO-Link-Modules	50
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DeviceNet™ system concept from Balluff

Machine design should not be restricted by inflexible network topology. Balluff DeviceNet™ products comprise cables, tees and hubs that you can use to combine elements of all topologies with one another. Flexible installation is ensured by raw cables, connection cables and color-coded, field-attachable connectors.

Trunk and drop

- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs

Connected in series

- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer wiring components

Star

- Simple troubleshooting
- Ideal for large I/O clusters
- Less expensive – only one splitter box needed

Mixed topology

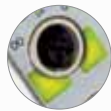
- Creation of logical groups results in relatively simple troubleshooting
- Popular method – ideal cost/benefit ratio

The best I/O modules in the industry

Impressive features. Impressive functionality. Impressive performance

Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.

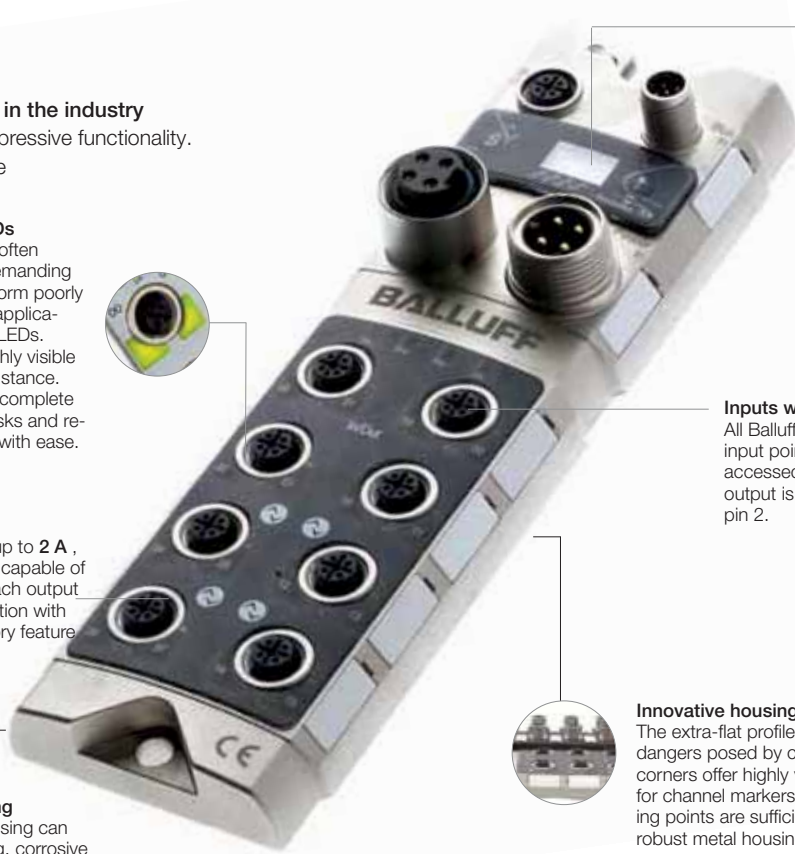


Powerful and reliable outputs

With an output current of up to 2 A, Balluff output modules are capable of driving almost any load. Each output also offers overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.



Addressable display

IP address, subnet mask and gateway address appear on the illuminated display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).

Inputs with high density

All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter. A DESINA output is also optionally available via pin 2.

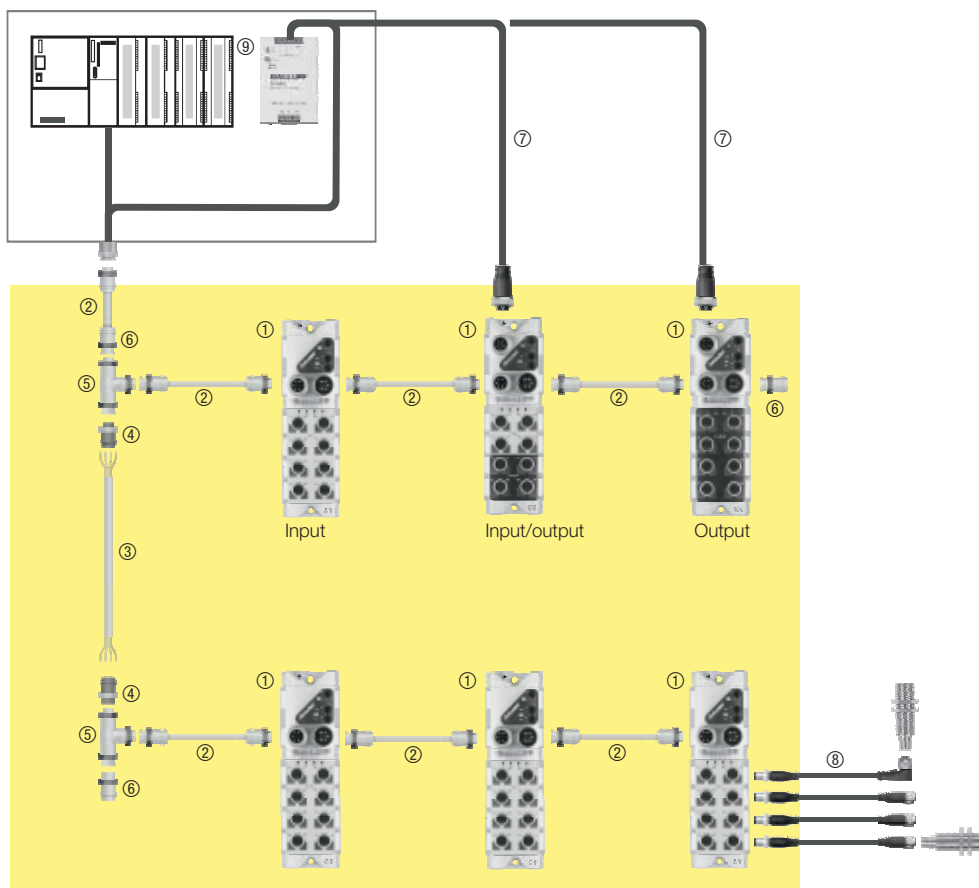


Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.

Complete DeviceNet™ product matrix

Precisely adapted cables and accessory parts are required to maximize utilization of the I/O blocks. Balluff offers all the components you need for constructing and maintaining a world-class DeviceNet™ network.



- | | |
|---------------------------------------|-----------|
| ① DeviceNet Modules BNI | Page 50 |
| ② Bus Cable BCC | Page 108 |
| ③ Network cables | |
| ④ Field Attachable Bus Connectors BCC | Page 357 |
| ⑤ Bus Tees BCC | Page 112 |
| ⑥ Bus Terminating Resistors BCC | Page 113 |
| ⑦ Power Cable BCC | Page 350 |
| ⑧ Connection Cable BCC | Page 318 |
| ⑨ Power Supplies BAE | IPage 427 |



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet
**Product
Topology**
IO-Link Modules
Modules
Bitmaps
Analyzer

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories



Fieldbus
Systems

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Profinet

CC-Link

DeviceNet

Product
Topology

IO-Link Modules

Modules

Bitmaps

Analyzer

Ethernet/IP

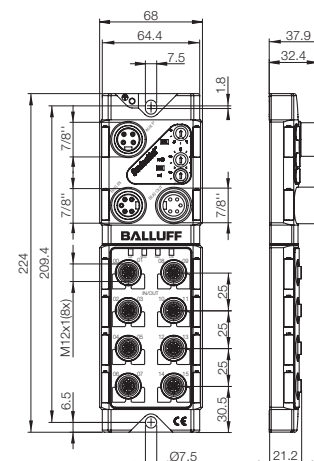
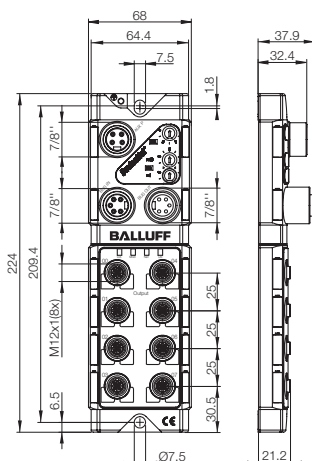
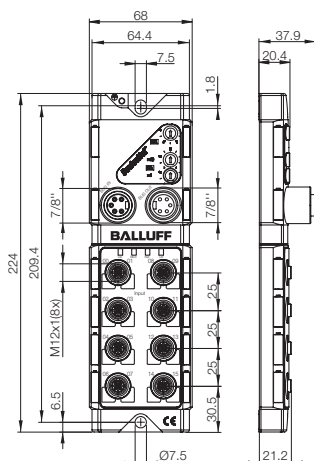
EtherCAT

Unmanaged
Switches

Connectors and
Accessories



DeviceNet	DeviceNet	DeviceNet
16 DI	8 DO	16 DI/DO
BNI0001	BNI0002	BNI0003
18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED
Red LED	Red LED	Red LED
Module	Module, actuators	Module, sensors, actuators
7/8" 5-pin female and male	7/8" 5-pin female and male 7/8" 4-pin male	7/8" 5-pin female and male 7/8" 4-pin male
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
8	8	8
16 PNP	8 PNP	16 PNP
no	no	yes
200 mA	2 A	200 mA
Green LED	Green LED	Green LED
Red LED	Red LED	Red LED
< 9 A	< 9 A	< 9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C
Approx. 580 g	Approx. 580 g	Approx. 580 g
2 mounting holes	2 mounting holes	2 mounting holes
224×68×37.9 mm	224×68×37.9 mm	224×68×37.9 mm
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn



16 inputs (4 bytes in, 0 bytes out)

		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Word 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Word 1	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0

8 outputs (3 bytes in, 2 bytes out)

		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Word 0	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Word 1																AP
OUT	Word 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

16 configurable (7 bytes in, 4 bytes out)

		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Word 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Word 1	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Word 2	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10	OL-9	OL-8	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0
	Word 3															SP	AP
OUT	Word 0	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Word 1	R-15	R-14	R-13	R-12	R-11	R-10	R-9	R-8	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0

8 inputs/8 outputs (5 bytes in, 2 bytes out)

		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Word 0	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Word 1	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Word 2															SP	AP
OUT	Word 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0



Bitmap legend

I	Input
O	Output
R	Output reset
S	Input short-circuit
OL	Output overload status
HS	Output handshake
AP	Actuator power status
SP	Sensor/network power status



Fieldbus Systems

Profibus

Profinet

CC-Link

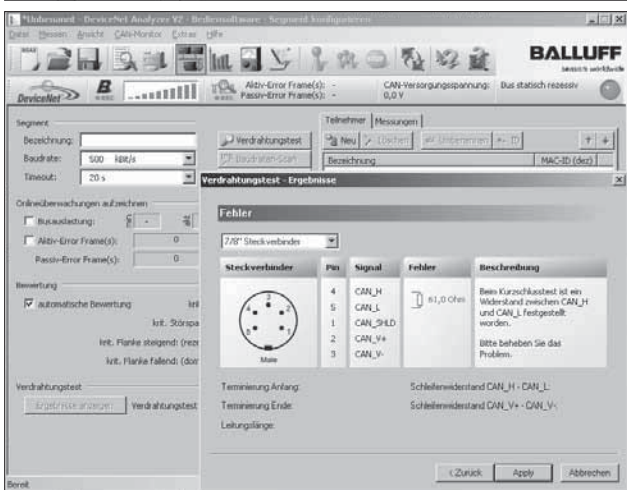
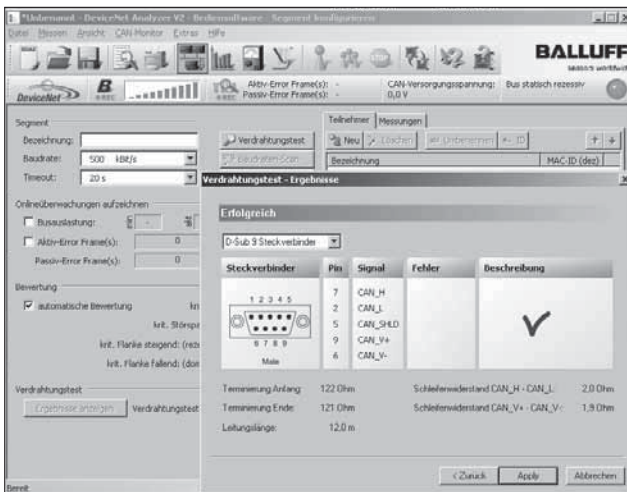
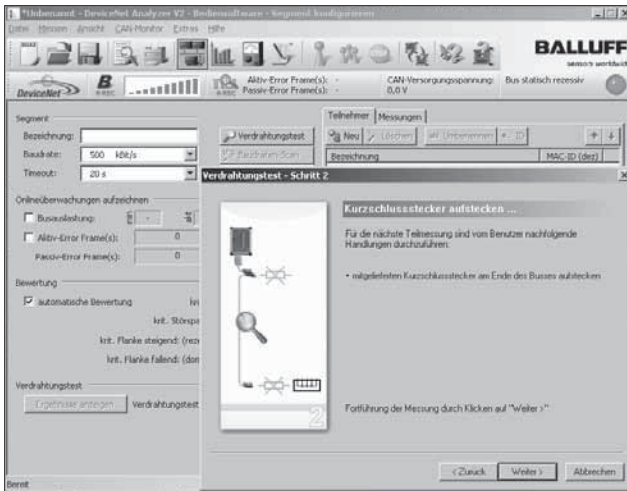
DeviceNet
Product Topology
IO-Link Modules
Modules
Bitmaps
Analyzer

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories



The DeviceNet Analyzer is a particularly powerful tool for analyzing, commissioning, monitoring and maintaining DeviceNet/CAN bus systems. The DeviceNet tester was designed primarily for preventive maintenance purposes. Whether maintenance technicians, integrators or technical experts, anyone who requires reliable information on the functional status of their DeviceNet system can use the DeviceNet analyzer to increase the overall efficiency of their facility. On-site testing and analysis simplify your working day, increase reliability and save you time.

Wiring test during commissioning

The analyzer wiring test is able to detect defects and weak points such as incorrect cable types and lengths, short circuits, line breaks and faulty plug connections as early as the installation phase. Analysis of the bus physics before or during commissioning is another important feature. Every node can check the rate of change, signal-to-noise ratio and much more to enable the consistent identification of telegrams with a poor signal quality as well as the rapid identification of possible causes of the faults (such as missing/excess number of bus terminations, faulty bus drivers, bus or stub lines that are too long, etc.). Not only does this ensure that the specification is observed, but it also ensures optimum signal quality. The bus operates more reliably and, at the same time, is more resistant to EMC problems.



Monitoring during ongoing operation

A comparison with previous measurements can be performed easily during operation, either at regular intervals or continuously via an online function. If required, the DeviceNet analyzer saves all the measuring and report data for the installation being monitored. Therefore gradual degradation of quality caused by cable wear, for example, can no longer be overlooked. Preventive maintenance saves time and costs compared to a sudden system failure.

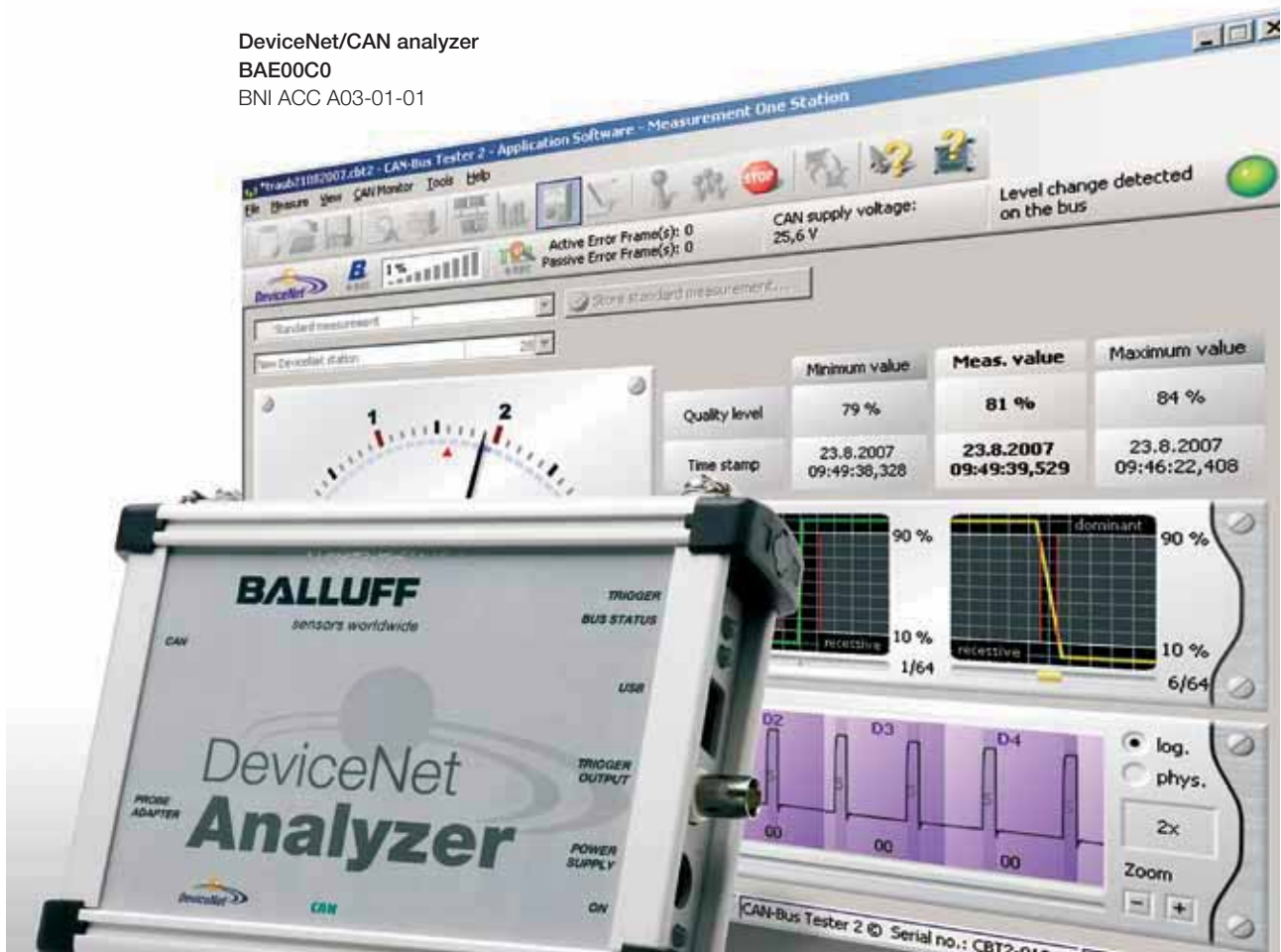
Scope of delivery

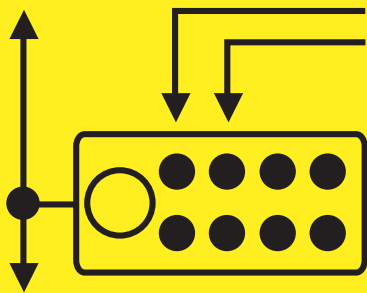
The analyzer set in a durable case equips the user ideally for all eventualities. The device is equipped with a complete set of high-quality DeviceNet accessories designed for harsh industrial use. The user can get started right away because all the necessary components such as adapters, adapter cables, tees and bus terminating resistors are already included. The analyzer also has a USB port for connecting a PC or notebook. The device is very simple to operate thanks to the easy-to-use PC software.



- Fieldbus Systems
- Profibus
- Profinet
- CC-Link
- DeviceNet
- Product Topology
- IO-Link Modules
- Modules
- Bitmaps
- Analyzer**
- Ethernet/IP
- EtherCAT
- Unmanaged Switches
- Connectors and Accessories

DeviceNet/CAN analyzer
BAE00C0
BNI ACC A03-01-01





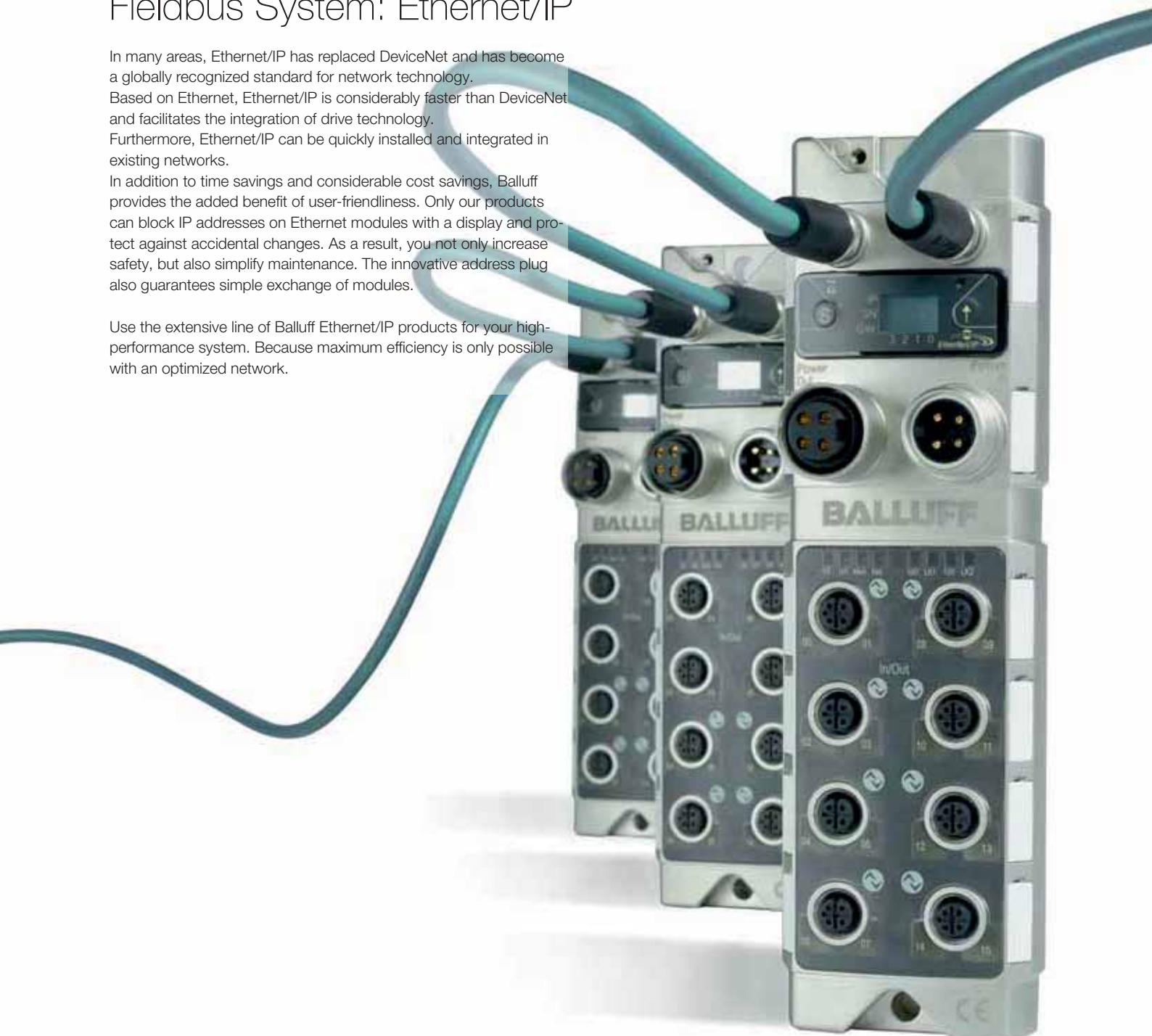
Fieldbus Systems

Fieldbus System: Ethernet/IP

In many areas, Ethernet/IP has replaced DeviceNet and has become a globally recognized standard for network technology. Based on Ethernet, Ethernet/IP is considerably faster than DeviceNet and facilitates the integration of drive technology. Furthermore, Ethernet/IP can be quickly installed and integrated in existing networks.

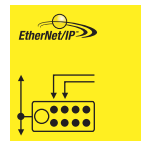
In addition to time savings and considerable cost savings, Balluff provides the added benefit of user-friendliness. Only our products can block IP addresses on Ethernet modules with a display and protect against accidental changes. As a result, you not only increase safety, but also simplify maintenance. The innovative address plug also guarantees simple exchange of modules.

Use the extensive line of Balluff Ethernet/IP products for your high-performance system. Because maximum efficiency is only possible with an optimized network.





EtherNet/IP™



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Display	70

Shock and vibration

- EN 60068-2-6 Vibration (sinusoidal)**
- EN 60068-2-27 Shocks**
- EN 60068-2-29 Continuous shocks**
- EN 60068-2-64 Broadband random noise**

Approvals



EtherNet/IP™
conformance tested



- Input**
- 16 or 32 PNP inputs
 - Short-circuit protected
 - Short-circuit diagnostics



- Input/output**
- 8 PNP inputs and 8 outputs or 16 PNP inputs and 16 outputs
 - Short-circuit protected
 - Short-circuit diagnostics
 - Overload protection at point level
 - Rated output current 2 A
 - Overload diagnostics
 - Resettable, latching overload diagnostics



- Output**
- 8 or 16 outputs
 - Overload protection at point level
 - Rated output current 2 A
 - Overload diagnostics
 - Resettable, latching overload diagnostics



- Unmanaged Switch**
- Unmanaged switch with 9 ports
 - Dual power sources
 - 10/100 base Tx ports
 - Supports half/full duplex
 - Overload diagnostics
 - M12 female, D-coded
 - Store-and-forward technology

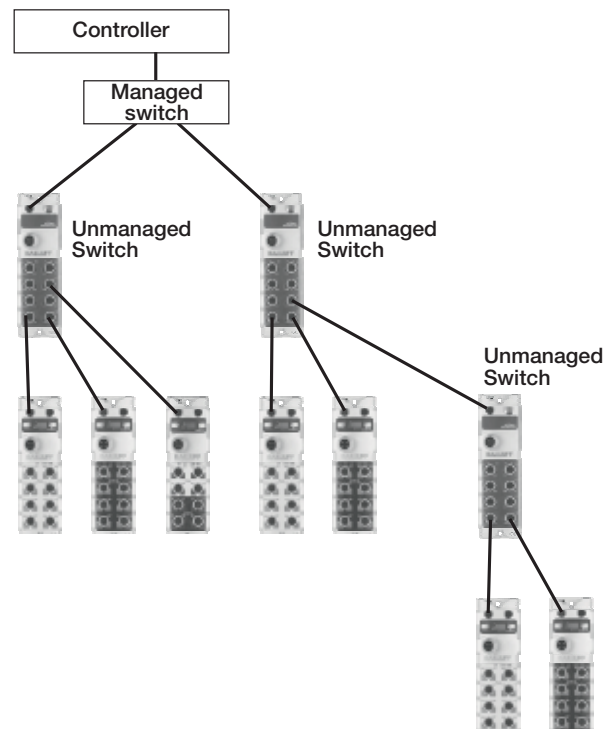
Advantages of star topology

In industrial Ethernet networks, star topologies have prevailed over daisy chain topologies. Balluff offers star topologies exclusively due to their greater reliability.

The advantages in detail

- Elimination of the single point of failure on the I/O block and cable level
- Immediate segment notification for quickly locating errors
- Managed switches use IGMP snooping to increase the control efficiency of multicast traffic
- Managed switch functions are not available when integrating at the device level

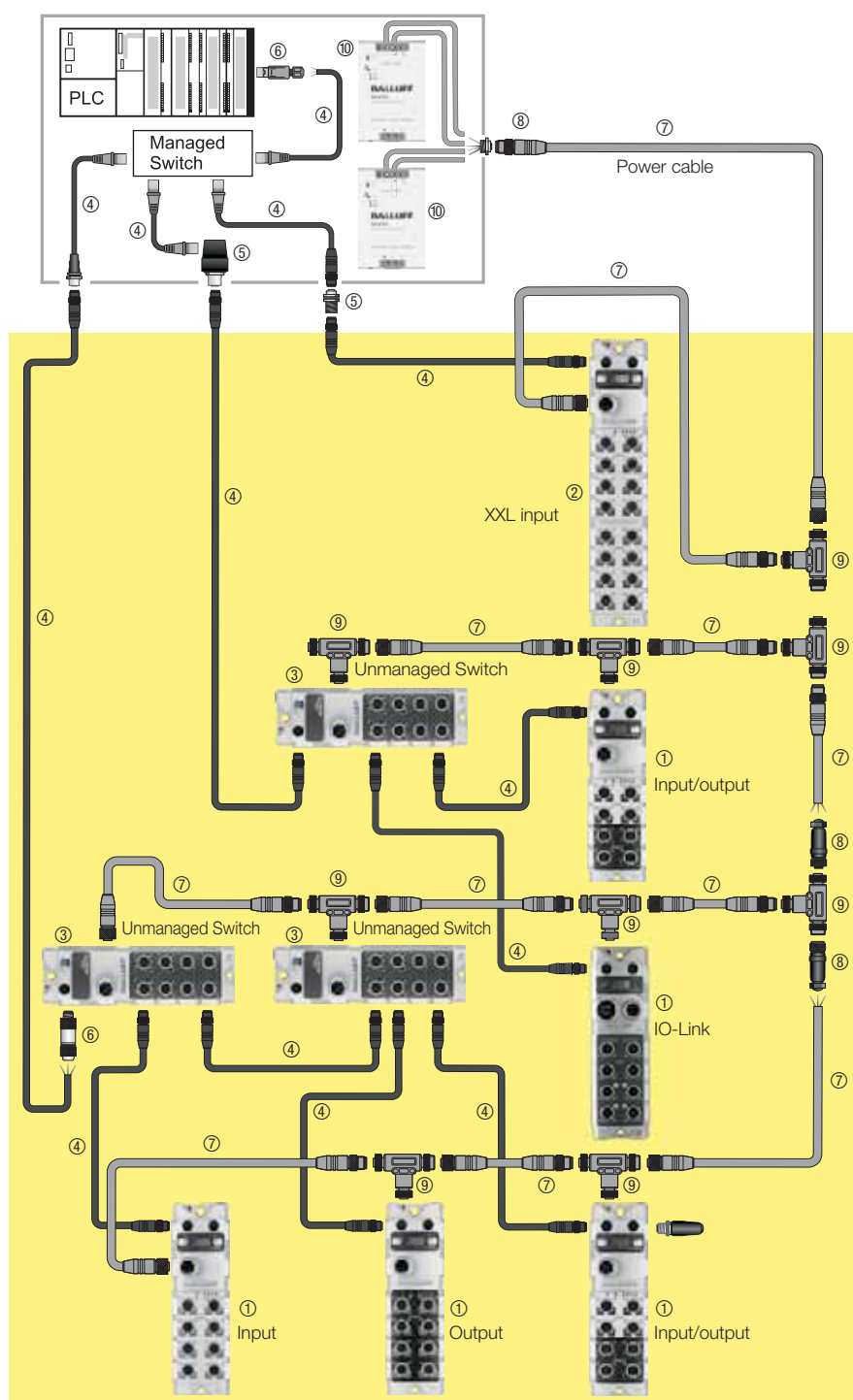
At first glance, the daisy chain topology appears to save money. However, implementing this topology requires the installation of a switch in each I/O block. This increases the cost of each I/O block, even if not all blocks (e.g. the last in a chain) can use this function. Since dedicated switches are now affordable, compensating for the costs is irrelevant. All possible savings are also offset by technical disadvantages.



Communication from start to finish all the way to the sensor

No other industrial network has seen the explosive level of growth experienced by Industrial Ethernet. Because communication from start to finish all the way to the sensor/actuator offers security. With the deterministic high-speed throughput and the proven reliability of the physical layer, Industrial Ethernet will continue to grow even more in the coming years.

At Balluff, you will find a high-performance range of permanently mountable I/O blocks with compatible cables and accessories.



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- ⑥ Field Attachable Bus Connectors BCC
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Simple integration

Ethernet/IP has developed into a globally recognized standard for network technology that links field devices to centralized control solutions. Ethernet/IP can be quickly installed and integrated in existing networks.

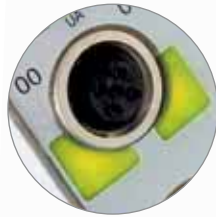
Balluff Ethernet/IP comprises two versions of permanently mountable I/O blocks, unmanaged switches, network cables and accessories. At the heart of the extensive line of Balluff products are I/O blocks. They are characterized by low startup costs per point and are designed to save money through maximum system readiness and simple maintenance throughout the entire service life of the system.

I/O-block network functions

- Simple, flexible IP addressing method
- BOOTP/DHCP
- IP 67 address plug (IPAP) for fast changes
- Addressable display (Series 100 only)
- Webserver interface
- Certified by ODVA to ensure reliable operation and full interoperability
- Operation with transfer rates of 10 Mbit/s and 100 Mbit/s for maximum throughput (automatic detection)
- Robust M12 Ethernet connection (D-coded)
- Supports star topology for increased reliability, exact troubleshooting and fast commissioning

Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.

**Robust, full-metal housing**

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, incorrect assembly as well as people stepping on it. All this and it costs no more than a plastic housing.

**Innovative housing design**

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.



Powerful and reliable outputs

With an output current of up to 2 A, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.



User-defined LEDs (100 series)

Like the IPAP, the display has red and green LEDs for simplifying possible troubleshooting.

Addressable display (Series 100 only)

IP address, subnet mask and gateway address appear on the illuminated display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

Product Topology

IO-Link Modules

Modules

Bitmaps

Technical Data

Display

EtherCAT

Unmanaged Switches

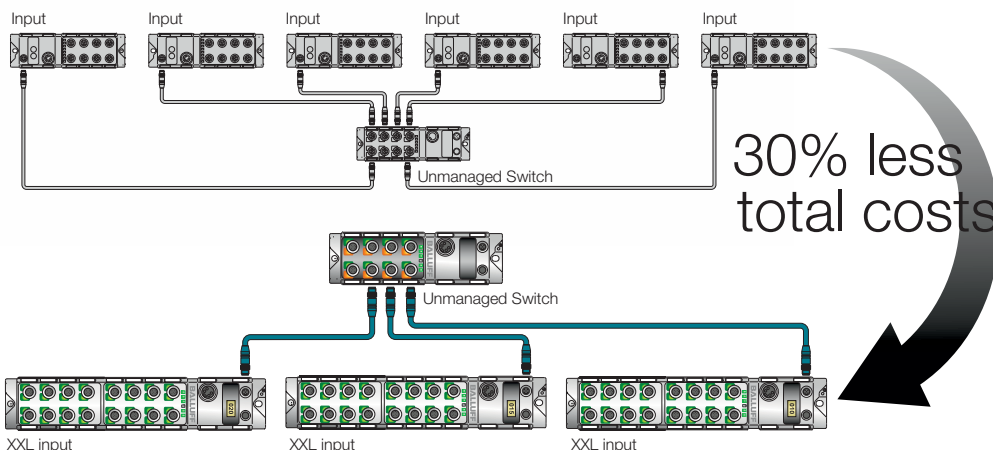
Connectors and Accessories

High-density XXL-I/O blocks reduce costs

High-density I/O blocks reduce per point costs because they consolidate communication hardware costs in a single unit. For example, if two 16-point input blocks are replaced by a 32-point input block, the cost for each point is reduced by 30% for the I/O blocks alone!

More savings

- Switch utilization reduced by 13% – renders one port superfluous
- No network cable required
- Without auxiliary power cable
- 20% less installation space





Webserver

For anyone that prefers a web interface, the Ethernet modules from Balluff have a simple integrated webserver. This web page can be used to program the module addresses and configure several of the user-defined functions.



A simple browser provides immediate access to the integrated webserver, which has been implemented in all Ethernet/IP modules of Gen IV.



Extensive diagnostics functions are available here, such as displaying all module LEDs, including all representations in plain text.



In the "Device Properties" area you have the option, for example, of configuring devices connected to the IO-Link port.



The module configuration, such as assigning or displaying the IP address, is hidden behind the "Configurations" function.

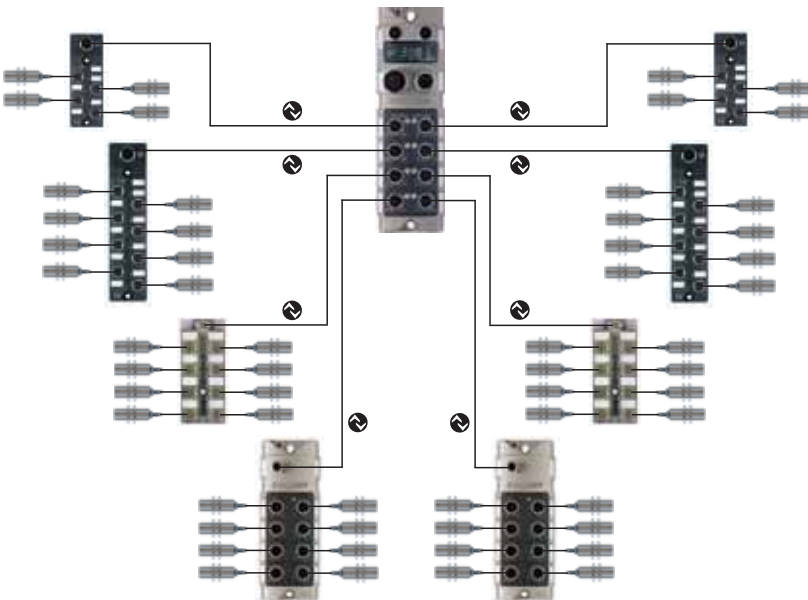
136 IOs on a module

Balluff IO-Link solutions save money

Previously, at least nine fieldbus modules had to be used for the capability of activating 136 IOs. Today, a single Profinet module is sufficient.

In connection with the extremely cost-effective sensor/actuator hubs from Balluff, now up to 136 IO signals are offered which can be processed in a most efficient manner. In this way, compared to the stan-

ard fieldbus modules, there is a high cost savings of 15 to 20% per input. If you add the savings from the fieldbus and power cables to that, you get 30 to 40%. A cost-effective M12 standard cable BCC is sufficient to connect a sensor/actuator hub. Furthermore, sensor hubs need just one bus address, can variably group sensor signals together within an area of 20 m and ensure exceptional efficiency.



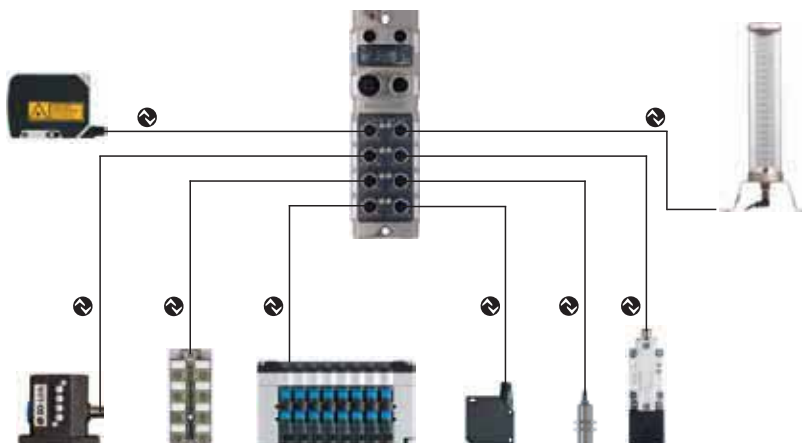
1000 tasks, one module:

The Ethernet module with eight IO-Link ports

Whether position measurement, object detection, identification, fluid sensor applications, temperature or pressure measurement: through IO-Link, the Ethernet module is suitable for every job.

IO-Link not only has advantages for installing standard sensors, but also can integrate intelligent devices via the same interface. With that, the module provides a uniform interface from the signal to the control level.

There are frequently high costs associated with field installation of intelligent devices, since shielded cables and intelligent interface cards such as analog input cards are used in the controllers. IO-Link not only makes error-prone analog inputs unnecessary, but also reduces the wiring, inspection and hardware effort. With simple plug-and-play of unshielded, cost-effective M12 cables, the system is quickly and securely brought into operation.



- EtherNet/IP
- Fieldbus Systems
- Profibus
- Profinet
- CC-Link
- DeviceNet
- EtherNet/IP Product Topology
- IO-Link Modules
- Modules
- Bitmaps
- Technical Data
- Display
- EtherCAT
- Unmanaged Switches
- Connectors and Accessories

Ethernet/IP with IO-Link functionality

Now IO-Link communicates not only with Profibus, Profinet and CC-Link.

This not only ensures freedom of installation, but also guarantees simplified wiring, integrated diagnostics and central configuration. System failures can be prevented more reliably and systems restarted quickly if a failure occurs.

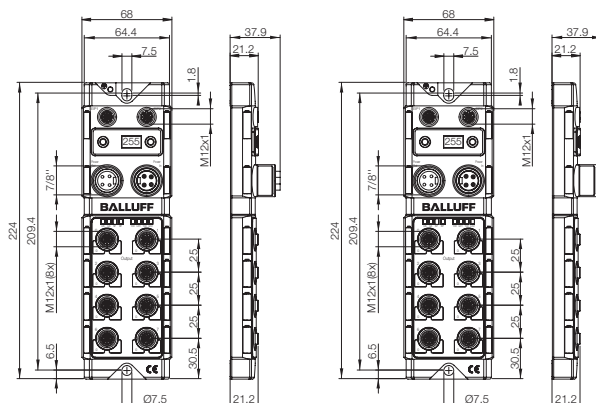
Thus Ethernet/IP with IO-Link supports optimum operation. Users gain time, save costs and incorporate intelligent connection technology to improve process quality.

The Ethernet/IP module with IO-Link includes four IO-Link master ports that can be configured and used fully independently of one another. This provides four additional, freely configurable standard I/O ports that offer a further eight inputs/outputs for standard sensors and actuators.



Fieldbus	Ethernet/IP	Ethernet/IP
Type	4x IO-Link, 16 DI/DO PNP	8x IO-Link, 16 DI/DO PNP
	BNI004A	BNI006A
Supply voltage U_B	18...30 V DC	18...30 V DC
Module current consumption	120...130 mA	120...130 mA
AUX input/output power status	U_S/U_A	U_S/U_A
U_A LED		
Module status indicator: Mod LED	yes	yes
Network status indicator: Net LED	yes	yes
Port status indicator	Black, red, yellow	Black, red, yellow
Fieldbus connection	M12, D-coded, female	M12, D-coded, female
AUX power connection	7/8", male, 4-pin	7/8", male, 4-pin
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8
Number of inputs	max. 16 PNP	max. 16 PNP
Number of outputs	max. 16 PNP	max. 16 PNP
Configurable inputs/outputs	yes	yes
Max. load current, sensors/channel	200 mA	200 mA
Max. load current, output	1.6 A/2 A	1.6 A/2 A
Port status indicator (signal status)	Yellow LED	Yellow LED
Port diagnostic indicator (overload)	Red LED	Red LED
Total actuator current	≤ 9 A	≤ 9 A
Total sensor current	≤ 9 A	≤ 9 A
Degree of protection as per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C	-5...+70 °C
Storage temperature	-25...+70 °C	-25...+70 °C
Addressing methods	BOOTP, DHCP, function block, display	BOOTP, DHCP, function block, display
Fastening	2 mounting holes	2 mounting holes
Dimensions (LxWxH)	224x68x36.9 mm	224x68x36.9 mm
Housing material	Nickel-plated GD-Zn	Nickel-plated GD-Zn

IO-Link	Version 1.1	Version 1.1
No. of IO-Link master ports	4x master	8x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3	SIO, COM 1, COM 2, COM 3
Displays	Communication: Green LED Error: Red LED	Green LED Red LED
Max. load current IO-Link device	1.6 A	1.6 A



All modules include four screw plugs and a label set.



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

Product

Topology

IO-Link Modules

Modules

Bitmaps

Technical Data

Display

EtherCAT

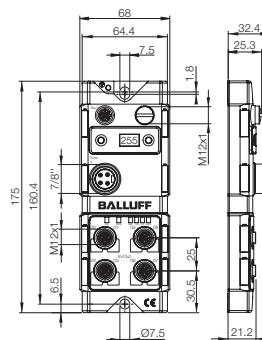
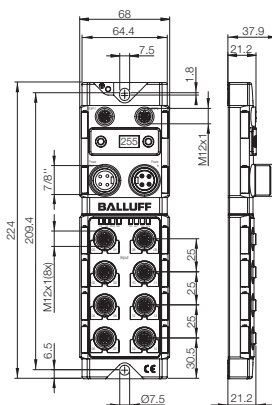
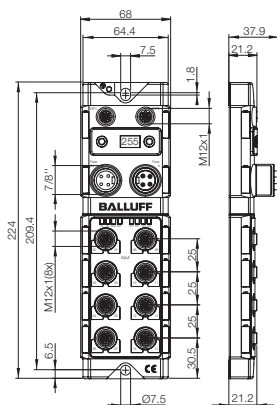
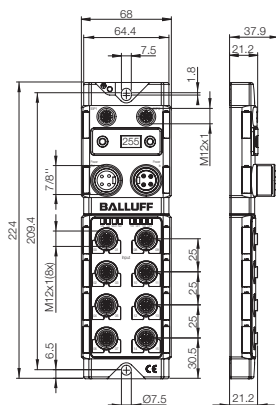
Unmanaged

Switches

Connectors and

Accessories

Ethernet/IP	Ethernet/IP	Ethernet/IP	Ethernet/IP
16 DI/DO PNP configurable	16 DI PNP	8 DO PNP	8 DI/DO PNP configurable
BNI004F	BNI004M	BNI005J	BNI0044
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
120...130 mA	120...130 mA	120...130 mA	120...130 mA
Us/U _A	Us/U _A	U _A	Us/U _A
yes	yes	yes	yes
yes	yes	yes	yes
Black, red, yellow	Black, red, yellow	Black, red, yellow	Black, red, yellow
M12, D-coded, female	M12, D-coded, female	M12, D-coded, female	M12, D-coded, female
7/8", male, 4-pin	7/8", male, 4-pin	7/8", male, 4-pin	7/8", male, 4-pin
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8	4
max. 16 PNP	16 PNP	8 PNP	max. 8 PNP
max. 16 PNP		8 PNP	max. 8 PNP
yes	no	no	yes
200 mA	200 mA		200 mA
1.6 A/2 A		2 A	1.6 A/2 A
Yellow LED	Yellow LED	Yellow LED	Yellow LED
Red LED	Red LED	Red LED	Red LED
≤ 9 A	≤ 9 A	≤ 9 A	≤ 9 A
≤ 9 A			≤ 9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
BOOTP, DHCP, function block, display	BOOTP, DHCP, function block, display	BOOTP, DHCP, function block, display	BOOTP, DHCP, function block, display
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
224×68×36.9 mm	224×68×36.9 mm	224×68×36.9 mm	175×68×36.9 mm
Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn	Nickel-plated GD-Zn



16 inputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 4															SP	
OUT	Byte 1/Byte 0	Display (Series 100 only)								IPAP							

8 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 2																AP
OUT	Byte 1/Byte 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	Display								IPAP							

16 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	HS-15	HS-14	HS-13	HS-12	HS-11	HS-10	HS-9	HS-8	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 3/Byte 2	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10	OL-9	OL-8	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0
	Byte 4																AP
OUT	Byte 1/Byte 0	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	R-15	R-14	R-13	R-12	R-11	R-10	R-9	R-8	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0
	Byte 5/Byte 4	Display								IPAP							

8 inputs/8 outputs

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 4															SP	AP
OUT	Byte 1/Byte 0	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	Display								IPAP							

32 inputs

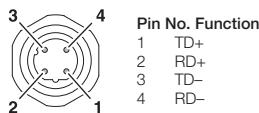
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	I-31	I-30	I-29	I-28	I-27	I-26	I-25	I-24	I-23	I-22	I-21	I-20	I-19	I-18	I-17	I-16
	Byte 5/Byte 4	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 7/Byte 6	S-31	S-30	S-29	S-28	S-27	S-26	S-25	S-24	S-23	S-22	S-21	S-20	S-19	S-18	S-17	S-16
	Byte 8															SP	
OUT	Byte 1/Byte 0	Display								IPAP							

8 inputs/8 outputs

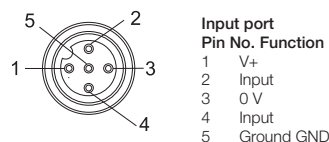
		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Byte 1/Byte 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Byte 3/Byte 2	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Byte 5/Byte 4	HS-15	HS-14	HS-13	HS-12	HS-11	HS-10	HS-9	HS-8	HS-7	HS-6	HS-5	HS-4	HS-3	HS-2	HS-1	HS-0
	Byte 7/Byte 6	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10	OL-9	OL-8	OL-7	OL-6	OL-5	OL-4	OL-3	OL-2	OL-1	OL-0
	Byte 8															SP	AP
OUT	Byte 1/Byte 0	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	Byte 3/Byte 2	R-15	R-14	R-13	R-12	R-11	R-10	R-9	R-8	R-7	R-6	R-5	R-4	R-3	R-2	R-1	R-0
	Byte 5/Byte 4	Display								IPAP							

Pin assignments

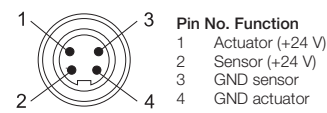
Ethernet



I/O port



Auxiliary power



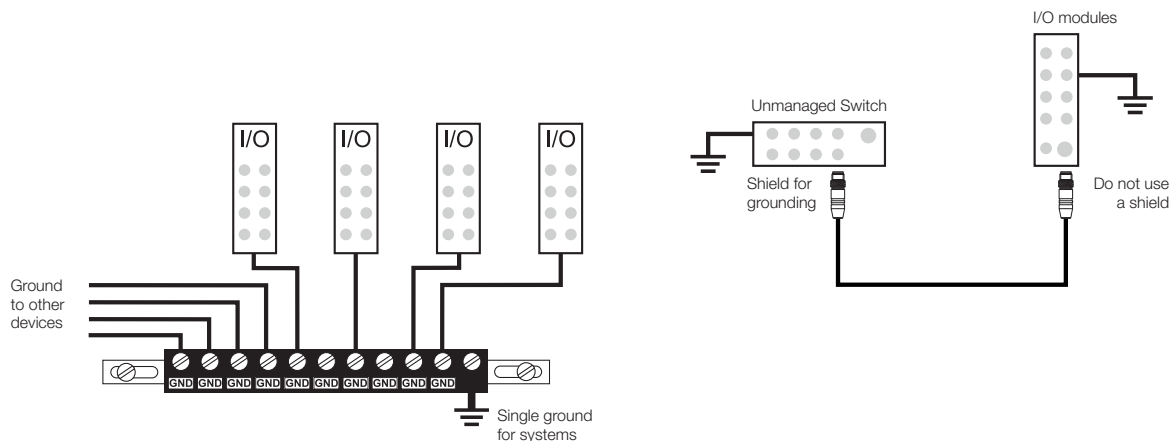
Information on grounding

With a standard European grounding connection, use a joint grounding point for all blocks (see first illustration). All blocks remain within the same grounding potential. Grounding straps are included for mounting on a painted surface.

If a single-point grounding system is not implemented, it is possible to use a varying grounding potential. However, the shield then generates an equalizing current that has a negative effect on data transmission since it can cause interruptions to communication.

With most grounding connections in North America, local machines with completely shielded cables are each connected to a separate ground. This is described in ODVA publication PUB00148RO, "Ethernet/IP Media Planning and Installation Manual."

ODVA recommends that the shield be connected to ground at the switch and not at the network device. Ethernet specification IEEE802.3 also permits the use of unshielded cables.

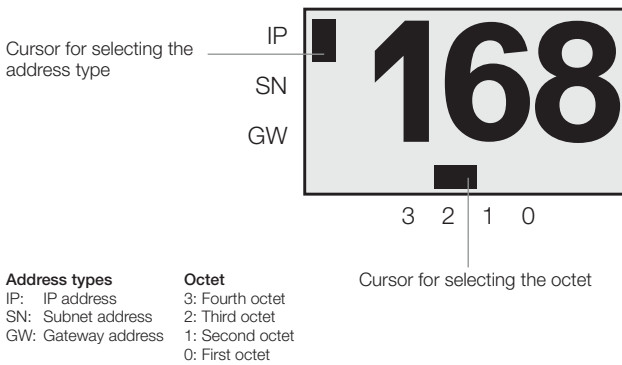


Bitmap legend	
I	Input
O	Output
R	Output reset
S	Input short-circuit
OL	Output overload status
HS	Output handshake
AP	Actuator power status
SP	Sensor/network power status

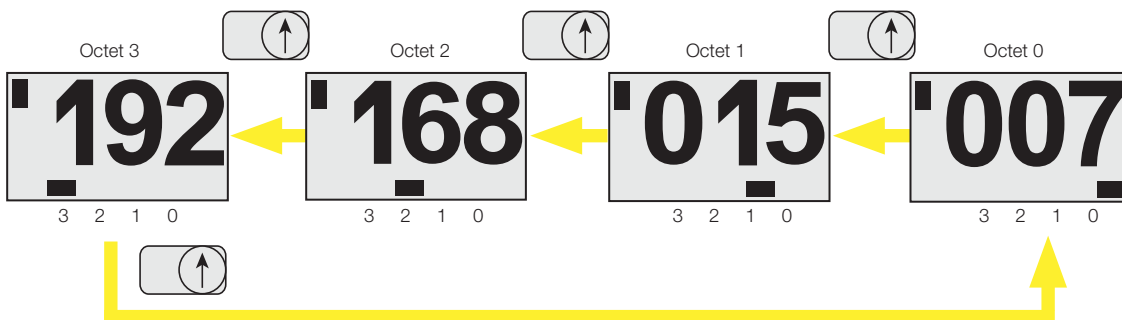
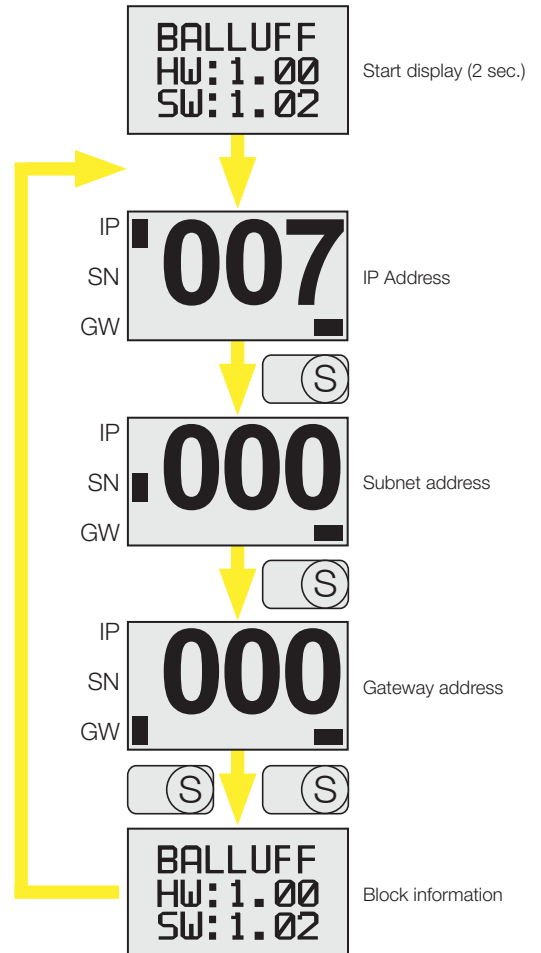
Output control byte display (Series 100 only)	
Bit 0	Red LED illuminates
Bit 1	Green LED illuminates
Bit 2	Display disable
Bit 3	
Bit 4	
Bit 5	
Bit 6	
Bit 7	

Ethernet/IP modules Display with operating buttons

The Balluff Series 100 modules feature a digital display with two operating buttons. that can be used to program the IP address, subnet and gateway address. You can also view the hardware and software versions from the module. When unused, octet 0 of the IP address is displayed by default.



1. Select the address you intend to change.
2. Select the octet you intend to change.
3. Press and hold down for three seconds.
4. Select the desired value.
5. Press and hold down for three seconds.



User-defined functions

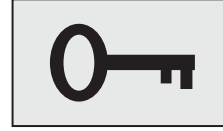
User-defined LEDs

The green and red LEDs indicate errors and provide the user with assistance when troubleshooting during maintenance.



Key disable

Using the controller as an interface, the operating keys can be disabled in order to prevent unauthorized access.



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

Product

Topology

IO-Link Modules

Modules

Bitmaps

Technical Data

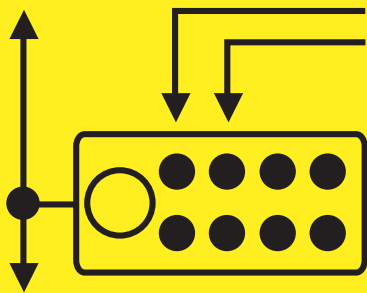
Display

EtherCAT

Unmanaged

Switches

Connectors and
Accessories



Fieldbus Systems

Fieldbus system: EtherCAT

EtherCAT at a glance

EtherCAT is the industrial Ethernet technology that impresses with its outstanding performance, low costs, flexible topology and ease of handling.

EtherCAT provides free selection of topology, so that line, branch, tree, and star can be combined as desired. This flexibility is reinforced by coupling and uncoupling of devices and segments in ongoing operation and by the line redundancy of the ring topology.

EtherCAT is suitable for centralized and decentralized architectures, supports Master/Slave, Master/Master, and Slave/Slave communication and can integrate lower-level fieldbuses. With the EtherCAT Automation Protocol it also covers the factory level and uses the existing infrastructure to do so.

EtherCAT supports up to 65,535 nodes, while its fast Ethernet physics allows a distance of up to 100 m between every two nodes. Optical fibers are used for longer distances.

The open technology, which anyone is allowed to implement, was introduced in 2003 and has been the international standard since 2007.



EtherCAT[®]



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The best I/O modules in the industry

Impressive features. Impressive functionality.
Impressive performance

Clearly visible status LEDs

Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.

Powerful and reliable outputs

With an output current of up to **2 A**, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing

The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.



Display

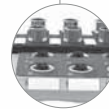
A firmly entrenched part of the module is a display that can be locked via the PLC, which prevents unauthorized access. Two LEDs controlled by the PLC allow you to visualize results that are not specific to the module or port at the location where they occur.

Inputs with high density

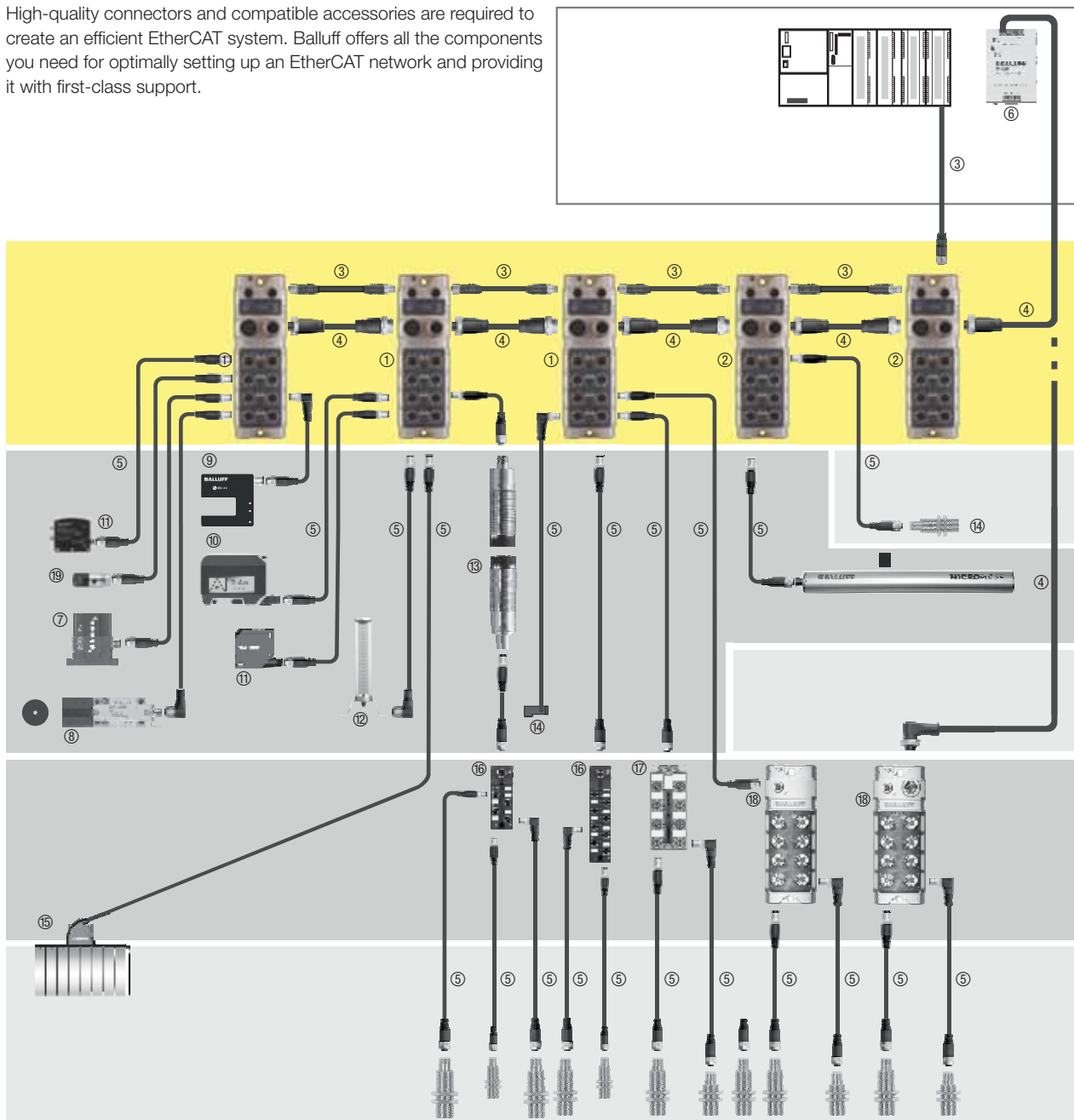
All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter. A DESINA output is also optionally available via pin 2.

Innovative housing design

The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers. And two mounting points are sufficient to secure the robust metal housing.



High-quality connectors and compatible accessories are required to create an efficient EtherCAT system. Balluff offers all the components you need for optimally setting up an EtherCAT network and providing it with first-class support.



- EtherCAT
- Fieldbus Systems
- Profibus
- Profinet
- CC-Link
- DeviceNet
- Ethernet/IP
- EtherCAT
- Product Topology
- IO-Link master
- Unmanaged Switches
- Connectors and Accessories

IO-Link

- ①, ② EtherCAT-IO-Link-Module BNI
- ③ Bus Cable BCC
- ④ Power Cable BCC
- ⑤ Connection Cable BCC
- ⑥ Power Supplies BAE

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- ⑦ IO-Link Multiple Position Switches BNS
- ⑧ IO-Link RFID System BIS
- ⑨ IO-Link Through-beam Fork Sensor BGL
- ⑩ IO-Link Laser Distance Sensor BOD
- ⑪ IO-Link Color Sensor BFS
- ⑫ IO-Link SmartLight BNI
- ⑬ IO-Link Inductive Couplers BIC
- ⑭ IO-Link Inductive Distance Sensor BAW
- ⑮ IO-Link Valve Terminal Connector BNI
- ⑯ IO-Link Sensor Hub BNI M8
- ⑰ IO-Link Sensor Hub BNI M12
- ⑱ IO-Link Sensor Hub, metal
- ⑲ IO-Link Pressure Sensor BSP

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Webserver

For anyone that prefers a web interface, the Ethernet modules from Balluff have a simple integrated webserver. This web page can be used to program the module addresses and configure several of the user-defined functions.



A simple browser provides immediate access to the integrated webserver, which has been implemented in all Ethernet/IP modules of Gen IV.



Extensive diagnostics functions are available here, such as displaying all module LEDs, including all representations in plain text.



In the "Device Properties" area you have the option, for example, of configuring devices connected to the IO-Link port.



The module configuration, such as assigning or displaying the IP address, is hidden behind the "Configurations" function.

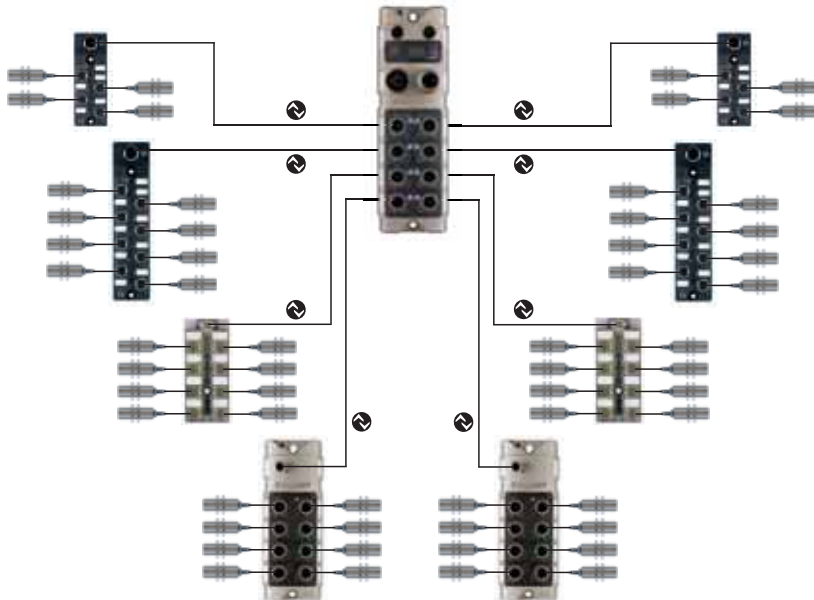
136 IOs on a module

Balluff IO-Link solutions save money

Previously, at least nine fieldbus modules had to be used for the capability of activating 136 IOs. Today, a single Profinet module is sufficient.

In connection with the extremely cost-effective sensor/actuator hubs from Balluff, now up to 136 IO signals are offered which can be processed in a most efficient manner. In this way, compared to the stan-

dard fieldbus modules, there is a high cost savings of 15 to 20% per input. If you add the savings from the fieldbus and power cables to that, you get 30 to 40%. A cost-effective M12 standard cable BCC is sufficient to connect a sensor/actuator hub. Furthermore, sensor hubs need just one bus address, can variably group sensor signals together within an area of 20 m and ensure exceptional efficiency.



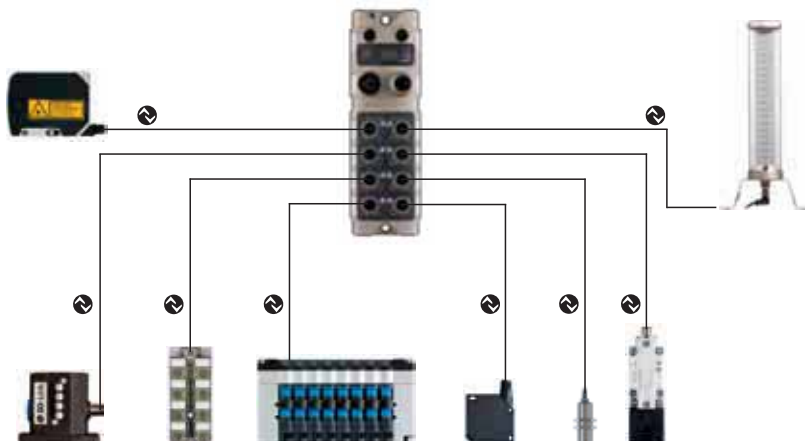
1000 tasks, one module:

The EtherCat module with eight IO-Link ports

Whether position measurement, object detection, identification, fluid sensor applications, temperature or pressure measurement: through IO-Link, the Ethernet module is suitable for every job.

IO-Link not only has advantages for installing standard sensors, but also can integrate intelligent devices via the same interface. With that, the module provides a uniform interface from the signal to the control level.

There are frequently high costs associated with field installation of intelligent devices, since shielded cables and intelligent interface cards such as analog input cards are used in the controllers. IO-Link not only makes error-prone analog inputs unnecessary, but also reduces the wiring, inspection and hardware effort. With simple plug-and-play of unshielded, cost-effective M12 lines, the system is quickly and securely brought into operation.



EtherCAT

- Fieldbus Systems
- Profibus
- Profinet
- CC-Link
- DeviceNet
- Ethernet/IP
- EtherCAT
- Product Topology**
- IO-Link master
- Unmanaged Switches
- Connectors and Accessories



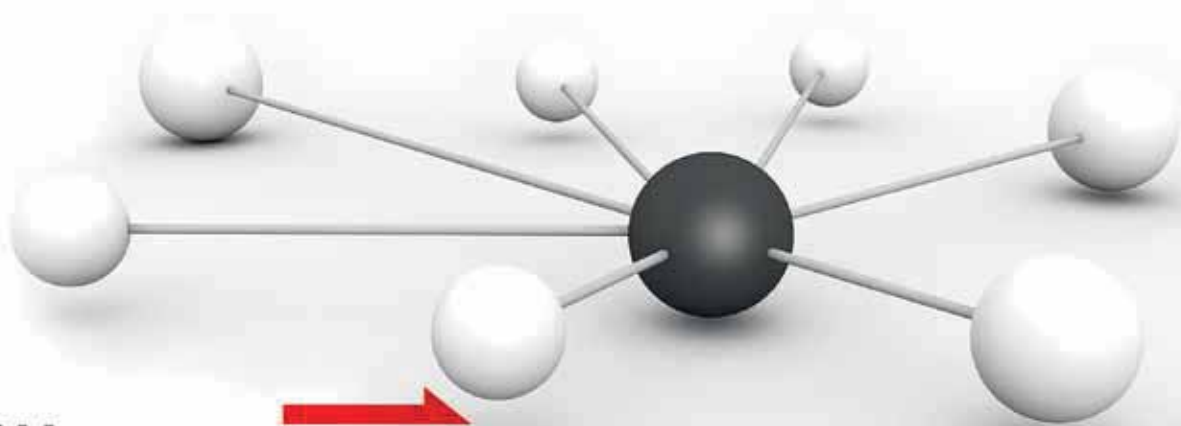
**EtherCAT module with eight IO-Link ports,
integrated display, and webserver**

The new EtherCAT module provides full IO-Link functionality. This makes it easy and cost-effective to install. And its eight IO-Link ports can be configured and used fully independently of one another. The IO-Link ports can also be freely configured as standard I/O ports and thereby provide eight additional inputs/outputs for standard sensors and actuators.

Like all Ethernet-based modules, the EtherCAT module also provides an integrated webserver and an integrated display for fast diagnostics without any additional hardware or software. Simply start Internet Explorer and call up the module. Right away the status of the module is displayed.

The EtherCAT module is even simpler than the classic fieldbus:

- Automatic address assignment
- No network tuning required
- Built-in diagnostics with fault-location system
- No switch configuration and no complex handling of MAC or IP addresses



EtherCAT®



EtherCAT



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Product
Topology

IO-Link master

Unmanaged
Switches

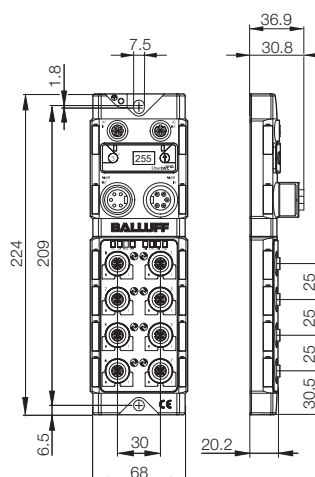
Connectors and
Accessories

Fieldbus	EtherCAT
Type	8x IO-Link, 16x I/O
	BNI0077
Supply voltage U_B	18...30 V DC
Indicator/input	Display/pushbutton
Function indicator	BUS/RUN
Module status indicator: Mod LED	yes
Network status indicator: Net LED	yes
Port status indicator	Black, red, yellow
Fieldbus connection	M12, D-coded, female
AUX power connection	7/8", male, 5-pin
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	8
Number of inputs	max. 16
Number of outputs	max. 16
Configurable inputs/outputs	yes
Max. load current, sensors/channel	200 mA
Max. load current, output	1.2 A/2 A
Port status indicator (signal status)	Yellow LED
Port diagnostic indicator (overload)	Red LED
Total actuator current	< 9 A
Total sensor current	< 9 A
Degree of protection as per IEC 60529	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C
Storage temperature	-25...+70 °C
Fastening	2 mounting holes
Dimensions (LxWxH)	224x68x36.9 mm
Housing material	Nickel-plated die-cast zinc

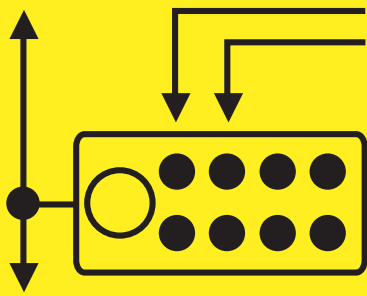
IO-Link

Version 1.1

No. of IO-Link master ports	8x master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Displays	Communication Error
	Green LED Red LED
Max. load current IO-Link device	1.2 A



All modules include four screw plugs and a label set.



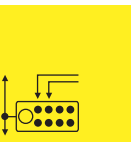
Fieldbus Systems

Fieldbus System: Unmanaged Switches



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Ethernet Switches 83

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Ethernet 5-port switch IP 20

Ethernet 8-port switch IP 20

Ethernet 9-port switch IP 67

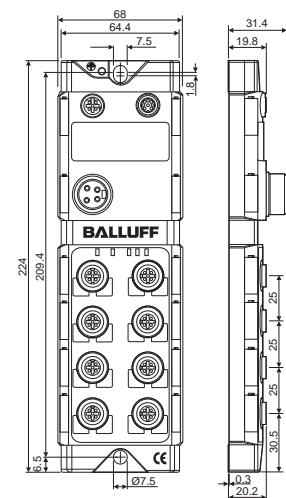
Ethernet-based network systems are gaining more and more importance in industrial automation. Balluff provides a wide variety of Ethernet-based systems and network components such as Profinet or Ethernet/IP for machine and plant equipment.

With Balluff, you receive a complete system so that you can use Ethernet to link Ethernet system components easily. The Ethernet product line was expanded with the addition of 5-port and 8-port Ethernet switches for this reason.

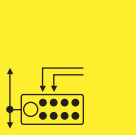
The switch makes it possible to connect 5-port and 8-port Ethernet devices to a component radially. The RJ45 ports and the 10 and 100 Mbps transmission rates support this. The transfer speed is automatically set via the auto-negotiation function. Wiring errors are reliably ruled out by the autocrossing function. This is because the module does not identify on its own what type of cable is being used.



Communication	Unmanaged Switch
Type	No display
	BNI000F
Supply voltage U_B	24 V DC
Module current consumption	80...100 mA
Module status indicator: Mod LED	yes
Network status indicator: Net LED	yes
Network data transfer rate: link LED	yes
Port status indicator	Black, red, yellow, green
Connection: Fieldbus	M12, D-coded, female
Connection: AUX power	7/8", male, 4-pin
Number of Ethernet ports	9
Enclosure rating per IEC 60529	IP 67
Operating temperature	0...+55 °C
Storage temperature	-25...+70 °C
Housing material	Nickel-plated GD-Zn
Transfer rates	10/100 Mbps, automatic detection, full-duplex
Enclosure rating	IP 67
Max. switching frequency	32 gigabytes
Overload protection	IEEE 802.3
IP address space	IPv4
Approvals	ODVA, CSA, CE, UL 94



All modules include four screw plugs and a label set.



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

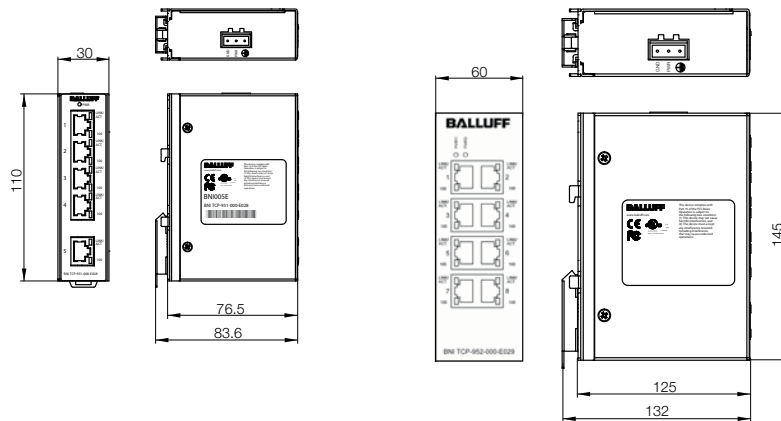
Port switches

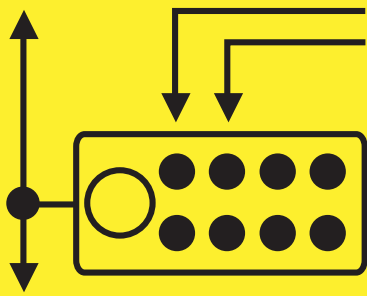
Ethernet switches

Connectors and Accessories



Communication Type	Ethernet	Ethernet
Type	Ethernet switch	Ethernet switch
	BNI005E	BNI0067
Ports	5×RJ45 Spring force clamp	8×RJ45 Spring force clamp
System power supply	0.2...2.5 mm ²	0.2...2.5 mm ²
Supply voltage U _B	12...48 V DC	2×12...30 V DC, redundant
Transmission rate	10/100 Mbps full duplex Auto crossing	10/100 Mbps full duplex Auto crossing
Operating modes	Auto negotiation	Auto negotiation
Communication status	Link/run LED, (yellow/green)	Link/run LED, (yellow/green)
Supply voltage	LED (green), power	LED (green), power
Enclosure rating	IP 20	IP 20
Housing	Black plastic	Black plastic
Temperature range	-10...+60 °C (storage temperature -25...+70 °C)	-10...+60 °C (storage temperature -25...+70 °C)
Fastening	Snaps on to DIN rail TH35 (EN60715)	Snaps on to DIN rail TH35 (EN60715)
Weight	152 g	363 g

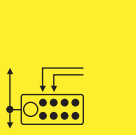




Fieldbus Systems



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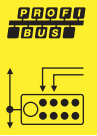


Connector diagram and wiring

PUR, violet	0.6 m
PUR, violet	1 m
PUR, violet	2 m
PUR, violet	5 m
PUR, violet	10 m
PUR, violet	15 m
PUR, violet	20 m
Supply voltage U_B	
Number of conductors \times conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	

Other cable lengths on request.





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

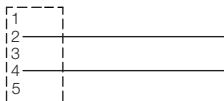
DeviceNet and CAN Bus

Ethernet/IP

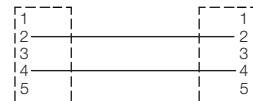
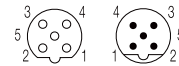
Accessories



Shield on cap nut

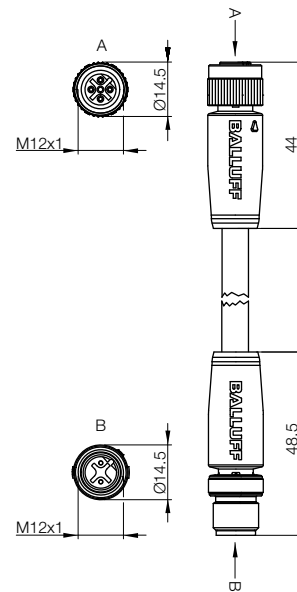
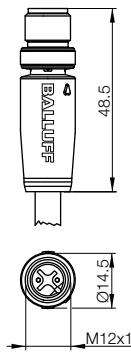
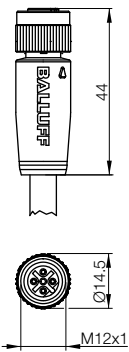


Shield on cap nut



Shield on cap nut

		BCC0A12
		BCC0A13
BCC070Y	BCC0A0Y	BCC0A14
BCC070Z	BCC0A0Z	BCC0A15
BCC0710	BCC0A10	BCC0A16
BCC0A0K		BCC0A17
BCC0A0L		BCC0A18
300 V	300 V	300 V
2x0.64 mm ²	2x0.64 mm ²	2x0.64 mm ²
IP 67	IP 67	IP 67
-20...+70 °C	-20...+70 °C	-20...+70 °C

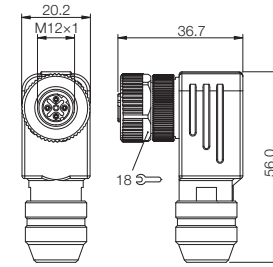
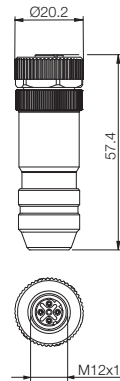




Connector diagram and wiring



Type	5-pin, B-coded	5-pin, B-coded
	BCC0715	BCC0717
Supply voltage U_B	10...30 V DC	10...30 V DC
Number of conductors x conductor cross-section	5x max. 0.75 mm ²	5x max. 0.75 mm ²
Cable diameter	Max. 8.0 mm	Max. 8.0 mm
Connection	Screw terminal	Screw terminal
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C
Housing material	CuZn	CuZn
Shielded design	yes	yes



Profibus
M12 connector, field-attachable
5-pin

PROFIBUS



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

Ethernet/IP

Accessories



5-pin, B-coded

BCC0714

10...30 V DC

5× max. 0.75 mm²

Max. 8.0 mm

Screw terminal

IP 67

-25...+85 °C

CuZn

yes

5-pin, B-coded

BCC0716

10...30 V DC

5× max. 0.75 mm²

Max. 8.0 mm

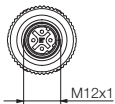
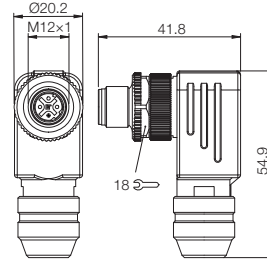
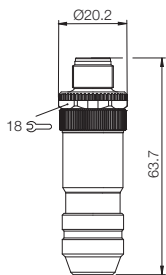
Screw terminal

IP 67

-25...+85 °C

CuZn

yes

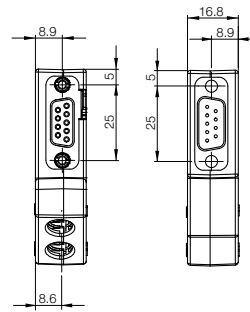
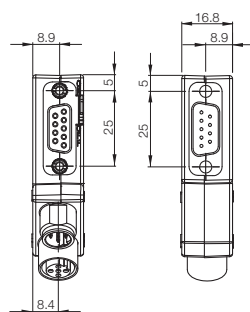
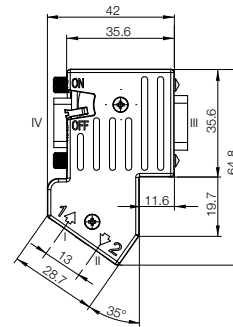
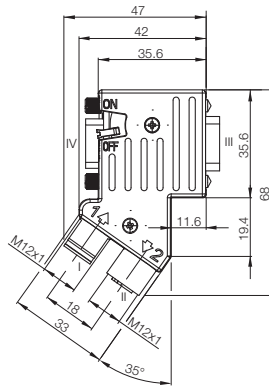


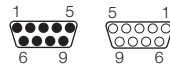
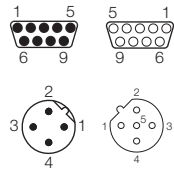


Connector diagram and wiring



	BCC0C0Y	BCC0C10
Connector type	Sub D/M12	Male Sub D / female Sub D
Supply voltage U_B	30 V	30 V
Enclosure rating per IEC 60529	IP 67	IP 30
Ambient temperature T_a	-20...+70 °C	-20...+70 °C
Cable outlets	angled	angled





BCC0C0Z

Sub D/M12

30 V

IP 67

-20...+70 °C

straight

BCC0C11

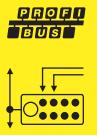
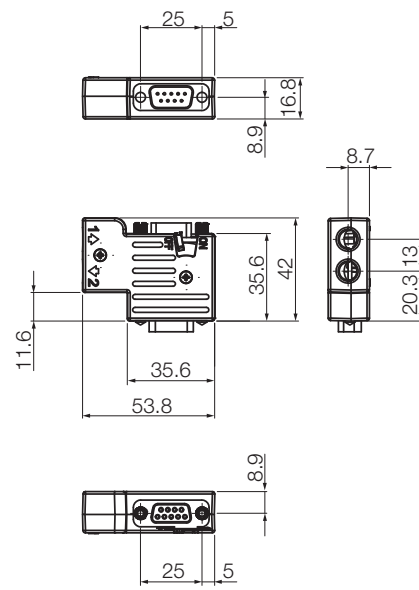
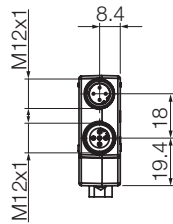
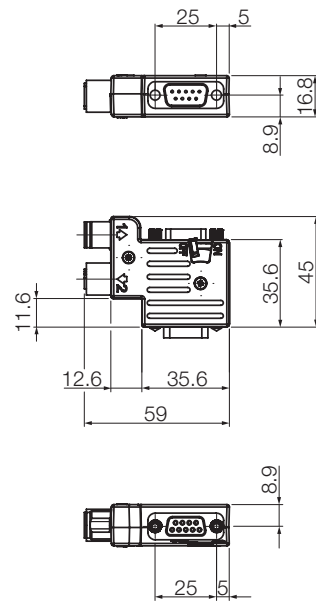
Male Sub D / female Sub D

30 V

IP 30

-20...+70 °C

straight



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

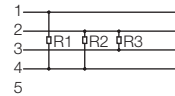
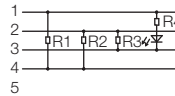
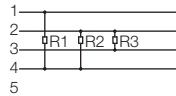
Unmanaged
Switches

Connectors and
Accessories

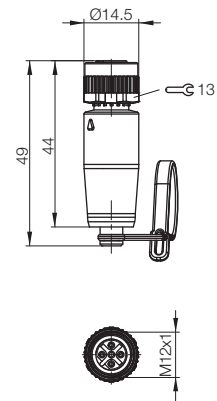
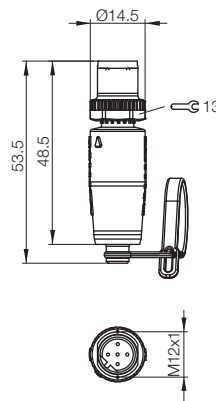
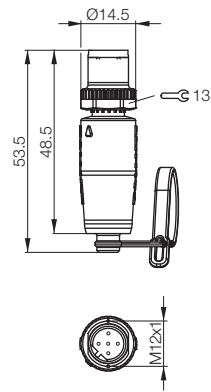
Profibus
Profinet and
EtherCAT
CC-Link
DeviceNet and
CAN Bus
Ethernet/IP
Accessories



Connector diagram
and wiring



Type	B-coded	B-coded	B-coded
	BCC0718	BCC0719	BCC0C6E
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	-40...+85 °C	-40...+85 °C	-40...+85 °C
Housing material	Plastic	Plastic	Plastic





Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

Profibus

Profinet and
EtherCAT

CC-Link

DeviceNet and
CAN Bus

Ethernet/IP

Accessories

Connector diagram
and wiring



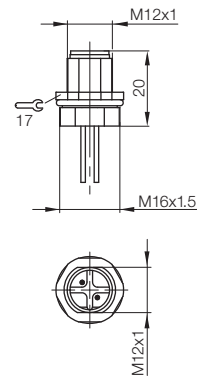
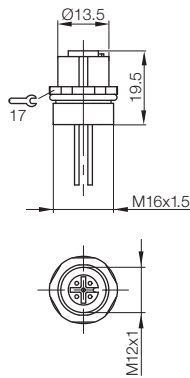
- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____



- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

0.2 m	BCC0E3Z	BCC0E40
Supply voltage U_B	125 V	125 V
Number of conductors × conductor cross-section	2×0.25 mm ²	2×0.25 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68
Ambient temperature T_a	-25...+85 °C	-25...+85 °C

Other cable lengths on request.

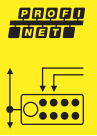


Connector diagram and wiring

Type	
PUR shielded, green	0.6 m
PUR shielded, green	2 m
PUR shielded, green	5 m
PUR shielded, green	10 m
PUR shielded, green	15 m
PUR shielded, green	20 m
PUR shielded, green	30 m
Supply voltage U_B	
Number of conductors × conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	



Profinet and EtherCAT
M12 connection cables, 4-pin,
D-coded and RJ45



Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

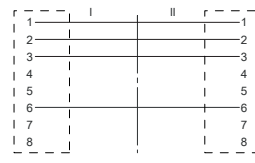
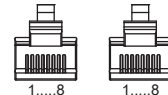
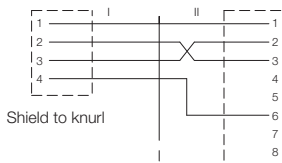
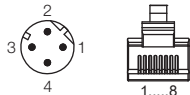
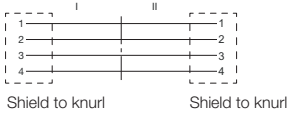
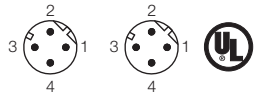
Connectors and
Accessories

Profibus

Profinet and
EtherCAT

CC-Link
DeviceNet and
CAN Bus

Ethernet/IP
Accessories



M12 male straight/M12 male straight

BCC04K0

BCC04K1

BCC04K2

BCC04K3

BCC04ZH

BCC04K4

BCC04K5

60 V AC/DC

4×22 AWG

IP 68

-20...+60 °C

M12 male straight/RJ45 male straight

BCC04K6

BCC04K7

BCC04K8

BCC04K9

BCC04ZJ

BCC04KA

BCC04KC

60 V AC/DC

4×22 AWG

IP 68/IP 20

-20...+60 °C

RJ45 male straight/RJ45 male straight

BCC04KE

BCC04KF

BCC04KH

BCC04KJ

BCC04ZK

BCC04KK

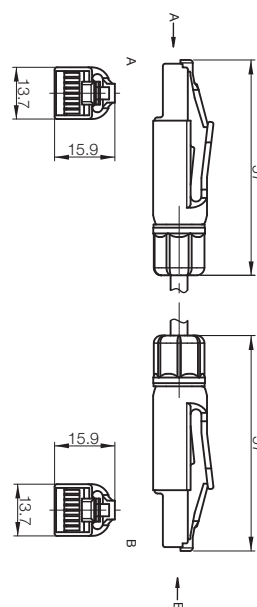
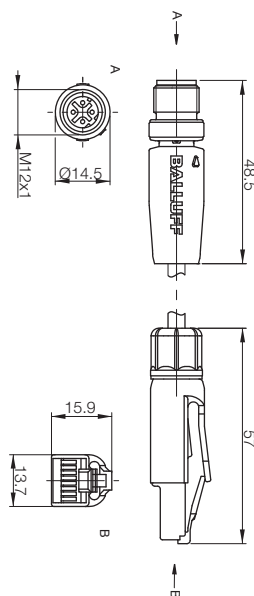
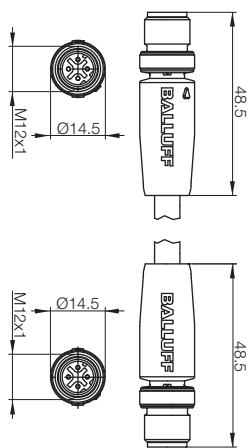
BCC04KL

60 V AC/DC

4×22 AWG

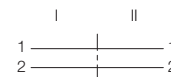
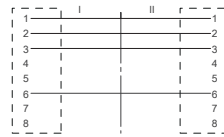
IP 20

-20...+60 °C

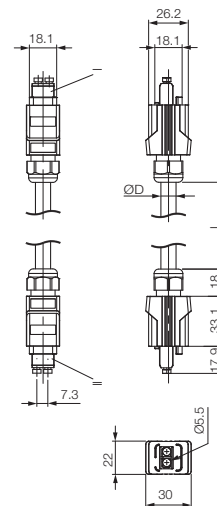
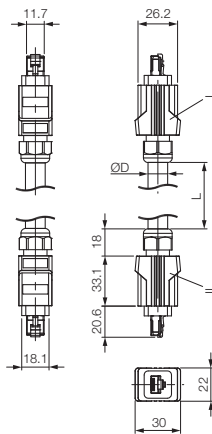




Connector diagram and wiring



Type		Push-Pull RJ45/Push-Pull RJ45	Push-Pull SCRJ45/Push-Pull SCRJ45
PUR shielded, green	0.6 m	BCC0F4U	
PUR shielded, green	2 m	BCC0F4W	
PUR shielded, green	5 m	BCC0F4Y	
PUR shielded, green	10 m	BCC0F4Z	
PUR shielded, green	20 m	BCC0F50	
Fiber optic, green	0.6 m		BCC0F51
Fiber optic, green	2 m		BCC0F52
Fiber optic, green	5 m		BCC0F53
Fiber optic, green	10 m		BCC0F54
Fiber optic, green	20 m		BCC0F55
Supply voltage U_B		50 V DC	
Number of conductors x conductor cross-section		0.34 mm ²	POF Ø 1.0 mm
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-40...+70 °C	-20...+70 °C



Profinet and EtherCAT
M12 connector, field-attachable
4-pin



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

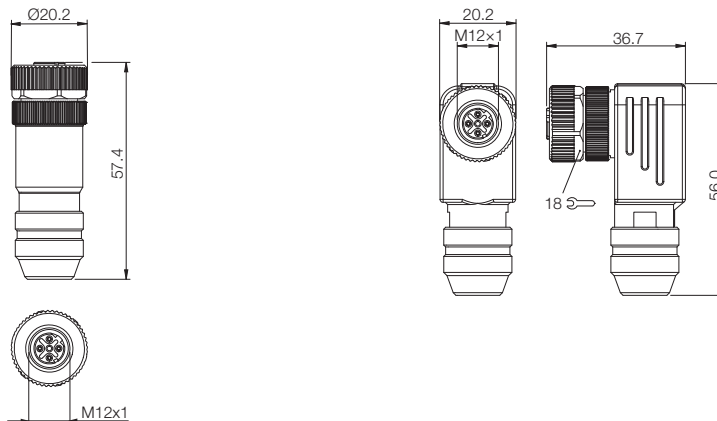
Ethernet/IP

Accessories

Connector diagram and wiring



Type	4-pin, D-coded	4-pin, D-coded
	BCC03Y1	BCC03Y2
Supply voltage U_B	60 V AC/DC	60 V AC/DC
Number of connections	4	4
Number of conductors × conductor cross-section	4×0.75 mm ²	4×0.75 mm ²
Cable diameter	Max. 8 mm	Max. 8 mm
Connection	Cage clamp	Screw plug
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C
Housing material	CuZn	CuZn
Shielded design	yes	yes

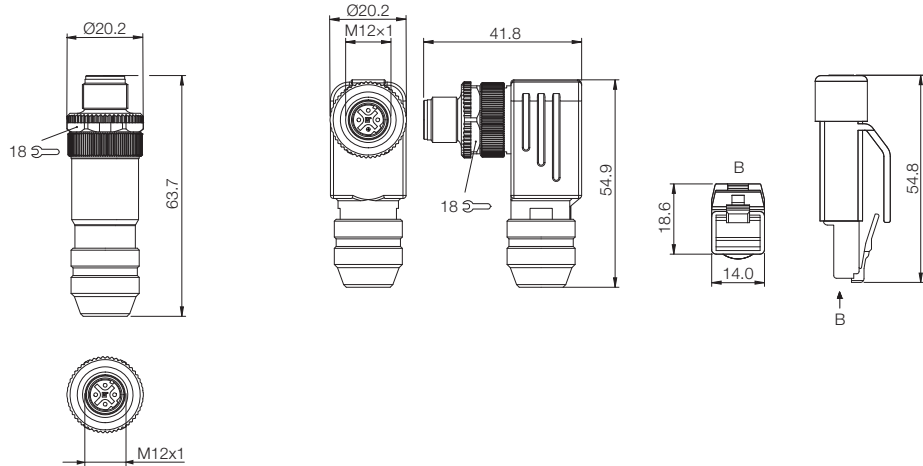




Connector diagram and wiring



Type	4-pin, D-coded	4-pin, D-coded	No coding
	BCC03WZ	BCC03Y0	BCC06FH
Supply voltage U_B	60 V AC/DC	60 V AC/DC	60 V AC/DC
Number of connections	4	4	4
No. of wires x conductor cross-section	4x0.75 mm ²	4x0.75 mm ²	244x max. AWG 22
Cable diameter	Max. 8 mm	Max. 8 mm	Max. 9 mm
Connection	Cage clamp	Screw plug	Insulation displacement connector technology
Enclosure rating per IEC 60529	IP 67	IP 67	IP 20
Ambient temperature T_a	-25...+85 °C	-25...+85 °C	-40...+70 °C
Housing material	CuZn	CuZn	
Shielded design	yes	yes	yes





Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

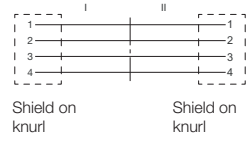
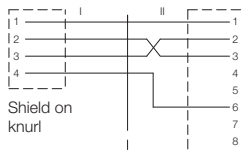
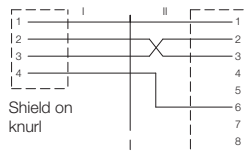
Profibus

Profinet and
EtherCAT

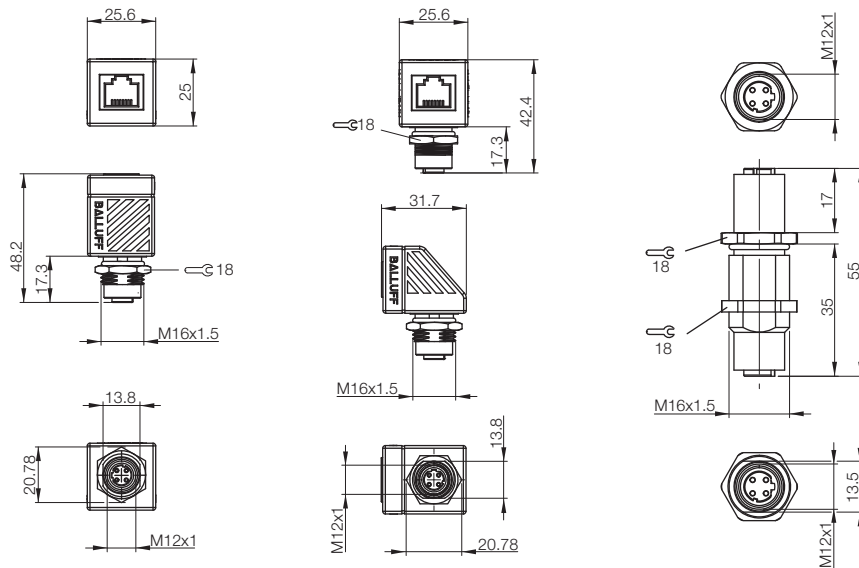
CC-Link
DeviceNet and
CAN Bus

Ethernet/IP
Accessories

Connector diagram
and wiring



Type	M12 female straight/ RJ45 straight, pass-thru	M12 female straight/ RJ45 right angle, pass-thru	M12 female straight/ M12 female straight, pass-thru
Type	D-coded/no coding	D-coded/no coding	D-coded
	BCC085F	BCC085H	BCC06YP
Supply voltage U_B	60 V AC/DC	60 V AC/DC	60 V AC/DC
Enclosure rating	IP 20	IP 20	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C	-25...+80 °C
Mounting thread	M16	M16	M16



For quick and simple installation

Balluff is offering suitable connectors for the new push-pull variants of PROFINET modules. Select between fiber-optic cables (FO) and copper versions for transmitting signals or files.

The push-pull connection technology for fieldbus and power lines has been specified by AIDA (Automation Initiative of German Automobile Manufacturers).

Push-pull guarantees quick and easy installation.

Connector diagram and wiring

PVC, gray	0.6 m
PVC, gray	2 m
PVC, gray	5 m
PVC, gray	10 m
PVC, gray	20 m
Supply voltage DC U_s	
Cable	
Number of conductors × conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	

Other cable materials,
colors and lengths on request.





Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

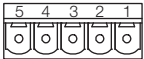
Unmanaged
Switches

Connectors and
Accessories

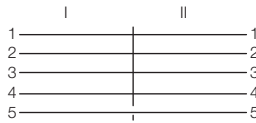
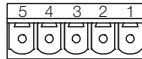
Profibus
and
EtherCAT

CC-Link
and
CAN Bus

Ethernet/IP
Accessories



PIN 1: brown
PIN 2: black
PIN 3: gray
PIN 4: blue
PIN 5: green/yellow



BCC0F4M

BCC0F4J

BCC0F4K

BCC0F4L

24 V DC

fabricated

5x2.5 mm²

IP 67

-40...+70 °C

BCC0F4N

BCC0F4P

BCC0F4R

BCC0F4T

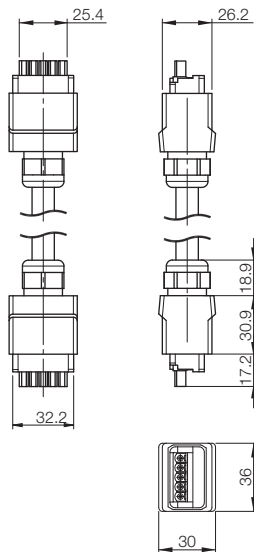
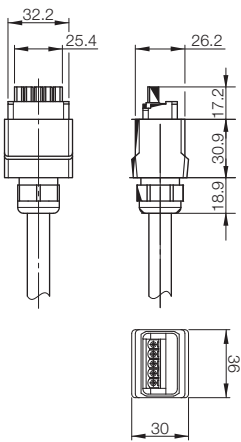
24 V DC

fabricated

5x2.5 mm²

IP 67

-40...+70 °C





Connector diagram and wiring

PVC, red	0.6 m
PVC, red	2 m
PVC, red	5 m
PVC, red	10 m
PVC, red	15 m
Supply voltage U_B	
Number of conductors \times conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	

Other cable materials, colors and lengths on request.

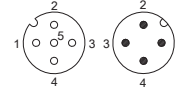




PIN 1: shield
PIN 2: white
PIN 3: yellow
PIN 4: blue



PIN 1: shield
PIN 2: white
PIN 3: yellow
PIN 4: blue



PIN 1: shield
PIN 2: white
PIN 3: yellow
PIN 4: blue

CC-Link



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

Ethernet/IP

Accessories

BCC06Y1
BCC06Y2
BCC06Y3

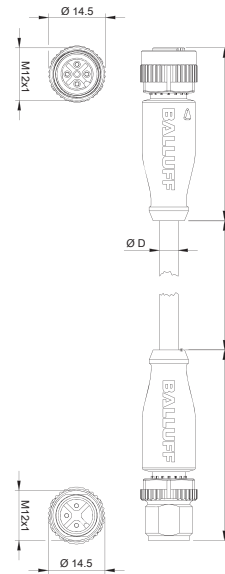
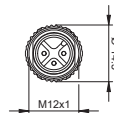
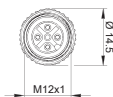
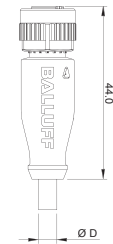
BCC084R
BCC084T
BCC084U

BCC06WU
BCC06WW
BCC06WY
BCC06WZ
BCC06Y0

250 V
3×1×AWG20
IP 67
-25...+70 °C

250 V
3×1×AWG20
IP 67
-25...+70 °C

250 V
3×1×AWG20
IP 67
-25...+70 °C

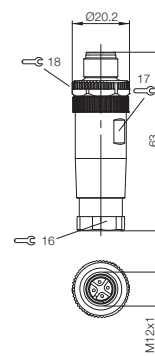
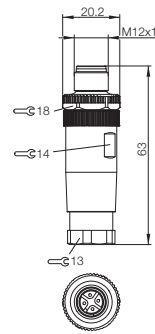
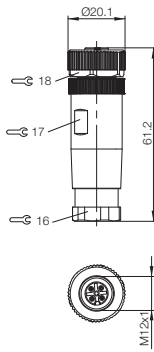
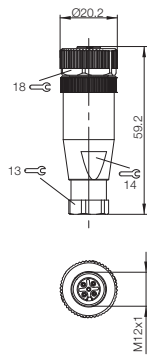




Connector diagram



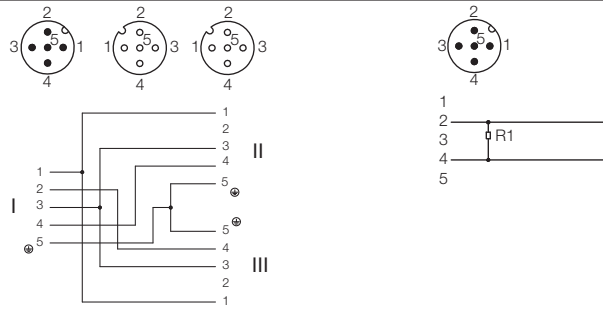
Cable diameter	BCC06F6	BCC06Y6	BCC06F7	BCC06Y5
Ø 6...8 mm				
Supply voltage AC U _S	250 V AC	250 V AC	250 V AC	250 V AC
Supply voltage DC U _S	250 V DC	250 V DC	250 V DC	250 V DC
Cable	field-attachable	field-attachable	field-attachable	field-attachable
No. of wires x conductor cross-section	4x0.14...0.75 mm ²	4x0.14...0.50 mm ²	4x0.14...0.75 mm ²	4x0.14...0.50 mm ²
Connection	Screw terminal	Spring clamp terminal	Screw terminal	Spring clamp terminal
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Ambient temperature T _a	-40...+85 °C	-25...+85 °C	-40...+85 °C	-25...+85 °C



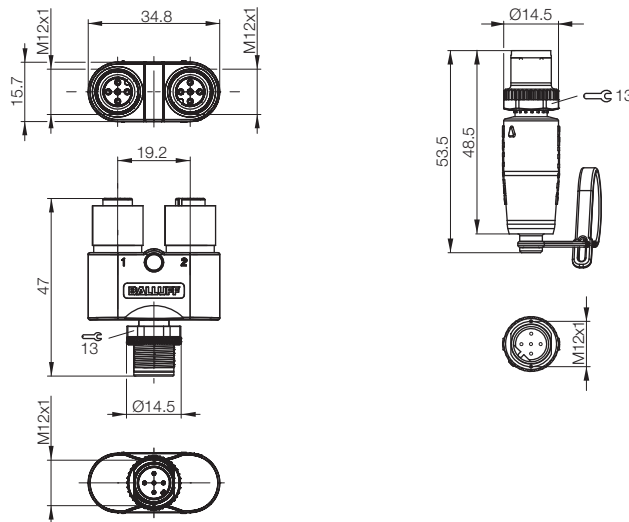


- Fieldbus Systems
- Profibus
- Profinet
- CC-Link
- DeviceNet
- Ethernet/IP
- EtherCAT
- Unmanaged Switches
- Connectors and Accessories
- Profibus
- Profinet and EtherCAT
- CC-Link
- DeviceNet and CAN Bus
- Ethernet/IP
- Accessories

Connector diagram and wiring



Type	T splitter	M12 terminating resistor
	BCC089P	BCC06Y4
Use	2x M12 female to 1x M12 male	
Supply voltage U_S	125 V	10...30 V DC
Rated operating current I_b	4 A	
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+80 °C	-40...+85 °C
Housing material	PA 6.6 + GF	Plastic





Connector diagram and wiring

PUR, violet	0.6 m
PUR, violet	2 m
PUR, violet	5 m
PUR, violet	10 m
PUR, violet	15 m
PVC, gray	0.6 m
PVC, gray	2 m
PVC, gray	5 m
PVC, gray	10 m
PVC, gray	15 m

Supply voltage U_B

Number of conductors \times conductor cross-section

Enclosure rating per IEC 60529

Ambient temperature T_a





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

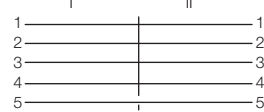
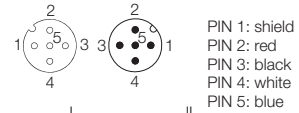
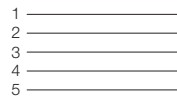
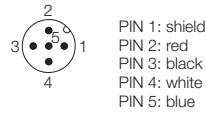
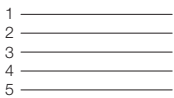
Profinet and EtherCAT

CC-Link

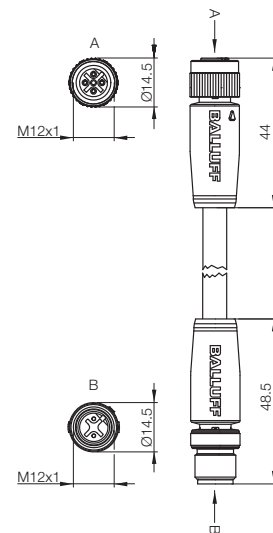
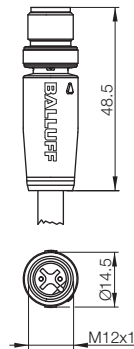
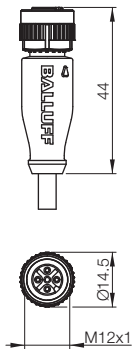
DeviceNet and CAN Bus

Ethernet/IP

Accessories



			BCC09M8	
BCC09MJ	BCC09MM	BCC09MA		
BCC09MK	BCC09MN	BCC09MC		
BCC09ML	BCC09MP	BCC09ME		
		BCC09MF		
		BCC0E03		
BCC0CZW	BCC0E00	BCC0E04		
BCC0CZY	BCC0E01	BCC0E05		
BCC0CZZ	BCC0E02	BCC0E06		
		BCC0E07		
30 V	30 V	30 V		
2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG		
IP 68	IP 68	IP 68		
-20...+80 °C	-20...+80 °C	-20...+80 °C		





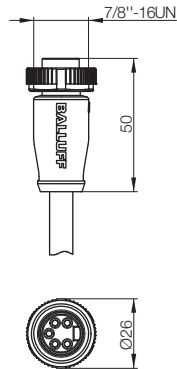
Connector diagram
and wiring



PIN 1: shield
PIN 2: red
PIN 3: black
PIN 4: white
PIN 5: blue



PUR, violet	0.6 m	
PUR, violet	2 m	BCC0AYR
PUR, violet	5 m	BCC0AYP
PUR, violet	10 m	BCC0AYN
PUR, violet	15 m	
PVC, gray	0.6 m	
PVC, gray	2 m	BCC09UY
PVC, gray	5 m	BCC09W0
PVC, gray	10 m	BCC09W3
PVC, gray	15 m	
Supply voltage U_B		30 V
Number of conductors × conductor cross-section		2×24 AWG + 2×22 AWG
Enclosure rating per IEC 60529		IP 68
Ambient temperature T_a		-20...+80 °C



Transmission rate	Cable	
	thick	thin
125 kbs baud rate	500 m	100 m
250 kbs baud rate	250 m	100 m
500 kbs baud rate	100 m	100 m



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

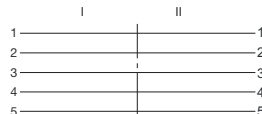
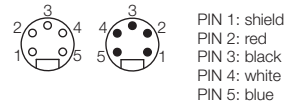
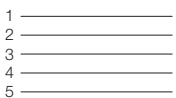
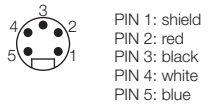
Profibus

Profinet and EtherCAT

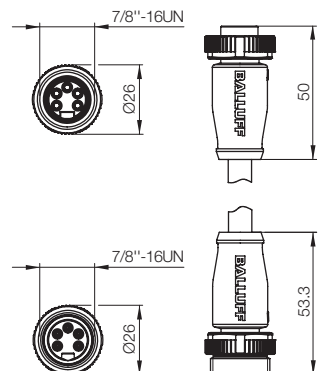
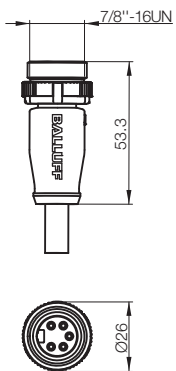
CC-Link

DeviceNet and CAN Bus

Ethernet/IP Accessories



	BCC0AYJ	
BCC0AYM	BCC0AYF	
BCC0AYL	BCC0AYE	
BCC0AYK	BCC0AYC	
	BCC0AYA	
	BCC09YA	
BCC09W8	BCC09YE	
BCC09WA	BCC09YJ	
BCC09WF	BCC09YP	
	BCC09YT	
30 V	30 V	
2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG	
IP 68	IP 68	
-20...+80 °C	-20...+80 °C	



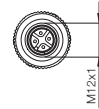
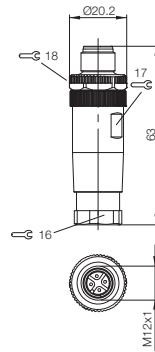
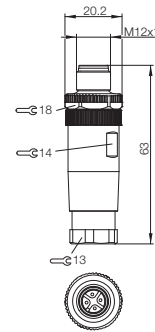
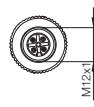
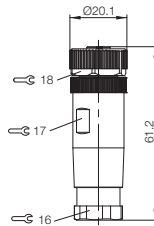
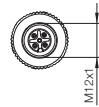
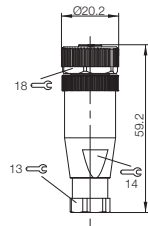
DeviceNet and CAN Bus M12 connector, field-attachable 4-pin



Connector diagram



Cable diameter Ø 6...8 mm	BCC06F6	BCC06Y6	BCC06F7	BCC06Y5
Supply voltage AC U_S	250 V AC	250 V AC	250 V AC	250 V AC
Supply voltage DC U_S	250 V DC	250 V DC	250 V DC	250 V DC
Cable	field-attachable	field-attachable	field-attachable	field-attachable
No. of wires x conductor cross-section	4x0.14...0.75 mm ²	4x0.14...0.50 mm ²	4x0.14...0.75 mm ²	4x0.14...0.50 mm ²
Connection	Screw terminal	Spring clamp terminal	Screw terminal	Spring clamp terminal
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Ambient temperature T_a	-40...+85 °C	-25...+85 °C	-40...+85 °C	-25...+85 °C



7/8"

DeviceNet and CAN Bus
7/8" female, 7/8" male, field-attachable
5-pin



Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

Ethernet/IP

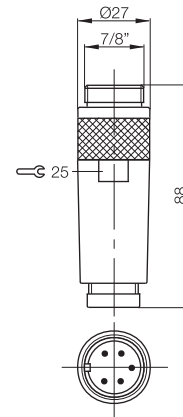
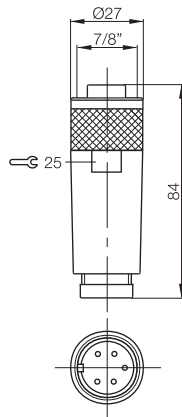
Accessories

Connector diagram and wiring



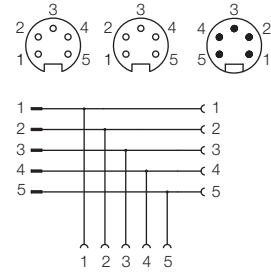
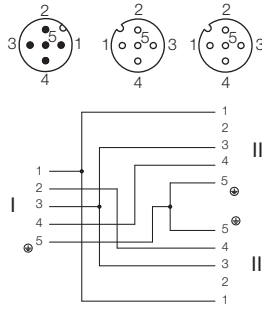
Cable diameter	Ø 6...8 mm	BCC070E	BCC070J
	Ø 8...10 mm	BCC070F	BCC070K
	Ø 10...12 mm	BCC070H	BCC070L
Supply voltage AC U _S	300 V AC	300 V AC	300 V AC
Supply voltage DC U _S	300 V DC	300 V DC	300 V DC
Number of conductors × conductor cross-section	5 × max. 1.5 mm ²		5 × max. 1.5 mm ²
Connection			Screw terminal
Enclosure rating per IEC 60529	IP 67		IP 67
Ambient temperature T _a	-25...+80 °C		-25...+80 °C

Other cable diameters on request.

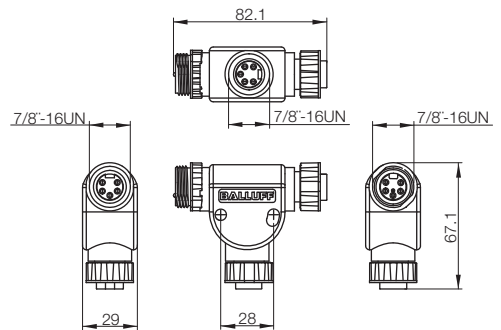
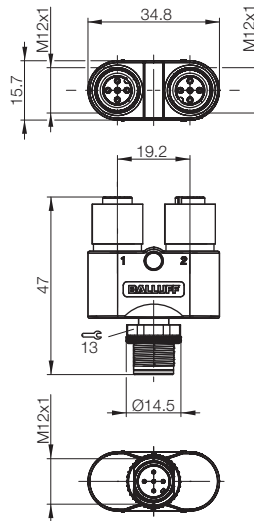




Connector diagram and wiring



Type	T splitter	7/8" power distributor
	BCC089P	BCC0AA7
Use	2x M12 female to 1x M12 male	Standard, 5-pin
Supply voltage U_S	125 V	300 V AC
Rated operating current I_b	4 A	
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+80 °C	-40...+90 °C
Housing material	PA 6.6 + GF	Plastic





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

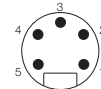
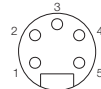
DeviceNet and CAN Bus

Ethernet/IP

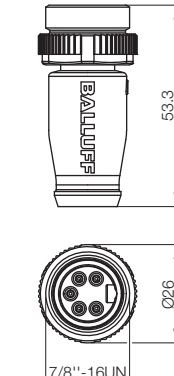
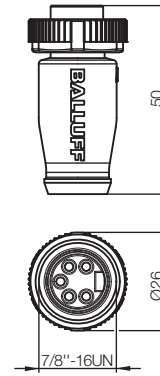
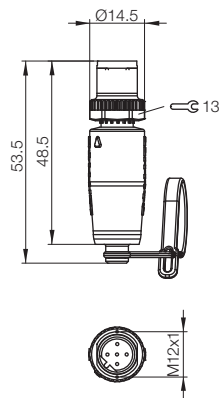
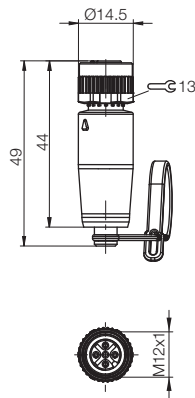
Accessories



Connector diagram and wiring



No LED	BCC0A08	BCC09MR	BCC0A0A	BCC0A09
Supply voltage U_B	10...30 V DC	50 V	50 V	50 V
Ambient temperature T_a	-40...+85 °C	-40...+85 °C	-25...+80 °C	-25...+80 °C
Enclosure rating per IEC 60529	IP 68	IP 68	IP 68	IP 68
Housing material	Plastic	Plastic	Plastic	Plastic



Connector diagram
and wiring

TPE shielded, blue-green	0.6 m
TPE shielded, blue-green	2 m
TPE shielded, blue-green	5 m
TPE shielded, blue-green	10 m
TPE shielded, blue-green	15 m
Supply voltage U_B	
Number of conductors \times conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	

Other cable materials, colors
and lengths on request.





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

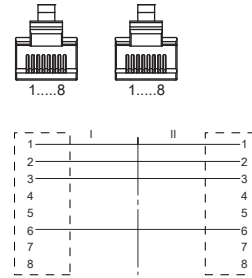
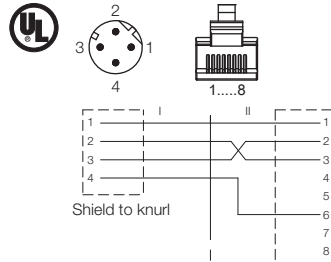
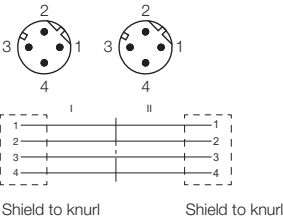
Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link and CAN Bus

Ethernet/IP Accessories



BCC09NL

BCC09NN

BCC09NP

BCC09NR

BCC09NT

250 V AC/DC

2×2×24 AWG

IP 67

-25...+75 °C

BCC0E92

BCC0E90

BCC0E8Z

BCC0E8P

BCC0E8W

60 V AC/DC

2×2×24 AWG

IP 67/IP 20

-25...+70 °C

BCC0E8K

BCC0E8F

BCC0E8H

BCC0E8J

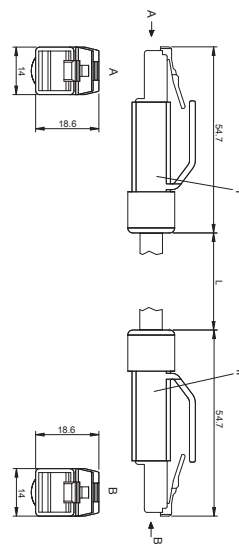
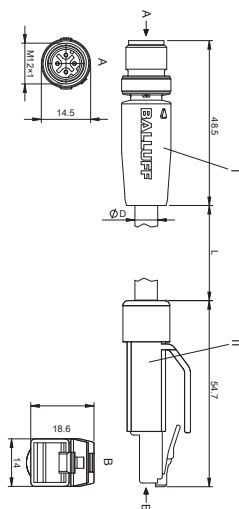
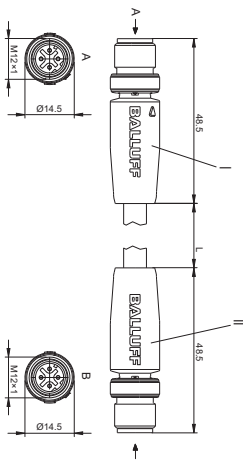
BCC0E8E

60 V AC/DC

2×2×24 AWG

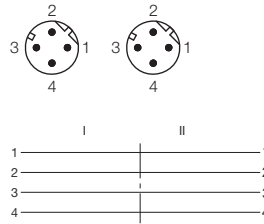
IP 20/IP 20

-25...+70 °C



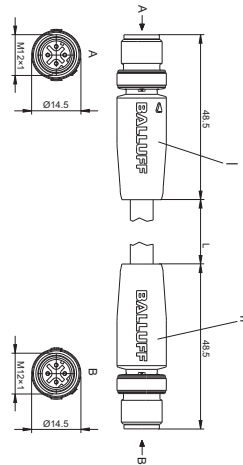


Connector diagram
and wiring



TPE unshielded, blue-green	0.6 m	BCC0CLW
TPE unshielded, blue-green	2 m	BCC0CLZ
TPE unshielded, blue-green	5 m	BCC0CM1
TPE unshielded, blue-green	10 m	BCC0CM3
TPE unshielded, blue-green	15 m	BCC0E09
Supply voltage U_B		60 V AC/DC
Number of conductors × conductor cross-section		2×2×24 AWG
Enclosure rating per IEC 60529		IP 67
Ambient temperature T_a		-40...+75 °C

Other cable materials, colors and lengths on request.





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

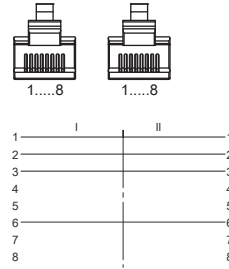
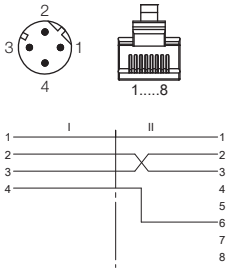
Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

Ethernet/IP
Accessories



BCC0E2E

BCC0E2H

BCC0E3A

BCC0E2J

BCC0E2K

60 V AC/DC

2×2×24 AWG

IP 67/IP 20

-40...+70 °C

BCC0E22

BCC0E24

BCC0E25

BCC0E26

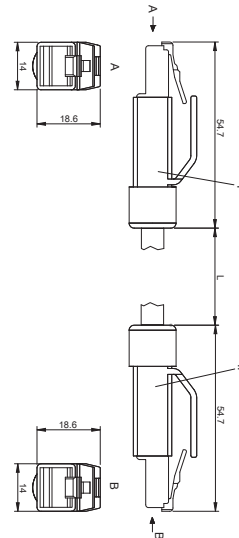
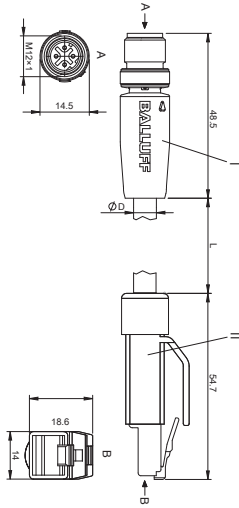
BCC0FA7

60 V AC/DC

2×2×24 AWG

IP 20/IP 20

-40...+70 °C



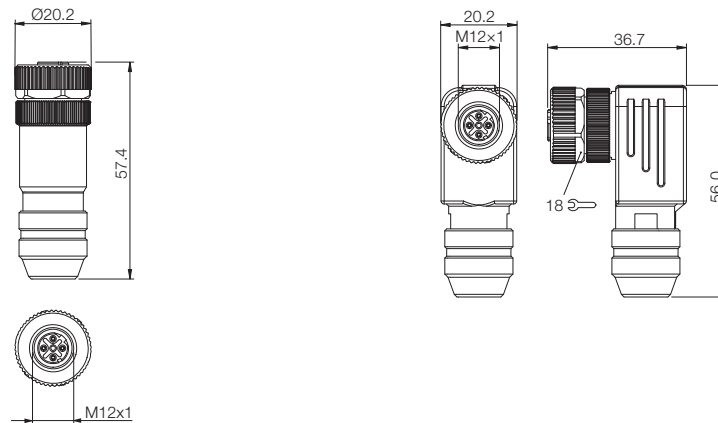
Ethernet/IP
M12 connector, field-attachable
4-pin



Connector diagram
and wiring



Type	4-pin, D-coded	4-pin, D-coded
	BCC03Y1	BCC03Y2
Supply voltage U_B	60 V AC/DC	60 V AC/DC
Number of connections	4	4
Number of conductors × conductor cross-section	4×0.75 mm ²	4×0.75 mm ²
Cable diameter	Max. 8 mm	Max. 8 mm
Connection	Cage clamp	Screw plug
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C
Housing material	CuZn	CuZn
Shielded design	yes	yes





Fieldbus Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged Switches

Connectors and Accessories

Profibus

Profinet and EtherCAT

CC-Link

DeviceNet and CAN Bus

Ethernet/IP
Accessories



4-pin, D-coded

4-pin, D-coded

No coding

BCC03WZ

BCC03Y0

BCC06FH

60 V AC/DC

60 V AC/DC

60 V AC/DC

4

4

4

4x0.75 mm²

4x0.75 mm²

244x max. AWG 22

Max. 8 mm

Max. 8 mm

Max. 9 mm

Cage clamp

Screw plug

Insulation displacement connector technology

IP 67

IP 67

IP 20

-25...+85 °C

-25...+85 °C

-40...+70 °C

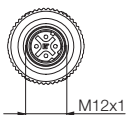
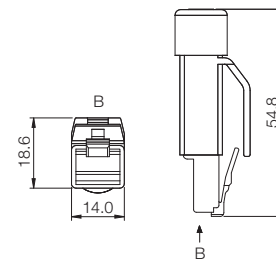
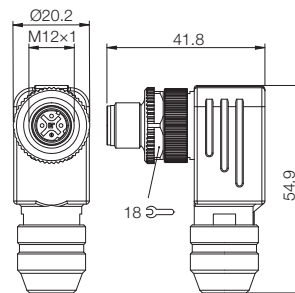
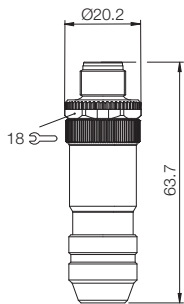
CuZn

CuZn

yes

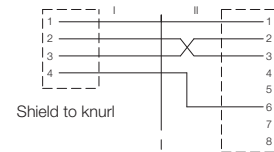
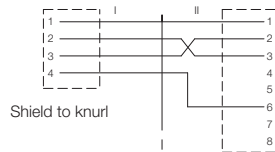
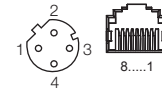
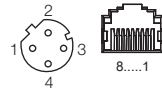
yes

yes

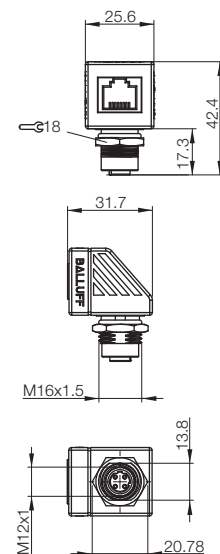
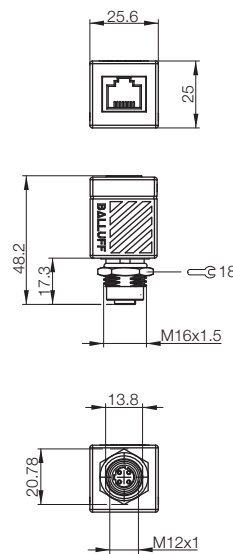




Connector diagram
and wiring



Type	M12 female straight/RJ45 straight, pass-thru	M12 female straight/RJ45 right angle, pass-thru
Type	D-coded/no coding	D-coded/no coding
	BCC085F	BCC085H
Supply voltage U_B	60 V AC/DC	60 V AC/DC
Enclosure rating	IP 20	IP 20
Ambient temperature T_a	-25...+85 °C	-25...+85 °C
Mounting thread	M16	M16





Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

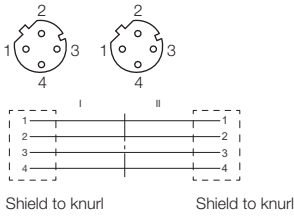
Profibus

Profinet and
EtherCAT

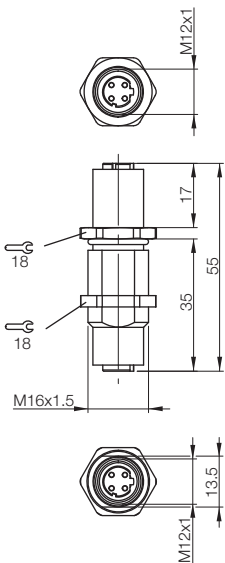
CC-Link

DeviceNet and
CAN Bus

Ethernet/IP
Accessories

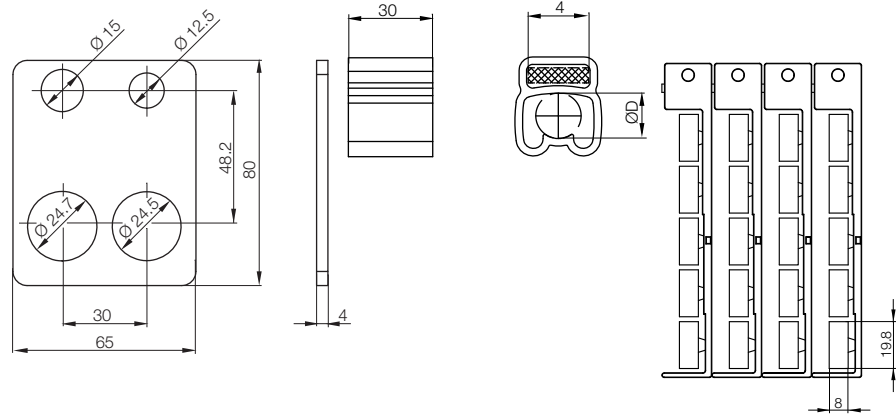


M12 female straight/M12 female straight,
pass-thru
D-coded
BCC06YP
60 V AC/DC
IP 67
-25...+80 °C
M16





Description	Integrated tamper protection BAM01J0	Marking sleeve	Label set BAM01JT
Cable diameter	2...4 mm	BAM023F	
	4...7 mm	BAM023H	
	6...10 mm	BAM023J	
Use	with 4 openings	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...
Housing material		PVC	Plastic





Fieldbus
Systems

Profibus

Profinet

CC-Link

DeviceNet

Ethernet/IP

EtherCAT

Unmanaged
Switches

Connectors and
Accessories

Profibus

Profinet and
EtherCAT

CC-Link

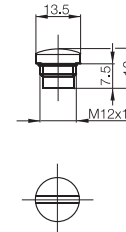
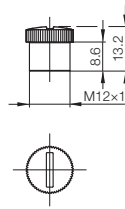
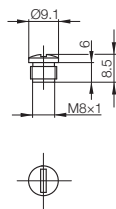
DeviceNet and
CAN Bus

Ethernet/IP

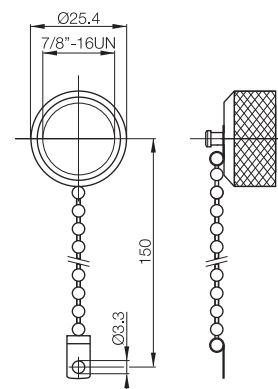
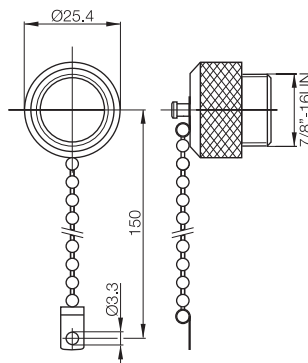
Accessories

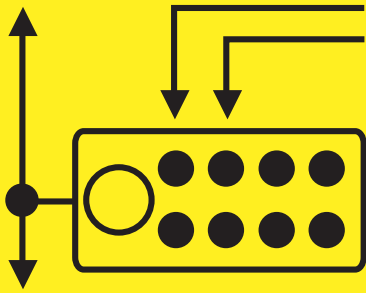


Description	M8 locking screw BAM01C1	M12 locking screw BAM01C2	M12 locking screw BAM0114
Use	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports	for connector type M12x1
Ambient temperature T _a	-20...+80 °C	-20...+80 °C	
Housing material	Plastic	Plastic	Brass



Description	Screw plug 7/8" BAM012T	Screw plug 7/8" BAM012U
Use	Cover for the power ports	Cover for the power ports
Ambient temperature T _a	-20...+80 °C	-20...+80 °C
Housing material	Nickel-plated CuZn	Nickel-plated CuZn





IO-Link

IO-Link interface

IO-Link is the first standardized, uniform, universally applicable interface in control technology to transmit all sensor and actuator signals to the controller. Likewise, IO-Link passes control data down to the lowest sensor level. All of this makes automation even more powerful than ever before.

IO-Link advantages at a glance

- Easy to get started, time-saving installation
- Automatic adjustment during ongoing operation
- Continuous monitoring



IO-Link

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Profibus IO-Link
Modules starting
on **page 22**
Profinet IO-Link
Modules starting
on **page 34**
Connection
cables BCC
starting
on **page 351**



IO-Link

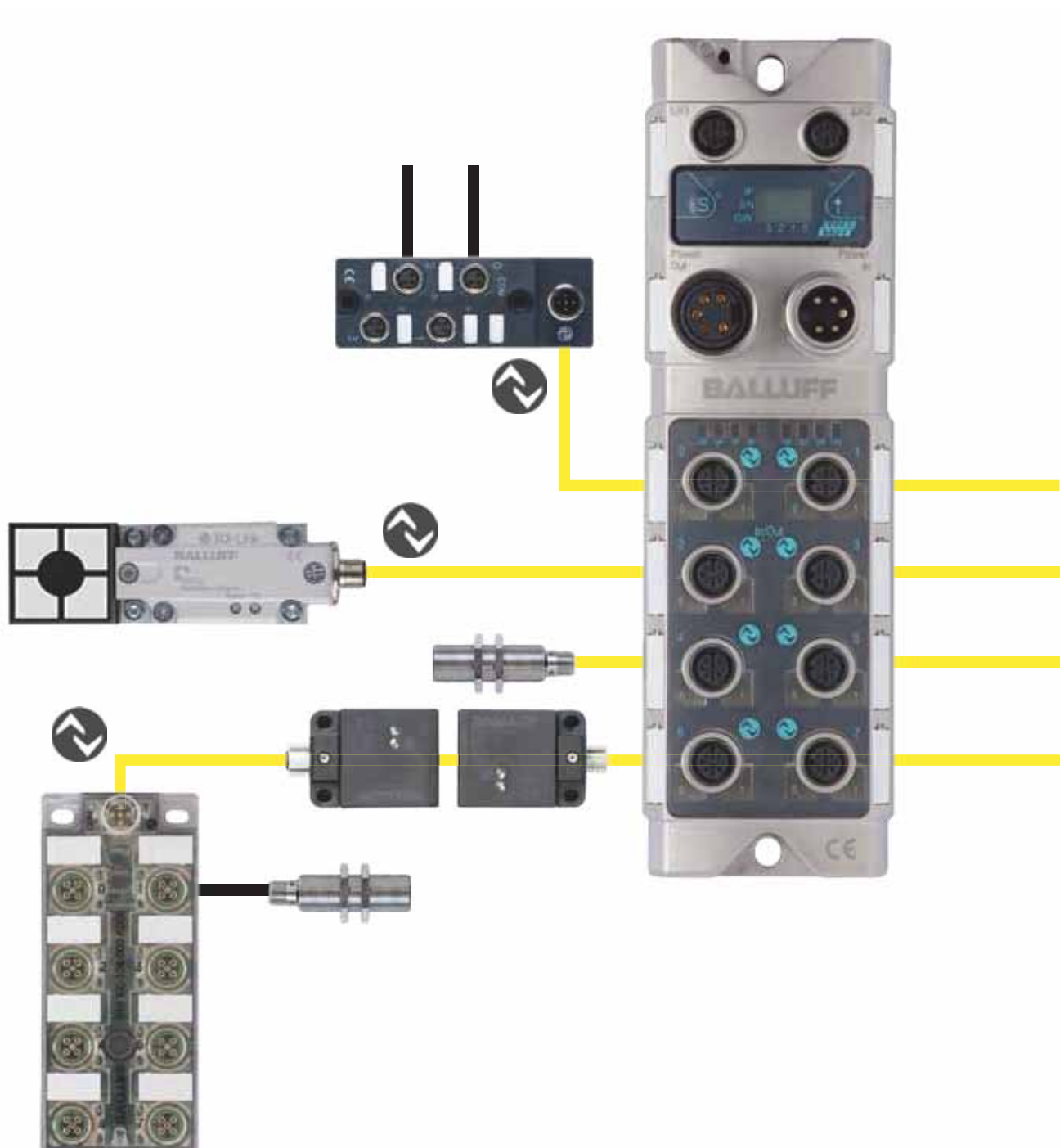
Network technology for reliable data transfer and more efficiency

More efficiency, lower costs

IO-Link saves time and money in overall production

IO-Link is all you need to make automation even more high-performance. This is because IO-Link provides substantial optimization and cost reduction potential for overall production.

The uniform, simple wiring, continuous diagnostics, and central configuration via the controller consequently provide an all-encompassing effect. And they do this in entirely different ways.



Simplification of installation

- Faster, simpler connection to an unshielded, three-core standard cable
- Standard sensors can also be integrated into the fieldbus level
- 8-fold IO-Link master for eight different IO-Link devices or eight hubs, each with up to 16 binary sensors
- Cost-saving due to fewer mechanical installations
- High security against interference thanks to digital communication



Requirements-based maintenance

- Continuous diagnostics
- Automatic readjustment via the controller
- Predictive error detection
- Longer maintenance intervals



More efficient operation

- Positioning of the sensors right where the action is
- Process monitoring, configuration and error analysis of the IO-Link devices via the controller
- Fast, high-performance data transmission
- Time-optimized machine processes
- High signal quality thanks to digital data transmission
- A selection of sensors that is highly suited to the particular application because of the simultaneous use of binary, analog, and IO-Link sensors



Highest machine availability

- Faster, error-free sensor replacement and prompt commissioning
- Automatic configuration of an IO-Link sensor
- Prompt format changes and recipe changes centrally via the controller
- Additional security from clearly identifiable IO-Link devices

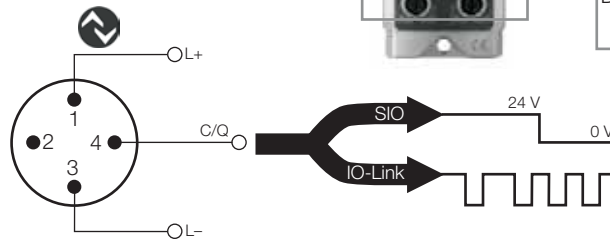
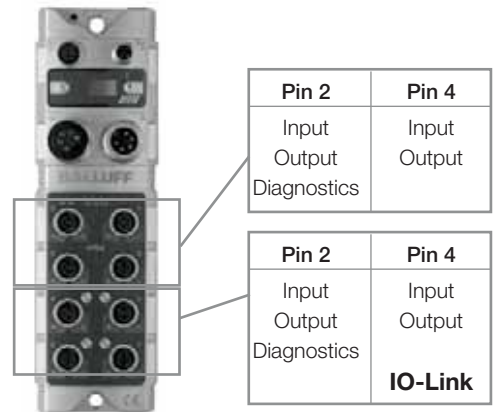


Flexible installation of Profibus and Profinet with IO-Link

- Quick
- Low cost thanks to the use of economical components and standard cables
- Shorter downtimes during installation, maintenance and operation

Depending on model type, the ports of the Balluff IO-Link distributor modules can be configured as a (diagnostic) input, output or IO-Link port. For each port, pin 2 or pin 4 can be used as input and output or for diagnostics.

IO-Link ports are labeled with the IO-Link symbol.

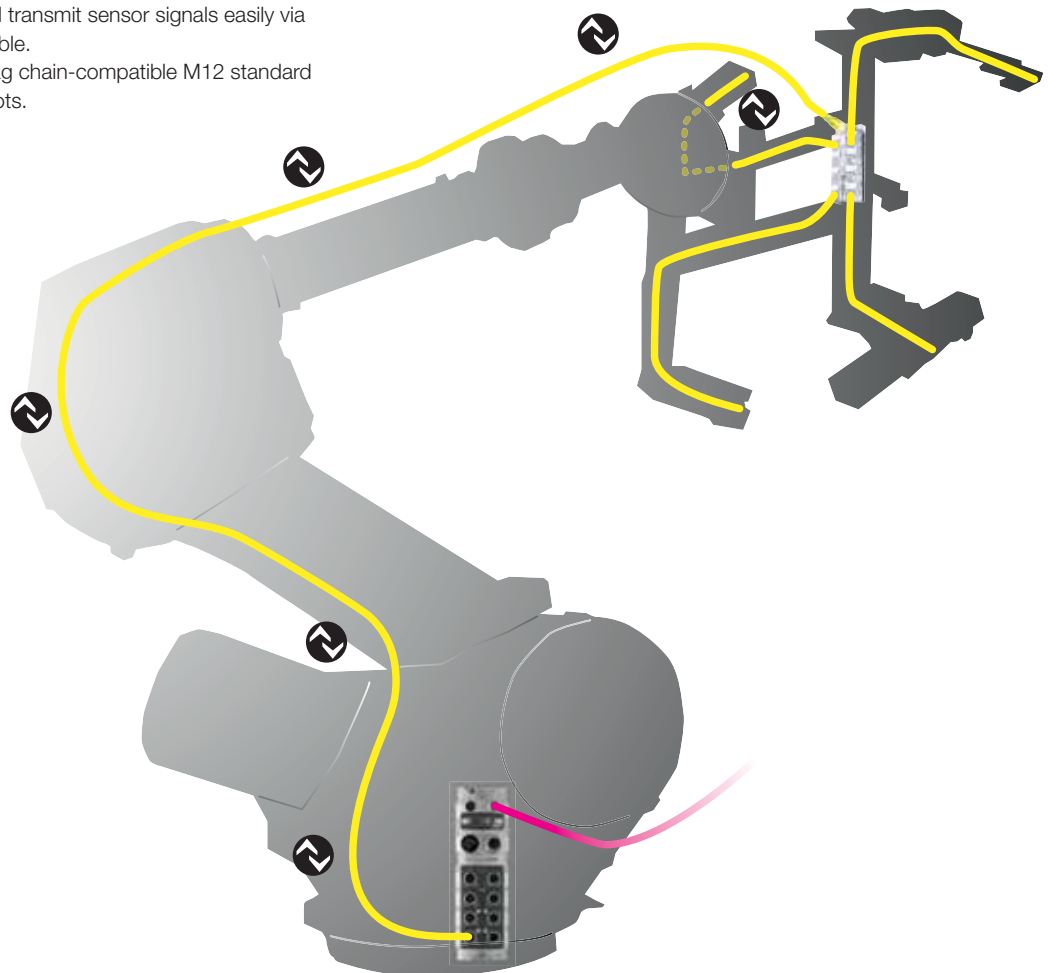


End-of-arm tooling

See the actual advantages of IO-Link in use

Modern robot systems require numerous sensors—particularly robot arms, which only tolerate lightweight sensors. High-performance Balluff sensor hubs prove their worth not only with their low weight, but also their ability to bundle and transmit sensor signals easily via IO-Link and a standard 3-core cable.

Balluff also offers economical, drag chain-compatible M12 standard cables BCC that are ideal for robots.



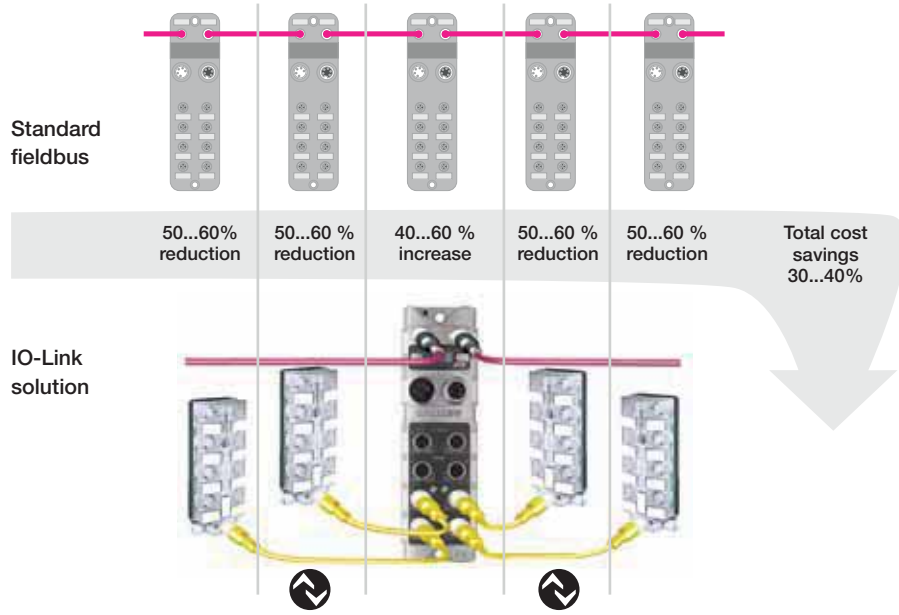
Balluff IO-Link sensor hubs save money

You save a great deal of money during the installation of IO-Link sensor hubs: 15 to 20% per input compared to Profibus and Profinet.

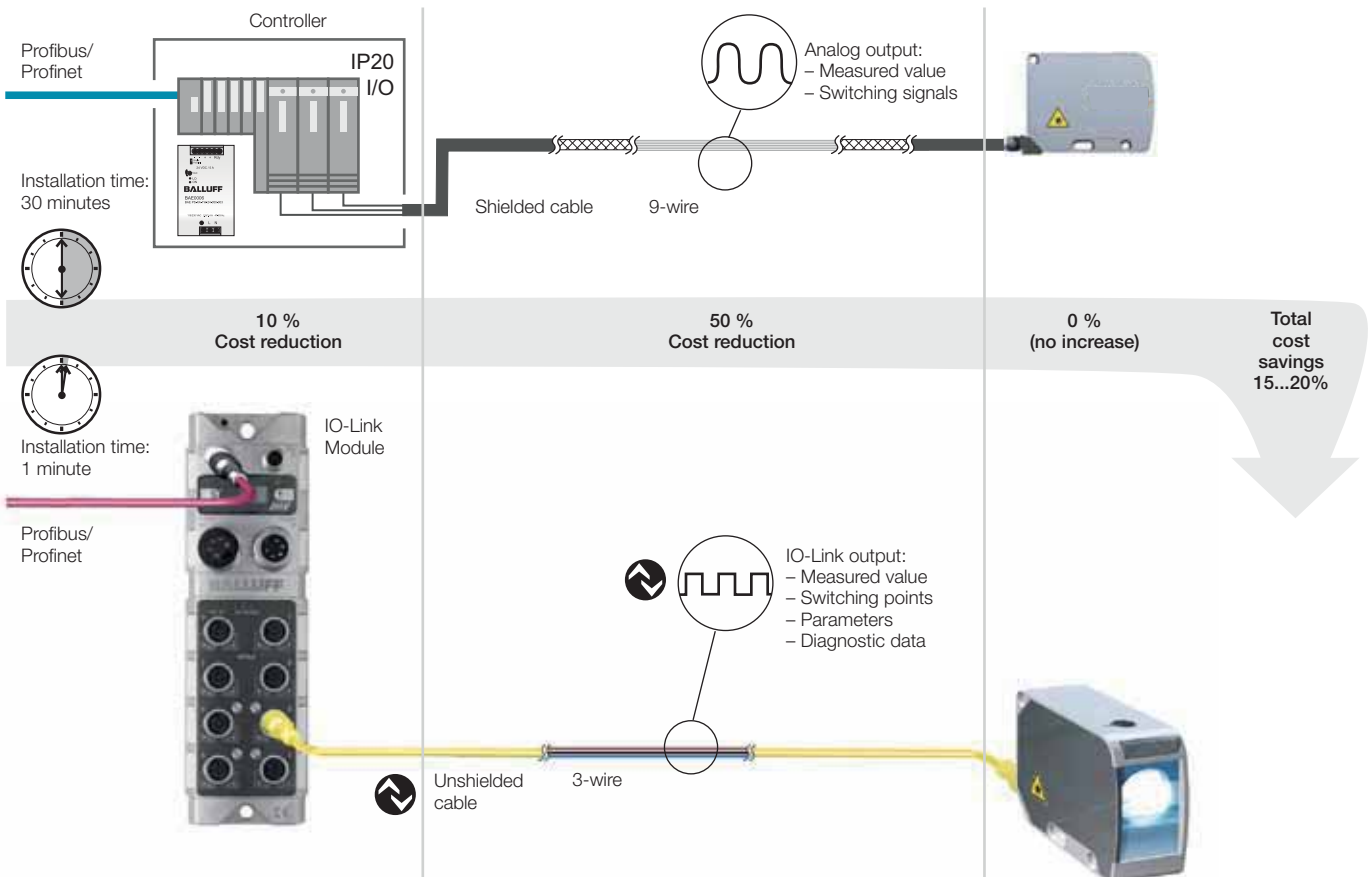
If you add the savings from Profibus and power cables, the cost savings are as much as 30 to 40%. One inexpensive M12 standard cable BCC suffices. Furthermore, sensor hubs need just one bus address to variably group sensor signals together within an area of 20 m and to ensure exceptional efficiency.

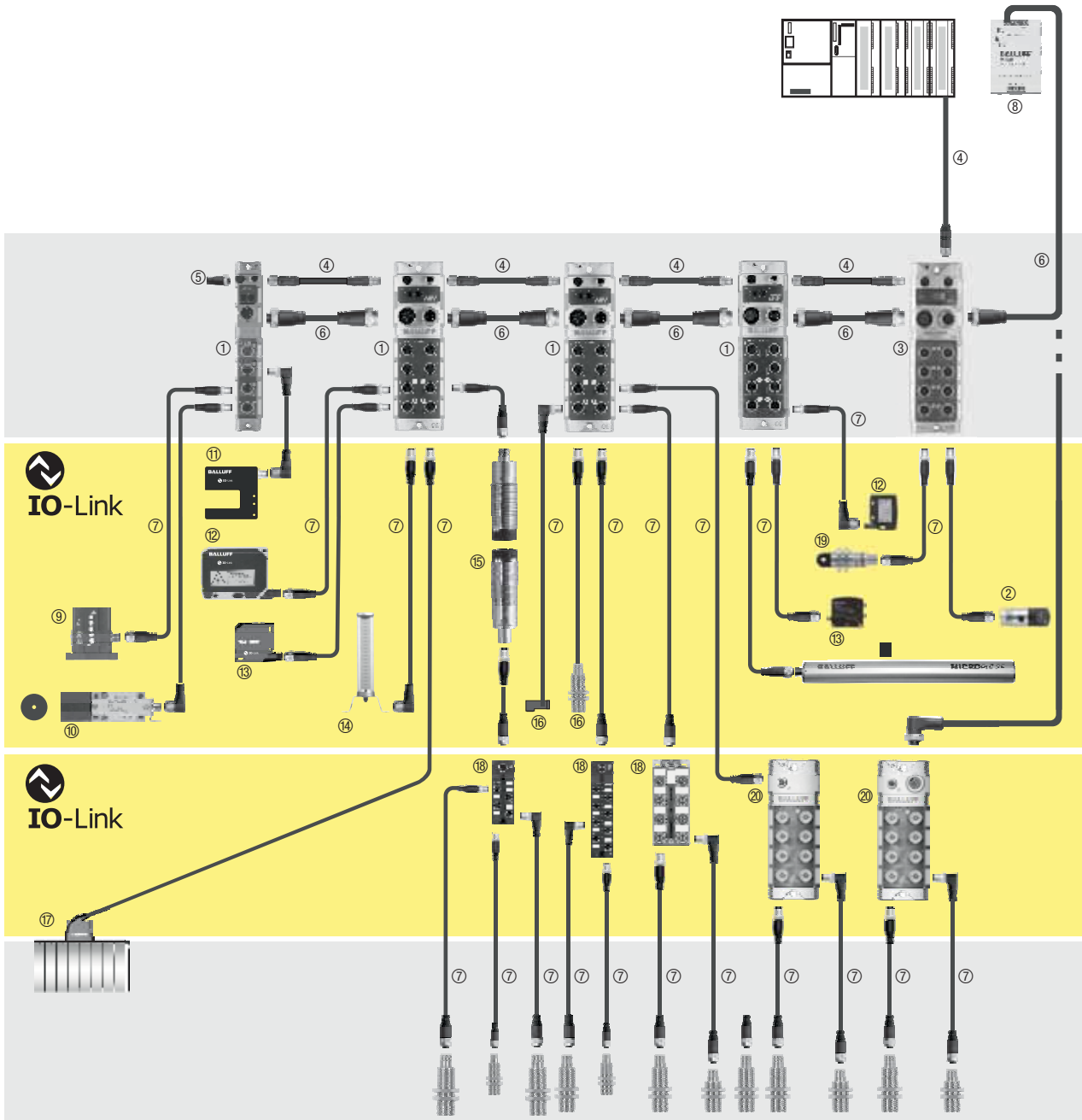
Cost-effective installation with high functionality

The high costs of field installations can be attributed to shielded cables and analog input cards. IO-Link sensor hubs not only solve the problem of fault-prone analog inputs, but also reduce wiring, testing and hardware costs. Thanks to simple plug-and-play of unshielded, cost-effective M12 cables, you



can conveniently set up the system in just one minute without so much as a screwdriver. For a standard connection, you would need around 30 minutes. Clear IO-Link advantages that speak for themselves.





IO-Link

- ① Profibus/Profinet IO-Link Modules BNI
- ② IO-Link Pressure Sensor BSP
- ③ Profibus/Profinet Module BNI
- ④ Bus Cable BCC
- ⑤ Terminating Resistor
- ⑥ Power Cable BCC
- ⑦ Connection cable BCC
- ⑧ Power Supplies BAE

- Page 22, 35
- Page 193
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- ⑨ IO-Link Multiple Position Switches BNS
- ⑩ IO-Link RFID System BIS
- ⑪ IO-Link Through-beam Fork Sensor BGL
- ⑫ IO-Link Laser Distance Sensor BOS, BOD
- ⑬ IO-Link Color Sensor BFS
- ⑭ IO-Link SmartLight
- ⑮ IO-Link Inductive Couplers BIC
- ⑯ IO-Link Inductive Distance Sensor BAW
- ⑰ IO-Link Valve Terminal Connector BNI
- ⑱ IO-Link Sensor Hub BNI, plastic
- ⑲ IO-Link Ultrasonic Sensors
- ⑳ IO-Link Sensor Hub, metal

- Page 173
- Page 186
- Page 165
- Page 166, 167
- Page 168, 139
- Page 135
- Page 238
- Page 176
- Page 163
- Page 138, 150
- Page 171
- Page 143

With IO-Link modules, you can quickly and reliably simplify your network. and save costs through reduced hardware, easy handling, high flexibility and greater efficiency.

Fieldbus modules

Reduce wiring costs

- Easily expand fieldbus modules with up to 8 sensor hubs. Everything as you need it. You can connect up to 128 inputs/outputs per node and save costs

Simple integration

- Only the bus module needs an address

Flexible adaptation

- Whether input/output or IO-Link port – you configure the device yourself and design your system with complete flexibility

Compact and efficient

- Compact design with high function density: Up to two sensors/actuators can be connected to each M12 connector

The advantages for your network

- Quick and easy network setup and modification
- Simple expansion of your network with the same number of fieldbus nodes
- Reliably reduce fieldbus nodes

Sensor hubs

Simple integration

- Sensor hubs can be configured easily via fieldbus

Low space requirements

- Smaller in size than a bus splitter

Flexible adaptation

- Each of the 16 inputs can be configured as NC or NO

Ready to use immediately

- One sensor hub provides 16 additional inputs/outputs

Low costs

- Simple Plug-and-Play of inexpensive, industrial-quality, unshielded 3-pin M12 cables



IO-Link

Product Topology

- IO-Link Master
- IO-Link SmartLight
- IO-Link Sensor Hub M8 plastic
- IO-Link-Sensor/Actuator Hub M12 metal
- IO-Link Sensor/Actuator Hub M12 plastic
- IO-Link Sensor/Actuator Hubs, IP 20
- IO-Link Converters
- IO-Link Sensors

Profibus IO-Link Modules starting on **page 22**
Profinet IO-Link Modules starting on **page 34**



Easy to connect

Test and configure IO-Link devices using the **IO-Link Master Tool**.

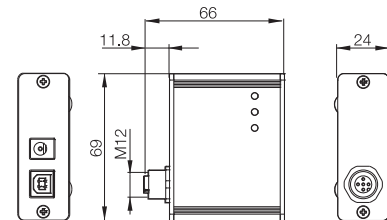
You can now operate an IO-Link, access process parameters and import all service parameters separately from the controller. The USB port ensures that connecting to a laptop is easy. Software simplifies operation.

The supply voltage for IO-Link devices is provided directly via the USB port. An external power supply supplies power if more is needed.



Network	USB
1 × master Just box	BNI0073
Power-on indicator	Green LED
Connection: network	USB B female
Supply voltage connection	DC-9, 2.1 mm
Connection: IO-Link port	M12, A-coded
No. of IO-Link ports	1
Max. load current for IO-Link port	50 mA via USB/1.6 A via external power supply
USB status indicator	Green LED
Error diagnostic indicator	Red LED
Enclosure rating per IEC 60529	IP 40 (when connected)
Operating temperature T _a	-5...+55 °C
Storage temperature	-25...+70 °C
Weight	Approx. 96 g
Fastening	none
Dimensions (L×W×H)	70×55×25 mm
Housing material	Aluminum

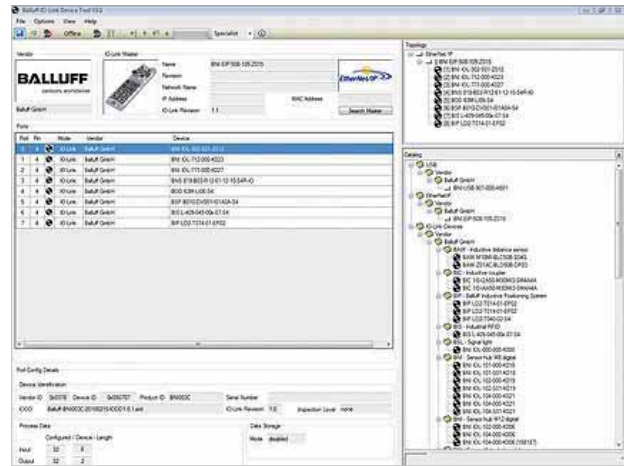
IO-Link	Version 1.0
IO-Link	Master
Operating mode	SIO, COM 1, COM 2, COM 3
Communication indicator	Green LED



Software can be downloaded at our website

The **USB master box** ensures that connecting to a laptop is easy, allowing you to configure and run diagnostics on any IO-Link device very easily using a computer.

The **device tool software** simplifies operation. The Supply voltage for IO-Link devices is provided directly via the USB port. An external power supply is used if more power is needed.



- IO-Link Product Topology
- IO-Link Master
- IO-Link SmartLight
- IO-Link Sensor Hub M8 plastic
- IO-Link Sensor/Actuator Hub M12 metal
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- IO-Link Sensor/Actuator Hubs, IP 20
- IO-Link Converters
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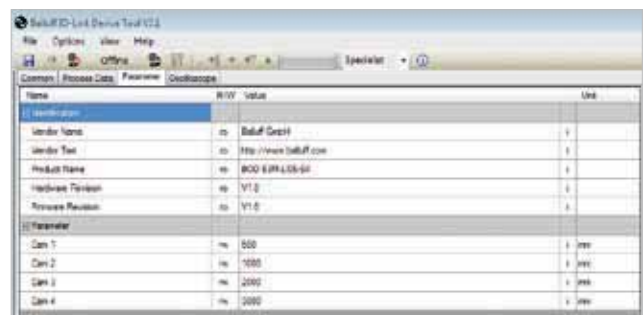
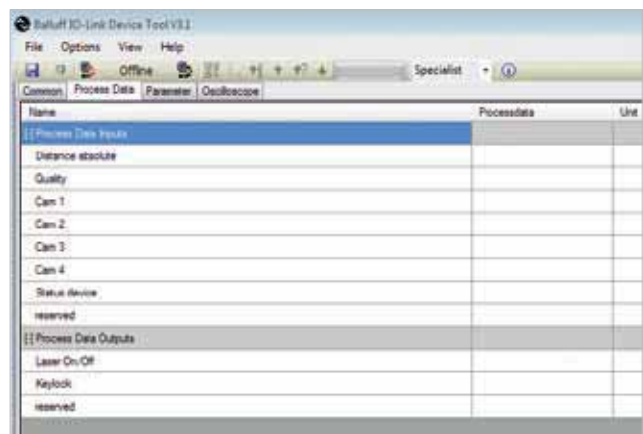
Device tool software

Each IO-Link device delivery contains an IODD (Input Output Device Description). This electronic file can be used to import the data for the device into the **device tool software**. This means you can configure and run diagnostics on any IO-Link device.

The **device tool software** can be used to address any IO-Link device using the **USB master box**. But even the existing system

infrastructure can be used for communicating using the device tool software.

If you are using Ethernet-based IO-Link masters such as Balluff Profinet or Ethernet/IP IO-Link masters, you can establish a direct UDP connection from the **device tool software** to those modules. This provides direct access to each individual IO-Link port and allows you to configure and run diagnostics directly on all of the connected IO-Link devices.



SmartLight – its broad color spectrum signals all common physical variables

The first LED signal stack light with IO-Link interface uses its color spectrum to signal operating states. And it does this with many individually definable colors. Depending on the requirement, the machine operator can have key and critical machine statuses displayed accurately. And from its color scale, one can even read tendencies, patterns and trends of physical variables. Temperature statuses, levels of systems, or the position of a slide over a position measurement system can be visualized on the tower light, which has up to 20 separately controllable LED circuits.

Colors can be determined individually and users have maximum flexibility

Connection and installation are easy. All that is needed to screw them in is a four-wire sensor cable, and there is no unmanageable number of individual parts. That already gives you maximum functionality, so that the LED signal tower light provides previously

unimagined benefits. With the IO-Link SmartLight, almost all common physical variables can be shown with a flexible color spectrum via multicolored LEDs. They are easily programmed via the PLC using bit address assignments of the IO-Link address range. Different colors can be assigned with a few commands, without having to mechanically change the LED stack lights.

With the Balluff SmartLight, you can implement all functions that users were able to display with the previously available systems. Thus, for example, it is possible to display different colors in different zones, whereby the signal light can be subdivided in up to 5 zones. Quite unlike the systems previously on the market, these colors and zones can be specified individually in terms of number, size and color definition, and can even be changed "on the fly" while the machine is operating. This gives users complete flexibility.



Holder not included in the standard scope of delivery.

IO-Link SmartLight – the intelligent stack light

- The first LED signal stack light with IO-Link interface
- Maximum flexibility
- Very easy to program
- Extremely fast and easy to install
- Different colors can be easily assigned without having to mechanically change the LED tower lights

The SmartLight has three central function modes for displaying different warning and indicator signals. These can be controlled using the process data and SPDU index.

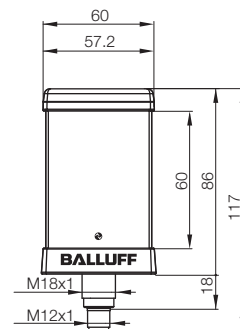
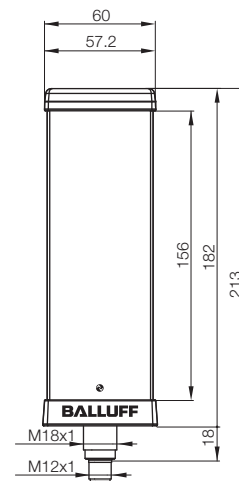
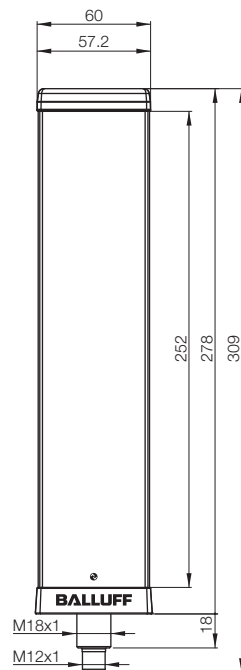
- Stack light mode: Display of different color signals in up to five different segments
- Level mode: Color gradient display for showing aspects such as levels or temperature values
- Running light mode: Automatic running light with freely configurable foreground and background color



IO-Link
Product
Topology
IO-Link
Master
**IO-Link
SmartLight**
IO-Link
Sensor Hub
M8 plastic
IO-Link Sensor/
Actuator Hub
M12 metal
IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
IO-Link
Sensors

IO-Link	Device	Device	Device
Description	SmartLight	SmartLight	SmartLight
Number of segments, max.	5	3	1
	BNI0072	BNI007F	BNI007T
Color spectrum per segment	Red, green, yellow, blue, white	Red, green, yellow, blue, white	Red, green, yellow, blue, white
Supply voltage U_B	18...30 V DC	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	Green LED	Green LED	Green LED
Power-on indicator	Green LED	Green LED	Green LED
Connection: IO-Link	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
Connection U_A	via IO-Link interface	via IO-Link interface	via IO-Link interface
Configurable	yes	yes	yes
Max. load current of actuators	0.5 A	0.25 A	0.25 A
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Operating temperature T_a	-5...+50 °C	-5...+50 °C	-5...+55 °C
Storage temperature	-15...+50 °C	-15...+50 °C	-25...+70 °C
Fastening	M18 thread	M18 thread	M18 thread
Dimensions (L×W×H)	60×60×278 mm	60×60×182 mm	60×60×117 mm
Housing material	Transparent plastic	Transparent plastic	Transparent plastic
Sound module	no	no	no

IO-Link	Version 1.1	Version 1.1	Version 1.1
Transmission rate	COM 2 (38.4 kbaud)	COM 2 (38.4 kbaud)	COM 2 (38.4 kbaud)
Cycle time	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master
IO-Link process data length	2-byte input	2-byte input	2-byte input
Communication indicators	Green LED	Green LED	Green LED

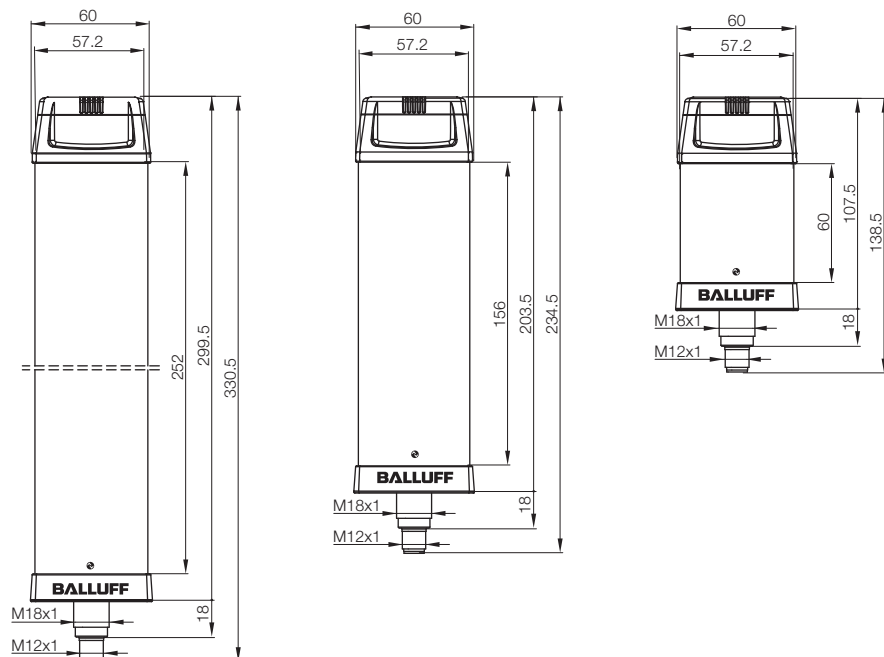


Base and wall holder for SmartLight, see page 137



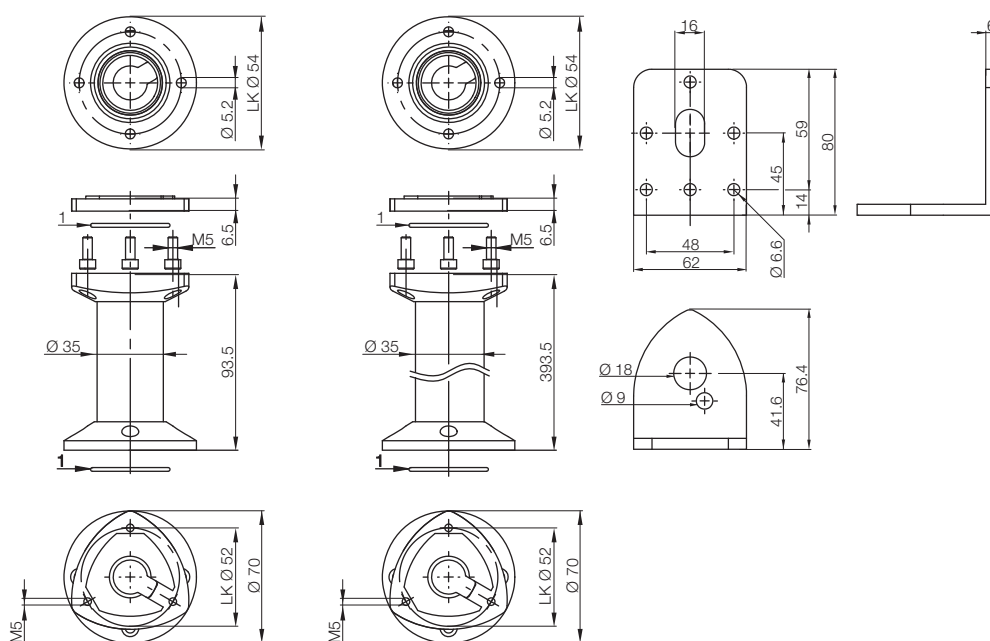
IO-Link	Device	Device	Device
Description	SmartLight Sound	SmartLight Sound	SmartLight Sound
Number of segments, max.	5	3	1
	BNI0083	BNI0086	BNI0087
Color spectrum per segment	Red, green, yellow, blue, white, orange	Red, green, yellow, blue, white, orange	Red, green, yellow, blue, white, orange
Supply voltage U_B	18...30 V DC	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	Green LED	Green LED	Green LED
Power-on indicator	Green LED	Green LED	Green LED
Connection: IO-Link	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
Connection U_A	via IO-Link interface	via IO-Link interface	via IO-Link interface
Configurable	yes	yes	yes
Max. load current of actuators	0.5 A	0.25 A	0.25 A
Enclosure rating per IEC 60529	IP 30	IP 30	IP 30
Operating temperature T_a	-5...+55 °C	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+70 °C	-25...+70 °C	-25...+70 °C
Fastening	M18 thread	M18 thread	M18 thread
Dimensions (L×W×H)	60×60×330.5 mm	60×60×234.5 mm	60×60×138.5 mm
Housing material	Transparent plastic	Transparent plastic	Transparent plastic
Sound module	yes	yes	yes
Volume	95 dB/1 m	95 dB/1 m	95 dB/1 m
Audio frequencies	1 Hz, 5 Hz, continuous tone, pulse	1 Hz, 5 Hz, continuous tone, pulse	1 Hz, 5 Hz, continuous tone, pulse

IO-Link	Version 1.1	Version 1.1	Version 1.1
Transmission rate	COM 2 (38.4 kbaud)	COM 2 (38.4 kbaud)	COM 2 (38.4 kbaud)
Cycle time	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master	5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master
IO-Link process data length	2-byte input	2-byte input	2-byte input
Communication indicators	Green LED	Green LED	Green LED





Description	Base for Smart Light BAM026K	Base for Smart Light BAM026L	Wall holder for Smart Light BAM0255
Fastening	for M18 thread	for M18 thread	for M18 thread
Dimensions (L×W×H)	Ø 70×100 mm	Ø 70×400 mm	76×80×6 mm
Housing material	Anodized aluminum	Anodized aluminum	Anodized aluminum



- IO-Link
- Product Topology
- IO-Link Master
- IO-Link SmartLight**
- IO-Link Sensor Hub M8 plastic
- IO-Link Sensor/Actuator Hub M12 metal
- IO-Link Sensor/Actuator Hub M12 plastic
- IO-Link Sensor/Actuator Hubs, IP 20
- IO-Link Converters
- IO-Link Sensors

Simple handling, fast data, four variants

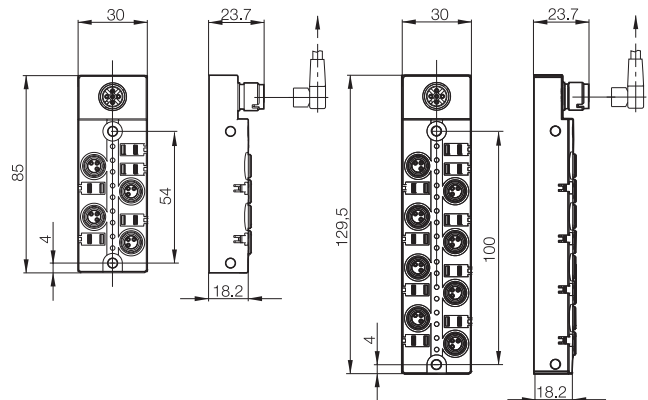
The space-saving M8 sensor hubs with IO-Link port are the first choice wherever space is limited, because they offer up to 16 inputs in the tightest of spaces. And their low weight makes them recommended for weight-critical applications. M8 sensor hubs are easy to install and save time, because a 3-pin standard cable is sufficient for the connection. M8 sensor hubs are time and cost saving, even during maintenance and in system operation. This is because, like all IO-Link products, they ensure consistent diagnostics and can be configured centrally. M8 sensor hubs are also particularly fast. Transmission of 16 sensor signals, for example, takes just 2.5 ms. This ensures that the controller always receives current information. Each individual channel can be programmed to function as normally closed (NC) or normally open (NO), which allows the connection of complementary sensors (DESINA).

M8 sensor hubs with IO-Link port are available in four variants.



IO-Link Type	Device	Device
	4× DI	8× DI
	BNI000P	BNI000R
Supply voltage U_B	18...30 V DC	18...30 V DC
Power-on indicator	Green LED	Green LED
Connection: I/O ports	M8, 3-pin, female	M8, 3-pin, female
Connection: IO-Link port	M12, A-coded, male	M12, A-coded, male
No. of I/O ports	4	8
Number of inputs	4 PNP	8 PNP
Configurable	NC/NO	NC/NO
Input status indicator	Yellow LED	Yellow LED
Total sensor current	max. 800 mA	max. 800 mA
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+70 °C	-25...+70 °C
Weight	Approx. 86 g	Approx. 103 g
Fastening	2 mounting holes	2 mounting holes
Dimensions (L×W×H)	85×30×23.7 mm	129.5×30×23.7 mm
Housing material	Plastic	Plastic

IO-Link	Version 1.0	Version 1.0
No. of IO-Link ports	1× device	1× device
Operating mode	COM 2	COM 2
IO-Link process data length	1 input byte	1 input byte
Displays	Communication	Green LED, pulsing
	Error	Red LED
Parameters	NC/NO per input	NC/NO per input

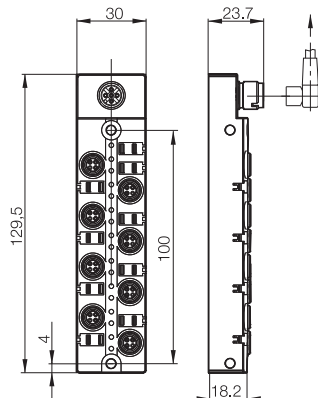


All hubs include four screw plugs and a label set.



IO-Link Type	Device 16× DI BNI0021	IO-Link Product Topology
Supply voltage U_B	18...30 V DC	IO-Link Master
Power-on indicator	Green LED	IO-Link SmartLight
Connection: I/O ports	M8, 4-pin, female	IO-Link Sensor Hub M8 plastic
Connection: IO-Link port	M12, A-coded, male	IO-Link Sensor/ Actuator Hub M12 metal
No. of I/O ports	8	IO-Link Sensor/ Actuator Hub M12 plastic
Number of inputs	16 PNP	IO-Link Sensor/ Actuator Hubs, IP 20
Configurable	NC/NO	IO-Link Converters
Input status indicator	Yellow LED	IO-Link Sensors
Total current I_B	max. 800 mA	
Enclosure rating per IEC 60529	IP 67 (when connected)	
Operating temperature T_a	-5...+55 °C	
Storage temperature	-25...+70 °C	
Weight	Approx. 103 g	
Fastening	2 mounting holes	
Dimensions (L×W×H)	129.5×30×23.7 mm	
Housing material	Plastic	

IO-Link		Version 1.0
No. of IO-Link ports		1× device
Operating mode		COM 2
IO-Link process data length		2 input bytes
Displays	Communication	Green LED, pulsing
	Error	Red LED
Parameters		NC/NO per input



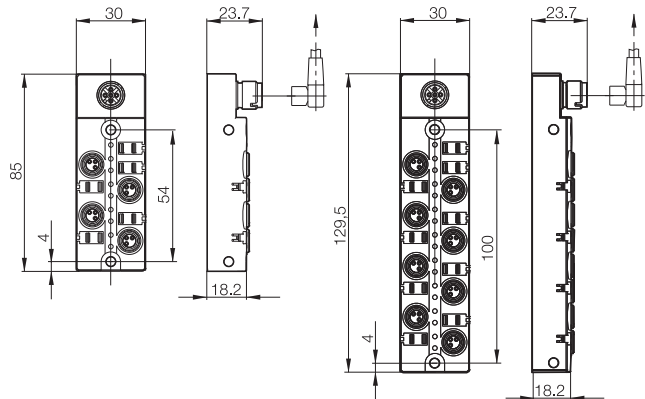
Fast, detailed diagnostics on individual channels

The lightweight, space-saving M8 sensor hubs with IO-Link port are also available with single-channel monitoring, which means that all the time and cost-saving benefits of IO-Link, including simple installation, central configuration and integrated diagnostics, are enhanced by this additional technical feature. This is because the single-channel monitoring function provides detailed diagnostic results extremely fast. The individual cable monitoring enables port-specific short circuit diagnostics for each individual channel separately. The diagnostic data is transferred with the process data, rendering acyclic services superfluous as a result. The extra benefit: Maximum diagnostic capability is achieved with minimal integration effort. And diagnostics are performed in no time at all because the diagnostic data is included with the process data.



IO-Link	Device	Device
Type	4x DI	8x DI
	BNI001W	BNI001Y
Supply voltage U_B	18...30 V DC	18...30 V DC
Power-on indicator	Green LED	Green LED
Connection: I/O ports	M8, 3-pin, female	M8, 3-pin, female
Connection: IO-Link port	M12, A-coded, male	M12, A-coded, male
No. of I/O ports	4	8
Number of inputs	4 PNP	8 PNP
Configurable	NC/NO	NC/NO
Input status indicator	Yellow LED	Yellow LED
Total sensor current	max. 800 mA	max. 800 mA
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+70 °C	-25...+70 °C
Weight	Approx. 86 g	Approx. 103 g
Fastening	2 mounting holes	2 mounting holes
Dimensions (LxWxH)	85x30x23.7 mm	129.5x30x23.7 mm
Housing material	Plastic	Plastic

IO-Link	Version 1.0	Version 1.0
No. of IO-Link ports	1x device	1x device
Operating mode	COM 2	COM 2
IO-Link process data length	2 input bytes	2 input bytes
Displays		
Communication	Green LED, pulsing	Green LED, pulsing
Error	Red LED	Red LED
Parameters	NC/NO per input	NC/NO per input



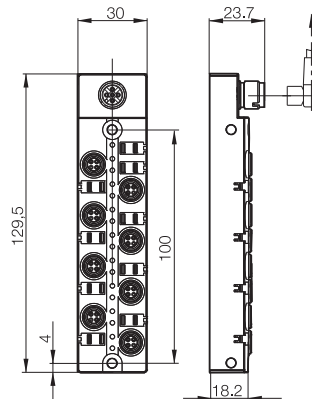
All hubs include four screw plugs and a label set.



IO-Link	Device	
Type	16× DI	
	BNI0022	
Supply voltage U_B	18...30 V DC	
Power-on indicator	Green LED	
Connection: I/O ports	M8, 4-pin, female	
Connection: IO-Link port	M12, A-coded, male	
No. of I/O ports	8	
Number of inputs	16 PNP	
Configurable	NC/NO	
Input status indicator	Yellow LED	
Total current U_B	max. 800 mA	
Enclosure rating per IEC 60529	IP 67 (when connected)	
Operating temperature T_a	-5...+55 °C	
Storage temperature	-25...+70 °C	
Weight	Approx. 103 g	
Fastening	2 mounting holes	
Dimensions (L×W×H)	129.5×30×23.7 mm	
Housing material	Plastic	

IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

IO-Link	Version 1.0
No. of IO-Link ports	1× device
Operating mode	COM 2
IO-Link process data length	4 input bytes
Displays	Communication: Green LED, pulsing
	Error: Red LED
Parameters	NC/NO per input



For harsh environments

The metal sensor hubs in a robust housing are suitable for installation in extremely harsh industrial environments such as machine tool plants, steel works and so on. Based on M12 connectors, metal sensor hubs are simple to install and fulfill the requirements for cost-effective installation and maintenance.

Port-specific single-channel monitoring detects short circuits, overloading and cable breaks at the port and offers a completely unique degree of selective diagnostics for devices with this functionality. Each input can be programmed as normally closed or normally open using a parameter set, increasing the flexibility of your installation. Complementary DESINA sensors can also be connected to the DI16 sensor hub with ease.

The BNI IOL-302... version combines two modules in one while achieving the best functionality and flexibility. The maximum sensor load current is 500 mA, which is suitable for operating sensors with a high degree of consumption. If configured as an output, up to 2 A is available at the port. This is ideal for the use of hydraulic valves with a high consumption level.

Benefits

- Robust housing
- Powerful inputs
- Powerful outputs
- Extended temperature range



IO-Link
Special function
Type
Supply voltage U_B
Function indicator IO-Link RUN
Power-on indicator
Connection: IO-Link
Connection: I/O ports
Connection U_B
Connection U_A
No. of I/O ports
Number of inputs
Number of outputs
Configurable
Single-channel monitoring
Max. load current, sensors/channel
Max. load current actuators/channel
Port status indicator
Total sensor current
Total actuator current
Enclosure rating per IEC 60529
Operating temperature T_a
Storage temperature
Fastening
Dimensions (LxWxH)
Housing material
IO-Link
No. of IO-Link ports
Max. cycle time
IO-Link process data length
Displays
Communication
Error

All hubs include four screw plugs and a label set.

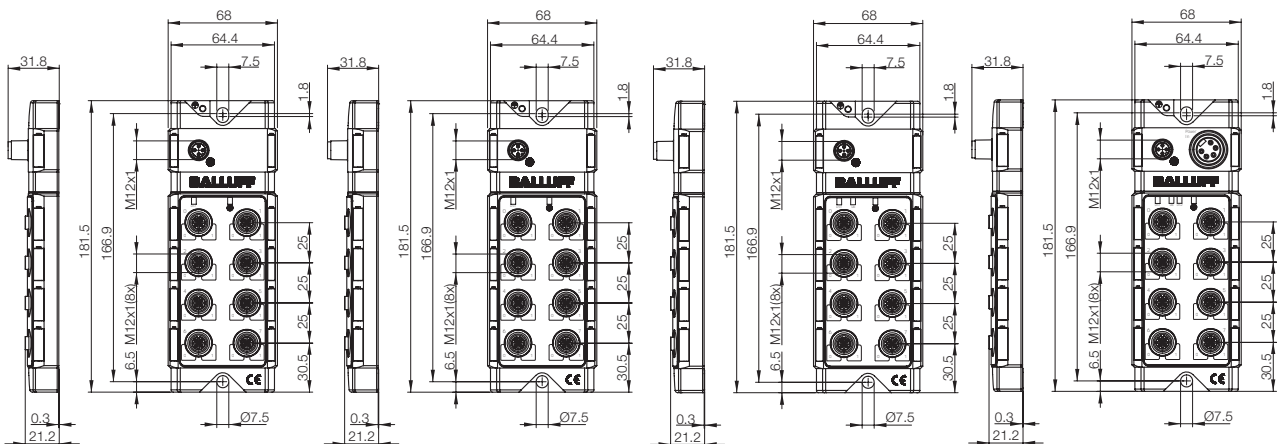


NPN



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device	Device	Device	Device
Standard module	selectable	Standard module	selectable
16× DI	16× DI	16× DI/DO	16× DI/DO
BNI0032	BNI0063	BNI003U	BNI0035
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED	Green LED
Green LED	Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
via IO-Link interface	via IO-Link interface	via IO-Link interface	via 7/8" connector
8	8	8	8
16	16	max. 16	max. 16
no	no	yes	yes
no	yes	no	no
100 mA	100 mA	100 mA	500 mA
		0.5 A	2 A
Yellow/red LED	Yellow/red LED	Yellow/red LED	Yellow/red LED
< 1.4 A	< 1.4 A	< 1.4 A	9 A
		< 1.4 A	9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
181×68×36.9 mm	181×68×36.9 mm	181×68×36.9 mm	181×68×36.9 mm
Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
Version 1.0	Version 1.1	Version 1.0	Version 1.0
1× device	1× device	1× device	1× device
2.5 ms	10 ms	10 ms	10 ms
2 input bytes	4 input bytes	2 input bytes/2 output bytes	2 input bytes/2 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Red LED	Red LED	Red LED	Red LED



Selectable IO-Link sensor hubs

Simple handling – lower costs – universal use

Selectable IO-Link sensor hubs from Balluff are a market innovation. Users can write and read their own, user-defined identification data. They are, therefore, particularly economical when it is necessary to encode tools. In addition, they are easy to use.

As an interface for interchangeable tools, they offer clearly calculable benefits:

- Fast, cost-effective installation using 3-core unshielded cables
- Quick, reliable format changes
- Centrally available data for continuous process control
- Simple tool replacement with hub and data
- Speedy setup
- Simple encoding for new tools via controller

Additional advantages

- Universal sensor hub in IP 67
- Each hub has 16 inputs with single-channel monitoring
- Convenient LED display of power supply and function
- Detailed diagnostics
- Reduced downtimes

Selectable sensor hubs from Balluff represent lower costs, less work and reduced idle periods and ensure the highest efficiency.



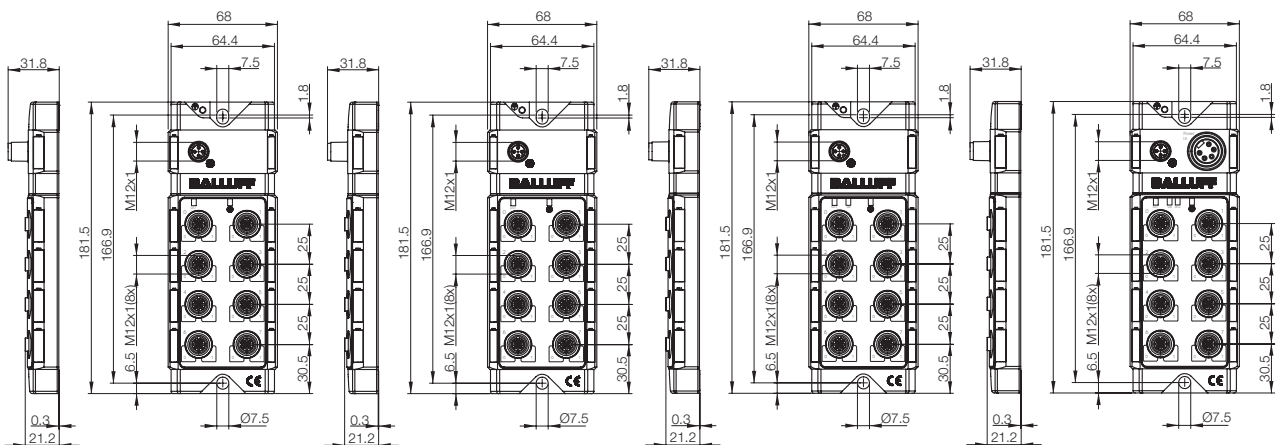
IO-Link
Special function
Type
Supply voltage U_B
Function indicator IO-Link RUN
Power-on indicator
Connection: IO-Link
Connection: I/O ports
Connection U_B
No. of I/O ports
Number of inputs
Number of outputs
Configurable
Single-channel monitoring
Max. load current, sensors/channel
Max. load current actuators/channel
Port status indicator
Total sensor current
Enclosure rating per IEC 60529
Operating temperature T_a
Storage temperature
Fastening
Dimensions (LxWxH)
Housing material
IO-Link
Max. cycle time.
IO-Link process data length
Displays Communication
Error

All hubs include four screw plugs and a label set.



IO-Link
Product
Topology
IO-Link
Master
IO-Link
SmartLight
IO-Link
Sensor Hub
M8 plastic
**IO-Link Sensor/
Actuator Hub
M12 metal**
IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
IO-Link
Sensors

Device	Device	Device	Device
16× DI	16× DI	16× DI	16× DI
BNI0039	BNI003T	BNI0062	BNI0061
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
via IO-Link interface	via IO-Link interface	via IO-Link interface	via IO-Link interface
8	8	8	8
16	16	16	16
0	0	0	0
yes	yes	yes	yes
100 mA	100 mA	100 mA	100 mA
Yellow/red LED	Yellow/red LED	Yellow/red LED	Yellow/red LED
< 1.4 A	< 1.4 A	< 1.4 A	< 1.4 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
181×68×36.9 mm	181×68×36.9 mm	181×68×36.9 mm	181×68×36.9 mm
Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
Version 1.0	Version 1.0	Version 1.1	Version 1.1
2.5 ms	15 ms	10 ms	10 ms
4 input bytes	6 input bytes	4 input bytes/2 output bytes	6 input bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Red LED	Red LED	Red LED	Red LED



Clearly visible status LEDs
 Low-quality LEDs that are often difficult to identify under demanding production conditions perform poorly when used in high-speed applications. Unlike Balluff status LEDs. These are large, bright, highly visible and provide maximum assistance. Balluff quality will help you complete setup and maintenance tasks and reduce machine downtimes with ease.



Inputs with high density
 All Balluff input blocks offer two input points for each plug connector, accessed via a V splitter.

Innovative housing design
 The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers, and two mounting points are sufficient to secure the robust metal housing.

Robust, full-metal housing
 The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it. All this and it costs no more than a plastic housing.

Powerful and reliable outputs
 With an output current of up to 2 A, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

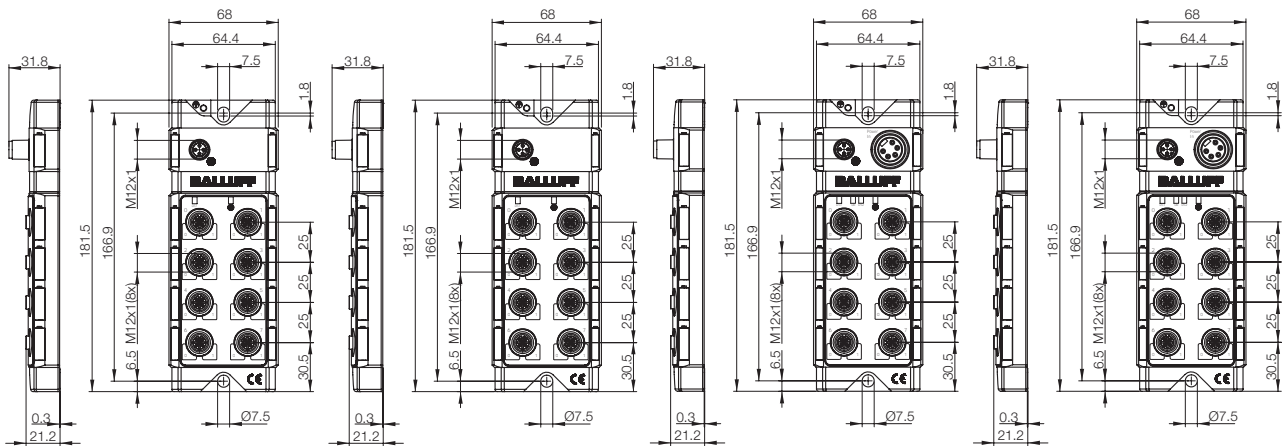


IO-Link
Special function
Type
Supply voltage U_B
Function indicator IO-Link RUN
Power-on indicator
Connection: IO-Link
Connection: I/O ports
Sensor connection
Actuator connection
No. of I/O ports
Number of inputs
Number of outputs
Configurable
Single-channel monitoring
Max. load current, sensors/channel
Max. load current actuators/channel
Port status indicator
Total sensor current
Total actuator current
Enclosure rating per IEC 60529
Operating temperature T_a
Storage temperature
Fastening
Dimensions (LxWxH)
Housing material
IO-Link
Max. cycle time
IO-Link process data length
Displays Communication
Error



IO-Link
Product
Topology
IO-Link
Master
IO-Link
SmartLight
IO-Link
Sensor Hub
M8 plastic
**IO-Link Sensor/
Actuator Hub
M12 metal**
IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
IO-Link
Sensors

Device	Device	Device	Device
16x DI/DO	selectable 16x DI	16x DI/DO	selectable 16x DI/DO
BNI003C	BNI005P	BNI003A	BNI0048
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED	Green LED
Green LED	Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
via IO-Link interface	via IO-Link interface	via 7/8" connector	via 7/8" connector
via IO-Link interface	via IO-Link interface	via 7/8" connector	via 7/8" connector
8	8	8	8
max. 16	max. 16	max. 16	max. 16
max. 16	max. 16	max. 16	max. 16
yes	yes	yes	yes
100 mA	100 mA	500 mA	500 mA
0.5 A	0.5 A	2 A	2 A
Yellow/red LED	Yellow/red LED	Yellow/red LED	Yellow/red LED
< 1.4 A	< 1.4 A	9 A	9 A
		9 A	9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
181x68x36.9 mm	181x68x36.9 mm	181x68x36.9 mm	181x68x36.9 mm
Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
Version 1.0	Version 1.0	Version 1.0	Version 1.0
25 ms	25 ms	25 ms	30 ms
8 input bytes/2 output bytes	8 input bytes	8 input bytes	10 input bytes/2 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Red LED	Red LED	Red LED	Red LED



All hubs include four screw plugs and a label set.

Safety for the network/system integration

If you wish to use standard I/Os or safety I/Os in a fieldbus topology, the issue of safety becomes increasingly important for network/system integration.

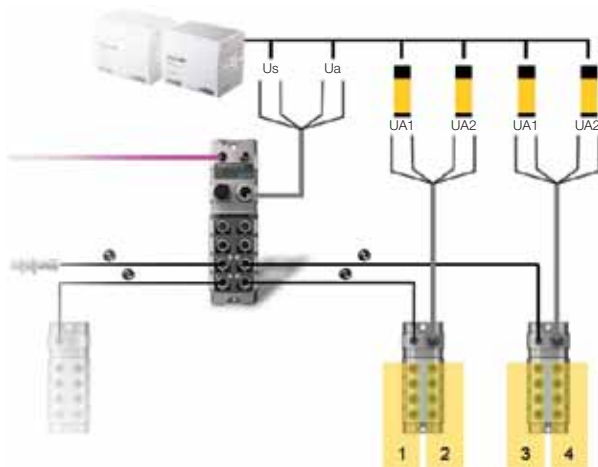
The model BNI IOL-252/256... IO-Link actuator hubs meet the requirement for safe shut-off ("passive safety") of outputs per the Machine Directive IEC 61508-1: 2010 (SIL2) IEL 61508-2: 2010 (SIL2), EN ISO 13849-1: 2008 (Cat. 3, PL d).

The I/O block is divided into two galvanically isolated segments in order that two separately switching safety circuits can be implemented using one module.

The functions of the IO-Link system concept are extended considerably as a result. The IO-Link fulfills the requirements for a holistic approach and simultaneously reduces the number of components and guarantees simpler installation.

Benefits

- Robust housing
- Powerful inputs
- Powerful outputs
- Extended temperature range
- Modules with reliable deactivation mechanism



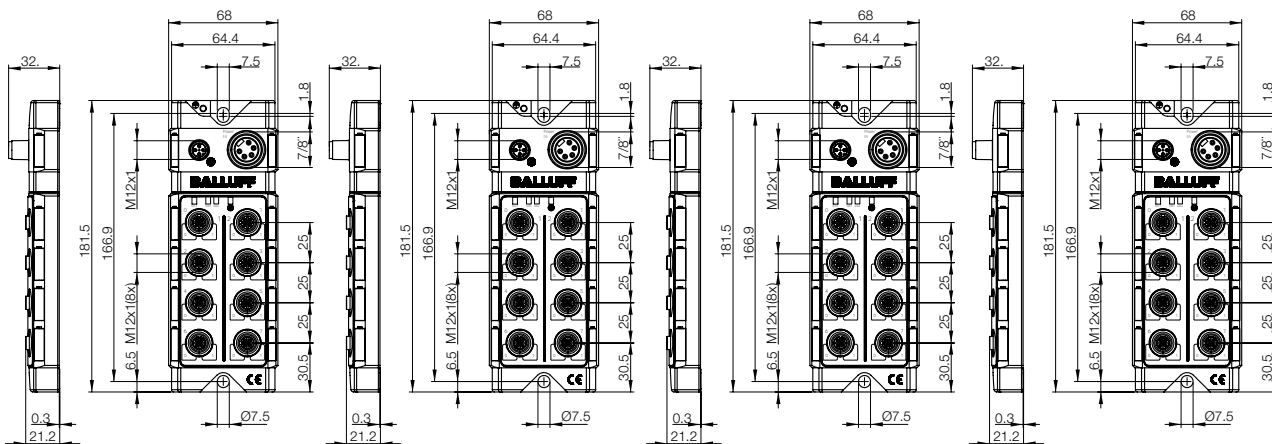
IO-Link
Type
Supply voltage U_B
Function indicator IO-Link RUN
Power-on indicator
Connection: IO-Link
Connection: I/O ports
Connection U_B
Connection U_A
No. of I/O ports
Number of outputs
Configurable
Single-channel monitoring
Number of output circuits
Outputs per output circuit
Single-channel monitoring
Max. load current actuators/channel
Port status indicator
Total sensor current
Total actuator current
Enclosure rating per IEC 60529
Operating temperature T_a
Storage temperature
Fastening
Dimensions (LxWxH)
Housing material
IO-Link
Max. cycle time
IO-Link process data length
Displays
Communication
Error

All hubs include four screw plugs and a label set.



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device	Device	Device	Device
2x 4xDO	2x 8xDO	2x 4xDO	2x 8xDO
BNI0033	BNI0034	BNI003W	BNI003Y
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED	Green LED
Green LED	Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
via 7/8" connector	via 7/8" connector	via 7/8" connector	via 7/8" connector
via 7/8" connector	via 7/8" connector	via 7/8" connector	via 7/8" connector
8	8	8	8
8	16	8	16
no	no	no	no
no	no	yes	yes
2	2	2	2
4	8	4	8
no	no	yes	yes
2 A	2 A	2 A	2 A
Yellow/red LED	Yellow/red LED	Yellow/red LED	Yellow/red LED
9 A	9 A	9 A	9 A
9 A	9 A	9 A	9 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
181x68x36.9 mm	181x68x36.9 mm	181x68x36.9 mm	181x68x36.9 mm
Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
Version 1.0	Version 1.0	Version 1.0	Version 1.0
2.5 ms	5 ms	15 ms	20 ms
1 output byte	2 output byte	3 input bytes/1 output byte	5 input bytes/2 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Red LED	Red LED	Red LED	Red LED



For high efficiency

The sensor hub is a particularly efficient complement to your machine installation. You can conveniently connect standard sensors using 8 or 16 standard inputs.

Each input can be programmed as normally closed or normally open using a parameter set.

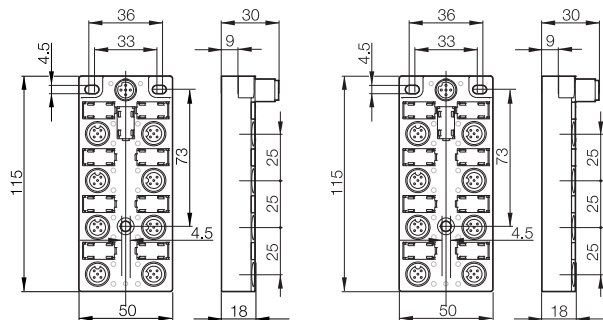
This adds significant flexibility to your installation. Complementary DESINA sensors can be easily connected to the DI16 sensor hub.

Communication with the IO-Link master takes place in COM2 mode (38.4 kbaud) on the standard 3-conductor cable. and gives you a complete process representation in as little as 2 ms.



IO-Link	Device	Device
Special function		
Type	8× DI	16× DI
	BNI0005	BNI0006
Supply voltage U_B	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	Green LED	Green LED
Power-on indicator	Green LED	Green LED
Connection: IO-Link	M12, A-coded, male	M12, A-coded, male
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8
Number of inputs	8 PNP	16 PNP
Configurable/parameterizable	no	no
Max. load current, sensors/channel	100 mA	100 mA
Port status indicator	Yellow LED	Yellow LED
Total sensor current	< 1.2 A	< 1.2 A
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+85 °C	-25...+85 °C
Weight	Approx. 86 g	Approx. 86 g
Fastening	3 mounting holes	3 mounting holes
Dimensions (L×W×H)	115×50×31 mm	115×50×31 mm
Housing material	Trogamide	Trogamide

IO-Link	Version 1.0	Version 1.0
No. of IO-Link ports	1× device	1× device
Max. cycle time	3 ms	3 ms
IO-Link process data length	2 input bytes	2 input bytes
Displays	Communication	Green LED
	Error	Red LED



All hubs include four screw plugs and a label set.



NPN



NPN

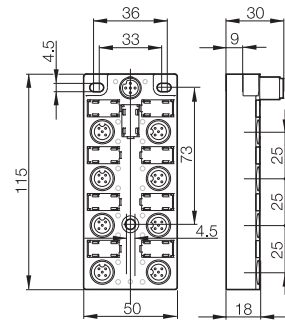
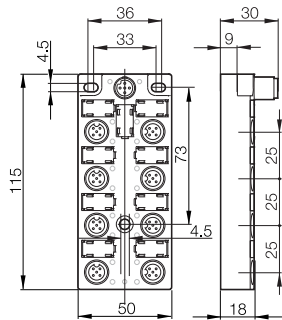
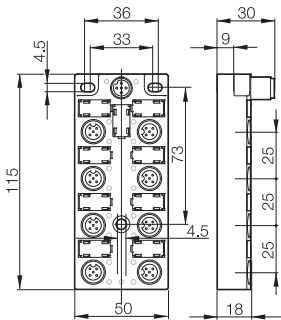


NPN



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device	Device	Device
	selectable	Single-channel diagnostics, codable
16× DI	16× DI	16× DI
BNI0074	BNI0075	BNI0076
18...30 V	18...30 V	18...30 V
Green LED	Green LED	Green LED
Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
8	8	8
16 NPN	16 NPN	16 NPN
NC/NO	NC/NO	NC/NO
200 mA	200 mA	200 mA
Yellow LED	Yellow LED	Yellow LED
< 1.2 A	< 1.2 A	< 1.2 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+55 °C	-5...+55 °C	-5...+55 °C
-25...+85 °C	-25...+85 °C	-25...+85 °C
3 mounting holes	3 mounting holes	3 mounting holes
115×50×31 mm	115×50×31 mm	115×50×31 mm
Trogamide	Trogamide	Trogamide
Version 1.1	Version 1.1	Version 1.1
1× device	1× device	1× device
3 ms	3 ms	3 ms
2 input bytes	2 input bytes	2 input bytes
Green LED	Green LED	Green LED
Red LED	Red LED	Red LED



Two variants

With the analog sensor hub, you can select from two additional variants with current and voltage interface, allowing you to connect non-IO-Link capable sensors with maximum reliability. Four existing analog channels can be used, which are supplemented by four additional dual-use standard input ports as per IEC 61131. The analog channels have a resolution of 10 bits.



IO-Link	
Type	
Supply voltage U _B	
Function indicator IO-Link RUN	
Power-on indicator	
Connection: IO-Link	
Connection: I/O ports	
No. of I/O ports	
Number of digital inputs	
Configurable	
Max. load current, sensors/channel	
Port status indicator	
Total sensor current	
Enclosure rating per IEC 60529	
Operating temperature T _a	
Storage temperature	
Weight	
Fastening	
Dimensions (LxWxH)	
Housing material	
Analog ports	
Number of analog ports	
Interface	
Resolution	
Analog signal indicator	
IO-Link	
No. of IO-Link ports	
Operating mode	
IO-Link process data length	
Displays	Communication Error
Max. load current	
Parameters	

All hubs include four screw plugs and a label set.



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub
M8 plastic
IO-Link Sensor/ Actuator Hub
M12 metal
IO-Link Sensor/ Actuator Hub M12 plastic
IO-Link Sensor/ Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device
4 AI, 4-20 mA, 8× DI
BNI0007
18...30 V DC
Green LED
Green LED
M12, A-coded, male
M12, A-coded, female
8
8 PNP
NC/NO
200 mA
Yellow LED
< 1.2 A
IP 67 (when connected)
-5...+55 °C
-25...+85 °C
Approx. 86 g
3 mounting holes
115×50×31 mm
Trogamide

Device
4 AI, 0-10 V DC, 8× DI
BNI0008
18...30 V DC
Green LED
Green LED
M12, A-coded, male
M12, A-coded, female
8
8 PNP
NC/NO
200 mA
Yellow LED
< 1.2 A
IP 67 (when connected)
-5...+55 °C
-25...+85 °C
Approx. 86 g
3 mounting holes
115×50×31 mm
Trogamide

4
4...20 mA
10 bit
Green LED

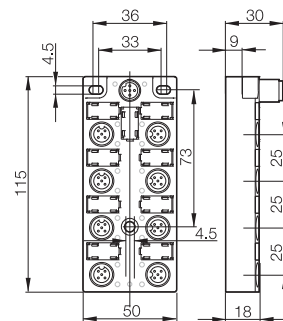
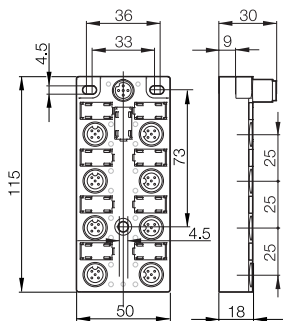
4
0...10 V DC
10 bit
Green LED

Version 1.0

1× device
COM 2 (3-wire)
10 input bytes
Green LED
Red LED
< 1.2 A
NC/NO each input,
2 switching points per analog channel

Version 1.0

1× device
COM 2 (3-wire)
10 input bytes
Green LED
Red LED
< 1.2 A
NC/NO each input,
2 switching points per analog channel



Simple handling, fast data, four variants

Space-saving M12 sensor hubs with IO-Link interface are the first choice wherever space is limited, because they provide up to 16 inputs in the tightest of spaces. And their low weight makes them recommended for weight-critical applications.

M12 sensor hubs are easy to install and save time, because a simple 4-pin standard cable is sufficient for the connection. The M12 sensor hubs also save time and costs during maintenance and system operation.

This is because, like all IO-Link products, they ensure consistent diagnostics and can be configured centrally. M12 sensor hubs are also particularly fast. Sending 16 sensor signals, for example, takes 2.5 ms. This ensures that the controller always receives current information. Each individual channel can be programmed to function as normally closed (NC) or normally open (NO), which allows the connection of complementary sensors.

M12 sensor hubs with IO-Link port are available in four variants.

Freely configurable

The maximum 16 channels of the M12 plastic sensor/actuator hub are freely configurable (input/output) and fulfill the requirements for cost-effective, flexible wiring. IO-Link 1.1 is connected using a 4-pin standard sensor cable.

Benefits

- Every port can be freely configured and used as an output or input
- Inputs can be programmed as normally closed or normally open, depending on requirements, via the configuration
- Max. load current 350 mA per port
- Max. load current 1.2 A overall
- Connected to a 1.1 IO-Link master, they provide full 1.1 functionality, such as data storage and an expanded data frame



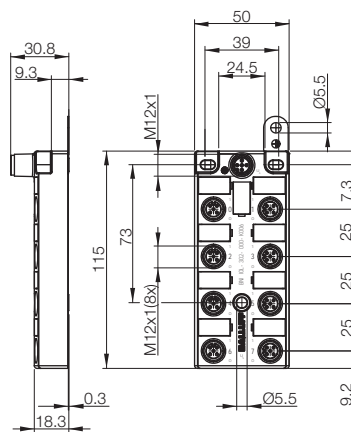
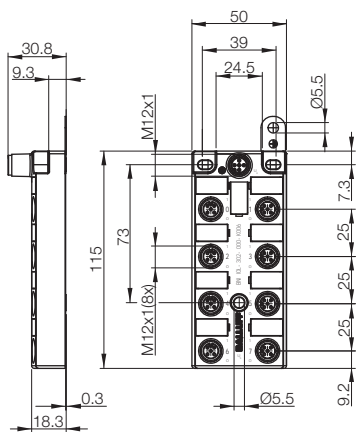
IO-Link
Special function
Type
Supply voltage U_B
Function indicator IO-Link RUN
Power-on indicator
Connection: IO-Link
Connection: I/O ports
Connection U_B
Connection U_A
No. of I/O ports
Number of inputs
Number of outputs
Configurable
Single-channel monitoring
Code able via IO-Link
Max. load current, sensors/channel
Max. load current actuators/channel
Port status indicator
Total sensor current
Total actuator current
Enclosure rating per IEC 60529
Operating temperature T_a
Storage temperature
Fastening
Dimensions (LxWxH)
Housing material
IO-Link
Max. cycle time
IO-Link process data length
Displays Communication
Error

All hubs include four screw plugs and a label set.



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device	Device	Device	Device
16× DI/DO	Single-channel diagnostics	selectable	Single-channel diagnostics and codable
BNI005L	BNI005T	BNI005U	BNI005W
18...30 V	18...30 V	18...30 V	18...30 V
Green LED	Green LED	Green LED	Green LED
Green LED	Green LED	Green LED	Green LED
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
via IO-Link interface	via IO-Link interface	via IO-Link interface	via IO-Link interface
via IO-Link interface	via IO-Link interface	via IO-Link interface	via IO-Link interface
8	8	8	8
16 max.	16 max.	16 max.	16 max.
16 max.	16 max.	16 max.	16 max.
yes	yes	yes	yes
no	yes	no	yes
no	no	yes	yes
100 mA	100 mA	100 mA	100 mA
0.35 A	0.35 A	0.35 A	0.35 A
Yellow/red LED	Yellow/red LED	Yellow/red LED	Yellow/red LED
< 1.3 A	< 1.3 A	< 1.3 A	< 1.3 A
< 1.6 A	< 1.6 A	< 1.6 A	< 1.6 A
IP 67	IP 67	IP 67	IP 67
-5...+55 °C	-5...+55 °C	-5...+55 °C	-5...+55 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
3 mounting holes	3 mounting holes	3 mounting holes	3 mounting holes
115×50×31	115×50×31 mm	115×50×31 mm	115×50×31 mm
Trogamide	Trogamide	Trogamide	Trogamide
Version 1.1	Version 1.1	Version 1.1	Version 1.1
3.5 ms	5 ms	4 ms	5.5 ms
2 byte input/2 byte output	8 byte input/2 byte output	4 byte input/2 byte output	10 byte input/2 byte output
Green LED	Green LED	Green LED	Green LED
Red LED	Red LED	Red LED	Red LED



Easy installation with IO-Link under IP 20 conditions

The maximum 16 channels of the IP 20 IO-Link sensor/actuator hub are user-configurable (input/output) and meet the requirements for inexpensive flexible wiring.

The IO-Link is connected with a 4-pin standard sensor cable. The connection from/to the peripherals is by means of removable screw terminal blocks.

IO-Link up to the control panel

The compact size enables simple and straightforward installation in control cabinets, control boxes and control panel housings. Simply snap the plastic housing onto a mounting rail according to EN 60175 – done.

IO-Link for integration in devices and device modules

Circuit board variants are available for the integration in spatially limited and complex functional units which can be integrated via spacing bolts.

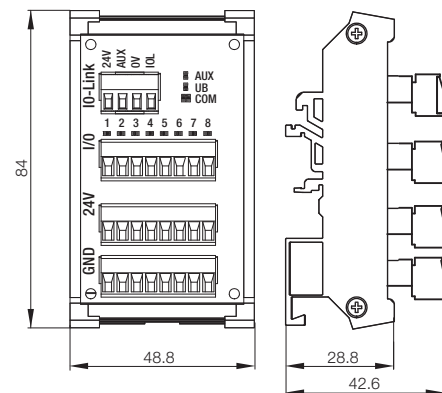


IO-Link	Device
Type	8× DI/DO
	BNI004K
Supply voltage U_B	18...30 V DC
Function indicator IO-Link RUN	Green LED
Power-on indicator	Green LED
Connection: IO-Link	Screw terminals, pluggable
Connection U_B	Screw terminals, pluggable
Connection U_A	Screw terminals, pluggable
Connection: I/O ports	Screw terminals, pluggable
No. of I/O ports	8
Number of inputs	Max. 8
Number of outputs	Max. 8
Configurable/parameterizable	yes
Single-channel monitoring	no
Max. load current, sensors/channel	100 mA
Max. load current actuators/channel	400 mA
Port status indicator	Yellow LED
Total sensor current	< 1.4 A
Total actuator current	< 1.4 A
Enclosure rating per IEC 60529	IP 20
Operating temperature T_a	-5...+50 °C
Storage temperature	-25...+75 °C
Fastening	Top-hat rail fitting over plastic shell
Dimensions (L×W×H)	49×84×43 mm

IO-Link	Version 1.0
No. of IO-Link ports	1× device
Max. cycle time	3 ms
IO-Link process data length	1 input byte/1 output byte
Displays	Communication: Green LED, pulsing
	Error: Red LED

Accessories:

Screw terminals for		
BNI004K, BNI007P	BAM01ZF	
BNI004L, BNI007R	BAM01ZH	
Spring terminals		
for BNI004K	BAM01ZJ	
for BNI004L	BAM01ZK	





No clamp

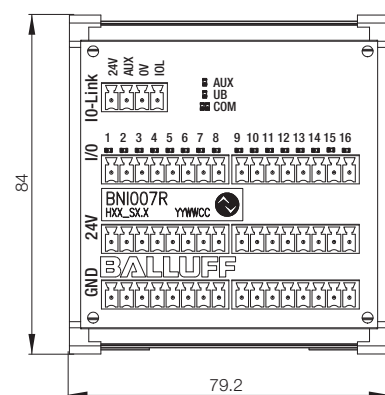
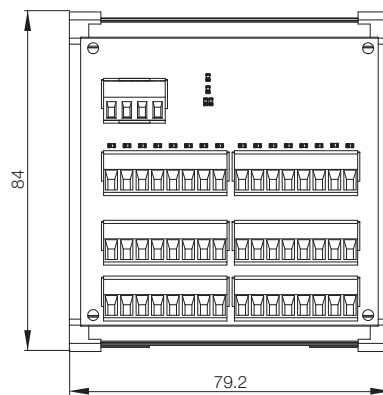
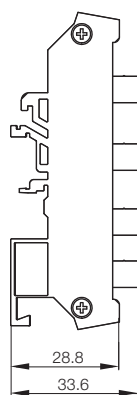
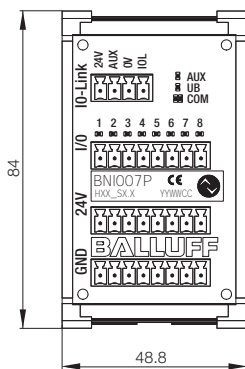


No clamp



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

Device	Device	Device
8x DI/DO	16x DI/DO	16x DI/DO
BNI007P	BNI004L	BNI007R
18...30 V DC	18...30 V DC	18...30 V DC
Green LED	Green LED	Green LED
Green LED	Green LED	Green LED
Pluggable, without terminals	Screw terminals, pluggable	Pluggable, without terminals
Pluggable, without terminals	Screw terminals, pluggable	Pluggable, without terminals
Pluggable, without terminals	Screw terminals, pluggable	Pluggable, without terminals
Pluggable, without terminals	Screw terminals, pluggable	Pluggable, without terminals
8	16	16
Max. 8	max. 16	max. 16
Max. 8	max. 16	max. 16
yes	yes	yes
no	no	no
100 mA	100 mA	100 mA
400 mA	400 mA	400 mA
Yellow LED	Yellow LED	Yellow LED
< 1.4 A	< 1.4 A	< 1.4 A
< 1.4 A	< 1.4 A	< 1.4 A
IP 20	IP 20	IP 20
-5...+50 °C	-5...+50 °C	-5...+50 °C
-25...+75 °C	-25...+75 °C	-25...+75 °C
Top-hat rail fitting over plastic shell	Top-hat rail fitting over plastic shell	Top-hat rail fitting over plastic shell
49x84x43 mm	79x84x43 mm	49x84x43 mm
Version 1.0	Version 1.0	Version 1.0
1x device	1x device	1x device
3 ms	12 ms	12 ms
1 input byte/1 output byte	2 input bytes/2 output bytes	2 input bytes/2 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Red LED	Red LED	Red LED



Converting analog signals into IO-Link signals and saving costs in the process

The number of analog data/information/signals is generally less than 10% of the signals generated in most systems and machines.

The connection and integration of analog input/output signals is associated with high costs due to the use of shielded cables on the installation side and expensive multi-channel input modules on the control side.

Our IO-Link analog plugs provide the fix. They provide considerable cost reduction potential for systems with limited analog value formation.

Expensive shielded cables are replaced with simple unshielded three-core cables. The signal neutrality of the IO-Link ports on the IO-Link master modules, together with the IO-Link analog plugs, ensures maximum signal variance. This makes "mixing" different input/output/current and voltage signals in one module possible.

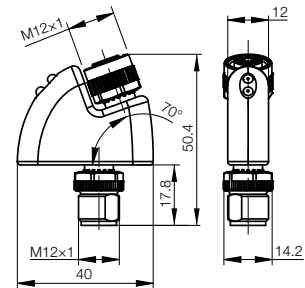
Benefits

- Compact housing
- High, 14-bit resolution
- Extended temperature range
- Inputs and outputs



IO-Link	Device
Type	1 AI, 0...10 V DC
	BNI0042
Supply voltage U_B	18...30 V DC
Connection: IO-Link	M12, A-coded, male
Analog interface connection	M12, A-coded, female
Number of analog ports	1
Interface	0...10 V DC input
Resolution	14 Bit
Max. load current, sensors/channel	1 A
Max. load current actuators/channel	1.4 A
Enclosure rating per IEC 60529	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C
Storage temperature	-25...+70 °C
Weight	21 g
Dimensions (LxWxH)	40x12x50 mm
Housing material	Plastic

IO-Link	Version 1.0
Max. cycle time	3 ms
IO-Link process data length	2 input bytes
Displays	Communication
	Module OK
	Green LED, pulsing
	Green LED



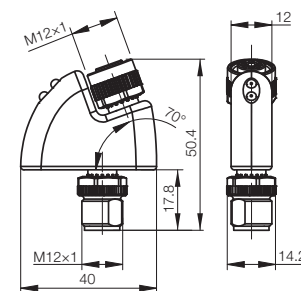
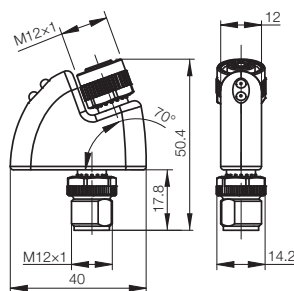
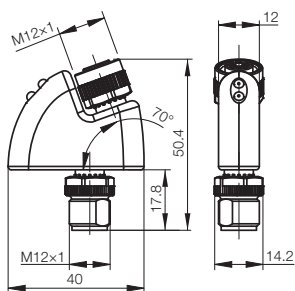
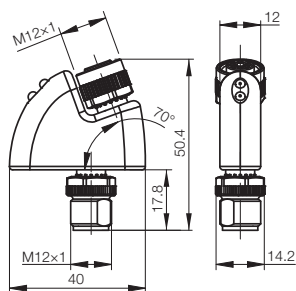


Device	Device	Device	Device
1 AI, 4...20 mA	1 AI, PT100	1 AO, 4...20 mA	1 AO, 0...10 V DC
BNI0041	BNI004T	BNI004C	BNI004E
18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
M12, A-coded, male	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
M12, A-coded, female	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
1	1	1	1
4...20 mA input	PT 100 Input	4...20 mA output	0...10 V DC output
14 Bit	14 Bit	14 Bit	14 Bit
1 A	1 A	1 A	1 A
1.4 A	1.4 A	1.4 A	1.4 A
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
-5...+70 °C	-5...+70 °C	-5...+70 °C	-5...+70 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
21 g	21 g	21 g	21 g
40×12×50 mm	40×12×50 mm	40×12×50 mm	40×12×50 mm
Plastic	Plastic	Plastic	Plastic
Version 1.0	Version 1.0	Version 1.0	Version 1.0
3 ms	3 ms	3 ms	3 ms
2 input bytes	2 input bytes	2 output bytes	2 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing	Green LED, pulsing
Green LED	Green LED	Green LED	Green LED

IO-Link



IO-Link
Product
Topology
IO-Link
Master
IO-Link
SmartLight
IO-Link
Sensor Hub
M8 plastic
IO-Link Sensor/
Actuator Hub
M12 metal
IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
**IO-Link
Converters**
IO-Link
Sensors



New options in installation, diagnostics and activation

The BNI IOL-770-V06-A027 module connects process-related, installed valve clusters in the simplest way with the control level. As common with IO-Link, it is ready to connect and has a simple, 3-wire standard cable. Eliminates complicated parallel wiring and risk of mixing up cables. Because the "intelligence" is in the interface, nothing changes in the valve cluster or its individual valves.

The valve cluster activation combines 24 double valves with the control level. The module is connected to the VQC valve cluster types from SMC via the preinstalled, 26-pin round plug. This saves enormous wiring effort and reduces sources of error very substantially. A common 3-wire standard cable is docked on the other end of the screw-in M12 plug and assumes the complete electric control and the transport of all process and service data to and from the valve cluster.

The omission of high-effort, multiple wiring enables lean wiring concepts and saves space, time and money. The excellent diagnostics functions, such as short-circuit and coil break monitoring, provide for increased security in system operation.



Connector diagram and wiring
IO-Link interface, M12, A-coded, pin

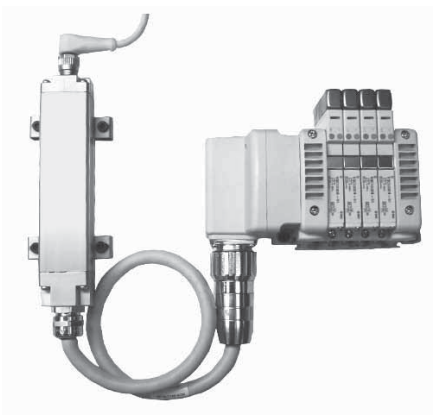
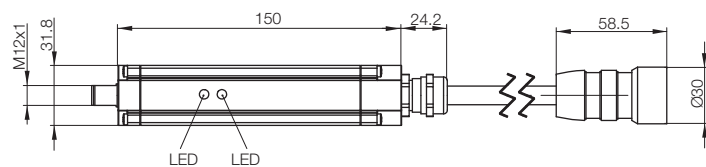


- PIN 1: +24 V, supply voltage
- PIN 2: +24 V, supply voltage Power Aux
- PIN 3: GND, reference potential
- PIN 4: Q/C, IO-Link data transmission channel
- PIN 5: -

Type	Power Aux valve terminal connector	
PVC, gray	0.5 m	BNI004W
Supply voltage U_B	18...30.2 V DC	
Outputs	24	
IO-Link process data length	4 input bytes/4 output bytes	
Error indicator	Red LED	
Communication indicator	Green LED	
Transmission protocol	IO-Link Version 1.1	
Transmission rate	COM 2/38.4 kBaud	
Interface area	M27 socket, 26-pin	
IO-Link process data length	9 byte input/4 byte output	
Min. cycle time	5.5 ms IO-Link version 1.1	
Operating temperature T_a	-5...+70 °C	
Storage temperature	-25...+70 °C	
Dimensions	187x32x32 mm without cable	
Housing material	Aluminum	
Total current I_S	1.2 A	
Enclosure rating	IP 65	
Cable length with M27 socket	50 cm	

IO-Link

Version 1.1



Benefits

- Compact adapter housing for docking directly on the valve cluster
- Switchable via IO-Link to different fieldbuses, cross-manufacturer openness
- Connection to control level is made with common 3-wire sensor cables, saving wiring effort
- Excellent diagnostics functions such as short-circuit, coil break, power supply

Signal assignment M27 socket round plug in accordance with SMC-VQC valve clusters

Universal IO-Link interface – unlimited options

Via the BNI IOL-771-000-K027 module, all devices are open for IO-Link with up to 16 inputs/outputs.

In a process-related manner, pumps, signal lights, control panels, valve clusters, switch units, transfer units, and much more are connected with the control level in the simplest way. The module provides both the fast IO-Link connection via the standard sensor line and an open cable with 10 or 18 wires, depending on the exact version.

With it, now any electric unit with up to 16 inputs/outputs can be connected to the control system via a standard sensor cable.

The omission of high-effort, multiple wiring enables lean wiring concepts and saves space, time and money.

Benefits

- Compact adapter housing for direct connection to different devices
- Via IO-Link, universal and fieldbus-independent
- Connection to control level with common sensor cable, reduces wiring effort
- Variants available with 8 or 16 input/output signals



Connector diagram and wiring
IO-Link interface, M12, A-coded, pin



PIN 1: +24 V, Supply voltage
PIN 2: +24 V, Supply voltage Power Aux
PIN 3: GND, reference potential
PIN 4: Q/C, IO-Link data transmission channel
PIN 5: Function ground

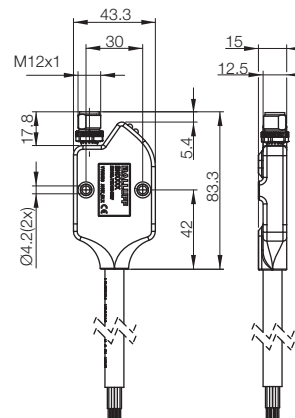
Type	IO-Link interface	
PVC, gray	0.4 m	BNI005M
Supply voltage U_B	18...30.2 V DC	
IO-Link process data length	2 input bytes/2 output bytes	
Indicators and monitoring	Power supply, communication, diagnostics	
Transmission protocol	IO-Link version 1.1	
Transmission rate	COM 2 (38.4 kbaud)	
Min. cycle time	4 ms	
Operating temperature T_a	-5...+75 °C	
Storage temperature	-25...+85 °C	
Dimensions	83.3×43.3×15 mm without cable	
Housing material	Plastic	
Total current I_A	1.2 A	
Enclosure rating	IP 54	



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

IO-Link

Version 1.1



Simply connect decentralized valve terminals

The advantages of IO-Link apply to valve terminal connectors as well. Now it is simple to connect decentralized valve terminals and the control level.

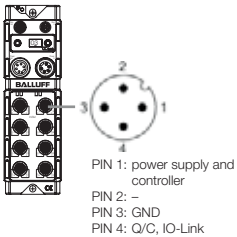
Benefits

- Compact adapter housing
 - Direct connection to the valve terminal using minimal space
- Flexibility
 - Compatible with pin configurations from a wide range of valve terminals
- Optimized wiring
 - Connects to the control level using standard 3/4-wire sensor cable
- Modular
 - Control of up to 24 solenoids

Valve terminal connectors

Use

Connection to valve terminal for power supply



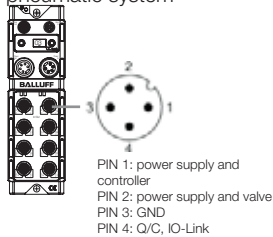
Benefits

For all applications without separate deactivation of the valve power supply.

Power Aux valve terminal connector

Use

Separate deactivation of actuators, valve terminals and pneumatic system



Benefits

Pin 1: separate electrical operating voltage for controller
Pin 2: configured as an output and connected to actuator power supply U_a

The actuator operating voltage can be switched on and off via the controller/PLC.

Preferred for 90% of all applications!



Series
Output signal
Interface area
Outputs
IO-Link process data length
Outputs
IO-Link process data length
Min. cycle time
Operating temperature
Storage temperature
Housing material
Dimensions
Cable length with M12
Enclosure rating
Error indicator
Communication indicator
Supply voltage U_B
Total current U_S
Pin assignments for IO-Link interface (M12, A-coded, male)

IO-Link

Mode
Transmission rate



The valve terminal connector makes your valve terminals IO-Link capable.

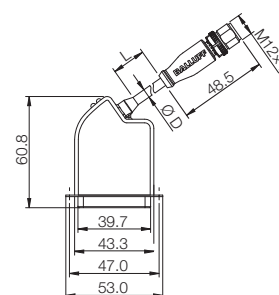
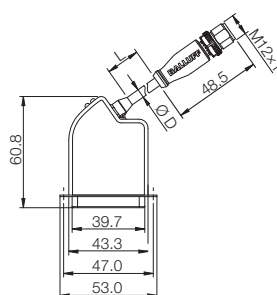
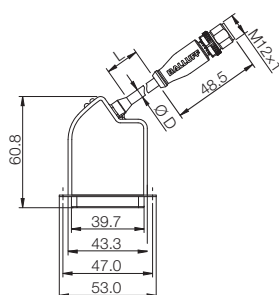
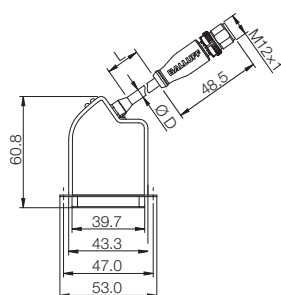
Festo CPV, MPA
Bosch Rexroth LS04, HF04



SMC VQC



Valve terminal connectors	Power Aux valve terminal connector	Valve terminal connectors	Power Aux valve terminal connector
IO-Link	IO-Link	IO-Link	IO-Link
SUB-D 25-pin	SUB-D 25-pin	SUB-D 25-pin	SUB-D 25-pin
BNI006E	BNI006M	BNI006H	BNI006T
16	16	16	16
2 bytes	2 bytes	2 bytes	2 bytes
BNI006J	BNI006N	BNI006K	BNI006P
24	24	24	24
3 bytes	3 bytes	3 bytes	3 bytes
3 ms	3 ms	3 ms	3 ms
-5...+55 °C	-5...+55 °C	-5...+55 °C	-5...+55 °C
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
Plastic	Plastic	Plastic	Plastic
53×60.8×12.5 mm	53×60.8×12.5 mm	53×60.8×12.5 mm	53×60.8×12.5 mm
60 cm	60 cm	60 cm	60 cm
IP 40	IP 40	IP 40	IP 40
Red LED	Red LED	Red LED	Red LED
Green LED	Green LED	Green LED	Green LED
18...30.2 V DC	18...30.2 V DC	18...30.2 V DC	18...30.2 V DC
1.6 A	1.6 A	1.6 A	1.6 A
Pin 1: +24 V Supply voltage	Pin 1: Controller +24 V Supply voltage	Pin 1: +24 V Supply voltage	Pin 1: Controller +24 V Supply voltage
Pin 2: -	Pin 2: Operating voltage +24 V power aux	Pin 2: -	Pin 2: Operating voltage +24 V power aux
Pin 3: GND, reference potential	Pin 3: GND, reference potential	Pin 3: GND, reference potential	Pin 3: GND, reference potential
Pin 4: Q/C, IO-Link	Pin 4: Q/C, IO-Link	Pin 4: Q/C, IO-Link	Pin 4: Q/C, IO-Link
Pin 5: Function ground	Pin 5: Function ground	Pin 5: Function ground	Pin 5: Function ground
Version 1.1	Version 1.1	Version 1.1	Version 1.1
COM 2	COM 2	COM 2	COM 2
38.4 kbaud	38.4 kbaud	38.4 kbaud	38.4 kbaud

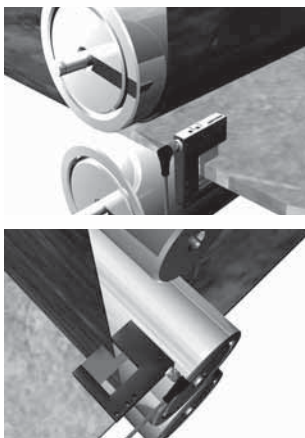


In-process correction

Thanks to their light array, through-beam fork sensors BGL can detect objects with absolute reliability while determining their position with pin-point accuracy. In-process correction is simplified substantially. Process reliability and product quality are significantly improved, thereby increasing efficiency.

Technical highlights

- Analog signal proportional to the skin depth of the object
- Constant value, even in the event of height variations
- Fieldbus connection with IO-Link



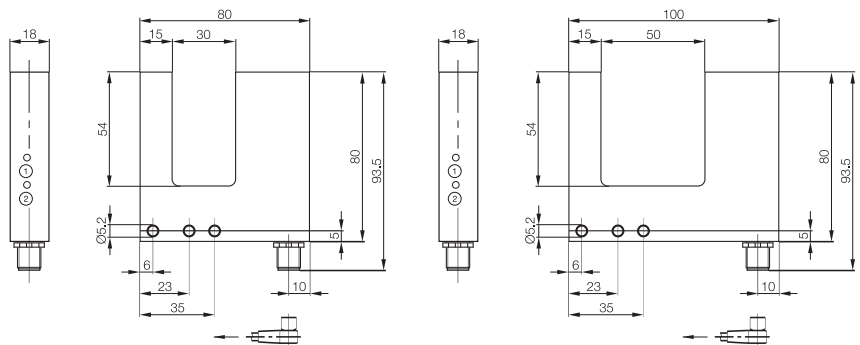
Reliable web edge control using the light array of the BGL fork sensor



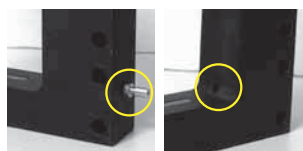
IO-Link
Product
Topology
IO-Link
Master
IO-Link
SmartLight
IO-Link
Sensor Hub
M8 plastic
IO-Link Sensor/
Actuator Hub
M12 metal
IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
**IO-Link
Sensors**

Series	BGL Series C Premium	BGL Series C Premium
Output signal	IO-Link	IO-Link
Fork opening	30 mm	50 mm
Measurement field length	25 mm	25 mm
PNP	BGL0035	BGL003F
Supply voltage U_B	18...30 V DC	18...30 V DC
No-load supply current I_0 max.	≤ 20 mA	≤ 20 mA
Output current	Max. 100 mA per output	Max. 100 mA per output
LED displays	2 x yellow LED	2 x yellow LED
Response time	≤ 1 ms	≤ 1 ms
Settings	2x teach button	2x teach button
Switching frequency f	500 Hz	500 Hz
Light type	Red light 633 nm	Red light 633 nm
Resolution	0.1 mm	0.1 mm
Repeat accuracy	0.25 mm	0.25 mm
Hysteresis	±0,8 %	±0,8 %
Connection	M12, 4-pin, A-coded	M12, 4-pin, A-coded
Housing material	Anodized aluminum	Anodized aluminum
Weight	155 g	175 g
Enclosure rating per IEC 60529	IP 67	IP 67
Polarity reversal protected	yes	yes
Short-circuit protected	yes	yes
Ambient temperature T_a	-5...+55 °C	-5...+55 °C
Permissible ambient light	≤ 1 klx	≤ 1 klx

IO-Link	Version 1.0	Version 1.0
Mode	COM 2	COM 2
Transmission rate	38.4 kbaud	38.4 kbaud
IO-Link process data length	2 input bytes	2 input bytes
Value range	000 H...03FF H	000 H...03FF H
Diagnostics	Contamination	Contamination
Parameters	Switching points/switching range, button disable, NO/NC switch, analog value characteristics	Switching points/switching range, button disable, NO/NC switch, analog value characteristics



For information about object detection, refer to our catalog or look online at www.balluff.com



Integral air purge nozzle to prevent dust from accumulating on the emitter and receiver optics. Simple connection via standard pneumatic system.

Versatile design with a long range

The new light barriers and diffuse sensors in the BOS 50K series combine top performance and compact dimensions. Thanks to their long range, these versatile sensors are suitable for use in numerous sectors, ranging from the automotive industry to the woodworking industry. The background suppression is particularly impressive with an almost color-independent detection of objects – and that at maximum sensing distance.

Benefits

- Reliable object detection even at large distances
- Real background suppression for a sensing distance of up to 2 m even on dark objects
- Simple alignment due to bright, clearly visible beam spot
- Simple and fast setting with potentiometer
- Through-beam sensor with test input for function check
- Varied and time-saving assembly options

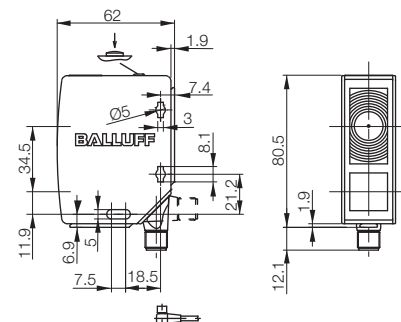


Type	Diffuse sensor
Detection range	1...3500 mm
PNP, NO/NC selectable IO-Link	BOS01JJ
Supply voltage U_B	10...30 V DC
Output current	100 mA
No-load supply current I_0 max.	≤ 50 mA
Switching type	Light/dark switching
Polarity reversal/short-circuit protected	yes/yes
Settings	Teach-in
Emitter, light type	LED, red light
Wavelength	630 Nm
Light spot diameter	80×80 mm at 3.5 m
Gray value shift (90%/18%)	
Power indicator	Green LED
Received light indicator	Yellow LED
Stability indicator	Yellow LED, flashes
Error indicator	
Response time	2.5 ms
Switching frequency f	200 Hz
Enclosure rating per IEC 60529	IP 67
Ambient temperature T_a	-5...+55 °C
Permissible ambient light	10 klx
Material	Housing: ABS/PC Optical surface: Glass
Connection	M12 connector, 4-pin

IO-Link

Version 1.0

Reference object: white, 90% reflection, 200×200 mm



In a rugged metal housing

When traditional sensing methods reach their technological and economic limits, laser distance sensors BOD 63M step in:

- For detecting small objects over long distances
- In difficult environments, such as high temperatures
- In robot cells

The BOD 63M with rugged metal housing has a working range of 200...6000 mm. Its data is transmitted via IO-Link mode, which makes setup and operation extremely easy: Two teach-in buttons are provided for initiating startup. You can set both switching points directly from the controller, deactivate the laser and disable the keys.



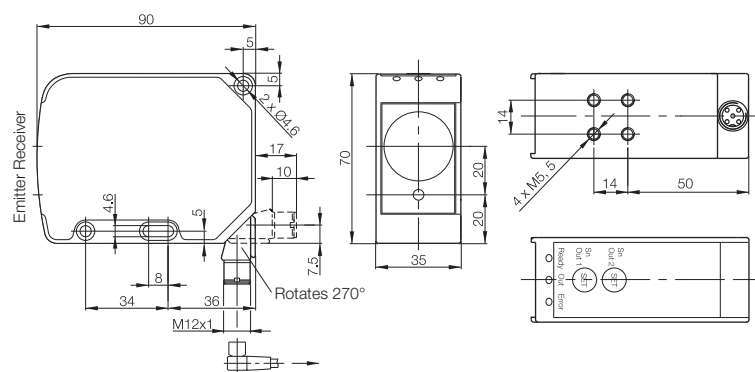
Series	BOD 63M
Output signal	IO-Link
Working range	200...6000 mm
Measuring range	5800 mm
PNP	BOD0012
Supply voltage U _B	18...30 V DC
No-load supply current I ₀ max.	90 mA
Settings	Teach-in
Switching points	4
Emitter, light type	Laser, red light
Wavelength	660 Nm
Laser class	2
Light spot diameter	5 mm at 3 m 10 mm at 6 m
Resolution	1 mm
Gray value shift	≤ 1.5%
Repeat accuracy	≤ ±4 mm
Temperature drift	≤ 1.5 mm/K
Output curve deviation max.	± 1% of Wh
Switching hysteresis (in % of Sr)	0.3 %
On/off delay	≤ 3.3 ms
Ready delay	≤ 20 ms
Switching frequency f	≤ 150 Hz
Power-on indicator	Green LED
Output function indicator	Yellow LED
Stability indicator	Red LED
Dimensions	90×70×35 mm
Connection	M12 connector, 4-pin
Housing material	Anodized aluminum
Optical surface	Glass
Weight	270 g
Enclosure rating per IEC 60529	IP 65
Polarity reversal protected	yes
Short-circuit protected	yes
Ambient temperature T _a	-10...+60 °C
Permissible ambient light	≤ 10 klx

IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

IO-Link	Version 1.0
Mode	COM 2
Transmission rate	38.4 kbaud
IO-Link process data length	3 input bytes/1 output byte
Value range analog	00C8 H...1770 H for WI...Wh
Diagnostics	Stability indicator
Parameters	Switching points, laser on/off, button disable



For information about object detection, refer to our catalog or look online at www.balluff.com

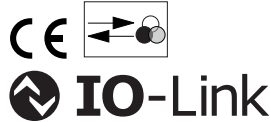


Reliability in challenging applications

Robotics, automation, quality assurance and production processes are among the applications for color sensors. Therefore the color sensor BFS 26K is particularly suited for

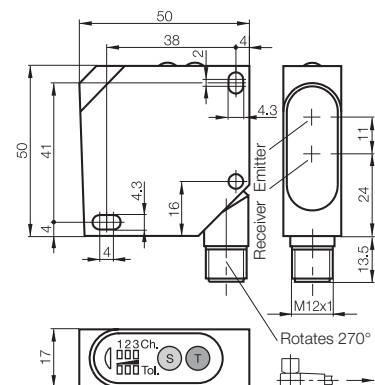
- Quality assurance
- Selection of components
- Detection of cable wires

The BFS 26K uses white light and is especially insensitive to ambient light. This provides you with reliable data in challenging applications. Making your setting is incredibly easy since the controller handles data configuration via IO-Link.



Series	BFS 26K	
Output signal	IO-Link	
Working range	Key operation	12...32 mm
Measuring range	Reflector mode	50...200 mm
BFS000F		
Supply voltage U_B	12...28 V DC	
No-load supply current I_0 max.	≤ 40 mA	
Output	3× PNP transistor	
Output current	100 mA	
Settings	Teach-in	
Emitter, light type	Pulsed white light	
Light spot geometry	round	
Light spot diameter	Ø 4 mm at sensing distance 22 mm	
Sensing distance tolerance	±6 mm at tol. 3	
Color resolution tolerance	Adjustable in 5 levels	
Power-on indicator	Green LED	
Output function indicator Ch. 1...Ch. 3	3× yellow LED	
Response time	1 ms	
Switching frequency f	500 Hz	
Dimensions	50×50×17 mm	
Connection	M12 connector, 4-pin	
Housing material	Impact-resistant ABS	
Optical surface	PMMA	
Weight	40 g	
Enclosure rating per IEC 60529	IP 67	
Polarity reversal protected	yes	
Short-circuit protected	yes	
Ambient temperature T_a	-10...+55 °C	
Ambient light limit according to	EN 60947-5-2	

IO-Link	Version 1.0
Mode	COM 2
Transmission rate	38.4 kBit
Cycle time	2.6 ms
IO-Link process data length	2 bytes
Parameters	5 colors, 5 tolerance ranges, NC/NO, key disable



See better than the human eye

Compared to traditional RGB sensors, the BFS 33M true color sensor is in a league of its own. Thanks to its high resolution, it not only detects colors but can also reliably distinguish between nuances. The True Color sensor thus detects for instance minimal color deviations in injection molded parts. And it can also tell if a metal enters production polished or unpolished. Faded colors or poor print quality are detected in an instant and separated. It thus opens up completely new dimensions in quality control. The integrated IO-Link interface enables simple, bi-directional communication with the controller.

Benefits

- Detection of and distinguishing between a random number of colors
- Reliably distinguishes between the smallest of color nuances
- Large sensing distance up to 400 mm
- Simple parameterizing via IO-Link
- Robust metal housing

Industries

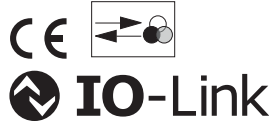
- Automotive industry
- Plastics processing
- Packaging industry
- Handling and assembly
- Printing industry
- Wood processing



For information about object detection, refer to our catalog or look online at www.balluff.com



256 colors!



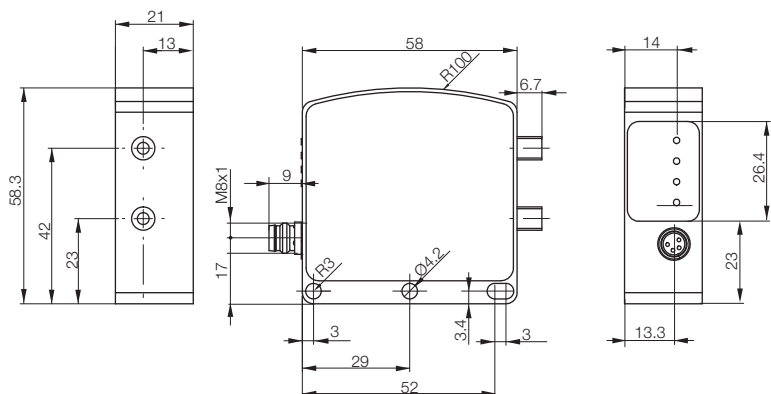
Series	BFS 33M (True Color sensor)	
Interface	IO-Link	
Working range	Key operation	Fiber-dependent (up to 400 mm)
Measuring range	Reflector mode	Fiber-dependent
BFS000M		
Supply voltage U_B	21.6...26.4 V DC	
No-load supply current I_0 max.	≤ 60 mA	
Emitter, light type	Pulsed white light	
Light spot geometry	Fiber-dependent	
Light spot diameter	Fiber-dependent	
Sensing distance tolerance	Adjustable	
Color resolution tolerance	Adjustable	
Power-on indicator	Green LED	
Output function indicator	Yellow LED	
Dimensions	58x58.3x21 mm	
Connection	M8 connector, 4-pin	
Housing material	Aluminum-coated	
Optical surface	Fiber-dependent	
Weight	150 g	
Enclosure rating per IEC 60529	IP 54	
Polarity reversal protected	yes	
Short-circuit protected	yes	
Ambient temperature T_a	+10...+55 °C	
Ambient light limit according to	EN 60947-5-2	

- IO-Link
- Product Topology
- IO-Link Master
- IO-Link SmartLight
- IO-Link Sensor Hub M8 plastic
- IO-Link Sensor/Actuator Hub M12 metal
- IO-Link Sensor/Actuator Hub M12 plastic
- IO-Link Sensor/Actuator Hubs, IP 20
- IO-Link Converters
- IO-Link Sensors**

IO-Link	Version 1.1
Mode	COM 3
Transmission rate	230.4 kBit/s
Cycle time	9.2 ms
IO-Link process data length	2 bytes
Parameters	256 colors, operating mode, tolerance, calibration

Recommended fiber optics: BFO00C9

Recommended cable: BCC03JW (2 m), BCC03JZ (5 m)



Extremely compact

With a housing length of only 41 mm, the new ultrasonic sensors BUS 18M are extremely compact. With their narrow sound cone and a blind zone of only 20 mm, they provide flexible application options. Two housing variants—straight and with a 90° angle head—are available, each with four sensing distances up to 1.3 m. The sensor family covers a broad range of applications—through three different output stages: a push-pull switching output or an analog output, available with 4...20 mA or 0...10 V. The highlight is complete support of the IO-Link interface. By means of the switching output, the sensors can communicate with an IO-Link-capable controller or an IO-Link master.

The sensors can be synchronized with one another, so that they do not influence one another.

Benefits

- 2 housing variants
- Measuring range from 20 mm to 1.3 m
- Push-pull switching output
- Analog output 4...20 mA or 0...10 V
- Teach-in via control line
- Temperature compensation



Control foil sag and monitor roll diameter

Using an ultrasonic sensor with analog output, the material on a roll is detected and the roll drive or a brake readjusted. Another sensor with analog output readjusts the material infeed at the dancer roller as a function of the cable loop.



Operating scanning range

BUS M18M switching output, straight

Resolution		
Push/Pull	NO/NC	IO-Link

BUS W18M switching output, right-angle

Resolution		
Push/Pull	NO/NC	IO-Link

Size

Supply voltage

Output current

Degree of protection as per EN 60529

Operating temperature

Material	Housing
	Plastic parts
	Sensing surface

Connection

IO-Link



20...150 mm



30...250 mm



65...350 mm



120...1000 mm



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

0.069 mm
BUS0020

0.069 mm
BUS0029

0.069 mm
BUS004Z

0.069 mm
BUS004P

0.069 mm
BUS0023

0.069 mm
BUS002A

0.069 mm
BUS004Y

0.069 mm
BUS004N

M18x1

M18x1

M18x1

M18x1

10...30 V DC

10...30 V DC

10...30 V DC

10...30 V DC

100 mA

100 mA

100 mA

100 mA

IP 67

IP 67

IP 67

IP 67

-25...+70 °C

-25...+70 °C

-25...+70 °C

-25...+70 °C

Nickel-plated brass tube

Nickel-plated brass tube

Nickel-plated brass tube

Nickel-plated brass tube

PBT

PBT

PBT

PBT

Polyurethane foam, epoxy resin containing glass

Polyurethane foam, epoxy resin containing glass

Polyurethane foam, epoxy resin containing glass

Polyurethane foam, epoxy resin containing glass

M12 connector, 5-pin

M12 connector, 5-pin

M12 connector, 5-pin

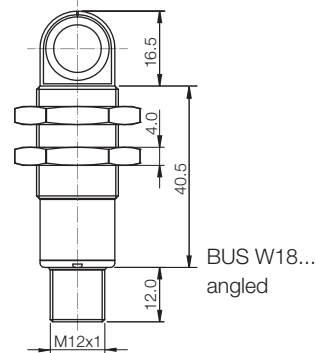
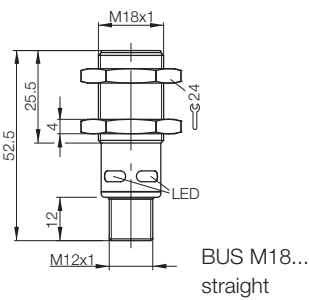
M12 connector, 5-pin

Version 1.0

Version 1.0

Version 1.0

Version 1.0



IO-Link

IO-Link – the new standard

The IO-Link interface fulfills the prerequisites for gapless communication through all levels of the system architecture all the way to the sensor. Commissioning and maintenance of a machine are simplified and productivity increased.



For information about object detection, refer to our catalog or look online at www.balluff.com

Multiple position switches in accordance with DIN 43697 with safety switching positions per DIN EN 60204-1/ VDE 0113

- Positive-opening switching elements and rigid plunger for additional security per

DIN EN 60204-1/VDE 0113

- Dual-chamber system with IP 67 degree of protection: wear-free membrane with hermetic sealing of plunger mechanism and switch chamber
- Maintenance-free, self-lubricating plunger guide with slide bearing

Multiple position switches with function indicator

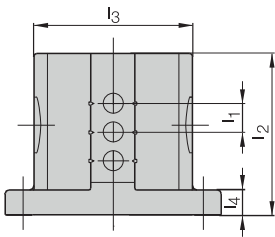
- Function indicators for choice of three voltage ranges

Multiple position switches with wiper plate

- Increased function security under extreme conditions of use
- Wiper plate prevents plunger from sticking in the guide
- For use in wet areas with strongly adhering media

IO-Link

- Simple installation: with M12 connector
- No cable gland needed, factory sealed to IP 67
- Connect in just seconds
- High diagnostic capability through parallel processing of normally open/normally closed signals



Available sizes

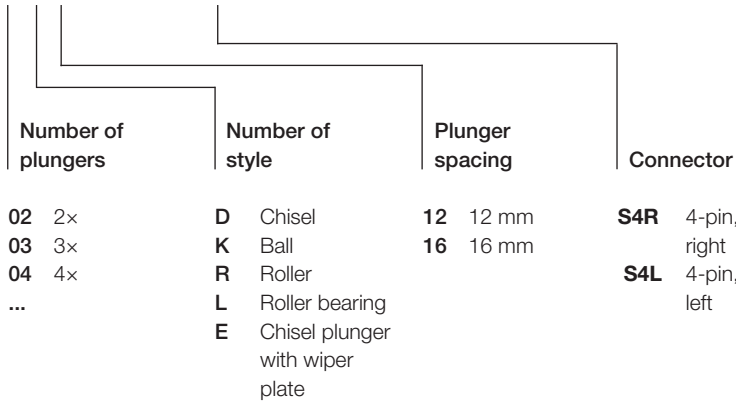
Number of plungers	2	3	4	5	6	8	10	12	
Dimension l ₂ with	Dimension l ₁ = 12 mm	70	80	90	105	120	140	170	200
	Dimension l ₃	88	88	88	88	88	80	80	80
	Dimension l ₄	14	14	14	14	14	20	20	20
	Dimension l ₁ = 16 mm	70	90	105	120	140	170	200	240
Dimension l ₃	Dimension l ₃	88	88	88	88	80	80	80	80
	Dimension l ₄	14	14	14	14	20	20	20	20

Dimensions in mm

Ordering example:

BNS 819-D02-D16-100-10-FD-S4R-I

BNS 819-D - - -100-10-FD- - -I



- Optimized for your application
- Customer-specific solutions are available
- Contact us



For information about mechanical and inductive multiple position switches and position switches, refer to our catalog or look online at www.balluff.com

IO-Link
 Mechanical multiple position switches BNS
 Series 100



Type	Series 100 multiple position switch
Output signal	IO-Link
Plunger spacing	12 mm or 16 mm
Mounting and function dimensions	as per DIN 43697
Plunger style	Chisel (D), ball (K), roller (R), roller bearing (L) or chisel plunger with wiper plate (E)
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection	M12 connectors
Ambient temperature	-5...+85 °C
Enclosure rating per IEC 60529	IP 67

IO-Link
 Product Topology
 IO-Link Master
 IO-Link SmartLight
 IO-Link Sensor Hub M8 plastic
 IO-Link Sensor/Actuator Hub M12 metal
 IO-Link Sensor/Actuator Hub M12 plastic
 IO-Link Sensor/Actuator Hubs, IP 20
 IO-Link Converters
IO-Link Sensors

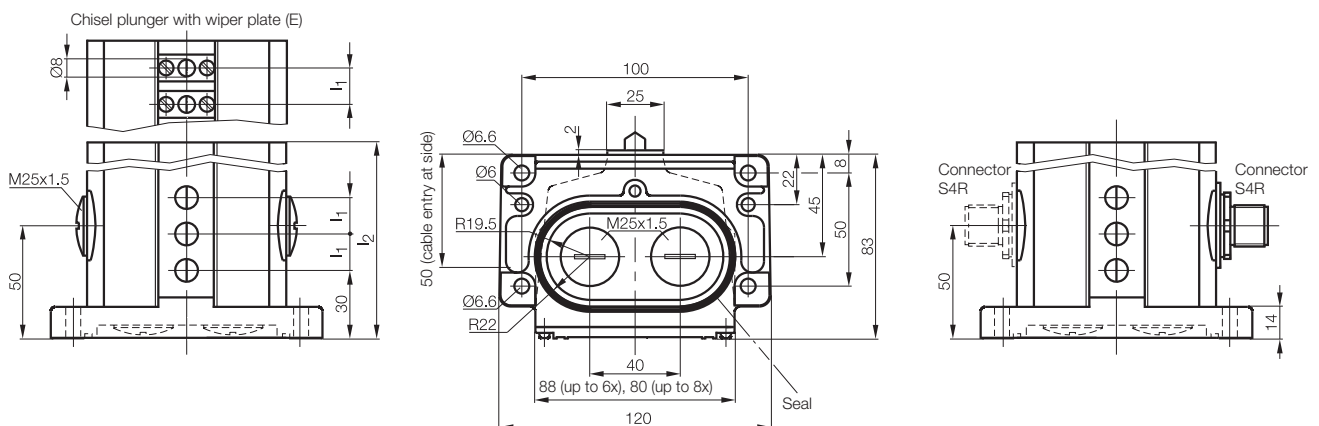
With switch element	BSE 30.0 BNS 819-...-...-100-10-FD-S4...
---------------------	--

Wiring diagram, style	
-----------------------	--

Switch element	
Contact material	Silver, gold plated
Switching principle	Snap switch
Contact system	Dual changeover, one normally open and one normally closed, galvanically isolated.
Electrical data	See catalog "The Mechanical Line"

Mechanical data	
Plunger point to reference surface	8 mm
Switching point to reference surface	6 mm
Maximum plunger travel D, K, R, L	5.5 mm
Maximum plunger travel E	4 mm
Switching actuating force on plunger	Min. 20 N
Switching rate	Max. 300/min
Traverse speed	Plunger D 40 m/min Plunger E 30 m/min Plunger K 8 m/min Plunger R 20 m/min Plunger L 120 m/min
Repeatability	Plungers D, E, K ±0.002 mm Plungers R, L ±0.01 mm

IO-Link	Version 1.0
Mode	COM 2
Transmission rate	38.4 kbaud
IO-Link process data length	2 input bytes
Parameters	NC/NO



Multiple position switches for standard applications

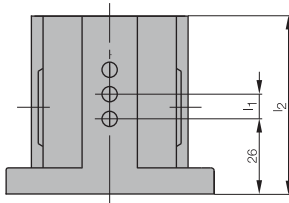
- Smallest plunger spacing for mechanical multiple position switches (8 mm or 10 mm)
- Dual-chamber system with IP 67 degree of protection: wear-free membrane with hermetic sealing of plunger mechanism and switch chamber
- Maintenance-free, self-lubricating plunger guide with slide bearing

Multiple position switches with wiper plate

- Increased function security under extreme conditions of use
- Wiper plate prevents plunger from sticking in the guide
- For use in wet areas with strongly adhering media

IO-Link

- Simple installation: with M12 connector
- No cable gland needed, factory sealed to IP 67
- Connect in just seconds
- High diagnostic capability through parallel processing of normally open/normally closed signals



Available sizes

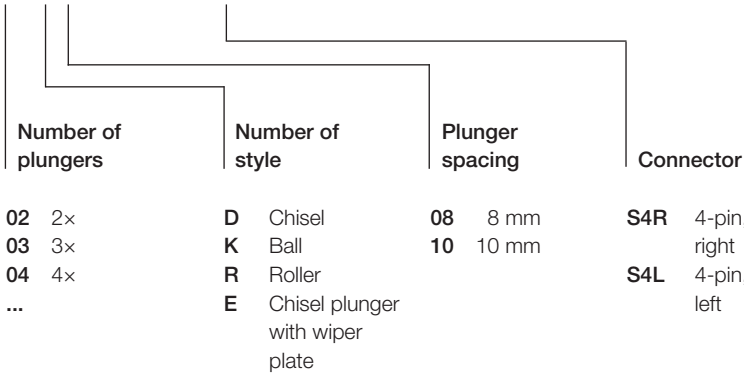
Number of plungers		2	3	4	5	6	8	10
Dimension l ₂ with	Dimension l ₁ = 8 mm	49	59	64	72	80	96	112
	Dimension l ₃	54	54	54	54	54	50	50
	Dimension l ₁ = 10 mm	49	59	72	80	89	112	129
	Dimension l ₃	54	54	54	54	50	50	50

Dimensions in mm

Ordering example:

BNS 819-B04-D08-46-12-FD-S4R-I

BNS 819-B - - - -46-12-FD- - - -I



For information about mechanical and inductive multiple position switches and position switches, refer to our catalog or look online at www.balluff.com

IO-Link
Mechanical multiple position switches BNS
Series 46



IO-Link
 Product Topology
 IO-Link Master
 IO-Link SmartLight
 IO-Link Sensor Hub
 M8 plastic
 IO-Link Sensor/Actuator Hub
 M12 metal
 IO-Link Sensor/Actuator Hub
 M12 plastic
 IO-Link Sensor/Actuator Hubs,
 IP 20
 IO-Link Converters
IO-Link Sensors

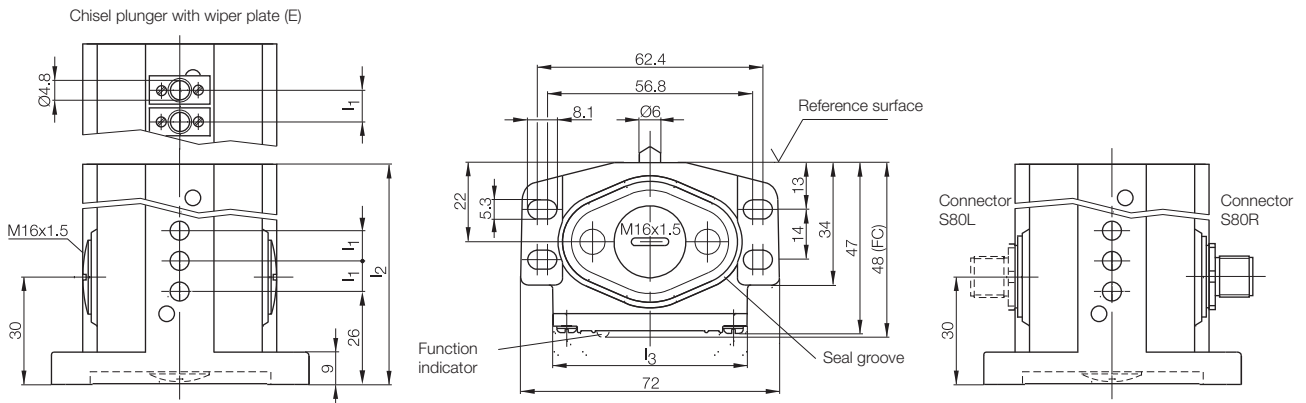
Type	Series 46 multiple position switch
Output signal	IO-Link
Plunger spacing	8 mm or 10 mm
Plunger style	Chisel (D), ball (K), roller (R), roller bearing (L) or chisel plunger with wiper plate (E)
Plunger material	Stainless steel, contact surfaces induction-hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection	M12 connectors
Ambient temperature	-5...+85 °C
Enclosure rating per IEC 60529	IP 67

With switch element	BSE 73
Part number	BNS 819-B...-46-12-FD-S4...
Wiring diagram, style	

Switch element	
Contact material	Gold
Switching principle	Snap switch
Contact system	Single-pin changeover
Connection	Solder connection
Electrical data	See catalog "The Mechanical Line"

Mechanical data		
Plunger point to reference surface	4 mm	
Switching point to reference surface	3.5 mm	
Maximum plunger travel	3.5 mm	
Switching actuating force on plunger	Min. 8 N	
Switching rate	Max. 200/min	
Startup speed	Plungers D, E	20 m/min (D), 10 m/min (E)
	Plunger K	9 m/min
	Plunger R	60 m/min
Repeatability	Plungers D, E	±0.02 mm
	Plunger K	±0.03 mm
	Plunger R	±0.05 mm

IO-Link	Version 1.0
Mode	COM 2
Transmission rate	38.4 kbaud
IO-Link process data length	2 input bytes
Parameters	NC/NO



Object detection easily accomplished

Our inductive distance sensors can detect positions, distances and material variations with incredible ease.

Applications

- Distance sensing (even at high speeds)
- Measurement of film and sheet thicknesses
- Belt center measurement
- Measurement of metal strip widths
- Detection of surface waves
- Counting tasks
- Positioning
- Position checking
- Clamping status detection
- Selection of different sizes and materials

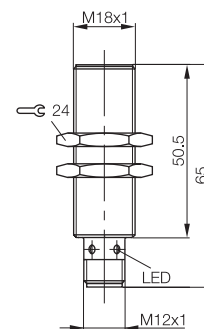
Features

- Contactless and absolute measuring principle
- Distance-proportional IO-Link output signal
- High repeat accuracy
- Optimal linearity
- Low temperature drift
- Measurement speed up to 40 m/s
- LED for indicating the working range
- Insensitive to contamination



Size	M18x1	
Output signal	IO-Link	
Installation type	flush	
Linear range s_l	1...5 mm	
BAW002F		
Supply voltage U_B	18...30 V DC	
Ripple	$\leq 15\%$ of U_B	
Rated insulation voltage U_i	250 V AC	
Effective distance s_e	3 mm	
Load resistance R_L	$\leq 2 \text{ k}\Omega$	
Load resistance R_T		
No-load supply current I_0 at U_B	$\leq 10 \text{ mA}$	
Polarity reversal protected	yes	
Short-circuit protected	yes	
Ambient temperature T_a	$-10...+70 \text{ }^\circ\text{C}$	
Repeat accuracy R_{BWN}	$\pm 8 \text{ }\mu\text{m}$	
Non-linearity	$\leq \pm 120 \text{ }\mu\text{m}$	
Measuring speed	$\leq 40 \text{ m/s}$	
Response time	2 ms	
Temperature coefficient TC	Typical	$-2 \text{ }\mu\text{m/K}$
In the optimum range from $+10...+50 \text{ }^\circ\text{C}$	Min.	$+1 \text{ }\mu\text{m/K}$
	Max.	$-8 \text{ }\mu\text{m/K}$
Enclosure rating per IEC 60529	IP 67	
Housing material	Nickel-plated CuZn	
Material of sensing face	PBT	
Connection	Plug connector	
Recommended connector	BCCM415/BCCM425	
Indicator	Out of Range	

IO-Link	Version 1.0
Mode	COM 2
Transmission rate	38.4 kbaud
IO-Link process data length	2 input bytes
Value range	0000 H...03FF H



For information on our Micropulse transducers BTL and BIW, refer to our catalog or visit our website at www.balluff.com



Temperature output



IO-Link
 Product Topology
 IO-Link Master
 IO-Link SmartLight
 IO-Link Sensor Hub M8 plastic
 IO-Link Sensor/Actuator Hub M12 metal
 IO-Link Sensor/Actuator Hub M12 plastic
 IO-Link Sensor/Actuator Hubs, IP 20
 IO-Link Converters
IO-Link Sensors

Size	14x38.5x17 mm Z01	14x38.5x17 mm Z05
Output signal	IO-Link, falling at approach	IO-Link, falling at approach
Installation type	flush	flush
Linear range	1...5 mm	1...5 mm
	BAW003A	BAW003W
Supply voltage U_B	18...30 V DC	18...30 V DC
Ripple	$\leq 15\%$ of U_e	
Rated insulation voltage U_i	75 V AC	75 V DC
No-load supply current I_0 at U_e	≤ 12 mA	
Polarity reversal protected	yes	yes/yes/yes
Short-circuit protected	yes	
Ambient temperature T_a	-10...+60 °C	-10...+60 °C
Repeat accuracy R_{BWN}	± 10.0 μ m	± 10.0 μ m
Non-linearity	± 150 μ m	± 150 μ m
Response time	5 ms	5 ms
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	Anodized aluminum	Anodized aluminum
Material of sensing face	LCP	LCP
Connection	3 m PUR cable, 4x0.14 mm ²	

IO-Link	Version 1.0	Version 1.0
Mode	COM 2	
Transmission rate	38.4 kbaud	
IO-Link process data length	2 input bytes	
Value range	0000 H...03FF H	

For metal

The inductive distance sensor BAW Z01... is an accurate position measurement system for detecting the positions of metallic objects.

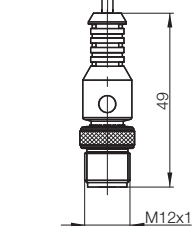
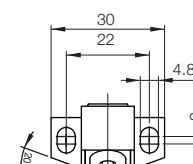
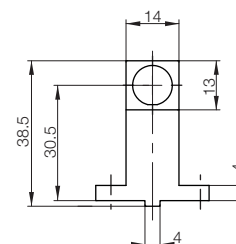
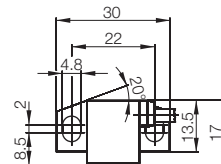
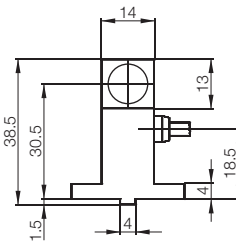
Features

- Absolute measuring principle and large measuring range
- Distance-proportional IO-Link output signal
- High repeat accuracy and precision
- Optimal linearity and low temperature drift
- Optimized housing design for clamping distance monitoring

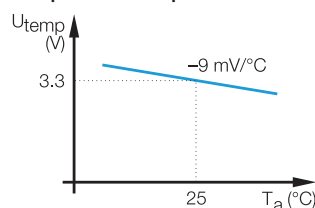
Application

In addition to distance sensing, thickness and width measurement, part inspection, parts identification and metering tasks, the main application area of the BAW Z01... is linear position monitoring of drive spindles for

- Molds
- Workpieces



Temperature output



The temperature output (not short-circuit protected) provides a signal representing a precisely measured temperature change.

Compact design

Balluff magneto-inductive displacement sensors detect positions up to 103 mm away. Displacement sensors BIP measure without contact and absolutely using a passive non-magnetic position encoder. The compact design means these sensors can be easily integrated into the application even when installation space is extremely tight. Even the position encoder can be designed as an integral part of an application. Analog and digital interfaces ensure easy usability.

Benefits

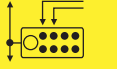
- Absolute measuring principle, several measuring ranges, teachable
- High repeat accuracy and precision
- Optimal linearity and low temperature drift
- Optimized housing design for clamping distance monitoring
- Distance-proportional IO-Link output signal
- Standard output 0...10 V, 4...20 mA



For information on our Micropulse transducers BTL and BIW, refer to our catalog or visit our website at www.balluff.com



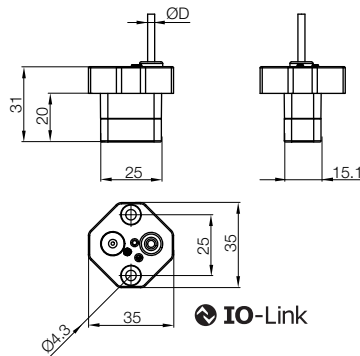
	BIP0007	BIP0004
Output signal	IO-Link	IO-Link
Length of measuring range is teachable	7...14 mm	20...40 mm
Detection range	0...14 mm	0...40 mm
Target width (EC80)	8 mm	14 mm
Target distance	0.5...2 mm	1...3 mm
Resolution	14 μ m	40 μ m
Repeat accuracy	\pm 80 μ m	\pm 100 μ m
Non-linearity	\pm 250 μ m	\pm 400 μ m
Ambient temperature	-25...+70 °C	-25...+85 °C
Connection	2 m cable	M12 connector
Supply voltage	15...30 V (IO-Link 18...30 V)	15...30 V (IO-Link 18...30 V)
Housing material	PA	PA
LED function indicator	yes	yes



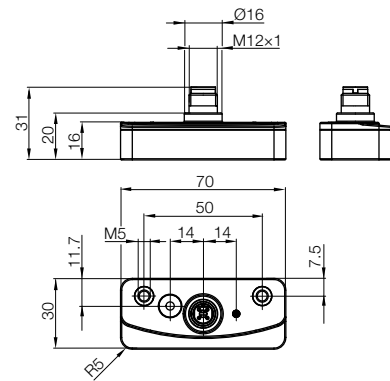
- IO-Link
- Product Topology
- IO-Link Master
- IO-Link SmartLight
- IO-Link Sensor Hub
- M8 plastic
- IO-Link Sensor/Actuator Hub M12 metal
- IO-Link Sensor/Actuator Hub M12 plastic
- IO-Link Sensor/Actuator Hubs, IP 20
- IO-Link Converters
- IO-Link Sensors

IO-Link

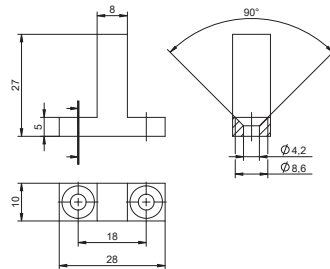
Version 1.0



Version 1.0

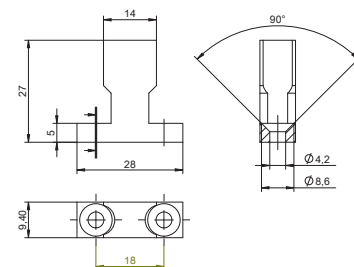


BAM TG-XE-001



BAM TG-XE-010

The position encoder must have a width of 14 mm and cover the sensing surface of the sensor orthogonally to the measuring direction.



Alternative to linear encoders

The structural design, high degree of protection and simple installation of Balluff Micropulse transducers in a profiled housing makes them an excellent alternative to linear transducers, such as potentiometers, glass scales and LVDTs. The linear sensing element is protected inside an extruded aluminum profile.

A passive position encoder with no power supply marks the measurement section on the measuring path without making contact. Measuring ranges between 50 and 4500 mm are possible.

Benefits

- High power density saves installation space
- Adjustable measuring range for rapid commissioning
- Large distance between position encoder and measurement system for easy installation



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IO-Link Sensor/
Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
**IO-Link
Sensors**

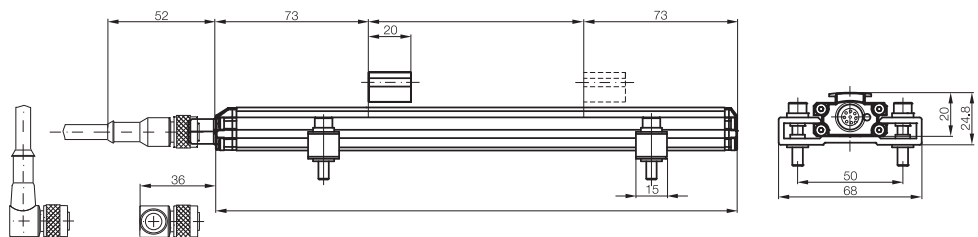
Features at a glance

- Non-contact detection of the measuring position
- IP 67, insensitive to contamination
- Wear-free
- Insensitive to shock and vibration
- Absolute output signal
- Max. resolution of 0.005 mm (depending on the electronic processor unit)
- Adjustable measuring range
- Diagnostic LED
- Free-moving and captive magnets
- Maximum distance of 15 mm between the position measurement system and the floating magnet

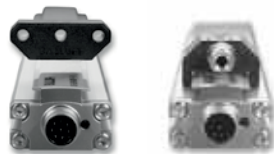
Series	BTL6-PF
Shock rating	50 g/6 ms per IEC 60068-2-27
Vibration	12 g, 10...2000 Hz per IEC 60068-2-6
Polarity reversal protected	Yes (up to 36 V)
Overvoltage protection	to 36 V
Dielectric strength	500 V (GND to housing)
Enclosure rating per IEC 60529	IP 67 (with IP 67 connector BKS-S... attached)
Housing material	Anodized aluminum
Housing attachment	Compression clamps
Connection	Plug connector
EMC testing	
RF emission	EN 55016-2-3 Group 1, Class A and B
Static electricity (ESD)	EN 61000-4-2 Severity level 3
Electromagnetic fields (RFI)	EN 61000-4-3 Severity level 3
Electrical fast transients (BURST)	EN 61000-4-4 Severity level 3
Surge voltage	EN 61000-4-5 Severity level 2
Conducted interference induced by high-frequency fields	EN 61000-4-6 Severity level 3
Magnetic fields	EN 61000-4-8 Severity level 4
Standard nominal lengths [mm]	0050, 0100, 0130, 0150, 0175, 0200, 0225, 0250, 0300, 0350, 0360, 0400, 0450, 0500, 0550, 0600, 0650, 0700, 0750, 0800, 0850, 0900, 0950, 1000, 1100, 1200, 1250, 1300, 1400, 1500, 1600, 1700, 1750, 1800, 1900, 2000, 2250, 2500, 2750, 3000, 3250, 3500, 3550, 3750, 4000, 4250, 4500

IO-Link

Version 1.1



Floating and captive magnets



Up to **15 mm** distance between transducer and floating magnet.

IO-Link

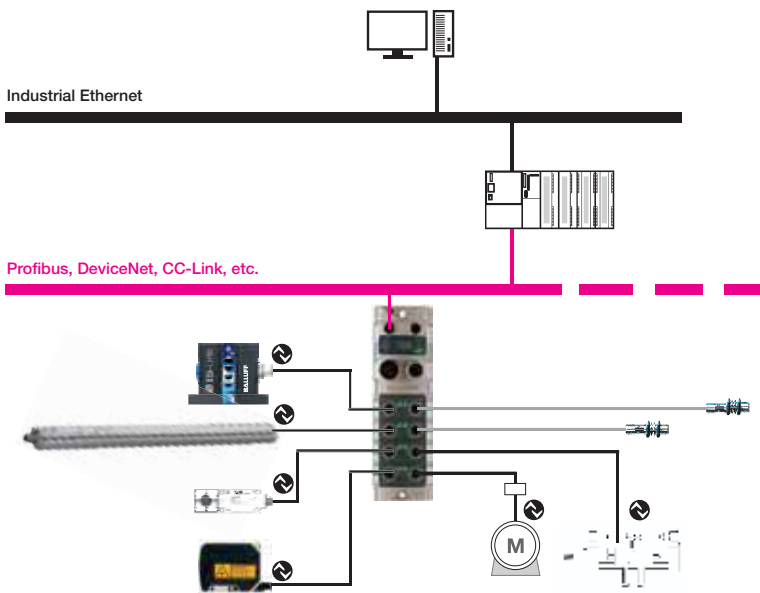
Contactless position measurement technology with IO-Link

Micropulse PF IO-Link is an absolute and non-contact position measurement system that continuously provides measurements in μm on a 1 ms cycle. These measurements are directly and digitally transmitted via IO-Link.

IO-Link is a point-to-point connection within any network. An IO-Link system consists of an IO-Link device such as a sensor or actuator, an IO-Link master and the wiring. Master modules are available with all current fieldbus protocols. The Micropulse PF IO-Link device is coupled to the master via a maximum 20 m long standard sensor/actuator line. Micropulse PF IO-Link operates using COM3 communication speed (230 kB), which achieves a process data cycle of 1 ms with a 1.1 master. The user interface can be mapped in the engineering system using an IODD (IO Device Description) via IO-Link. Due to the continuous flow of information, all data is centrally and permanently saved, so that configuration is possible and reproducible at any time.

Your added value with the PF IO-Link profile

- Simple to configure, quick to install and bring into operation
- COM 3, 1 ms process data cycle possible, securely measure quick movements
- OTF, automatic configuration in running operation (on the fly)
- Continuous monitoring and diagnostics
- High transfer rate, quick process data cycle
- Cost-effective to wire with standard M12 cable connector
- Easy to integrate in the controller via standard IO-Link modules
- For harsh, industrial environments, use with Balluff IO-Link master component groups in IP 67



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Precise

Micropulse position measurement systems enclosed in a PF profile housing are non-contact, absolute measuring systems used for accurately measuring measurement paths. They are characterized by their very flat design and the robust structure with high IP 67 degree of protection. The current axis positions are "marked" by the position encoder magnets through the wall of the aluminum profile. These position measurement systems tolerate a lateral offset as well as a vertical offset of up to 15 mm.

Advantages and characteristics of the PF profile

- Very flat design for simple pass over
- Non-contact detection of the measuring position
- IP 67, insensitive to contamination
- Insensitive to shock and vibration
- Absolute output signal
- Measurement length up to 4570 mm
- 5 µm resolution
- Non-linearity ±200 µm
- Error and status LED



- IO-Link
- Product Topology
- IO-Link Master
- IO-Link SmartLight
- IO-Link Sensor Hub M8 plastic
- IO-Link Sensor/ Actuator Hub M12 metal
- IO-Link Sensor/ Actuator Hub M12 plastic
- IO-Link Sensor/ Actuator Hubs, IP 20
- IO-Link Converters
- IO-Link Sensors



Ordering example:

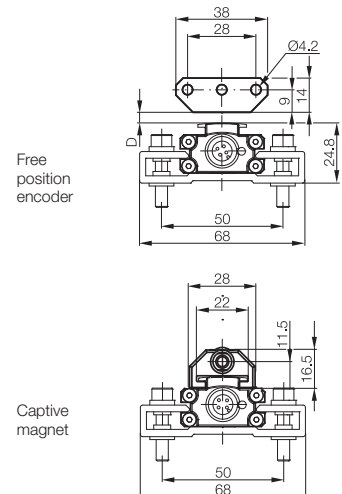
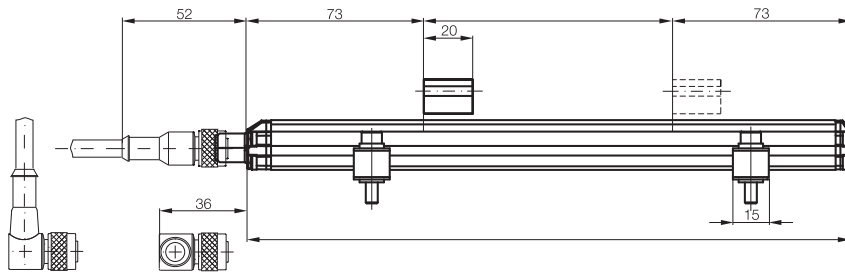
BTL6-U110-M-____-PF-S4

IO-Link V1.1

Nominal length [mm]

50...4570 mm in 5 mm increments

BTL6 profile PF transducer with free and captive magnet and plug connection S4



IO-Link
Industrial RFID system BIS V – The new generation
for more efficiency

Applications

Typical applications for combining RFID processor units and sensors include identification tasks for material flow control in production systems, for conveyor systems in mechanical engineering, in assembly lines and electric suspension systems or in the entire field of intralogistics.

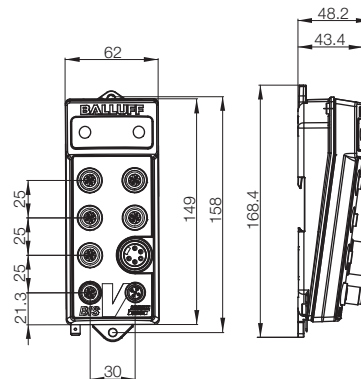


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IO-Link
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Sensor Hub
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Actuator Hub
M12 plastic
IO-Link Sensor/
Actuator Hubs,
IP 20
IO-Link
Converters
IO-Link
Sensors

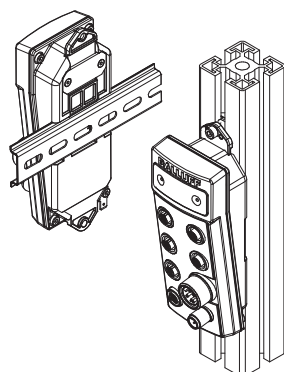
Description	RFID processor unit BIS V
Profibus	BIS00T3
EtherCAT	BIS00U9
CC-Link	BIS010P
Supply voltage	24 V DC \pm 10% LPS Class 2
Ripple	\leq 10%
Power supply	\leq 2 A
Ambient temperature T _a	0...+60 °C
Enclosure rating per IEC 60529	IP 65
Housing material	Cast zinc
Weight	800 g
Connection H1...H4	M12 female, 5-pin, A-coded
Power connection	7/8" plug, 5-pin
Application interface	IO-Link 1.1, USB 2.0
Application with read/write heads	BIS VM-3... and BIS VL-3...



Perfectly integratable

The compact EMC-protected metal housing with small dimensions (170x60x40 mm) is perfectly integrated and simple to mount. In control cabinets or in the field up to IP 65, on a top-hat rail, or on a profile.

The industrial RFID system BIS V was developed and qualified according to the principles of GAMP[®] 5. Please contact via e-mail for more information: rfidpharma@balluff.com



Non-Contact Power

Information preprogrammed into data carriers can be read and transmitted using non-contact data recognition. This data is output serially via the IO-Link interface and made available to the IO-Link master.

BIS L-409-045-001-07-S4 is an autonomous unit. No cable-carried power source is required. Rather, the required power is supplied by the integrated read head.

Applications

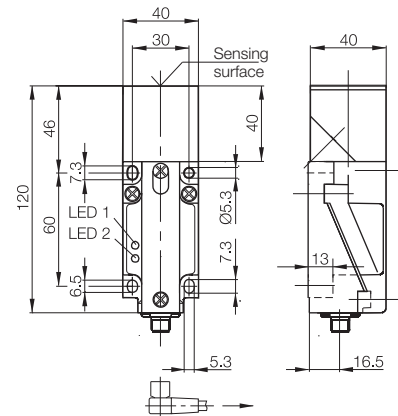
The key areas of application for the non-contact BIS L-409-045-001-07-S4 identification system are in equipment organization and production, e.g.:

- For controlling material flow
- In workpiece transport on conveyors
- For the detection of safety-relevant data



Description/dimensions	40x40x120 mm
Output signal	IO-Link
Housing material	PBT
Antenna type	round
BIS00CZ	
Supply voltage	24 V DC +10%/-20%
Ripple	≤ 10%
Power supply	≤ 150 mA
Ambient temperature T _a	0...+70 °C
Enclosure rating per IEC 60529	IP 67
Installation type (steel)	non-flush
LED function indicator	yes
Connection	M12 male, 4-pin
Weight	220 g

IO-Link	Version 1.1
Max. cycle time	8.8 ms
IO-Link process data length	8 input bytes/8 output bytes
Communication indicators	Green LED, pulsing

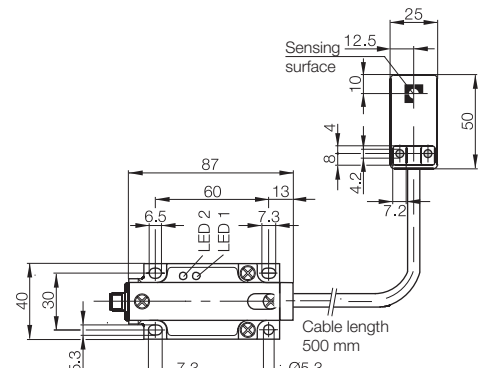
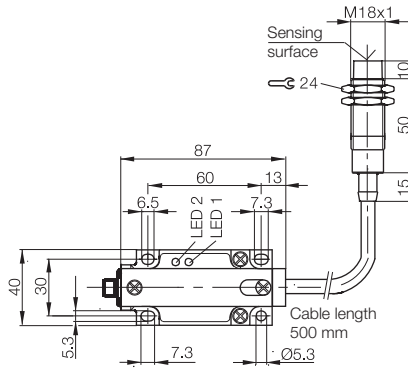
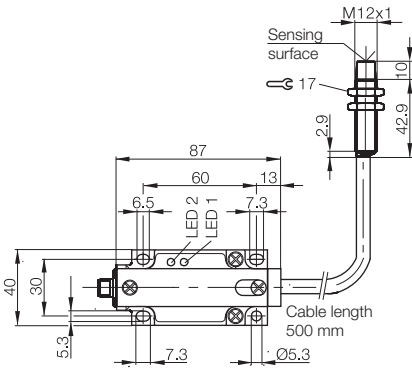


For information about Industrial Identification, refer to our catalog or look online at www.balluff.com



IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

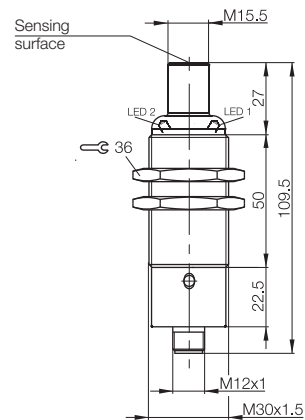
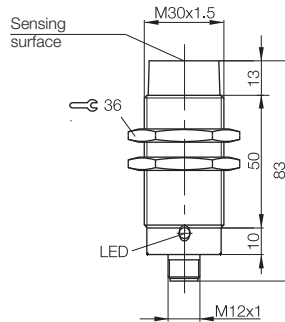
M12x1	M18x1	25x50x10 mm
IO-Link	IO-Link	IO-Link
PBT/nickel-plated brass	PBT/nickel-plated brass	PBT/ABS
round	round	round
BIS00E1	BIS00E0	BIS00E2
24 V DC +10%/−20%	24 V DC +10%/−20%	24 V DC +10%/−20%
≤ 10%	≤ 10%	≤ 10%
≤ 150 mA	≤ 150 mA	≤ 150 mA
0...+70 °C	0...+70 °C	0...+70 °C
IP 67	IP 67	IP 67
non-flush	non-flush	non-flush
yes	yes	yes
M12 male, 4-pin	M12 male, 4-pin	M12 male, 4-pin
170 g	200 g	200 g
Version 1.1	Version 1.1	Version 1.1
8.8 ms	8.8 ms	8.8 ms
8 input bytes/8 output bytes	8 input bytes/8 output bytes	8 input bytes/8 output bytes
Green LED, pulsing	Green LED, pulsing	Green LED, pulsing





Description/dimensions	M30x1.5	M30x1.5
Output signal	IO-Link	IO-Link
Housing material	Nickel-plated CuZn	Nickel-plated CuZn
Antenna type	round	round
10 bytes	BIS00LH	BIS00LJ
32 bytes	BIS0108	BIS0104
Supply voltage	18...30 V DC	18...30 V DC
Ripple	≤ 1.3 V _{ss}	≤ 1.3 V _{ss}
Power supply	≤ 150 mA	≤ 150 mA
Ambient temperature T _a	0...+70 °C	0...+70 °C
Enclosure rating per IEC 60529	IP 67	IP 67
Installation type (steel)	non-flush	non-flush
LED function indicator	yes	yes
Connection	M12 male, 4-pin	M12 male, 4-pin
Weight	100 g	100 g

IO-Link		Version 1.1	Version 1.1
Communication indicators		Green LED, pulsing	Green LED, pulsing
10 bytes	Max. cycle time	8.8 ms	8.8 ms
	IO-Link process data length	10 input bytes/10 output bytes	10 input bytes/10 output bytes
32 bytes	Max. cycle time	24 ms	24 ms
	IO-Link process data length	32 input bytes/32 output bytes	32 input bytes/32 output bytes

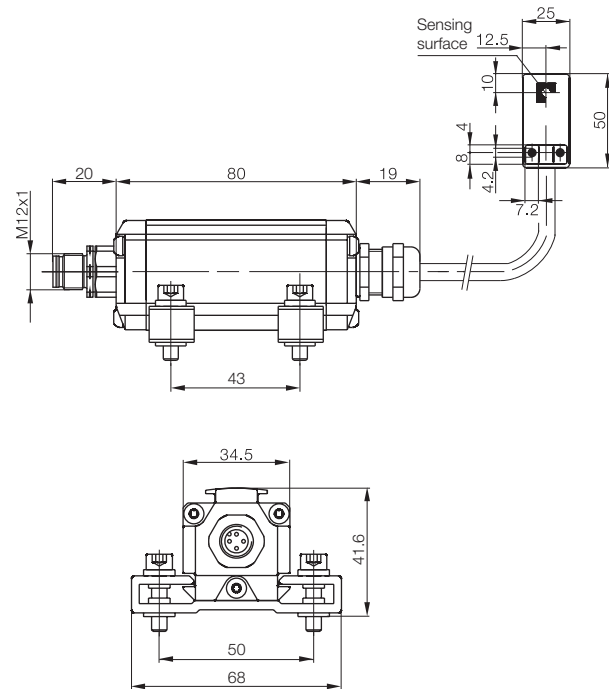
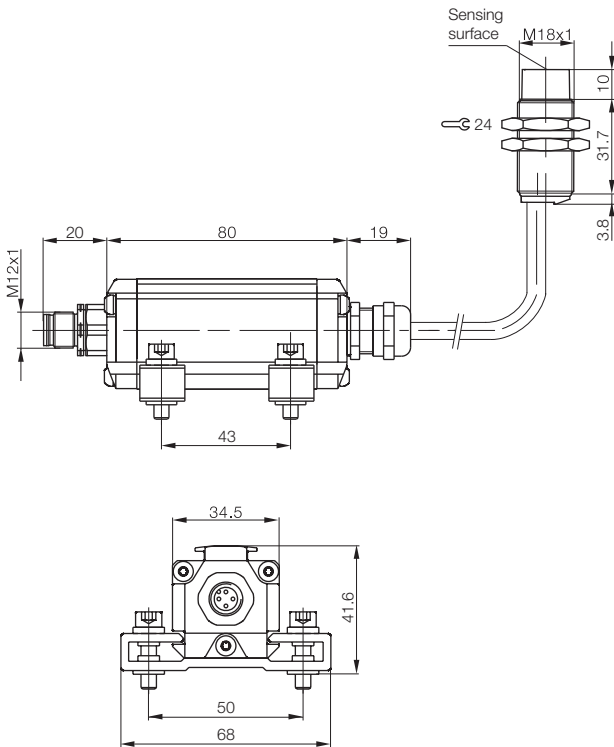


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IO-Link
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 M8 plastic
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 M12 metal
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 M12 plastic
 IO-Link Sensor/Actuator Hubs, IP 20
 IO-Link Converters
IO-Link Sensors

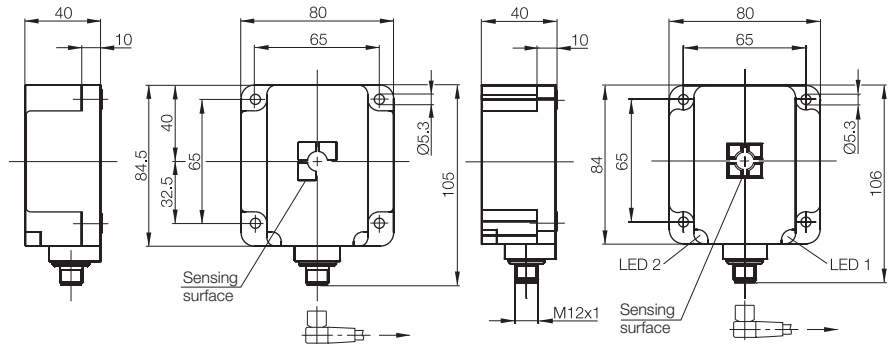
M18x1	25x50x10 mm
IO-Link	IO-Link
AlMgSi0.5/nickel-plated brass	AlMgSi 0.5/ABS-GF16
round	round
BIS00LW	BIS00M1
BIS0105	BIS0106
18...30 V DC	18...30 V DC
≤ 1.3 V _{pp}	≤ 1.3 V _{pp}
≤ 150 mA	≤ 150 mA
0...+70 °C	0...+70 °C
IP 67	IP 67
non-flush	non-flush
yes	yes
M12 male, 4-pin	M12 male, 4-pin
220 g	220 g
Version 1.1	Version 1.1
Green LED, pulsing	Green LED, pulsing
8.8 ms	8.8 ms
10 input bytes/10 output bytes	10 input bytes/10 output bytes
24 ms	24 ms
32 input bytes/32 output bytes	32 input bytes/32 output bytes





Description/dimensions	80x80x40 mm	80x80x40 mm
Output signal	IO-Link	IO-Link
Housing material	PBT	PBT
Antenna type	round	Rod
10 bytes	BIS00LK	BIS00LM
32 bytes	BIS0104	BIS0103
Supply voltage	18...30 V DC	18...30 V DC
Ripple	≤ 1.3 Vpp	≤ 1.3 Vpp
Power supply	≤ 150 mA	≤ 150 mA
Ambient temperature T _a	0...+70 °C	0...+70 °C
Enclosure rating per IEC 60529	IP 67	IP 67
Installation type (steel)	non-flush	non-flush
LED function indicator	yes	yes
Connection	M12 male, 4-pin	M12 male, 4-pin
Weight	190 g	360 g

IO-Link		Version 1.1	Version 1.1
Communication indicators		Green LED, pulsing	Green LED, pulsing
10 bytes	Max. cycle time	8.8 ms	8.8 ms
	IO-Link process data length	10 input bytes/10 output bytes	10 input bytes/10 output bytes
32 bytes	Max. cycle time	24 ms	24 ms
	IO-Link process data length	32 input bytes/32 output bytes	32 input bytes/32 output bytes



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 IO-Link Sensor/Actuator Hub M12 plastic
 IO-Link Sensor/Actuator Hubs, IP 20
 IO-Link Converters
IO-Link Sensors



Size	76x45x11 mm
Installation	Spring or standard rail mounting
PNP/NPN	NO/NC codable
	BAE00LC
Supply voltage U_B	18...30 V DC
Voltage drop U_d at I_o	< 2 V
Rated insulation voltage U_i	75 V DC
Output current max.	100 mA
No-load supply current I_o max.	25 mA
Polarity reversal protected/transposition protected/short-circuit protected	yes/yes/yes
Ambient temperature T_a	-5...+70 °C
Switching frequency f	
Supply voltage/Output function indicator	Green LED/Yellow LED
Enclosure rating per IEC 60529	IP 40
Material	PBT, PA
Housing	
Connection	0.3 m PUR cable with M12 connector, 4-pin

IO-Link **Version 1.1**

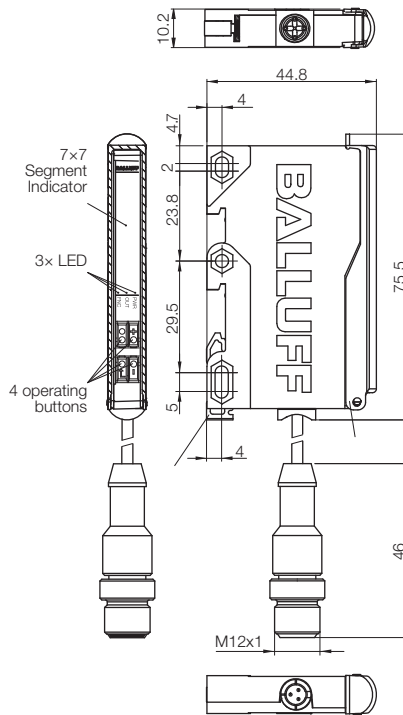
When space is at a premium

Because of its compact dimensions, capacitive mini-sensors can be also used in tight spaces. They are calibrated conveniently on the downstream processor unit.

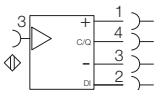
The new IO-Link processor unit for rail mounting offers versatile features:

- Selection of output function: PNP/NPN/NO/NC ...
- Analog via the IO-Link interface
- LED display
- Teachable and triggerable switching point
- Dynamic object detection
- Free choice of delay times
- Two-point control via configurable hysteresis
- Monitoring of sensor input
- Full IO-Link access to all functions
- Pigtail and cable connection

The range of more than 30 different capacitive mini-sensors BCS includes very compact designs, starting at Ø 4 mm, and disk designs. Furthermore, all passive high-temperature and/or high-pressure sensor heads can be attached. This makes Balluff as the first manufacturer to provide a complete series of capacitive IO-Link sensors.



IO-Link version wiring diagram



Right where the action is

Standard pressure sensors with IO-Link can be positioned in the machine right where the action is from a process technology standpoint. That is because the accessibility of the sensors loses its significance through IO-Link. Process monitoring, configuration and error analysis of the IO-Link devices now take place in the controller and this way processes are optimized chronologically. Signal delays and distortions are eliminated reliably. Digital transmission of data also ensures high signal quality.

- Reduced downtimes: Simple sensor replacement with plug-and-play
- Maximum flexibility: System conversion during ongoing operation
- Simple commissioning: Complete parameter sets can be duplicated using IO-Link
- In-process diagnostics: Process data and errors are reported directly to the controller via IO-Link



PNP pressure sensors

-1...2 bar (-14.5...29 psi)
-1...10 bar (-14.5...145 psi)
0...2 bar (0...29 psi)
0...5 bar (0...73 psi)
0...10 bar (0...145 psi)
0...20 bar (0...290 psi)
0...50 bar (0...725 psi)
0...100 bar (0...1450 psi)
0...250 bar (0...3626 psi)
0...400 bar (0...5802 psi)
0...600 bar (0...8702 psi)
Supply voltage U_B
Output current max.
No-load supply current I_0 max.
Switching frequency f max.
Accuracy
Temperature error
Polarity reversal/short-circuit protected
Ambient/media temperature
Display/function indicators
Enclosure rating per IEC 60529
Material
Housing
Measuring cell
Seal
Connection
Plug connector
Process connection

IO-Link

NPN variants

All sensors are also available as NPN variants. Please contact our technical service department by phone at +49 7158 173-777 or e-mail: tsm@balluff.de

Design	Relative nominal pressure	Overload pressure	Burst pressure \geq	Permitted vacuum
-1...2 bar	2 bar	4 bar	10 bar	vacuum proof
-1...10 bar	10 bar	20 bar	35 bar	
0...2 bar	2 bar	4 bar	10 bar	
0...5 bar	5 bar	10 bar	15 bar	
0...10 bar	10 bar	20 bar	35 bar	
0...20 bar	20 bar	40 bar	75 bar	
0...50 bar	50 bar	100 bar	150 bar	
0...100 bar	100 bar	200 bar	250 bar	
0...250 bar	250 bar	400 bar	450 bar	
0...400 bar	400 bar	650 bar	700 bar	
0...600 bar	600 bar	750 bar	800 bar	



For information about our pressure sensors BSP, refer to our catalog or look online at www.balluff.com



IO-Link
Two programmable switching points (NO or NC)



IO-Link
One programmable switching point and analog output 0...10 V DC



IO-Link
One programmable switching point and analog output 4...20 mA



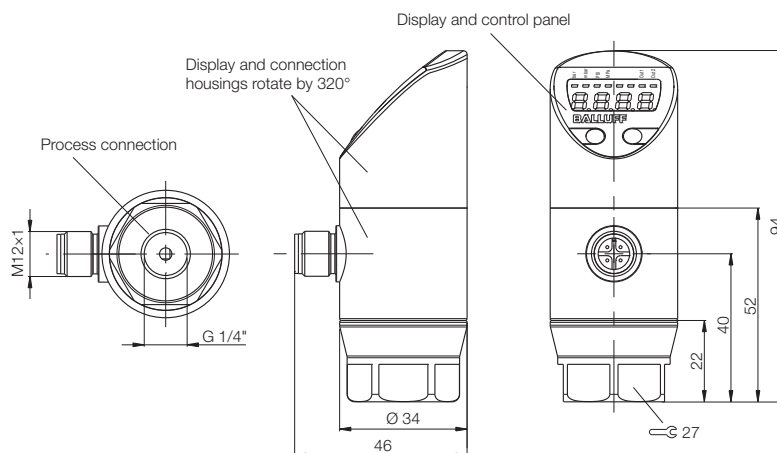
IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub M8 plastic
IO-Link Sensor/Actuator Hub M12 metal
IO-Link Sensor/Actuator Hub M12 plastic
IO-Link Sensor/Actuator Hubs, IP 20
IO-Link Converters
IO-Link Sensors

BSP0086	BSP008L	BSP0091
BSP0087	BSP008M	BSP0092
BSP0088	BSP008N	BSP0093
BSP0089	BSP008P	BSP0094
BSP008A	BSP008R	BSP0095
BSP008C	BSP008T	BSP0096
BSP008E	BSP008U	BSP0097
BSP008F	BSP008W	BSP0098
BSP008H	BSP008Y	BSP0099
BSP008J	BSP008Z	BSP009A
BSP008K	BSP0090	BSP009C
18...36 V DC	18...36 V DC	18...36 V DC
500 mA	500 mA	500 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
200 Hz	200 Hz	200 Hz
≤ ±0.5% FSO BFSL	≤ ±0.5% FSO BFSL	≤ ±0.5% FSO BFSL
≤ ±0.3% FSO/10 K	≤ ±0.3% FSO/10 K	≤ ±0.3% FSO/10 K
yes/yes	yes/yes	yes/yes
-25...+85 °C/-25...+125 °C	-25...+85 °C/-25...+125 °C	-25...+85 °C/-25...+125 °C
7-segment display/LED	7-segment display/LED	7-segment display/LED
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
PA 6.6 and stainless steel	PA 6.6 and stainless steel	PA 6.6 and stainless steel
Ceramic	Ceramic	Ceramic
Fluoroelastomer	Fluoroelastomer	Fluoroelastomer
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
Internal thread G1/4" in accordance with DIN EN 3852	Internal thread G1/4" in accordance with DIN EN 3852	Internal thread G1/4" in accordance with DIN EN 3852

Version 1.1

Version 1.1

Version 1.1



For highest machine availability

Stainless steel pressure sensors with IO-Link monitor cooling lubricant, hydraulic fluids and pneumatic systems. Using IO-Link, you continuously relay your measured values and data to the controller. You initiate the exact readjustment and thereby provide for the highest machine availability. IO-Link pressure sensors enable quick, error-free sensor replacement and prompt commissioning. Downtimes are significantly reduced since the parameters of a replaced IO-Link sensor are automatically transmitted from the IO-Link master to the new sensor. Commissioning processes, format changes or recipe changes are processed centrally via the controller's functional components. This saves time and reduces the potential for errors to a minimum.



PNP pressure sensors

-1...2 bar (-14.5...29 psi)
-1...10 bar (-14.5...145 psi)
0...2 bar (0...29 psi)
0...5 bar (0...73 psi)
0...10 bar (0...145 psi)
0...20 bar (0...290 psi)
0...50 bar (0...725 psi)
0...100 bar (0...1450 psi)
0...250 bar (0...3626 psi)
0...400 bar (0...5802 psi)
0...600 bar (0...8702 psi)
Supply voltage U_B
Output current max.
No-load supply current I_0 max.
Switching frequency f max.
Accuracy
Temperature error
Polarity reversal/short-circuit protected
Ambient/media temperature
Display/function indicators
Enclosure rating per IEC 60529
Material
Housing
Measuring cell
Seal
Connection
Plug connector
Process connection

IO-Link

NPN variants

All sensors are also available as NPN variants. Please contact our technical service department by phone at +49 7158 173-777 or e-mail: tsm@balluff.de

Design	Relative nominal pressure	Overload pressure	Burst pressure \geq	Permitted vacuum
-1...2 bar	2 bar	4 bar	10 bar	vacuum proof
-1...10 bar	10 bar	20 bar	35 bar	
0...2 bar	2 bar	4 bar	10 bar	
0...5 bar	5 bar	10 bar	15 bar	
0...10 bar	10 bar	20 bar	35 bar	
0...20 bar	20 bar	40 bar	75 bar	
0...50 bar	50 bar	100 bar	150 bar	
0...100 bar	100 bar	200 bar	250 bar	
0...250 bar	250 bar	400 bar	450 bar	
0...400 bar	400 bar	650 bar	700 bar	
0...600 bar	600 bar	750 bar	800 bar	



For information about our pressure sensors BSP, refer to our catalog or look online at www.balluff.com



IO-Link
Two programmable switching points
(NO or NC)



IO-Link
One programmable switching point and analog output
0...10 V DC



IO-Link
One programmable switching point and analog output
4...20 mA



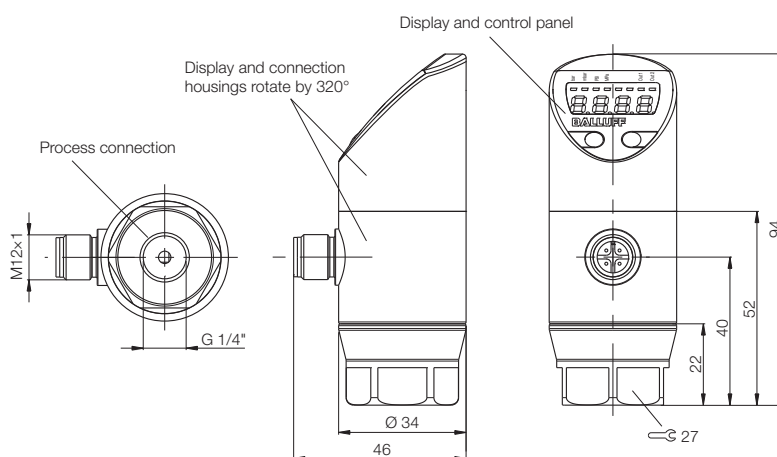
IO-Link
Product Topology
IO-Link Master
IO-Link SmartLight
IO-Link Sensor Hub
M8 plastic
IO-Link Sensor/ Actuator Hub
M12 metal
IO-Link Sensor/ Actuator Hub
M12 plastic
IO-Link Sensor/ Actuator Hubs,
IP 20
IO-Link Converters
IO-Link Sensors

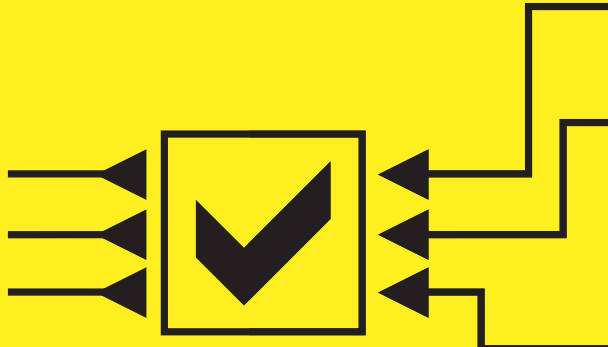
BSP00CF	BSP00AM	BSP00A7
BSP00CH	BSP00AN	BSP00A8
BSP00CJ	BSP00AP	BSP00A9
BSP00CK	BSP00AR	BSP00AA
BSP00CL	BSP00AT	BSP00AC
BSP00CM	BSP00AU	BSP00AE
BSP00CN	BSP00AW	BSP00AF
BSP00CP	BSP00AY	BSP00AH
BSP00CR	BSP00AZ	BSP00AJ
BSP00CT	BSP00C0	BSP00AK
BSP00CU	BSP00C1	BSP00AL
18...36 V DC	18...36 V DC	18...36 V DC
500 mA	500 mA	500 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
200 Hz	200 Hz	200 Hz
≤ ±0.5% FSO BFSL	≤ ±0.5% FSO BFSL	≤ ±0.5% FSO BFSL
≤ ±0.3% FSO/10 K	≤ ±0.3% FSO/10 K	≤ ±0.3% FSO/10 K
yes/yes	yes/yes	yes/yes
-40...+85 °C/-40...+125 °C	-40...+85 °C/-40...+125 °C	-40...+85 °C/-40...+125 °C
7-segment display/LED	7-segment display/LED	7-segment display/LED
IP 67 (when connected)	IP 67 (when connected)	IP 67 (when connected)
Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	Ceramic
Fluoroelastomer	Fluoroelastomer	Fluoroelastomer
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
Internal thread G1/4" in accordance with DIN EN 3852	Internal thread G1/4" in accordance with DIN EN 3852	Internal thread G1/4" in accordance with DIN EN 3852

Version 1.1

Version 1.1

Version 1.1





Dynamic Sensor Control

Dynamic Sensor Control: Condition monitoring

Reliable diagnostics are extremely important for highly dynamic machines. In the printing and paper machine industry, for example, the machine must react to faults within milliseconds.

Dynamic Sensor Control lets you recognize deviations in quality in the manufacturing process in real time, allowing you to implement corrective measures immediately.

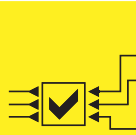
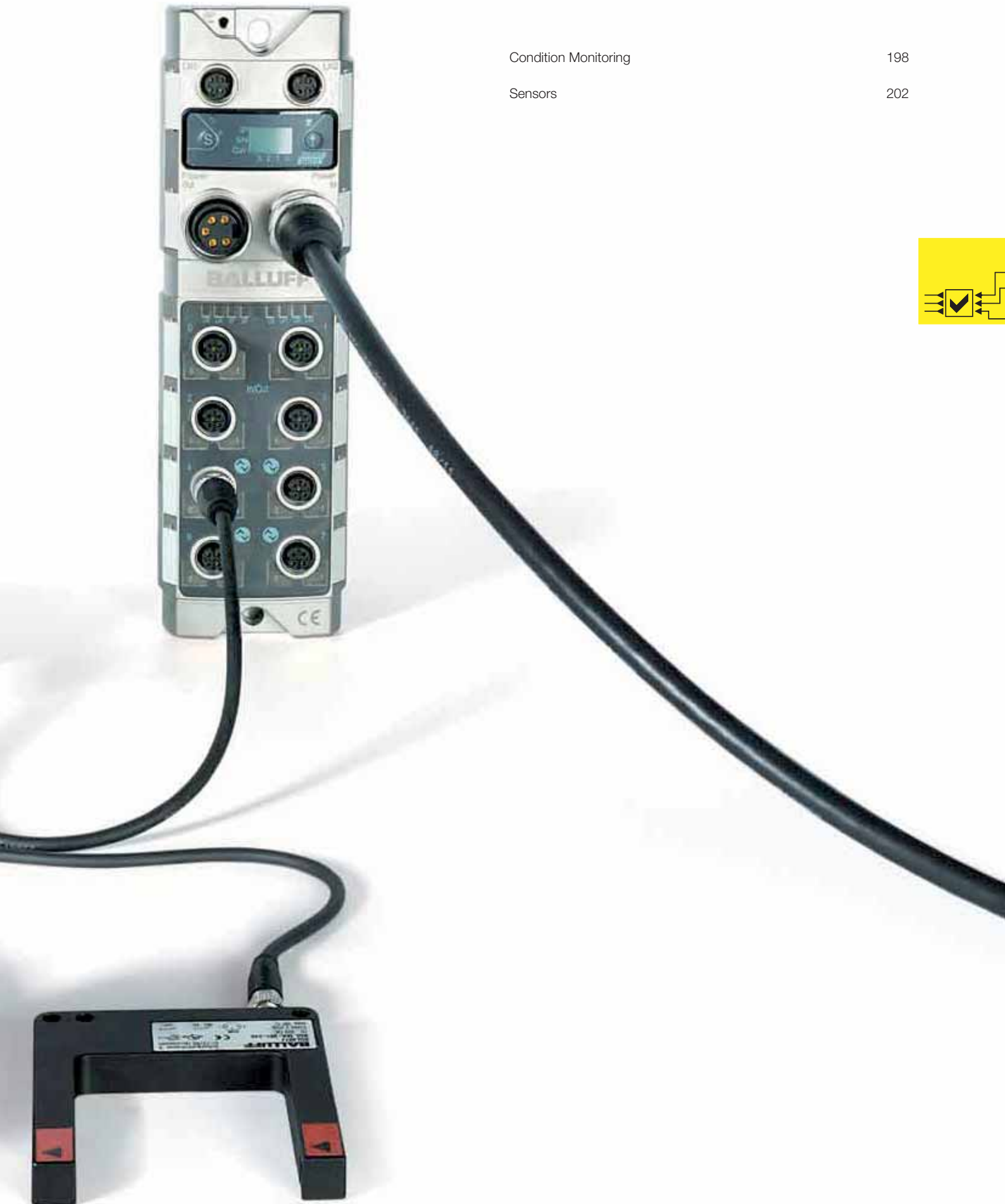


Condition Monitoring

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Sensors

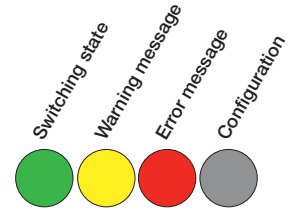
202



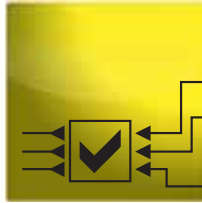
Knowledge

IO-Link

- Continuous signal
- Diagnostics
- Configuration



Information



- Switching signal
- Diagnostics
- Warning messages

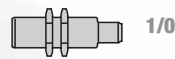
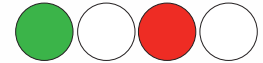


Data

Increase in diagnostic accuracy and functionality



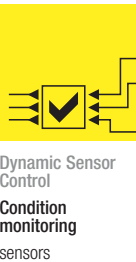
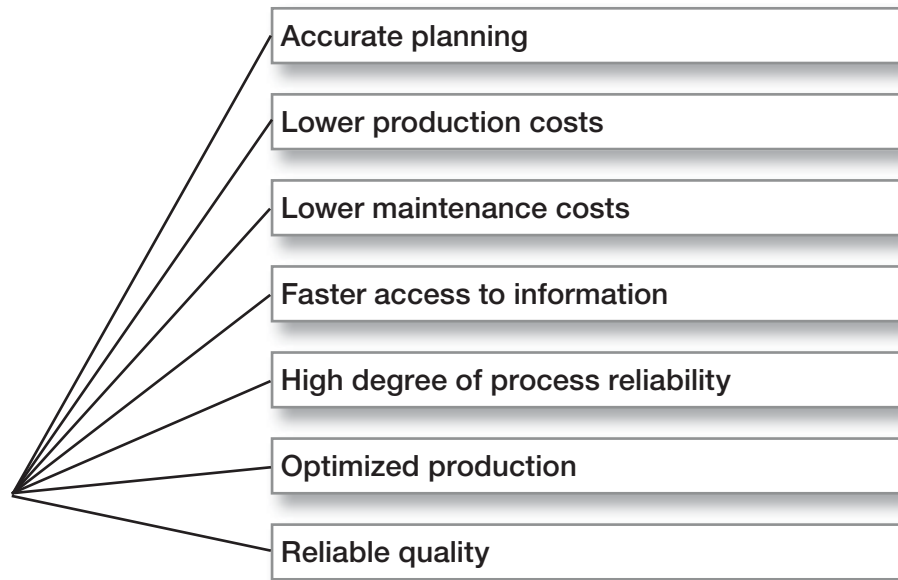
- Switching signal
- Diagnostics



- Switching signal



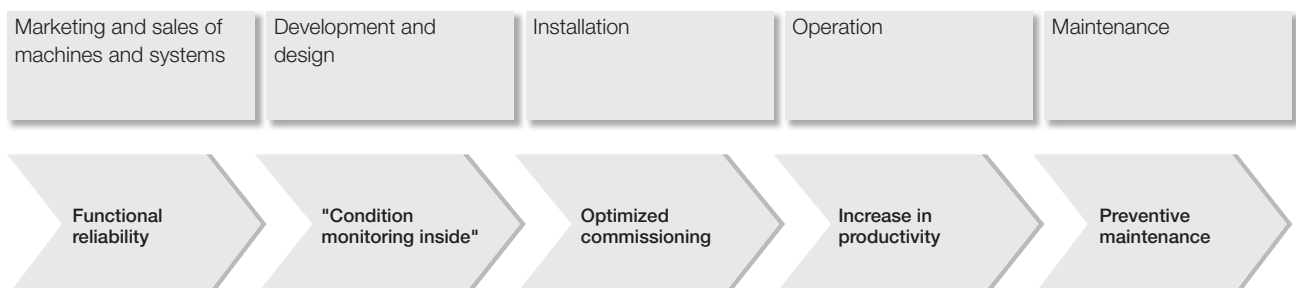
Dynamic Sensor Control



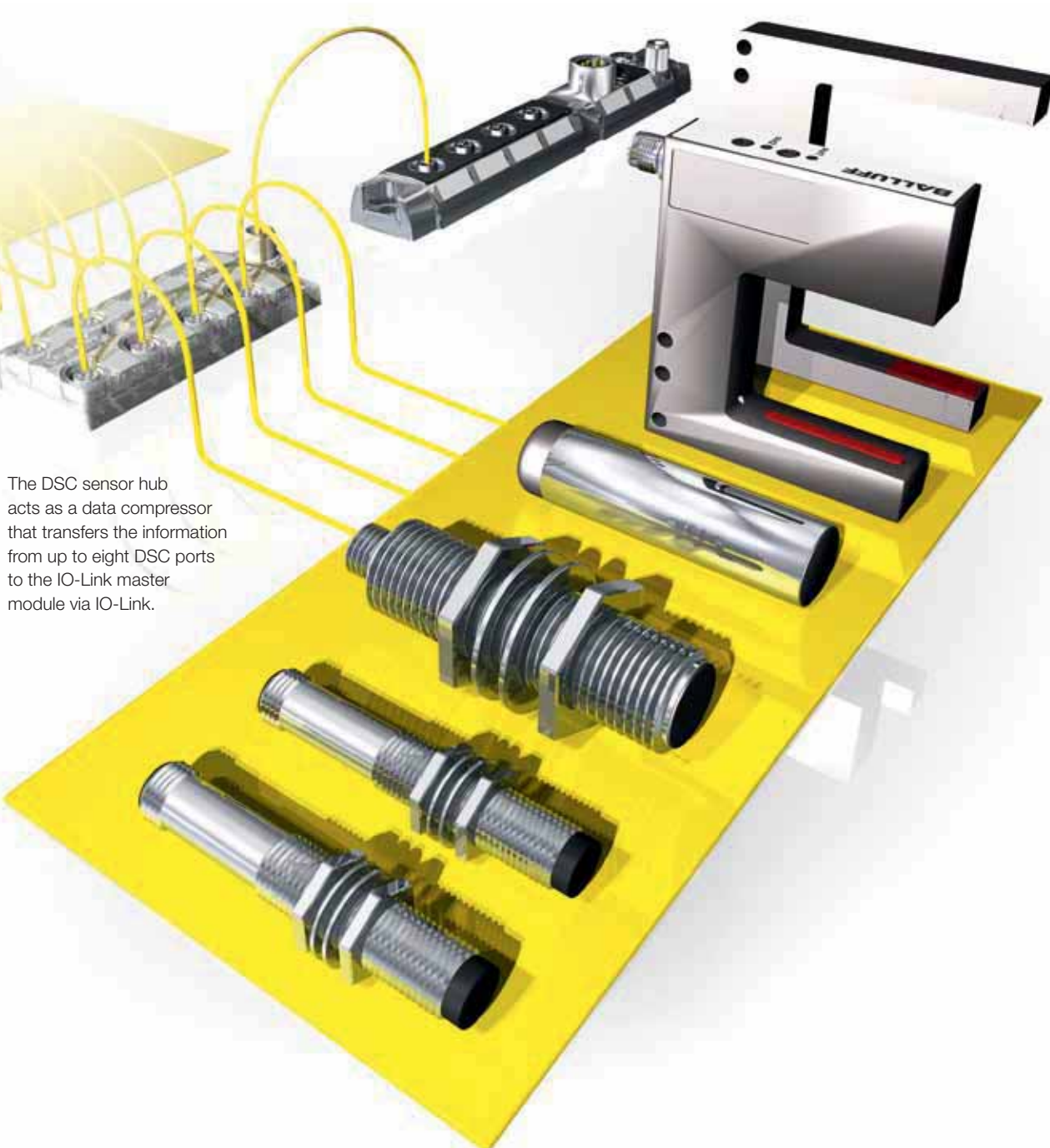
Reliable and timely detection of changing ambient conditions or machine states is often a decisive factor in being able to initiate repair actions in the production process in a timely manner. Dynamic Sensor Control (DSC) provides high-quality information in addition to the sensor function. This lets users immediately detect such aspects as whether detection ranges remain optimally configured or whether increasing contamination has started impairing the accuracy of a sensor, and does so during ongoing operations. This enables immediate correction.

DSC increases the productivity of systems and machines.

Σ Reduce your total cost of ownership



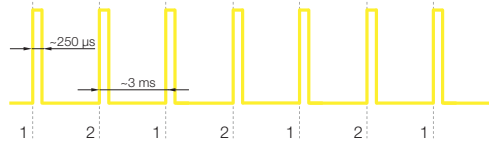
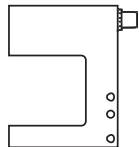
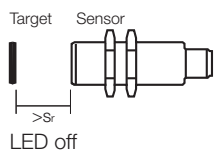
This compact IO-Link master module is equipped with four IO-Link ports that allow the connection of up to 32 DSC-compatible sensors in combination with DSC sensor hubs.



The DSC sensor hub acts as a data compressor that transfers the information from up to eight DSC ports to the IO-Link master module via IO-Link.

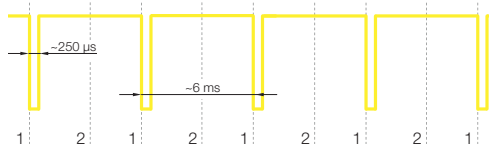
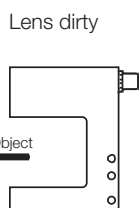
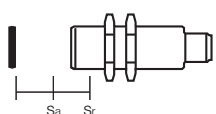
Inductive high-end sensors **Photoelectric high-end sensors**

Target proximity $> s_r$

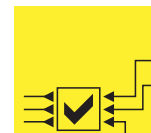


Switching state OK
Output low

Target between s_a and s_r
(typical)

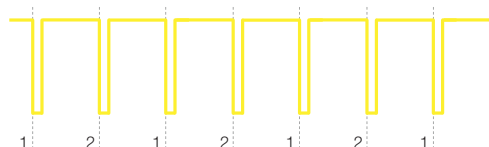
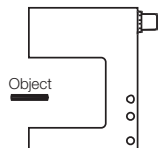
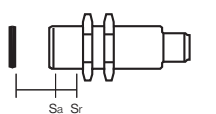


Warning message
Output high



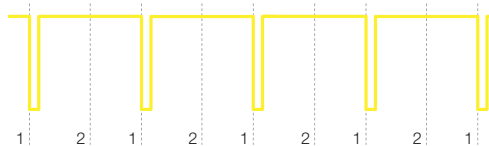
Dynamic Sensor Control
Condition monitoring sensors

Target in the safe area

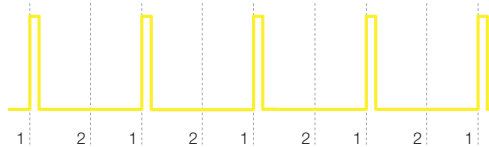
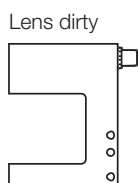


Switching state OK
Output high

Target too close

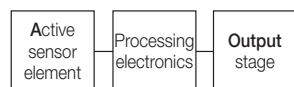


Warning message
Output high

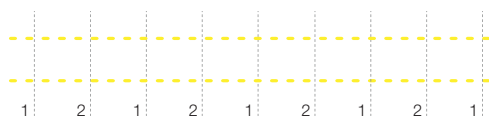


Warning message
Output low

Sensor defective



Sensor defective



Error
No pulses
Output high or low

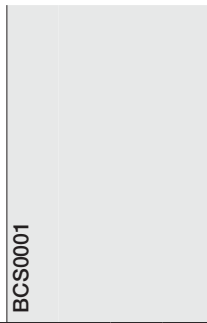
Dynamic Sensor Control

Diagnostics from A to E



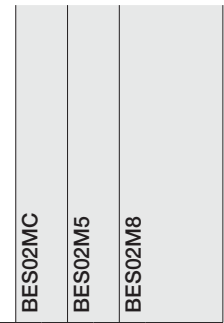
Coil break, fault in the processing electronics, output stage defective.

**Capacitive
Ø 20 mm sensor
with Dynamic
Sensor Control**



Switching type	PNP complementary	■
Rated switching distance s_n	10 mm	
Size, installation type	Ø 20 mm, flush	
Supply voltage U_B	10...30 V DC	
Function indicator	yes	
Enclosure rating per IEC 60529	IP 63	
Approvals	CE	
Housing material	V2A, EP	
Connection	3 m PUR cable, 3x0.25 mm ²	

**Inductive
M12 sensors
with Dynamic
Sensor Control**



Switching type	PNP NO contact	■	
	PNP NC contact		■ ■
Rated switching distance s_n		3.7 mm	4 mm
Size, installation type		M12x1, non-flush	
Supply voltage U_B		20...30 V DC	
Function indicator		no	
Enclosure rating per IEC 60529		IP 67	
Approvals		CE	
Housing material		CuZn coated	
Connection		M12 connector	

Classic capacitive sensors

- Switching state: Target yes/no
- Warning message: –
- Error message: Sensor OK? yes/no

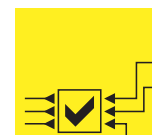
Classic inductive sensors

- Switching state: Target yes/no
- Warning message: –
- Error message: Sensor OK? yes/no

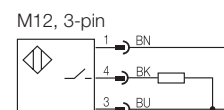
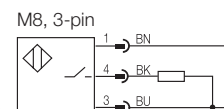
**Inductive M08, M12, M18
and M30 sensors
with Dynamic
Sensor Control**



	BES03EN	BES03EP	BES03EL	BES03EM	BES03ER	BES03ET	BES03EU	BES03EW	BES03EY	BES03EZ
Size	M8	M8	M8	M8	M12	M12	M18	M18	M30	M30
Switching type	PNP NO contact									
Rated switching distance s_n	1.5	2.5	1.5	2.5	2	4	5	8	10	15
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Installation type	flush									
	non-flush									
Supply voltage U_B	18...30 V DC									
Function indicator	yes									
Enclosure rating per IEC 60529	IP 67									
Approvals	CE, cULus									
Housing material	Stainless steel					CuZn coated				
Connection	M8,		M12, 3-pin							
	3-pin									



Dynamic Sensor Control
Condition Monitoring
sensors



High-end inductive sensors

- Switching state: Target yes/no
- Warning message: Target in critical area
Function indicator flashes
- Error message: Sensor OK? yes/no



Fork sensors BGL with Dynamic Sensor Control



		BGL0036	BGL003H	BGL003N	BGL003P	BGL003R
Fork sensor	1× PNP			■	■	■
	2× PNP	■	■			
Fork opening	30 mm	■		■		
	50 mm		■		■	
	80 mm					■
Light type	Red light	■	■			
	Infrared			■	■	■
Function indicator		yes				
Repeat accuracy		≤ 0.25 mm	≤ 0.15 mm			
Connection	Plug connector	M12, 4-pin	M8, 3-pin			

Photoelectric sensor BOS 18M Teach-In with Dynamic Sensor Control



		BOS01CU	BOS01CT	BOS01CW
Switching type	PNP NO/NC	■	■	■
	Switchable			
Rated switching distance s_n		500 mm	5 m*	20 m
Size, installation type		M18		
Supply voltage U_B		10...30 V DC		
Function indicator		yes		
Enclosure rating per IEC 60529		IP 67		
Housing material		Nickel-plated brass		
Connection		M12 connector		

* based on reflector BOS R-1

High-end photoelectric sensors

- Switching state: Target yes/no
- Warning message: Optical system dirty
Function indicator flashes
- Error message: Sensor OK? yes/no

High-end photoelectric sensors

- Switching state: Target yes/no
- Warning message: Optical system dirty
Function indicator flashes
- Error message: Sensor OK? yes/no

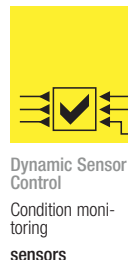
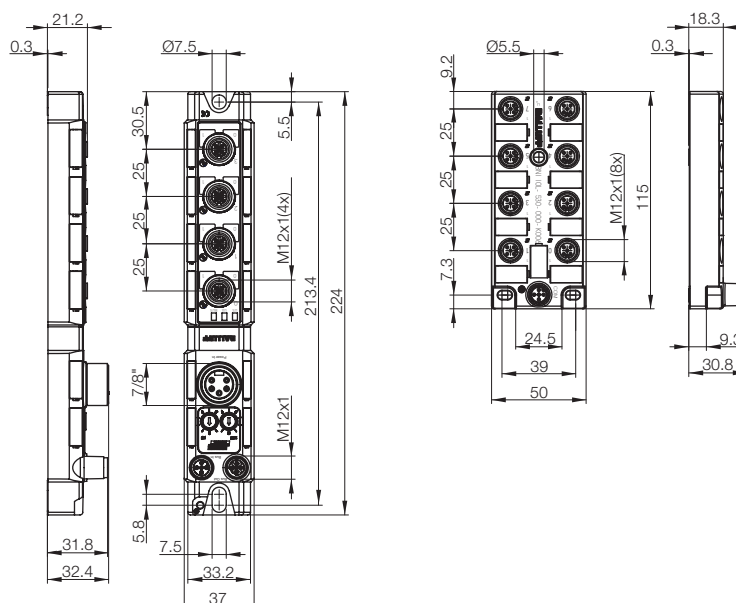




Fieldbus	Profibus DP	
IO-Link	Device	
Type	4x IO-Link ports or 4 standard I/O ports	8x DSC or 8x I/O ports
	BNi004N	BNi002Z
Supply voltage U_B	18...30 V DC	18...30 V DC
Fieldbus connection	M12, B-coded	
Supply voltage connection	7/8"	
Connection: IO-Link		M12, A-coded, male
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	4	8
No. of DSC ports		8
Number of inputs	Max. 8	8
Number of outputs	Max. 8	
Configurable	yes	< 1.2 A
Max. load current, sensors/channel	200 mA	200 mA
Max. load current, output	≤ 1.6 A	
Total actuator current	≤ 9 A	
Total sensor current	≤ 9 A	
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Operating temperature T_a	-5...+70 °C	-5...+55 °C
Storage temperature	-25...+70 °C	-25...+85 °C
Dimensions (LxWxH)	224x37x32 mm	115x50x31 mm
Housing material	Nickel-plated GdZn	PC

IO-Link	Version 1.0	Version 1.0
Connection: I/O ports	4x master	
Operating modes	SIO, COM 1, COM 2, COM 3	
Communication indicator	Green LED	
Error indicator	Red LED	
Max. load current IO-Link device	≤ 1.6 A	
Operating modes		COM 2
Parameters		<ul style="list-style-type: none"> - Enable/disable DSC - DSC sensitivity - Diagnostics reset - NC/NO

All hubs include four screw plugs and a label set.





Inductive Couplers

Inductive Couplers

Balluff inductive couplers BIC are extremely suitable for the quick connection and disconnection of modules. New requirements can be implemented within a very short period and with maximum flexibility.

BIC couplers are installed immediately via plug-and-play, making retrofitting extremely simple. Even maintenance is significantly easier since cable breaks and mechanical wear are a thing of the past. The units can be disconnected quickly during maintenance. Power and signals are transferred reliably over an air gap.



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The non-contact connector

Fixed wiring is a detriment when sensors are intended to follow the movements of a machine, as is the case in flexible automation. This puts heavy strain on contacts and cables.

These kinds of problems are a thing of the past thanks to inductive couplers BIC; signals and power are transmitted over an air gap without any contact.

System components

- Sensor – mechanical, inductive, optical, magnetic or capacitive
- Remote – for connecting the sensors to the inductive system, installed on the mobile side
- Base – connects the system to the controller: transmits power to the remote, receives the status information from the sensor and relays it to the controller

Power only

Power transmitting units for actuator systems, loading units or just supplying power

Unidirectional systems

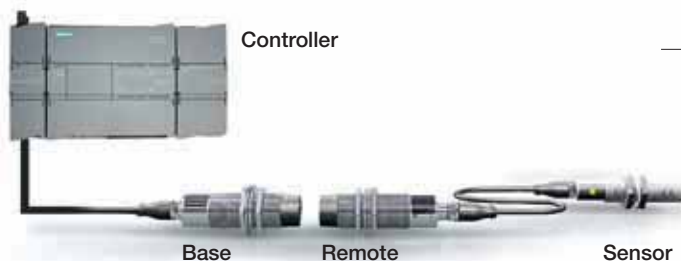
- Signal transmission from sensor to controller
- Up to 16 sensors are transmitted depending on the system
- Special systems for analog signals and PT100 measuring sensors

Bidirectional systems

These systems transmit the signals in both directions.

Active unit

- Mobile interface for the IO-Link environment
- This allows the use of IO-Link as the transmission protocol for all IO-Link-capable systems



Group	Series	Signal form	Number of signals/ process data Length
Axial	Power only		0
Axial	Unidirectional	digital	1
		digital	4
		digital	1
		digital	8
		digital	1
		digital	8
		digital	8
		digital	8
		digital	8
		digital	8
Axial		analog	1
			1
Axial	Bidirectional	digital	4+4
Axial	Active unit	IO-Link	3 bytes, 1...32 bytes
Axial	Programmable cams		1

Design	Output voltage of remote	Output current of remote	Connection of	Remote (moving)	Base (stationary)	Page
M30	24 V DC	500 mA	Consumer	BIC0008	BIC0007	243
M12 + M18			Special detectors or mechanical switches	BIC003W BIC003Z	BIC002T BIC002P	220
M18 + M30			Special detectors or mechanical switches	BIC001N BIC001T	BIC0069 BIC0015 BIC001A	226
M12	24 V DC	50 mA		BIC0078	BIC0077	237
M18	12 V DC	30 mA	2-wire and 3-wire sensors, inductive, capacitive optical or mechanical	BIC002L BIC002K	BIC002C BIC0029	222
M18 + M30	12 V DC	30 mA	2-wire and 3-wire sensors, inductive	BIC0012 BIC000Y	BIC0011 BIC000W	221
M30	12 V DC	40 mA	2-wire and 3-wire sensors, inductive, capacitive optical or mechanical	BIC0044	BIC002E	223
80x80x40	12 V DC	100 mA	2-wire and 3-wire sensors, inductive, capacitive optical or mechanical	BIC001Y	BIC001J	227
M30	12 V DC	150 mA		BIC0045	BIC0048 BIC006A	229
M30				BIC000A	BIC0009	237
40x40x75	12 V DC	200 mA		BIC0021 BIC0022	BIC0026 BIC0027	228
90x90x45	24 V DC	300 mA		BIC0023	BIC0028	215
M18	18 V DC	15 mA	0...10 VDC	BIC0043	BIC0046	232
M18			PT100	BIC0041 BIC004C	BIC0047	233
90x90x45	24 V DC	300 mA	2-wire and 3-wire sensors, inductive, capacitive optical or mechanical	BIC0039	BIC003C	231
M30 + Q40	24 V DC	500 mA	Sensor hub	BIC000A	BIC0009	237
Q40	24 V DC	500 mA	IO-Link devices	BIC0071	BIC0070	241
M18 + M30			Mechanical switches	BIC0004 BIC0005 BIC0006	BES01CE BES01CE BES0166	218



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Symbols



Unidirectional, digital



Bidirectional, digital



Unidirectional, analog



Power

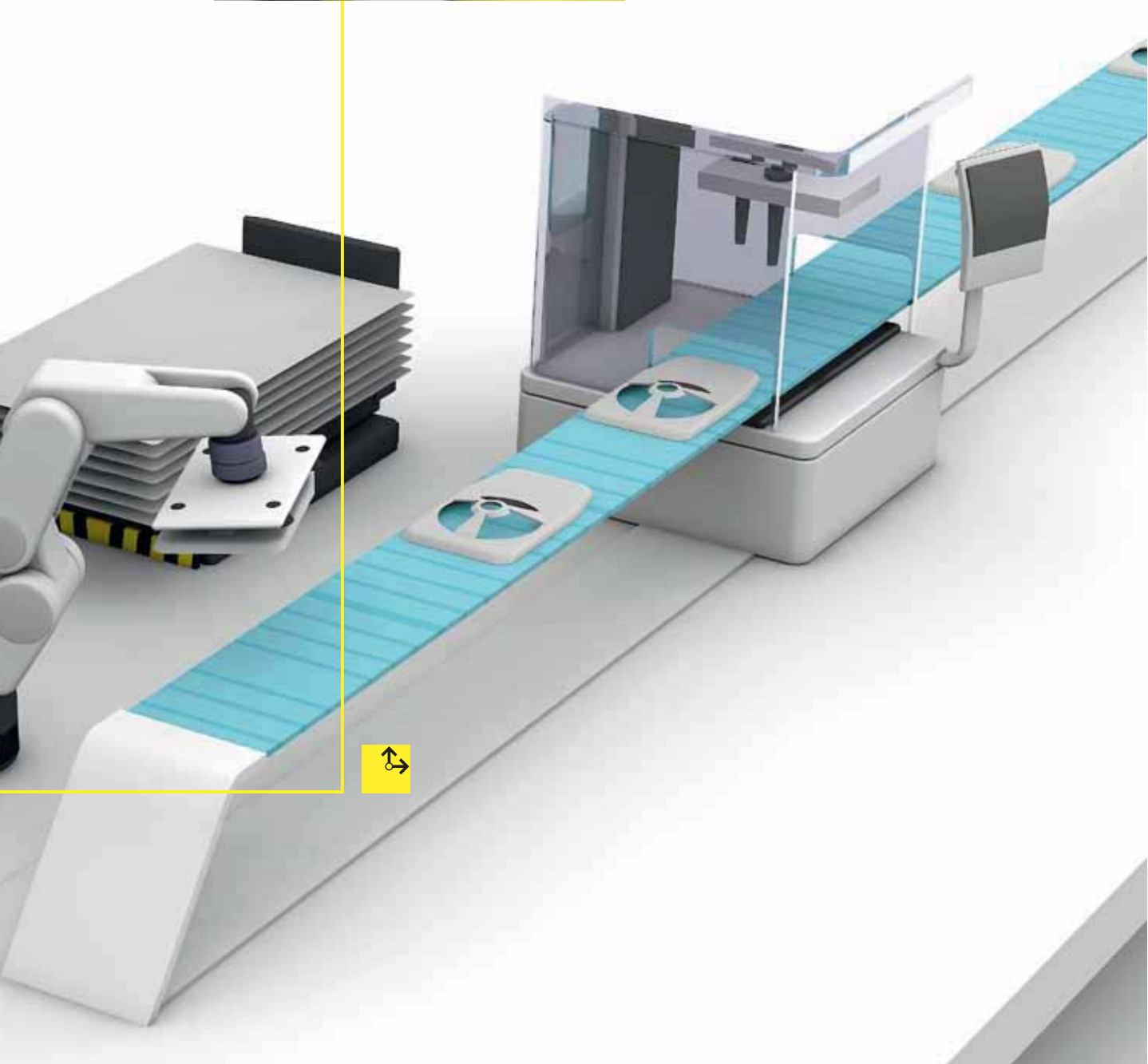
Change tools automatically and detect them reliably Sensors attached to the interchangeable tools of the press detect the alignment of the material. The positioning signals from the sensor are reliably transmitted over a BIC inductive coupler.

BICs permit automatic tool changing because manual plug-in of mechanical connectors is no longer necessary. In conjunction with a BNI network interface, tools can also be identified.





The inductive coupling system serves as a contact-free connection between the press and the tool.

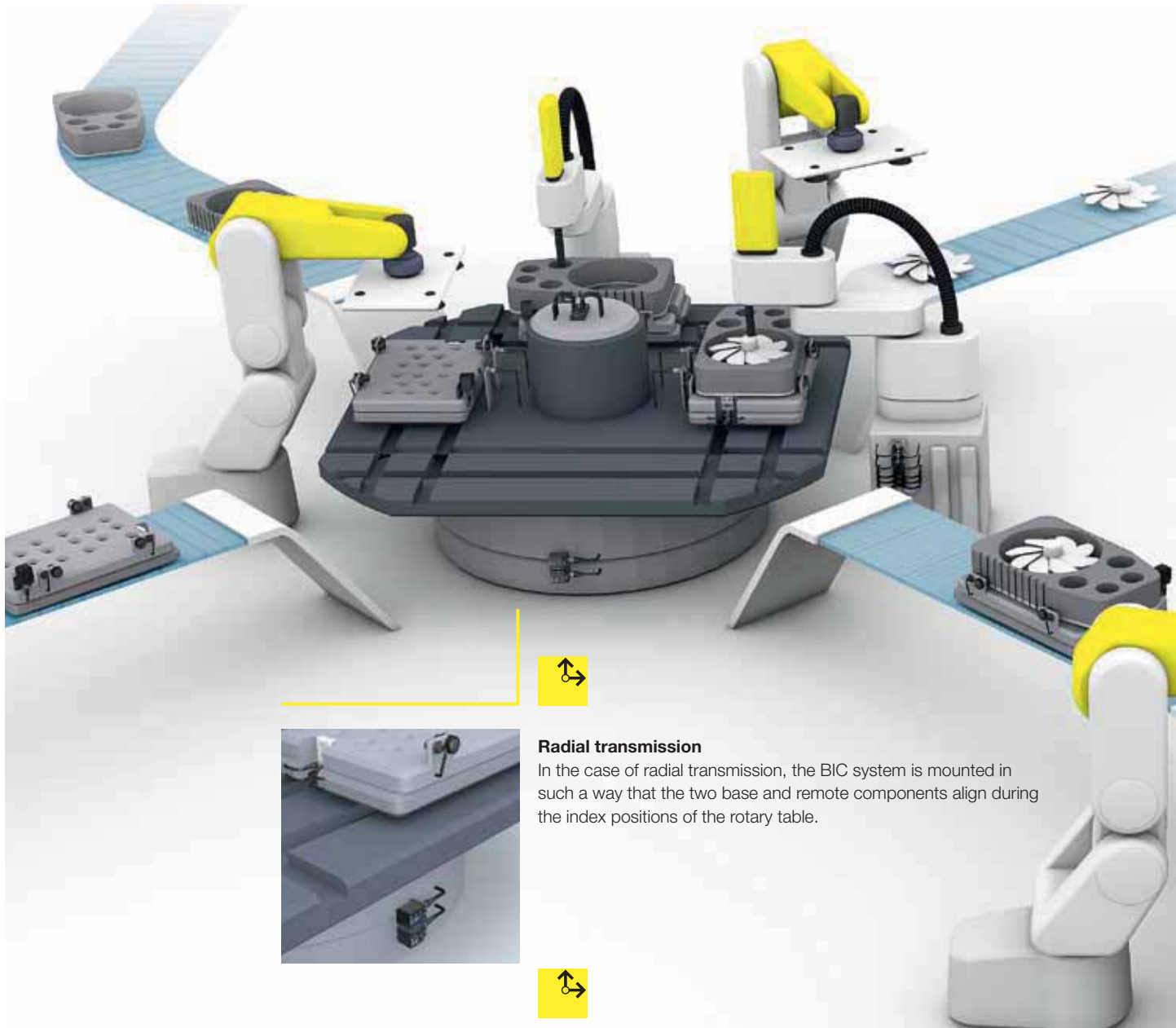


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Without any slip rings

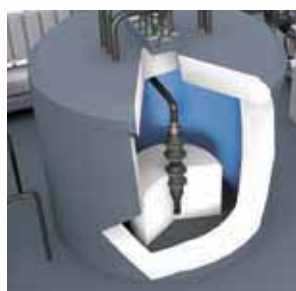
On the rotary indexing table, data is to be transmitted from rotating to stationary machine parts. Classic carriers such as slip rings are subject to heavy mechanical wear. This wear leads to malfunctions and expensive downtime.

This can be avoided with wireless BIC systems. The inductive couplers transmit data and power for sensors and actuators without contact. Slip rings on the rotary table are now a thing of the past.



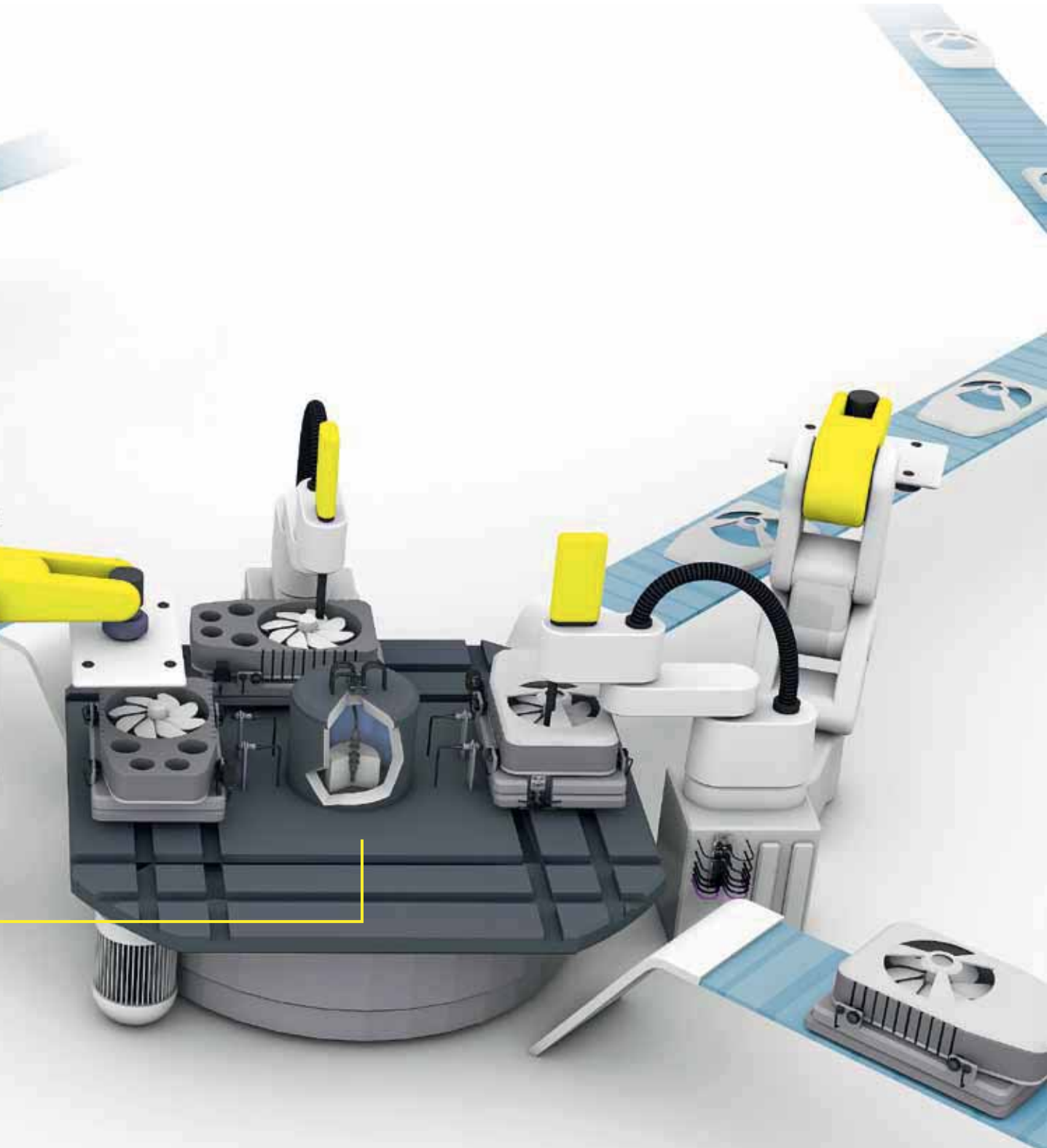
Radial transmission

In the case of radial transmission, the BIC system is mounted in such a way that the two base and remote components align during the index positions of the rotary table.



Axial transmission

In the case of axial transmission, the BIC system is located in the central axis of the rotary index table. Communication takes place continuously, independent of the position of the table.

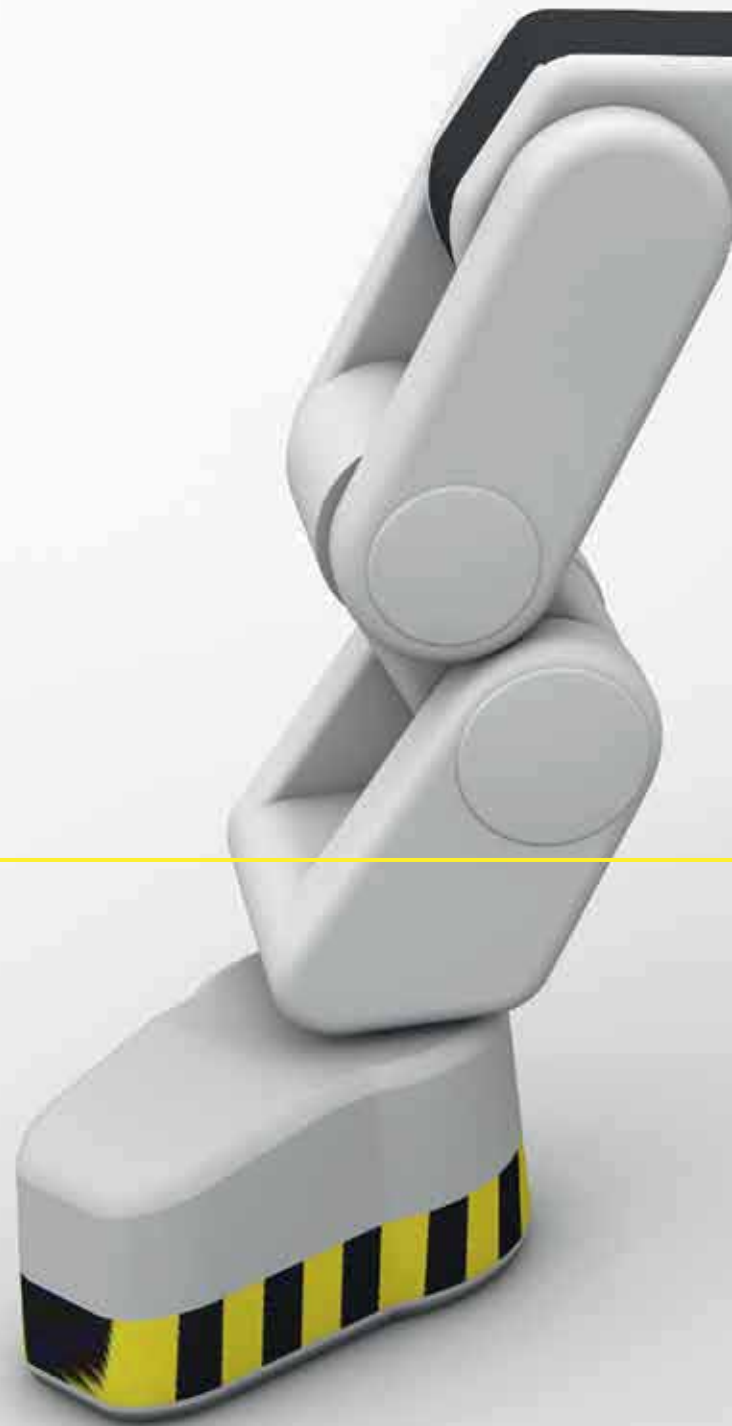


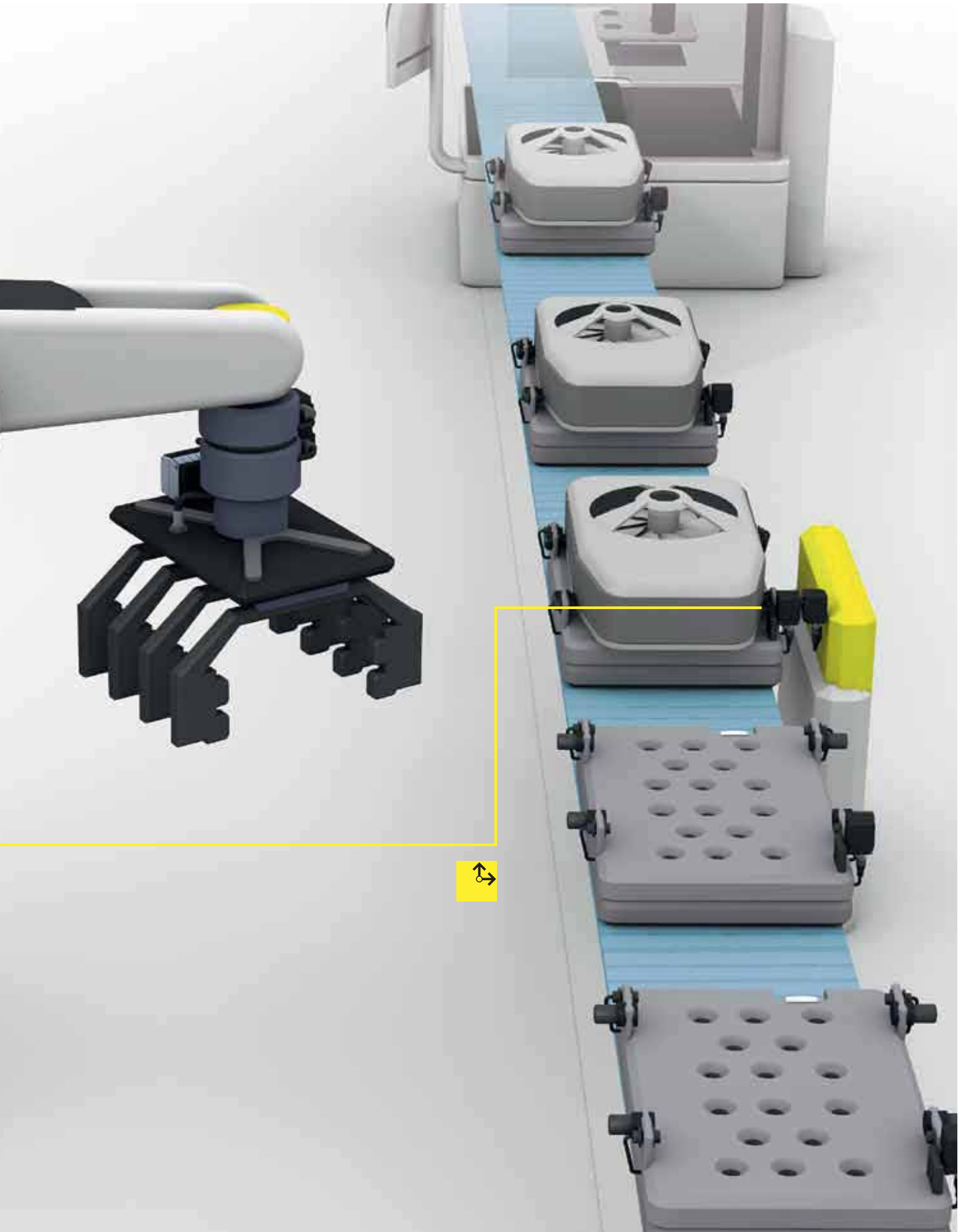
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Immediate contacts – high clock frequency

Sensors are mounted on load carriers that convey components from processing station to processing station. They check the correct alignment of the components and monitor the position of the clamping units. The non-contact BIC inductive coupling system is responsible for supplying the power to the sensors and transmitting the sensor signals to the processing stations.

Communication is established at each station as soon as the base and remote align. A mechanical connection is no longer necessary.





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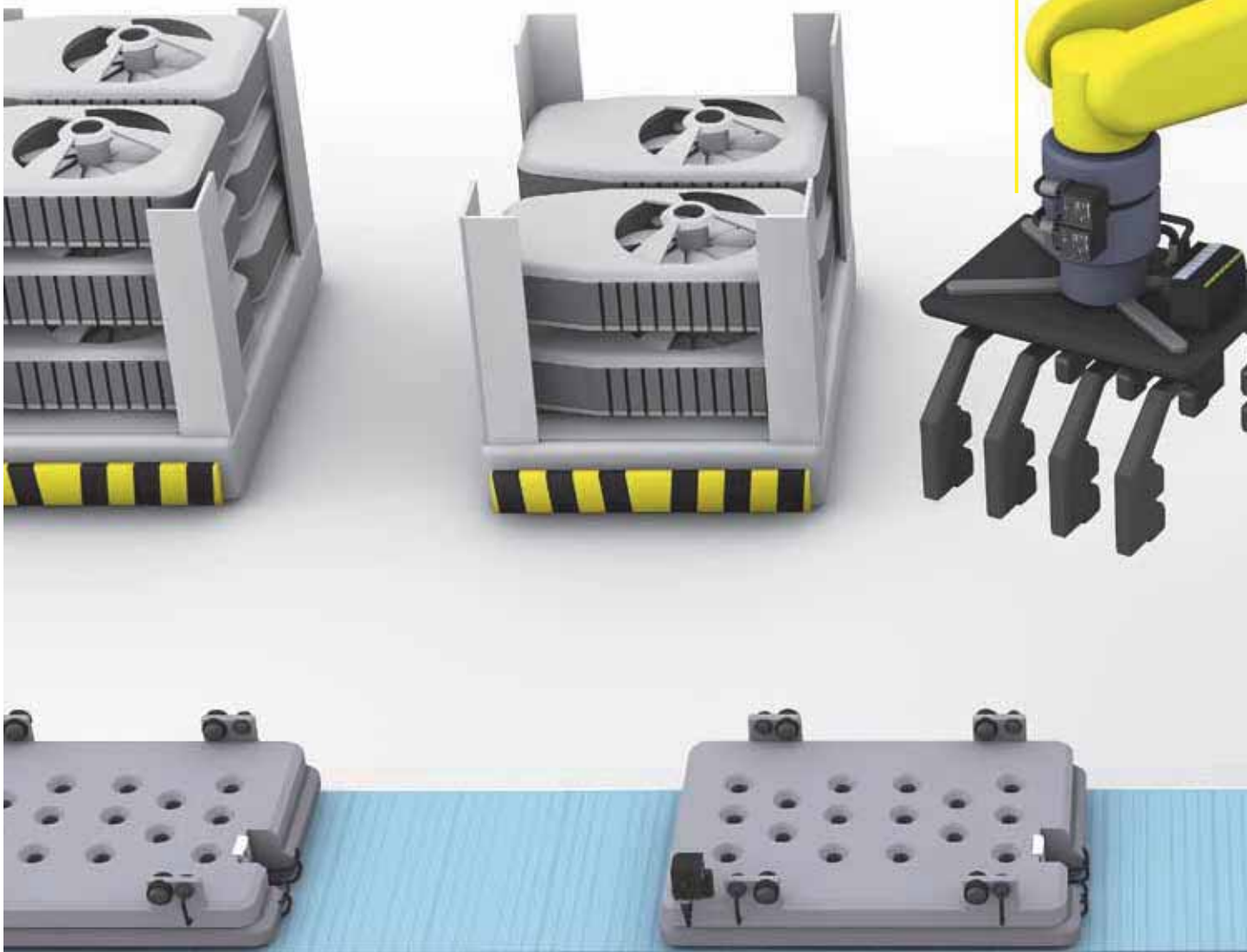
Inductive Couplers

Gripper changing on robots

Fast tool changing – clear allocation of tools

Fast format changes are important for high productivity. However, plugs make it difficult to change grippers on robots.

BIC inductive couplers render mechanical connectors unnecessary. They transmit signals contact-free over an air gap. This ensures freedom from wear, guarantees tools are changed quickly and provides a large degree of flexibility. A further benefit: The unique identity of the tool can be ensured through an ID stored in the sensor/actuator hub. This excludes the possibility of incorrect allocation.





Benefits

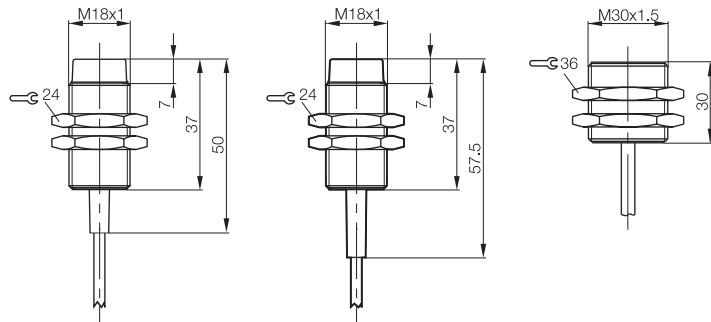
- No warped, damaged pins
- No bending during coupling – axial offset is permissible
- No mechanical contact, no wear



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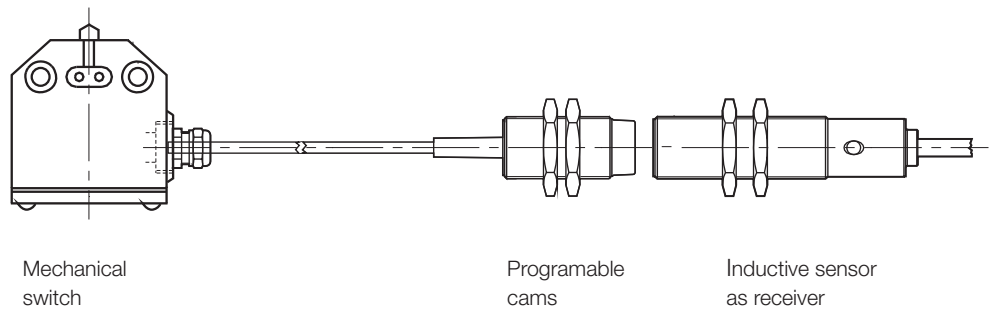


Size	M18x1	M18x1	M30x1.5
Installation	non-flush	non-flush	non-flush
Rated switching distance s_n	4 mm	4 mm	15 mm
Assured switching distance S_a	1...3.5 mm	1...3.5 mm	5...10 mm
Programmable cams 3 m cable	BIC0004	BIC0005	BIC0006
Ambient temperature T_a	-25...+70 °C	-25...+70 °C	-25...+70 °C
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
Connection	PVC cable	PUR cable	PUR cable
Number of conductors × conductor cross-section	2×0.14 mm ²	2×0.34 mm ²	2×0.34 mm ²
	In combination with inductive sensor BES 516-326-B0-C-02, see Object detection catalog	In combination with inductive sensor BES 516-326-B0-C-02, see Object detection catalog	In combination with inductive sensor BES 516-114-G-S4-H, see Object detection catalog



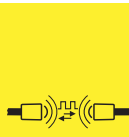
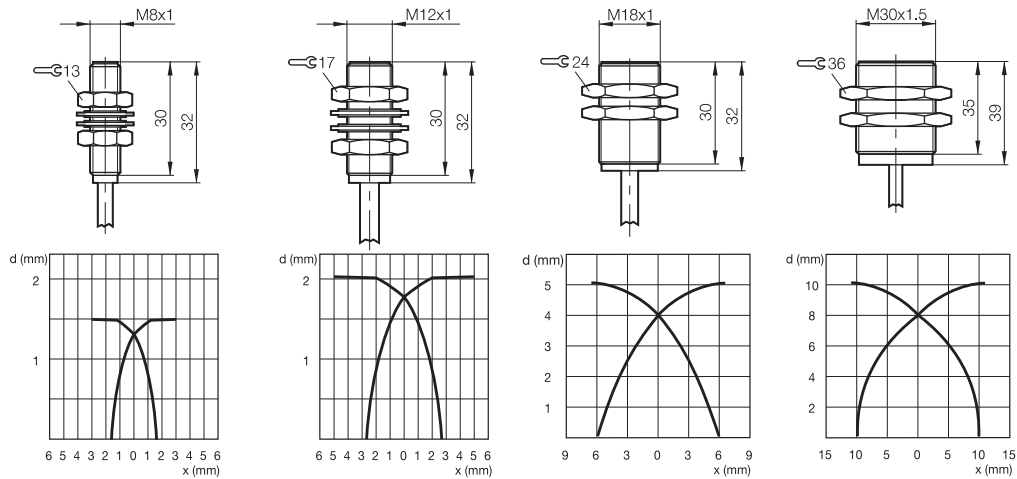
Simple principle for non-contact transmission of the switching state of a mechanical switch.

- Switch open, sensor damped
- Switch closed, sensor undamped



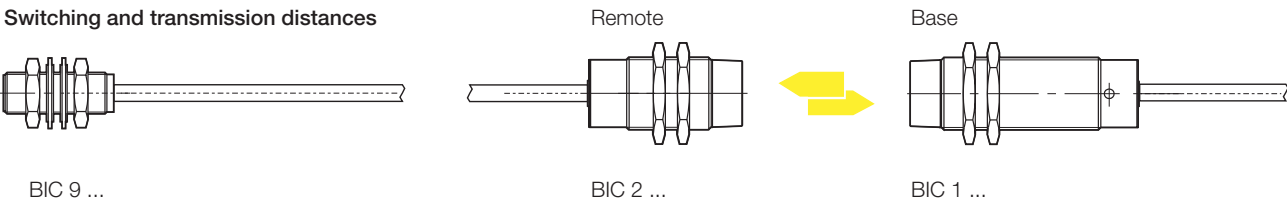


Size	M8 x 1	M12x1	M18x1	M30x1.5
Installation	flush	flush	flush	flush
Rated switching distance S_n	1.5 mm	2 mm	5 mm	10 mm
Assured switching distance S_a	1.2 mm	1.6 mm	4.1 mm	8.1 mm
Normally open 1 m cable	BIC004M		BIC004W	BIC0050
Normally open 2 m cable		BIC004N		
Normally open 10 m cable		BIC004P		
Normally open 15 m cable		BIC004R		
Ambient temperature T_a	0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
Connection	PUR cable	PUR cable	PUR cable	PUR cable
Switching hysteresis H	≤ 20% of s_r	≤ 20% of s_r	≤ 20% of s_r	≤ 20% of s_r



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Switching and transmission distances



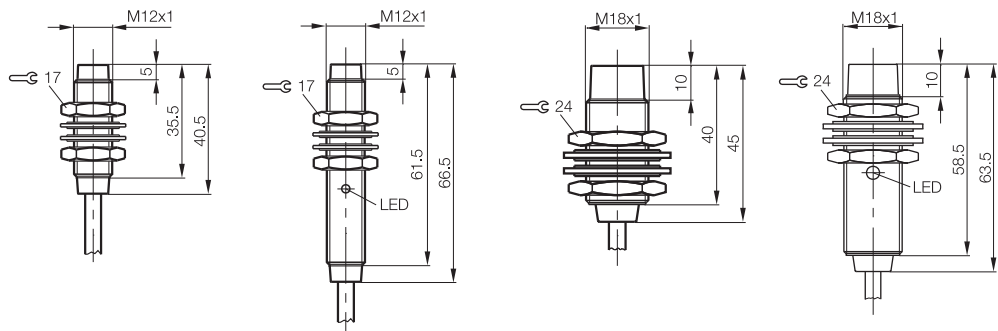
Detector	Size	Rated switching distance
BIC004M	M8	1.5 mm
BIC004N	M12	2 mm
BIC004W	M18	5 mm
BIC0050	M30	10 mm

Remote			Base			
	Size	Transmission distance		Size	Output circuit	
	BIC003W	M12	2 mm	BIC002T	M12	PNP/NO
	BIC003Z	M18	5 mm	BIC002P	M18	PNP/NO



Connection for 1 detector (2-wire) or mechanical switch

Size	M12x1	M12x1	M18x1	M18x1
Working range	2 mm		5 mm	
Installation	non-flush	non-flush	non-flush	non-flush
Remote 5 m cable	BIC003W		BIC003Z	
Base PNP 5 m cable		BIC002T		BIC002P
Supply voltage U_B , including ripple		24 V \pm 5 %		24 V \pm 5 %
Rated operating current I_e		\leq 100 mA		\leq 100 mA
No-load supply current I_0 max.		\leq 25 mA		\leq 25 mA
Max. current load per output		\leq 50 mA		\leq 50 mA
Short-circuit protected		yes		yes
Rated insulation voltage U_i		75 V DC		75 V DC
Operational readiness		40 ms		40 ms
Ambient temperature T_a	0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
Storage temperature	-25...+75 °C	-25...+75 °C	-25...+75 °C	-25...+75 °C
Switching frequency f		25 Hz		25 Hz
Function/supply voltage indicator		yes		yes
Tightening torque	15 Nm	15 Nm	40 Nm	40 Nm
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
Material of sensing face	ABS/PBT	ABS/PBT	PA 12	PA 12
Connection	PUR cable	PUR cable	PUR cable	PUR cable
No. of wires \times conductor cross-section	2 \times 0.5 mm ²	3 \times 0.3 mm ²	2 \times 0.5 mm ²	3 \times 0.3 mm ²



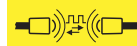
Switching and transmission distances

Detector	Remote			Base	
	Size	Rated switching distance	Size	Transmission distance	Output circuit
BIC004M	M8	1.5 mm			
BIC004N	M12	2 mm	BIC003W	M12	PNP/NO
BIC004W	M18	5 mm	BIC003Z	M18	PNP/NO
BIC0050	M30	10 mm			

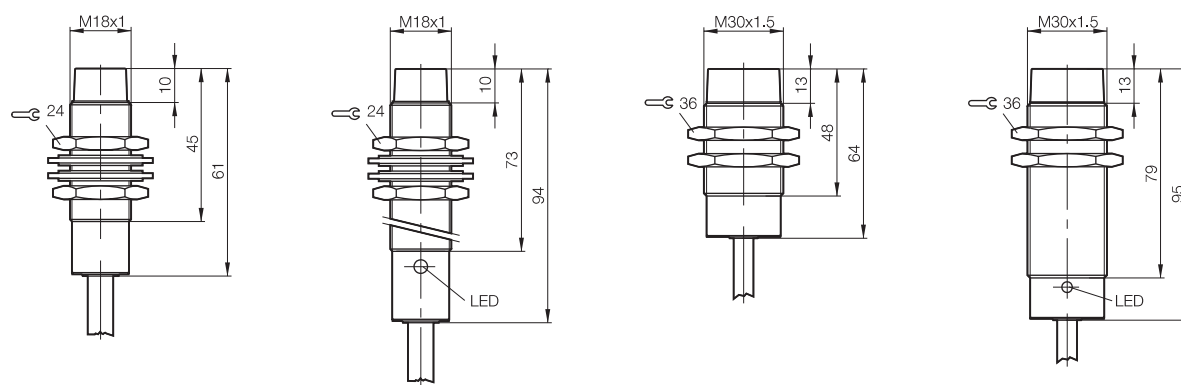


Connection for max. 8 detectors or mechanical switches

M18x1	M18x1	M30x1.5	M30x1.5
5 mm		10 mm	
non-flush	non-flush	non-flush	non-flush
BIC0012	BIC0011	BIC000Y	BIC000W
	24 V ±5 %		24 V ±5 %
	≤ 100 mA		≤ 100 mA
	≤ 25 mA		≤ 25 mA
	≤ 50 mA		≤ 50 mA
	yes		yes
75 V DC		75 V DC	
	300 ms		300 ms
0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
-25...+75 °C	-25...+75 °C	-25...+75 °C	-25...+75 °C
	3.2 Hz		3.2 Hz
	yes		yes
40 Nm	40 Nm	40 Nm	40 Nm
IP 67	IP 67	IP 67	IP 67
Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn	Nickel-plated CuZn
PA 12	PA 12	PA 12	PA 12
PVC cable	PVC cable	PVC cable	PVC cable
12x0.18 mm ²	12x0.18 mm ²	12x0.18 mm ²	12x0.18 mm ²



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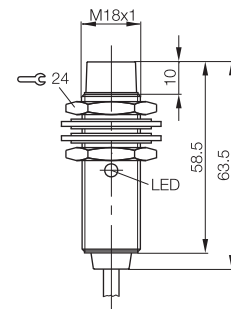
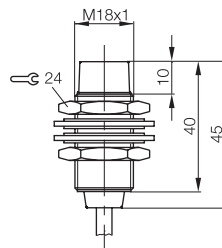


Detector			Remote		Base			
	Size	Rated switching distance	Size	Transmission distance	Size	Output circuit		
BIC004M	M8	1.5 mm		BIC003W	M12	BIC002T	M12	PNP/NO
BIC004N	M12	2 mm		BIC003Z	M18	5 mm	BIC002P	M18
BIC004W	M18	5 mm						
BIC0050	M30	10 mm						



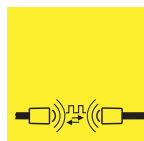
Connection for 1 sensor

Size	M18x1	M18x1
Working range	2.5 mm	
Installation	non-flush	non-flush
Remote NPN 1 m cable	BIC002L	
Remote PNP 2 m cable	BIC002K	
Remote PNP 3 m cable		
Base NPN 2 m cable		BIC002C
Base PNP 5 m cable		BIC0029
Supply voltage U_B , including ripple		24 V DC $\pm 5\%$
Rated operating current I_o		≤ 250 mA
No-load supply current I_o max.		≤ 150 mA
Max. current load per output		≤ 50 mA
Short-circuit protected		yes
Remote output voltage	12 ± 1.5 V DC	
Power supply, continuous output current	≤ 30 mA	
Rated insulation voltage U_i	75 V DC	
Operational readiness		40 ms
Ambient temperature T_a	0...+50 °C	0...+50 °C
Storage temperature	-25...+75 °C	-25...+75 °C
Offset	± 2 mm	
Switching frequency f		25 Hz
Function/power-on indicator		yes/yes
Tightening torque	40 Nm	40 Nm
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn
Material of sensing face	ABS/PBT	ABS/PBT
Connection	PUR cable	PUR cable
Number of conductors \times conductor cross-section	3 \times 0.34 mm ²	3 \times 0.34 mm ²

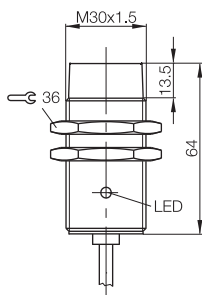
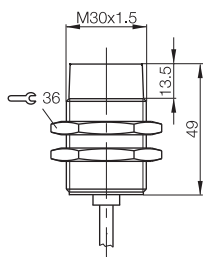




M30x1.5	M30x1.5
4.5 mm	
non-flush	non-flush
BIC0044	BIC002E
	24 V DC $\pm 5\%$
	≤ 250 mA
	≤ 150 mA
	≤ 50 mA
	yes
12 ± 1.5 V DC	
≤ 30 mA	
75 V DC	
0...+50 °C	40 ms
-25...+75 °C	0...+50 °C
± 3 mm	-25...+75 °C
	25 Hz
	yes/yes
40 Nm	40 Nm
IP 67	IP 67
Nickel-plated CuZn	Nickel-plated CuZn
ABS/PBT	ABS/PBT
PUR cable	PUR cable
3x0.34 mm ²	3x0.34 mm ²



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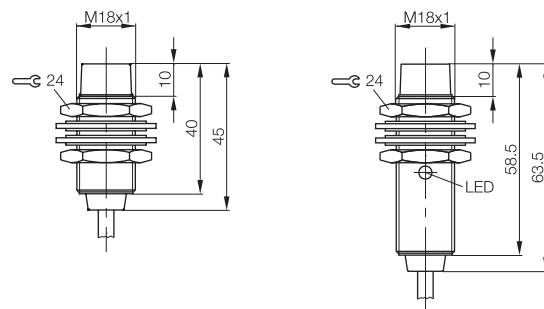




Connection for 1 sensor (Teflon-coated housing)

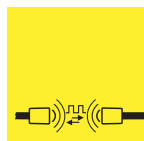
Size	M18x1	M18x1
Working range	2.5 mm	
Installation	non-flush	non-flush
Remote PNP 3 m cable		
Remote DC-2 wire 3 m cable		
Remote NPN 5 m cable	BIC005P	
Remote DC-2 wire 5 m cable	BIC005R	
Base NPN 3 m cable		
Base PNP 3 m cable		
Base NPN 5 m cable		BIC005T
Supply voltage U_s , including ripple		24 V DC $\pm 5\%$
Rated operating current I_e		≤ 250 mA
No-load supply current I_0 max.		≤ 150 mA
Max. current load per output		≤ 50 mA
Short-circuit protected		yes
Remote output voltage	12 ± 1.5 V DC	
Power supply, continuous output current	≤ 30 mA	
Rated insulation voltage U_i	75 V DC	
Operational readiness		40 ms
Ambient temperature T_a	0...+50 °C	0...+50 °C
Storage temperature	-25...+75 °C	-25...+75 °C
Offset	± 2 mm	
Switching frequency f		25 Hz
Function/power-on indicator		yes/yes
Tightening torque	40 Nm	40 Nm
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	Teflon	Teflon
Material of sensing face	ABS/PBT	ABS/PBT
Connection	PUR cable	PUR cable
Number of conductors \times conductor cross-section	3 \times 0.34 mm ²	3 \times 0.34 mm ²

We ask that you request the user's guide for your electrical project planning.

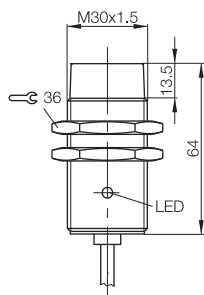
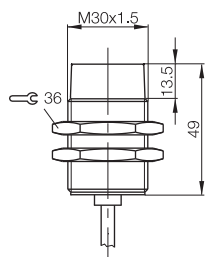




M30x1.5	M30x1.5
4.5 mm	
non-flush	non-flush
BIC005K	
BIC005M	
	BIC005N
	BIC005L
	24 V DC $\pm 5\%$
	≤ 250 mA
	≤ 150 mA
	≤ 50 mA
	yes
12 ± 1.5 V DC	
≤ 30 mA	
75 V DC	
	40 ms
0...+50 °C	0...+50 °C
-25...+75 °C	-25...+75 °C
± 3 mm	
	25 Hz
	yes/yes
40 Nm	40 Nm
IP 67	IP 67
Teflon	Teflon
ABS/PBT	ABS/PBT
PUR cable	PUR cable
3x0.34 mm ²	3x0.34 mm ²



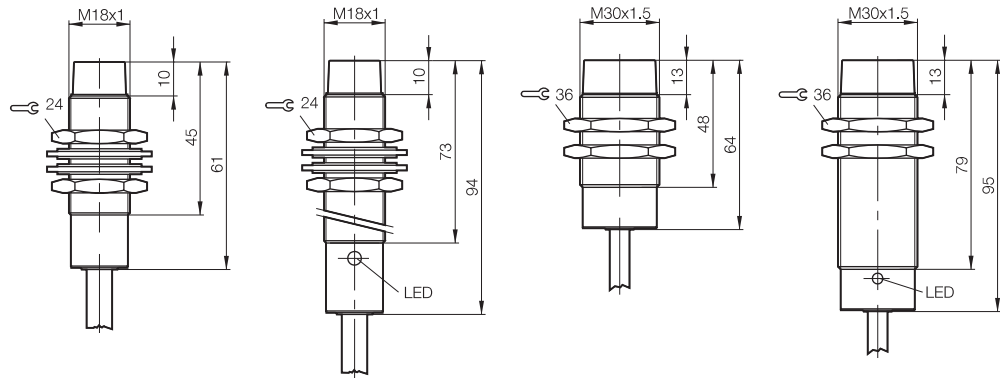
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for max. 4 sensors

Size	M18x1	M18x1	M30x1.5	M30x1.5
Working range	3 mm		5 mm	
Installation	non-flush		non-flush	
Remote PNP 5 m cable	BIC001N		BIC001T	
Base NPN 5 m cable				
Base PNP 5 m cable	BIC0015		BIC001A	
Supply voltage U_B , including ripple	24 V DC $\pm 5\%$		24 V DC $\pm 5\%$	
Rated operating current I_e	≤ 700 mA		≤ 700 mA	
No-load supply current I_0 max.	≤ 170 mA		≤ 150 mA	
Max. current load per output	≤ 50 mA		≤ 50 mA	
Short-circuit protected	yes		yes	
Remote output voltage	12 ± 1.5 V DC		12 ± 1.5 V DC	
Power supply, continuous output current	≤ 30 mA		≤ 40 mA	
Rated insulation voltage U_i	75 V DC		75 V DC	
Operational readiness	40 ms		40 ms	
Ambient temperature T_a	0...+50 °C		0...+50 °C	
Storage temperature	-25...+75 °C		-25...+75 °C	
Offset	± 2 mm		± 4 mm	
Switching frequency f	30 Hz		30 Hz	
Function/supply voltage indicator	yes/yes		yes/yes	
Tightening torque	40 Nm		40 Nm	
Enclosure rating per IEC 60529	IP 67		IP 67	
Housing material	Nickel-plated CuZn		Nickel-plated CuZn	
Material of sensing face	PA 12		PA 12	
Connection	PUR cable		PUR cable	
No. of wires \times conductor cross-section	7 \times 0.3 mm ²		7 \times 0.3 mm ²	



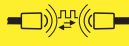
Inductive Couplers

Unidirectional for up to eight sensors

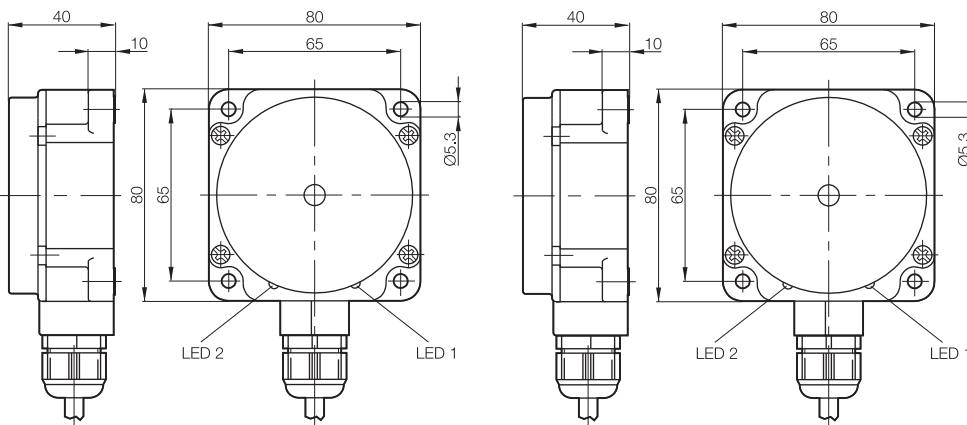


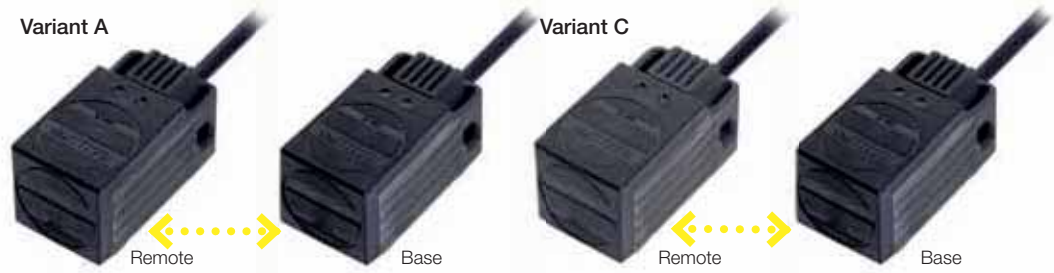
Connection for max. 8 sensors

80x80x40 mm	80x80x40 mm
10 mm	
non-flush	non-flush
BIC001Y	BIC001J
	24 V DC $\pm 5\%$
	≤ 950 mA
	≤ 300 mA
	≤ 50 mA
	yes
12 ± 1.5 V DC	
≤ 100 mA	
75 V DC	
0...+50 °C	40 ms
-25...+75 °C	0...+50 °C
± 6 mm	-25...+75 °C
	30 Hz
	yes/yes
IP 67	IP 67
PBT	PBT
PBT	PBT
PUR cable	PUR cable
12x0.18 mm ²	12x0.18 mm ²



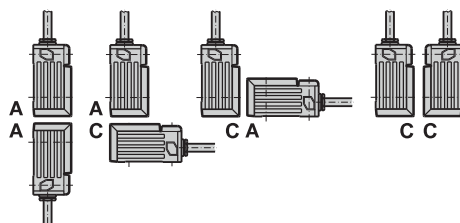
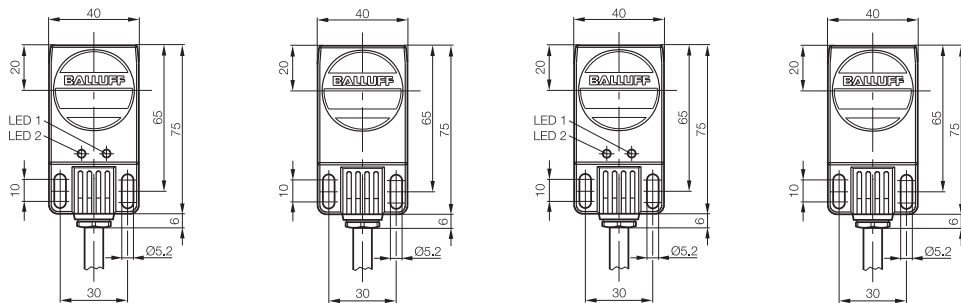
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- IO-Link, unidirectional
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Connection for max. 8 sensors

Size	40x75x40 mm	40x75x40 mm	40x75x40 mm	40x75x40 mm
Working range	8 mm		8 mm	
Installation	non-flush	non-flush	non-flush	non-flush
Remote PNP 5 m cable	BIC0021		BIC0022	
Base PNP 5 m cable		BIC0026		BIC0027
Supply voltage U_B , including ripple		24 V DC $\pm 10\%$		24 V DC $\pm 10\%$
Rated operating current I_e		≤ 1.2 A		≤ 1.2 A
No-load supply current I_0 max.		≤ 500 mA		≤ 500 mA
Max. current load per output		≤ 50 mA		≤ 50 mA
Short-circuit protected		yes		yes
Remote output voltage	12 ± 1.5 V DC		12 ± 1.5 V DC	
Power supply, continuous output current	≤ 200 mA		≤ 200 mA	
Rated insulation voltage U_i	75 V DC		75 V DC	
Operational readiness		20 ms		20 ms
Ambient temperature T_a	0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
Storage temperature	-25...+75 °C	-25...+75 °C	-25...+75 °C	-25...+75 °C
Offset	± 3 mm		± 3 mm	
Switching frequency f		60 Hz		60 Hz
Function/supply voltage indicator		yes/yes		yes/yes
Tightening torque	40 Nm	40 Nm	40 Nm	40 Nm
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing material	Al	Al	Al	Al
Material of sensing face	ABS/PBT	ABS/PBT	ABS/PBT	ABS/PBT
Connection	PUR cable	PUR cable	PUR cable	PUR cable
No. of wires x conductor cross-section	9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²

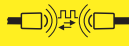


Select between versions **A** or **C**
Version A: sensing surface, front
Version B: sensing surface, side

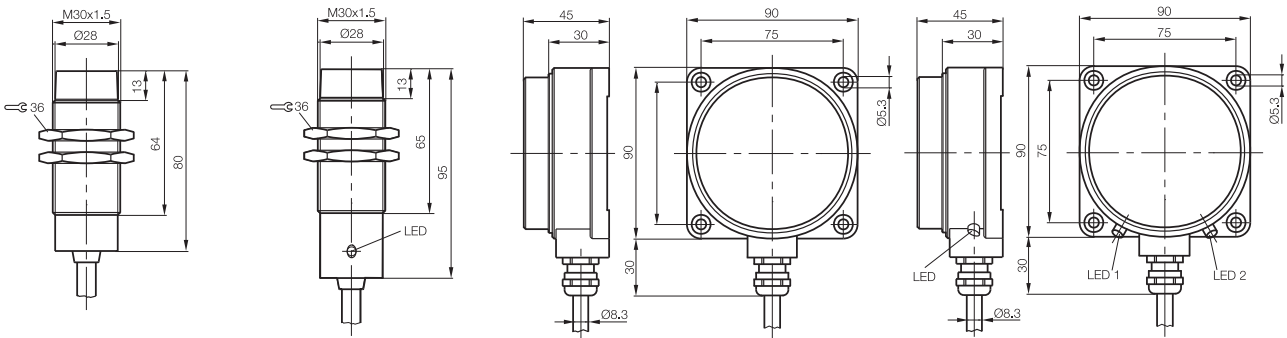


Connection for max. 8 sensors

M30x1.5	M30x1.5	90x90x45 mm	90x90x45 mm
5 mm		4...12 mm	
non-flush	non-flush	non-flush	non-flush
BIC0045	BIC0048	BIC0023	BIC0028
	24 V DC ±10%		24 V DC ±5 %
	≤ 1 A		≤ 1.5 A
	≤ 400 mA		≤ 800 mA
	≤ 50 mA		≤ 50 mA
	yes		yes
12 ±1.5 V DC		24 ±1.5 V DC	
≤ 150 mA		≤ 300 mA	
75 V DC		75 V DC	
	20 ms		20 ms
0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
-25...+75 °C	-25...+75 °C	-25...+75 °C	-25...+75 °C
±3 mm		±6 mm	
	60 Hz		60 Hz
	yes/no		yes/yes
40 Nm	40 Nm		
IP 67	IP 67	IP 67	IP 67
Nickel-plated CuZn	Nickel-plated CuZn	Al	Al
ABS/PBT	PA 12	ABS/PBT	ABS/PBT
PUR cable	PUR cable	PUR cable	PUR cable
9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²



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Send signals in both directions

BIC bidirectional is the coupler system for four sensor signals and four actuator control signals.

The bidirectional system transmits signals inductively in both directions. The remote unit can now be used for controlling individual sensors and clamping units.

From the stationary side base, up to four signals can be transmitted, and four channels can be independently controlled.



Size
Working range
Installation
Remote PNP, 5 m cable
Base PNP, 5 m cable
Supply voltage U_s , including ripple
Rated operating current I_o
No-load supply current I_o max.
Max. current load per output
Short-circuit protected
Output voltage
Power supply, continuous output current
Rated insulation voltage U_i
Operational readiness
Ambient temperature T_a
Storage temperature
Offset
Switching frequency f
Function/power-on indicator
Enclosure rating per IEC 60529
Housing material
Material of sensing face
Connection
Number of conductors × conductor cross-section

Inductive Couplers
Bidirectional
Four sensor signals and four actuator signals

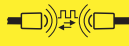
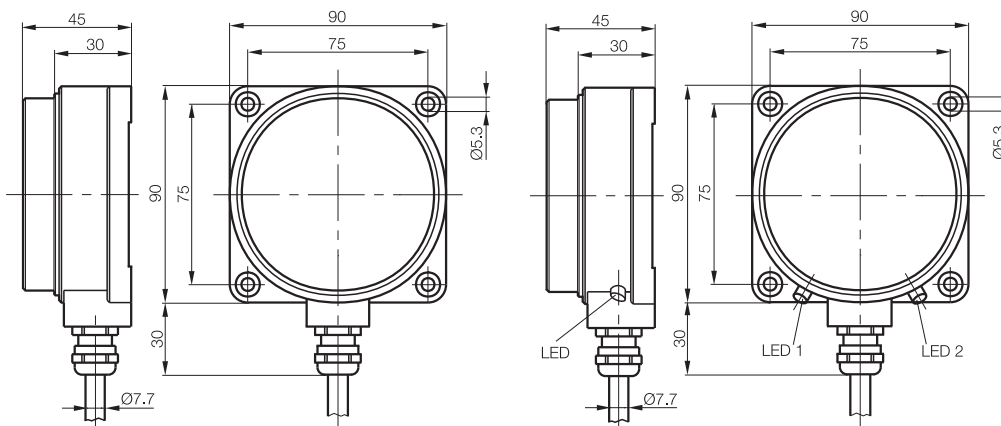


Connection for max. 4 sensors + 4 actuators

90x90x45 mm	90x90x45 mm
3...10 mm	
non-flush	non-flush
BIC0039	BIC003C
	24 V DC ±10%
	≤ 1.5 A
	≤ 800 mA
	≤ 50 mA
	yes
24 ±1.5 V DC	
≤ 300 mA	
75 V DC	
0...+50 °C	30 ms
-25...+75 °C	0...+50 °C
±7 mm	-25...+75 °C
	40 Hz
	yes/yes
IP 67	IP 67
Al	Al
ABS/PBT	ABS/PBT
PUR cable	PUR cable
9x0.18 mm ² + 2x0.5 mm ²	9x0.18 mm ² + 2x0.5 mm ²

The remote is attached on the moving side where the sensors and actuators are located.

The base is connected to the power supply and the controller on the stationary side.



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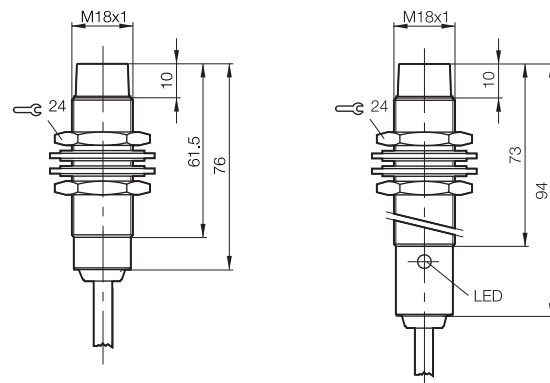
Remote – detect moving components

Digital signals are not the only signal that can be transmitted inductively, now analog signals can be processed as well. The power for the analog displacement sensor from the BAW series (voltage output of 0...10 V DC) is provided inductively and, like the sensor's analog output signal, transmitted without contact.

This enables the use of BAW sensors in places such as moving machine tool components. The remote built into a rotating shaft reliably transmits the information to the base regardless of the rotational speed.



Size	M18x1	M18x1
Working range	2.5 mm	
Installation	non-flush	non-flush
Remote 5 m cable	BIC0043	
Base 5 m cable		BIC0046
Supply voltage U_B incl. ripple		24 V DC $\pm 5\%$
No-load supply current I_0 max.		≤ 150 mA
Output signal		0...10 V DC
Short-circuit protected		yes
Signal input	0...10 V DC	
Load resistance R_L	≥ 2 k Ω	
max. non-linearity	$\leq \pm 0.8\%$ of U_a max.	
Resolution	$\leq \pm 0.05$ V DC	$\leq 0.1\%$
Temperature drift	$\leq \pm 0.04\%/^{\circ}\text{C}$	
Power supply, continuous output current	≤ 10 mA	
Rated insulation voltage U_i	75 V DC	
Operational readiness		200 ms
Ambient temperature T_a	0...+60 $^{\circ}\text{C}$	0...+60 $^{\circ}\text{C}$
Storage temperature	-25...+75 $^{\circ}\text{C}$	-25...+75 $^{\circ}\text{C}$
Offset	± 2 mm	
Switching frequency f		25 Hz
Function/power-on indicator		yes/yes
Tightening torque	40 Nm	40 Nm
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn
Material of sensing face	ABS/PBT	ABS/PBT
Connection	PUR cable	PUR cable
Number of conductors \times conductor cross-section	3 \times 0.34 mm ²	3 \times 0.34 mm ²



Examples of compatible inductive distance sensors

	Size	Output signal	Linear range S _I
BAW M08EI-UAD15B-	M8 \times 1	0...10 V	0.5...1.5 mm
BAW M12MG2-UAC20B-	M12 \times 1	0...10 V	0.5...2.0 mm
BAW M12MF2-UAC40F-...	M12 \times 1	0...10 V	1.0...4.0 mm
BAW002K	M18 \times 1	0...10 V	1.0...5.0 mm
BAW M18ME-UAC50B-...	M18 \times 1	0...10 V	1.0...5.0 mm
BAW002C	M18 \times 1	0...10 V	2.0...8.0 mm
BAW002W	M30 \times 1.5	0...10 V	2.0...10.0 mm

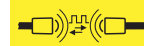
See Linear Position Sensing and Measurement brochure

Remote – non-contact transmission of temperature values

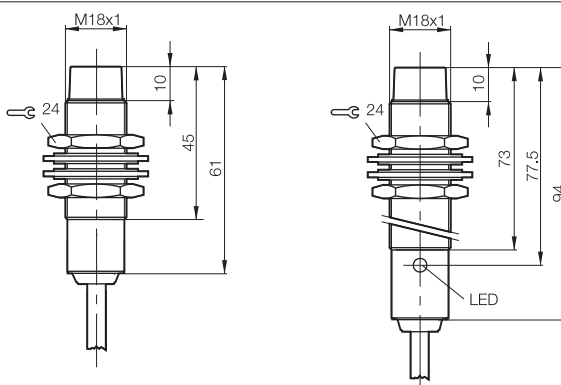
Thermal remote systems are compatible with PT100 thermocouples for sensing temperature on moving components even while they are being processed. The thermocouple detects the temperature of the object and changes its resistance value, which is processed by the remote. The digitized information is passed to the base. The latter converts the digital values into an analog signal (4...20 mA) and provides it to the external controller.



Size	M18x1	M18x1
Working range	1...4 mm	
Installation	non-flush	non-flush
Remote 5 m cable	BIC0041	
Remote 5 m cable	BIC004C	
Base 5 m cable		BIC0047
Supply voltage U_B incl. ripple		24 V DC $\pm 5\%$
Rated operating current I_B		≤ 200 mA
No-load supply current I_0 max.		≤ 150 mA
Output signal		4...20 mA
Short-circuit protected		yes
Temperature measuring range	0...+100 °C (BIC0041) 0...+300 °C (BIC004C)	
Load resistance R_L		$\leq 400 \Omega$
Measurement deviation		$\leq \pm 0.8\%$ of I_a max.
Delay time	0.5 s	
Temperature drift		$\leq \pm 0.04\%/^{\circ}\text{C}$
Rated insulation voltage U_i	75 V DC	
Operational readiness		2 s
Ambient temperature T_a	0...+60 °C	0...+60 °C
Storage temperature	-25...+75 °C	-25...+75 °C
Offset	± 2.5 mm	
Switching frequency f		25 Hz
Function/power-on indicator		yes/yes
Tightening torque	20 Nm	20 Nm
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	Nickel-plated CuZn	Nickel-plated CuZn
Material of sensing face	ABS/PBT	ABS/PBT
Connection	PUR cable	PUR cable
Number of conductors x conductor cross-section	3x0.3 mm ²	3x0.3 mm ²



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Compatible PT100 thermocouples

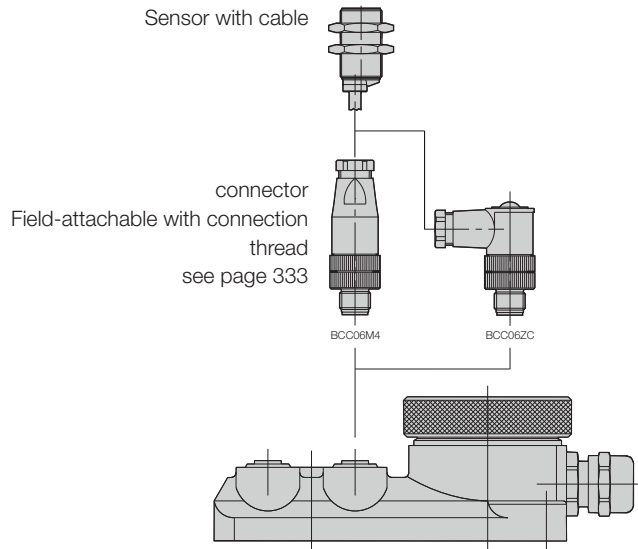
If required, Thermocouple with temperature measuring ranges of 0...+100 °C and 0...+300 °C used in conjunction with the corresponding remote.

Remote

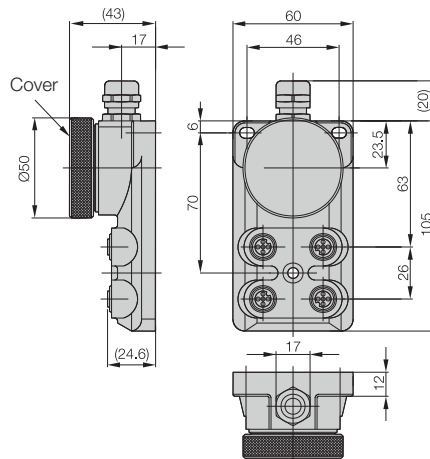
	Temperature measuring range
BIC0041	0...+100 °C
BIC004C	0...+300 °C

Easy to connect

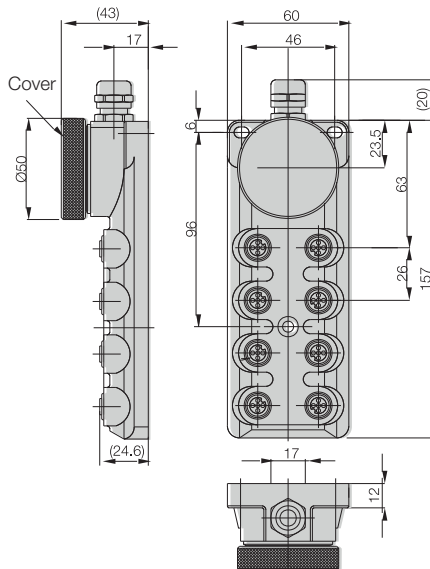
Rugged splitter boxes for easily connecting the sensors to the remote with cable outlet.
The remote sensor is connected using a terminal block with spring clamps – no screws required.
The sensors are connected using standard M12 connectors.



Splitter
BPI0069
BPI 4M4A40-2M-IC-THF7



Splitter
BPI006C
BPI 8M4A40-2M-IC-THFC





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For maximum flexibility –

Non-contact power transmission and reliable data transfer

Inductive couplers are at their best whenever modules that route signals have to be able to be disconnected quickly and connected correctly. The ability to disconnect units quickly allows you to implement new requirements with the utmost flexibility in almost no time. Power and signals are transmitted over the air gap reliably, quickly and with exceptional performance.

Retrofitting is simple: BIC is plug-and-play. Your maintenance costs are reduced to a minimum. Cable breaks and mechanical wear are a thing of the past. The IO-Link connection enables linking to the bus world.

The best solutions for the application can be selected from various performance classes in a compact design.



Function indicators visible from all angles

IP 67 degree of protection

Simple plug connection with Balluff connectors BCC

Large working range of 0...5 mm



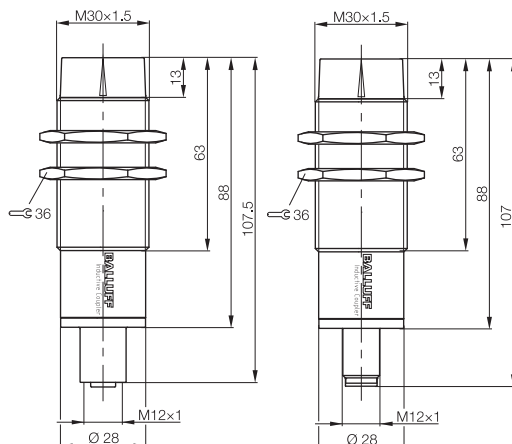
Uni-Standard with 0.5 A power and 8 PNP signals

50 mA power and 2 PNP signals

Size	M30x1.5	M30x1.5	M12x1	M12x1
Working range	0...5 mm	0...5 mm	0...2 mm	0...2 mm
Installation	non-flush	non-flush	non-flush	non-flush
	BIC000A	BIC0009	BIC0078	BIC0077
Supply voltage U_B incl. ripple		24 V DC $\pm 10\%$		24 V DC $\pm 10\%$
Rated operating current I_o		max. 1 A		300 mA
No-load supply current I_o max.		100 mA		100 mA
Max. current load per output		50 mA		35 mA
Short-circuit protected	yes	yes		yes
Remote output voltage	24 V DC $\pm 5\%$		24 V DC $\pm 10\%$	
Power supply, continuous output current	500 mA		50 mA	
Rated insulation voltage U_i	150 V DC/125 V AC	150 V DC/125 V AC		
Operational readiness	< 100 ms		< 100 ms	
Ambient temperature T_a	0...+55 °C	0...+55 °C	-10...+50 °C	
Storage temperature	-25...+75 °C	-25...+75 °C	-20...+60 °C	
Offset	± 4 mm		± 2 mm	
Switching frequency f	40 Hz	40 Hz	60 Hz	
Function/power-on indicator	yes/yes	yes/yes	no/no	yes/yes
Tightening torque	70 Nm	70 Nm	15 Nm	15 Nm
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67	IP 67
Housing material	CuZn coated	CuZn coated	CuZn coated	CuZn coated
Material of sensing face	PC	PC	Plastic, PA30	Plastic, PA30
Connection	M12 connector, female, 12-pin	M12 connector, male, 12-pin	M12 pigtail, female 5-pin	M12 pigtail, male 5-pin



For suitable cables, see pages 310 and 346.





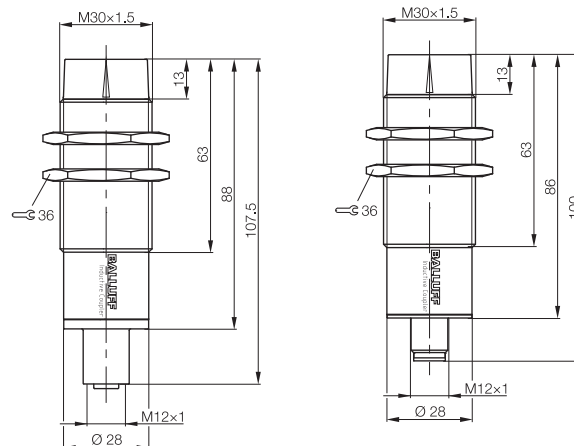
IO-Linkinterface 16 IN

Size	M30x1.5	M30x1.5
Working range	0...5 mm	0...5 mm
Installation	non-flush	non-flush
	BIC000E	BIC000C
Supply voltage U_s , including ripple		24 V DC $\pm 10\%$
Rated operating current I_o		max. 1 A
No-load supply current I_o max.		
Short-circuit protected	yes	yes
Remote output voltage	24 V DC $\pm 5\%$	
Power supply, continuous output current	500 mA	
Rated insulation voltage U_i	150 V DC/125 V AC	150 V DC/125 V AC
Operational readiness	< 100 ms	
Ambient temperature T_a	0...+55 °C	0...+55 °C
Storage temperature	-25...+75 °C	-25...+75 °C
Offset	± 4 mm	
Switching frequency f	IO-Link*	IO-Link*
Transmission distance		
Function/power-on indicator	yes/yes	yes/yes
Tightening torque	70 Nm	70 Nm
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	CuZn coated	CuZn coated
Material of sensing face	PC	PC
Connection	M12 connector, female, 5-pin	M12 connector, male, 4-pin



IO-Link	Version 1.0	Version 1.0
Transmission rate	38.4 kbaud	38.4 kbaud
Cycle time min.	3 ms	3 ms
Process data cycle	12 ms	12 ms
IO-Link process data length	3 input bytes (device)	4 output bytes
Frame type	1	1

Take advantage of the IO-Link connection, which allows up to 16 sensors per system and lets you connect to the fieldbus environment.



Together with analog hub



IO-Linkinterface 4x analog

M30x1.5	M30x1.5
0...5 mm	0...5 mm
non-flush	non-flush
BIC0054	BIC0053
	24 V DC ±10%
	max. 1 A
yes	yes
24 V DC ±5 %	
500 mA	
150 V DC/125 V AC	150 V DC/125 V AC
< 100 ms	
0...+55 °C	0...+55 °C
-25...+75 °C	-25...+75 °C
±4 mm	
IO-Link*	IO-Link*
yes/yes	yes/yes
70 Nm	70 Nm
IP 67	IP 67
CuZn coated	CuZn coated
PC	PC
M12 connector, female, 5-pin	M12 connector, male, 4-pin



IO-Link

40x40x63 mm	40x40x63 mm
1 mm...5 mm	1 mm...5 mm
BIC005C	BIC005A
	24 V DC ±10%
	1000 mA
	100 mA
yes	yes
24 V DC ±5 %	
500 mA	
< 100 ms	
-5...+55 °C	-5...+55 °C
-25...+70 °C	-25...+70 °C
0...5 mm	0...5 mm
yes/yes	yes/yes
IP 67	IP 67
PBTP	PBTP
PBTP	PBTP
M12 connector, female, 5-pin, A-coded	M12 connector, male, 4-pin, A-coded

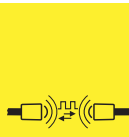
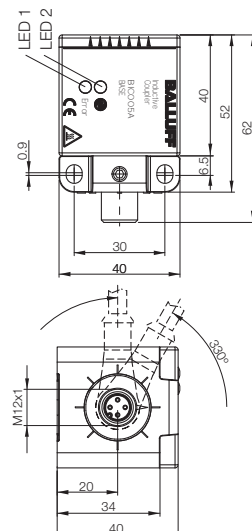
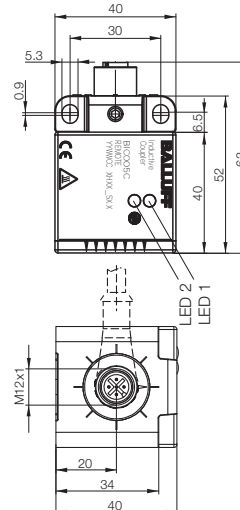
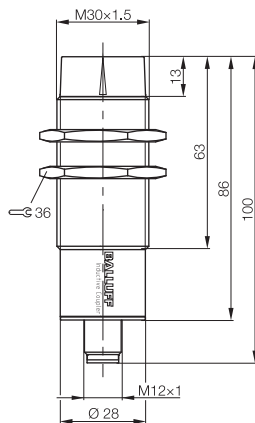
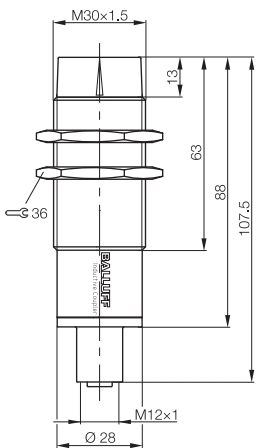


Version 1.0

38.4 kbaud	38.4 kbaud
3 ms	3 ms
33 ms	33 ms
10 input bytes (device)	14 output bytes
1	1

Version 1.0

38.4 kbaud	38.4 kbaud
3 ms	3 ms
	12 ms at minimum cycle time
3 input bytes (device)	4 output bytes
1	1



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Send signals in both directions

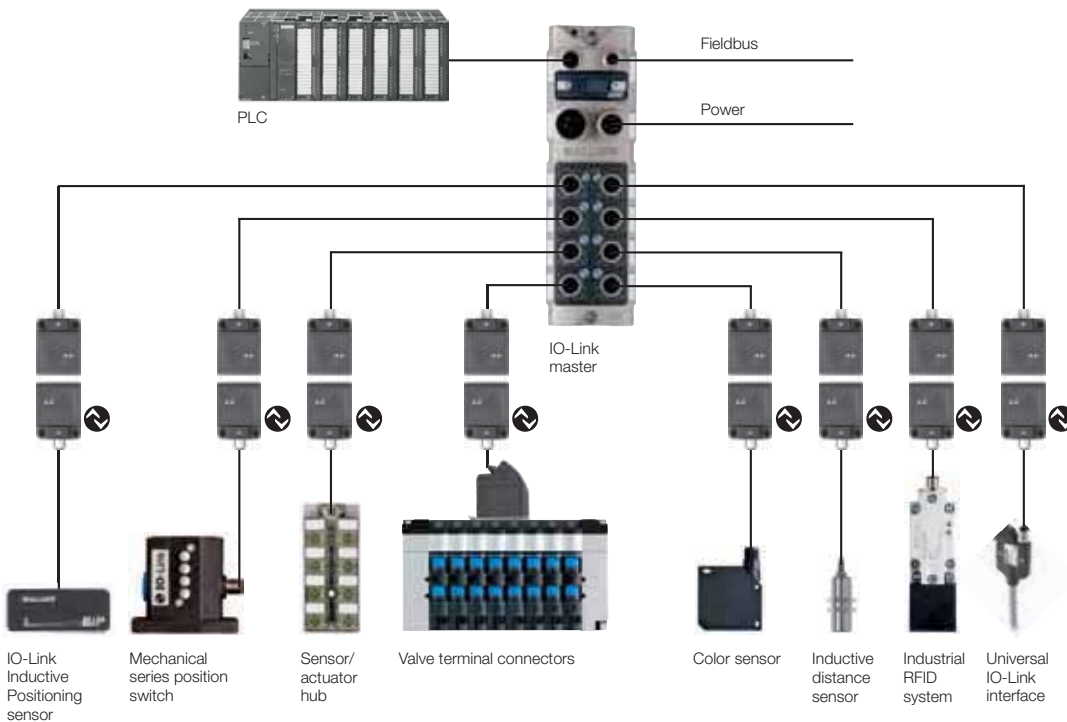
Inductive couplers make mechanical plug-in contacts unnecessary, because energy and data can be transmitted without contact via an air gap. The data can be sent in both directions if the new bidirectional coupling system in the 40x40 Unicomact housing with IO-Link is used.

The contactless data transmission with IO-Link standard has a transparent structure. This means the BIC system behaves "invisibly" and does not have to be configured. To install, simply integrate between IO-Link master and device and communicate immediately (contact-free). Regardless of the IO-Link revision status, the system has a full-fledged IO-Link interface. Events, parameter data and process data are directly exchanged between master and device.

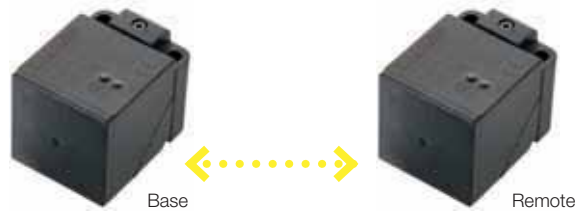
Mechanically disconnected and electrically connected:

BIC bidirectional – the contactless IO-Link interface

- Simultaneous activation of actuators and collection of sensor signals
- AUX power for actuators can be switched on and off
- Simplest installation via plug and work
- IO-Link functionality up to the device
- Flexible process data length

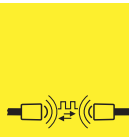


The new BIC Q40 bidirectional establishes a contactless connection between each IO-Link device and the master.



IO-Link

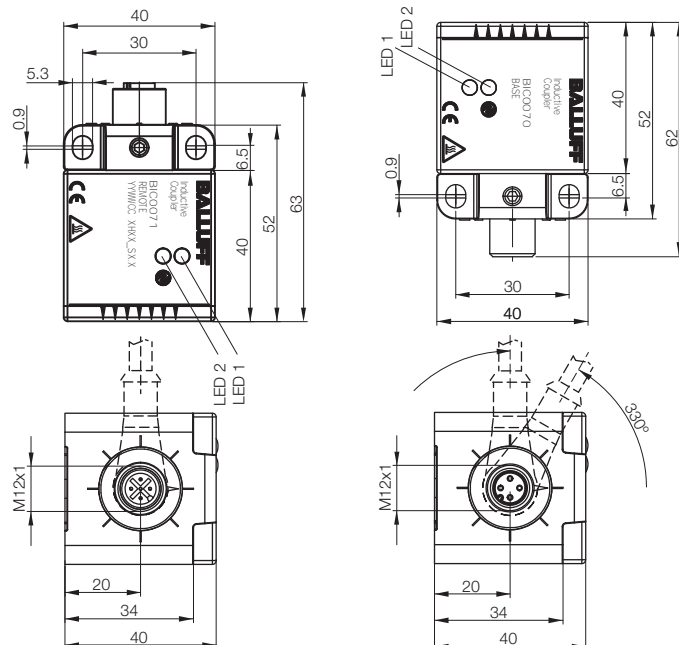
	BIC0070	BIC0071
Size	40x40x63 mm	40x40x63 mm
Working range	1...5 mm	1...5 mm
	BIC0070	BIC0071
Reliable offset	±5 mm	±5 mm
Transfer voltage	24 V	24 V
Continuous output current remote	500 mA	
Transferable output	12 W	12 W
Supply voltage U_B , including ripple	24 V DC ±10%	
Rated operating current I_e	1 A	
No-load supply current I_0 max.	100 mA	
Max. current load per output		1000 mA
Short-circuit protected	yes	yes
Remote output voltage		24 V DC ±5 %
Power supply, continuous output current		500 mA
Ambient temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+70 °C	-25...+70 °C
Transmission distance	0...5 mm	0...5 mm
Function/power-on indicator	yes/yes	yes/yes
Weight	Approx. 160 g	Approx. 160 g
Enclosure rating per IEC 60529	IP 67	IP 67
Housing material	PBTP	PBTP
Material of sensing face	PBTP	PBTP
Connection	M12 connector, male, 4-pin, A-coded	M12 connector, female, 5-pin, A-coded
IO-Link	Version 1.1	Version 1.1
Transmission rate	COM 2	COM 2
Min. cycle time	depends on IO-Link device	depends on IO-Link device
IO-Link process data length	1...32 byte	1...32 byte
SIO MODE	no	no



Inductive Couplers
Overview
Applications
Programmable cams
Detectors
Couplers for detectors
Unidirectional
Bidirectional
Radial system
Analog, unidirectional
Single thermal
Terminal boxes
Power and signals
Uni-Standard
IO-Link, unidirectional
IO-Link Bidirectional
Power only
Topology

Benefits

- Simultaneous activation of actuators and collection of sensor signals
- AUX power for actuators can be switched on and off
- Simplest installation via plug and work
- Transparent communication
- IO-Link functionality up to the device
- Flexible adaptation of process data length to the IO-Link device
- Full IO-Link diagnosis functionality
- Switching off of power if the remote is uncoupled



Your advantages – when only power is being transmitted

- Simple connection, quick startup
- Wear-free
- Robust, even in harsh environments





Size
Working range
Installation
Supply voltage U_B , including ripple
Rated operating current I_e
No-load supply current I_0 max.
Short-circuit protected
Remote output voltage
Power supply, continuous output current
Rated insulation voltage U_i
Operational readiness
Ambient temperature T_a
Storage temperature
Offset
Switching frequency f
Function/power-on indicator
Tightening torque
Enclosure rating per IEC 60529
Housing material
Material of sensing face
Connection

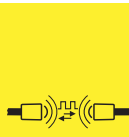
Retrofitting is simple – Plug-and-Work lets you quickly install BIC. Your maintenance costs are reduced to a minimum since cable breaks and mechanical wear become a thing of the past.



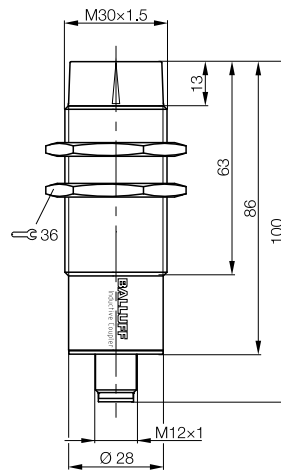
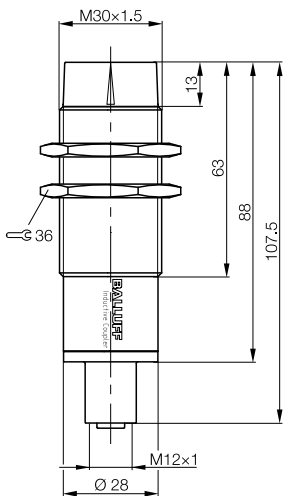


Power only with 0.5 A of power

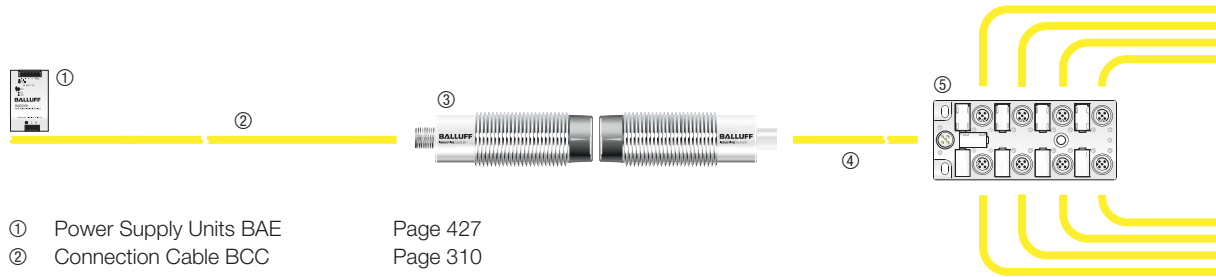
M30x1.5	M30x1.5
0...5 mm	0...5 mm
non-flush	non-flush
BIC0008	BIC0007
	24 V DC ±10%
	max. 1 A
	100 mA
yes	yes
24 V DC ±5 %	
500 mA	
150 V DC/125 V AC	150 V DC/125 V AC
< 100 ms	
0...+55 °C	0...+55 °C
-25...+75 °C	-25...+75 °C
±4 mm	
10 Hz	10 Hz
yes/yes	yes/yes
70 Nm	70 Nm
IP 67	IP 67
CuZn coated	CuZn coated
PC	PC
M12 connector, female, 5-pin	M12 connector, male, 4-pin
	



- Inductive Couplers
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- Applications
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- Couplers for detectors
- Unidirectional
- Bidirectional
- Radial system
- Analog, unidirectional
- Single thermal
- Terminal boxes
- Power and signals
- Uni-Standard
- IO-Link, unidirectional
- IO-Link Bidirectional
- Power only**
- Topology

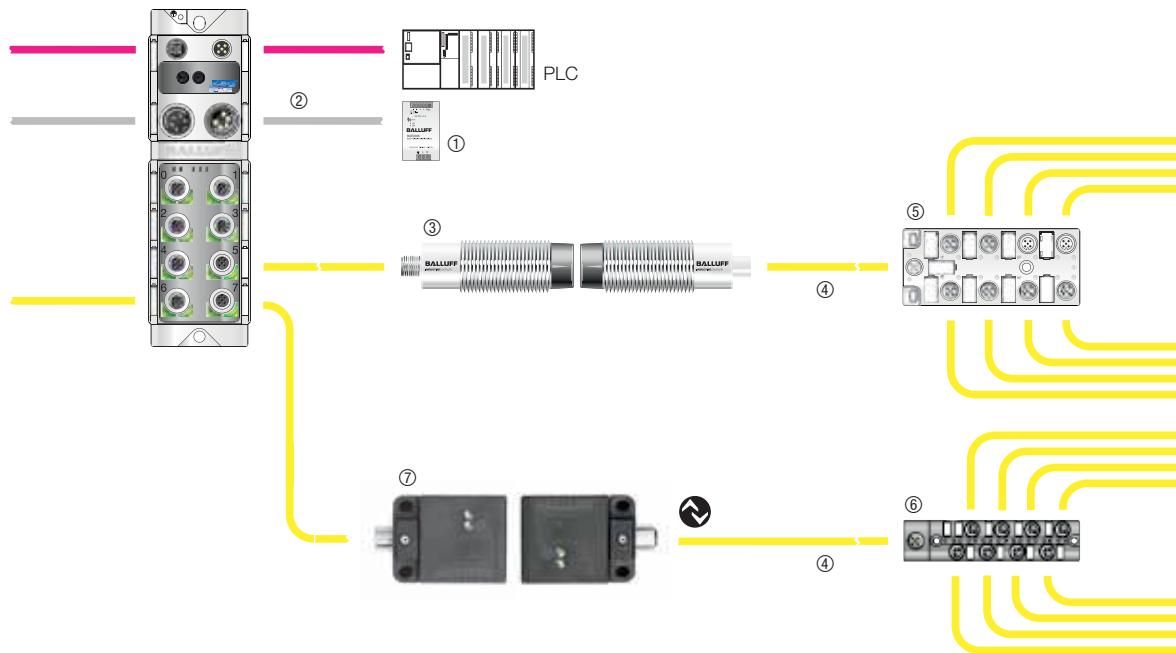


Uni-Standard inductive coupler BIC – 0.5 A power and 8 signals



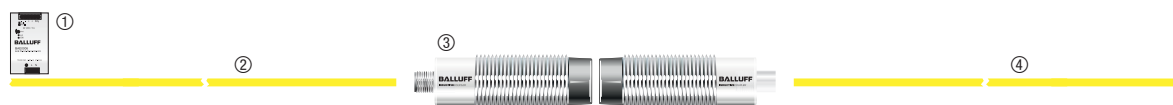
- | | | |
|---|------------------------------|---------------|
| ① | Power Supply Units BAE | Page 427 |
| ② | Connection Cable BCC | Page 310 |
| ③ | Inductive Coupler BIC – Base | Page 237 |
| ④ | Connection Cable BCC | Page 310, 346 |
| ⑤ | Passive Splitter Box BPI | Page 247 |

Inductive coupler BIC – IO-Linkconnection, 0.5 A power and 8 or 16 signals (depending on the sensor hub)



- | | | |
|---|---------------------------|----------|
| ① | Power Supply Units BAE | Page 427 |
| ② | Power Cable 7/8" BCC | Page 350 |
| ③ | Inductive Coupler BIC | Page 238 |
| ④ | Connection Cable BCC | Page 318 |
| ⑤ | M12 Sensor Hub BNI | Page 150 |
| ⑥ | M8 Sensor Hub BNI | Page 138 |
| ⑦ | Inductive Coupler BIC Q40 | Page 241 |

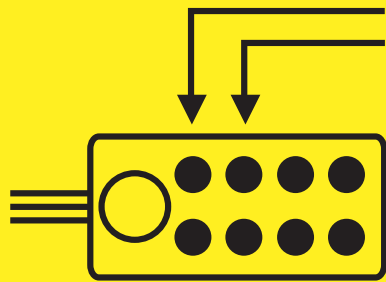
Power only inductive coupler BIC – 0.5 A of power



- | | | |
|---|------------------------|----------|
| ① | Power Supply Units BAE | Page 427 |
| ② | Connection Cable BCC | Page 318 |
| ③ | Inductive Coupler BIC | Page 243 |
| ④ | Connection Cable BCC | Page 318 |



- Inductive Couplers
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- Bidirectional
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- Terminal boxes
- Power and signals
- Uni-Standard
- IO-Link, unidirectional
- IO-Link Bidirectional
- Power only
- Topology**

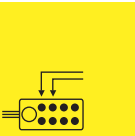


Passive Splitters



Product Topology		248
Passive splitters		
M8	3-pin, 4-pin	250
M12	4-pin, 5-pin	252
Passive Interface Splitters		
M12	4-pin	256
M12	5-pin	258

Passive splitters



Balluff Passive Interface BPI units connect sensors and actuators to the controller. They are especially ideal for harsh conditions and come highly recommended for situations where coolants and lubricants are used. Metal screw inserts ensure optimum media resistance. Fully potted housing provides a higher degree of protection as well as better shock and vibration resistance characteristics.

Through excellent design, Balluff Passive Interface BPI units can be integrated into all systems and machines. Metal screw inserts also ensure improved fit of the connectors.

The BPI can be flexibly mounted on all standard profiles and base plates. The mounting holes are centrally positioned. Additional mounting holes allow you to mount the BPI on its side.

Flexible mounting is supported by the highly visible LED.

The full line of Balluff products includes all styles.

Balluff Passive Interface BPI — a multitasking solution, even under demanding conditions

- Outstanding design
- Fully potted housing
- High shock and vibration ratings
- Metal screw inserts
- Flexible mounting options

Passive splitters

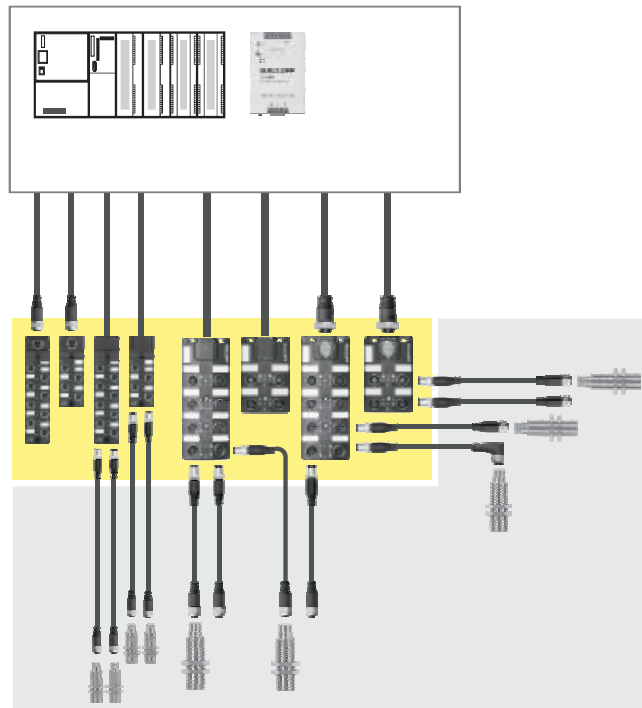
Lightweight and compact M8 and M12 plastic splitter boxes are used wherever space is limited or moving machine members are present. The plastic splitters come either complete or in modular form.

Features

- Customized, versatile and light, usable as M8 or M12 splitters
- Quick assembly and disassembly for transport
- Potential isolation using jumpers

Typical applications for the plastic version

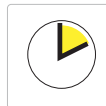
- Assembly and handling machines
- Packaging technology
- Specialty machine construction



Conventional splitter boxes or wiring directly in the control cabinet

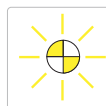
Use of passive splitter boxes

Assembly time



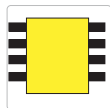
Machines, systems and connectivity components are divided into transportable sections and dismantled prior to delivery. **During commissioning, installation times are normally reduced by 60%.**

Info/ Feedback



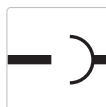
LEDs indicate the status of the system. **Fewer qualified employees are required.**

Dimension



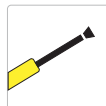
Usually smaller sizes.

Connection technology



The plug-in solution provides clear advantages.

Complexity



Connectors, sensors and other actuators are easy to replace. **Downtimes are reduced.**

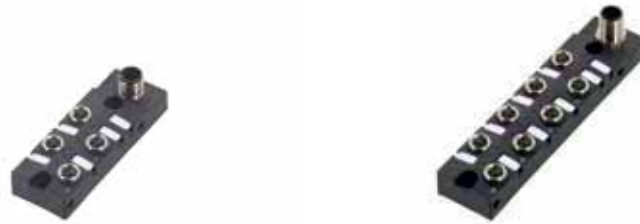
Service personnel



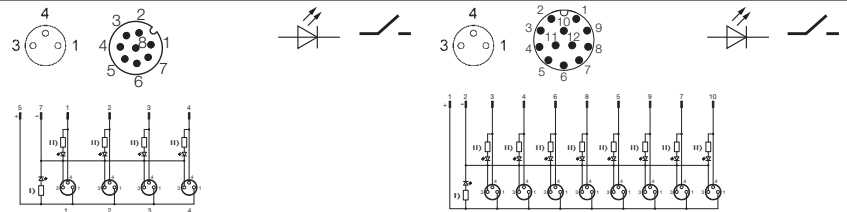
Fewer qualified employees are required to maintain the machine.



You can significantly reduce your installation and maintenance costs with Balluff splitters.

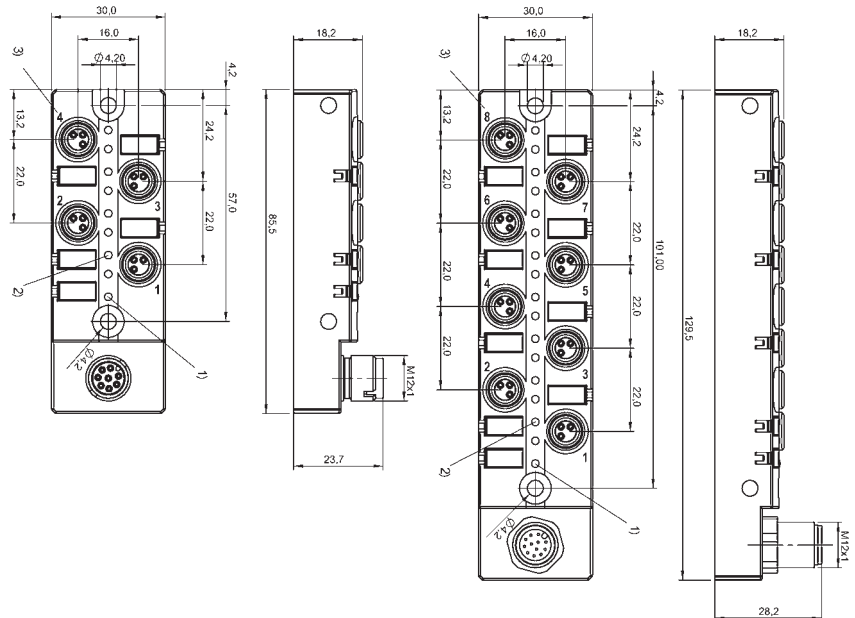


View of female/
male side



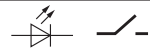
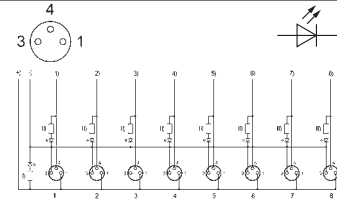
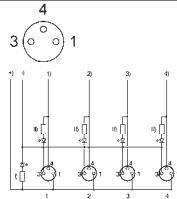
Type	4-way BPI003P	8-way BPI003T
Rated operating voltage U_o	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Power-on indicator (LED)	1 × (PNP), green	1 × (PNP), green
Indicator switching function (LED)	4 × (PNP), yellow	8 × (PNP), yellow
Sensor connection	3-pin female, M8×1	3-pin female, M8×1
Controller connection	8-pin connector, M12×1	12-pin connector, M12×1
Number of sockets	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Ambient temperature T_a	-5...+60 °C	-5...+60 °C
Use	Normally open (NO)	Normally open (NO)

Passive splitters
Product
Topology
Passive
Splitters
M8
Passive
Splitters
M12
Passive interface
splitters
M12

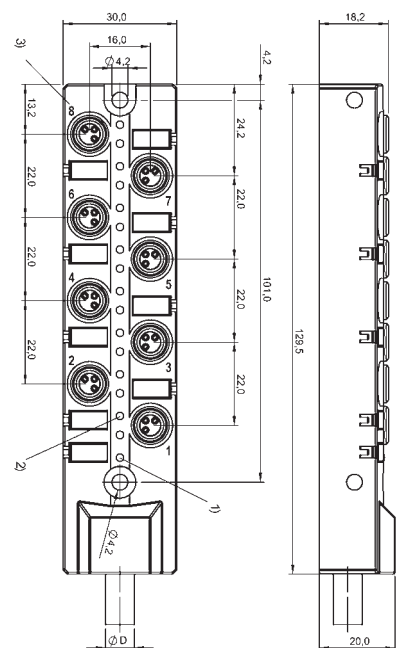
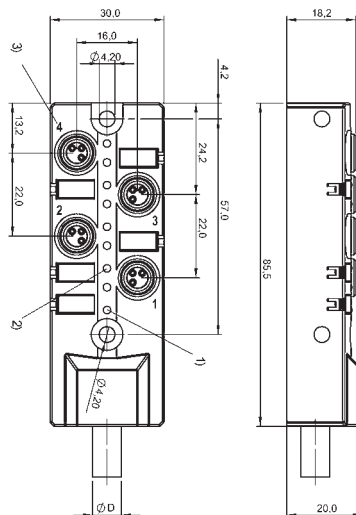




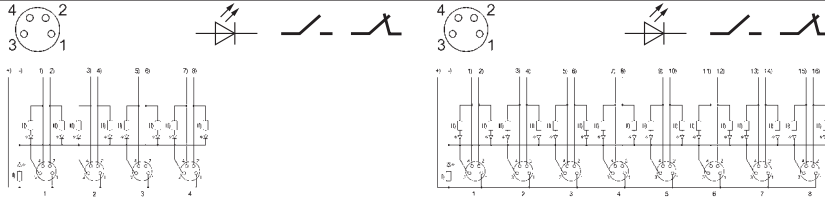
View of female/
male side



Type	4-way		8-way	
PUR, black	3 m	BPI002N	BPI0030	
PUR, black	5 m	BPI002P	BPI0031	
PUR, black	10 m	BPI002R	BPI0032	
PUR, black	15 m	BPI002T	BPI0033	
Rated operating voltage U_e	24 V DC		24 V DC	
Supply voltage U_B	10...30 V DC		10...30 V DC	
Power-on indicator (LED)	1x (PNP), green		1x (PNP), green	
Indicator switching function (LED)	4x (PNP), yellow		8x (PNP), yellow	
Sensor connection	3-pin female, M8x1		3-pin female, M8x1	
Controller connection	Permanently connected cable		Permanently connected cable	
Number of sockets	4		8	
Current load capacity	2 A		2 A	
Total current	6 A		6 A	
Housing material	PBT, GF		PBT, GF	
Enclosure rating per IEC 60529	IP 67 (when connected)		IP 67 (when connected)	
Ambient temperature T_a	-5...+60 °C		-5...+60 °C	
Use	Normally open (NO) ---		Normally open (NO) ---	



Passive splitters M8, 4-pin with cable



4-way

BPI0038

BPI0039

BPI003A

BPI003C

24 V DC

10...30 V DC

1x (PNP), green

8x (PNP), yellow

4-pin female, M8x1

Permanently connected cable

4

2 A

6 A

PBT, GF

IP 67 (when connected)

-5...+60 °C

Complementary (NO/NC)

8-way

BPI003K

BPI003L

BPI003M

BPI003N

24 V DC

10...30 V DC

1x (PNP), green

16x (PNP), yellow

4-pin female, M8x1

Permanently connected cable

8

2 A

6 A

PBT, GF

IP 67 (when connected)

-5...+60 °C

Complementary (NO/NC)



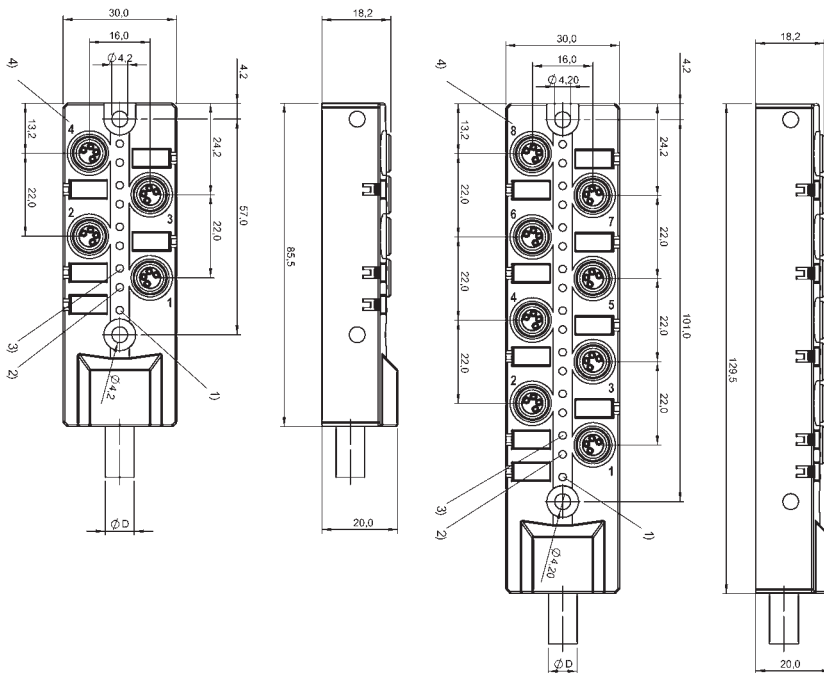
Passive splitters

Product
Topology

**Passive
Splitters
M8**

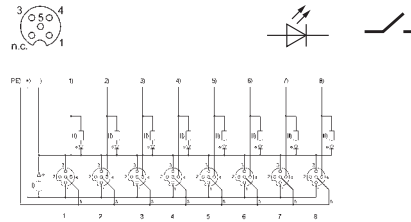
Passive
Splitters
M12

Passive interface
splitters
M12

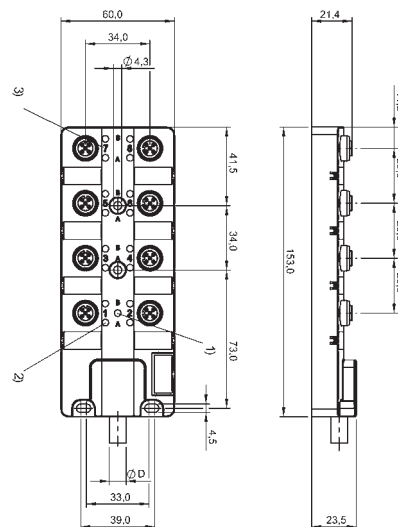




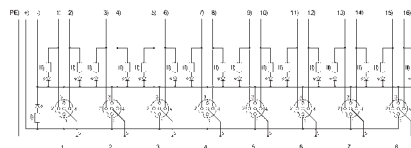
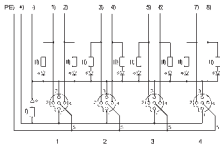
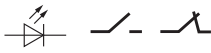
View of female/male side



Type	8-way	
PUR, black	3 m	BPI0059
PUR, black	5 m	BPI005A
PUR, black	10 m	BPI005C
PUR, black	15 m	BPI005E
Rated operating voltage U_e	24 V DC	
Supply voltage U_B	10...30 V DC	
Power-on indicator (LED)	1x (PNP), green	
Indicator switching function (LED)	8x (PNP), yellow	
Sensor connection	4-pin female, M12x1	
Controller connection	Permanently connected cable	
Number of sockets	8	
Current load capacity	2 A	
Total current	6 A	
Housing material	PBT, GF	
Enclosure rating per IEC 60529	IP 67 (when connected)	
Ambient temperature T_a	-5...+60 °C	
Use	Normally open (NO)	



Passive splitters M12, 5-pin with cable



4-way

BPI0049

BPI004A

BPI004C

BPI004E

24 V DC

10...30 V DC

1x (PNP), green

8x (PNP), yellow

5-pin female, M12x1

Permanently connected cable

4

2 A

6 A

PBT, GF

IP 67 (when connected)

-5...+60 °C

Complementary (NO/NC)

8-way

BPI004R

BPI004T

BPI004U

BPI004W

24 V DC

10...30 V DC

1x (PNP), green

16x (PNP), yellow

5-pin female, M12x1

Permanently connected cable

8

2 A

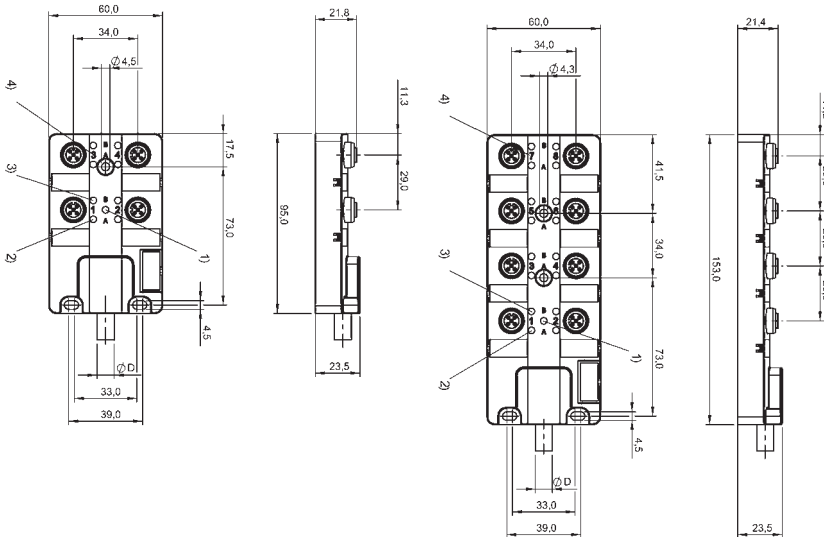
6 A

PBT, GF

IP 67 (when connected)

-5...+60 °C

Complementary (NO/NC)



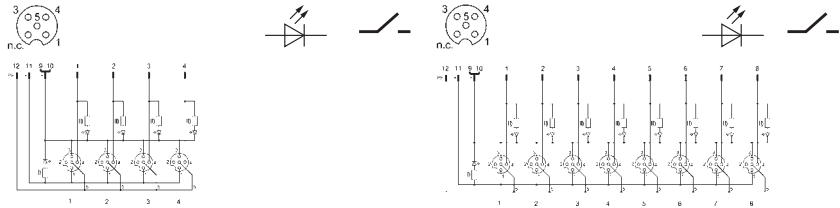
Passive splitters
Product
Topology
Passive
Splitters
M8
**Passive
Splitters
M12**
Passive interface
splitters
M12

Passive splitters

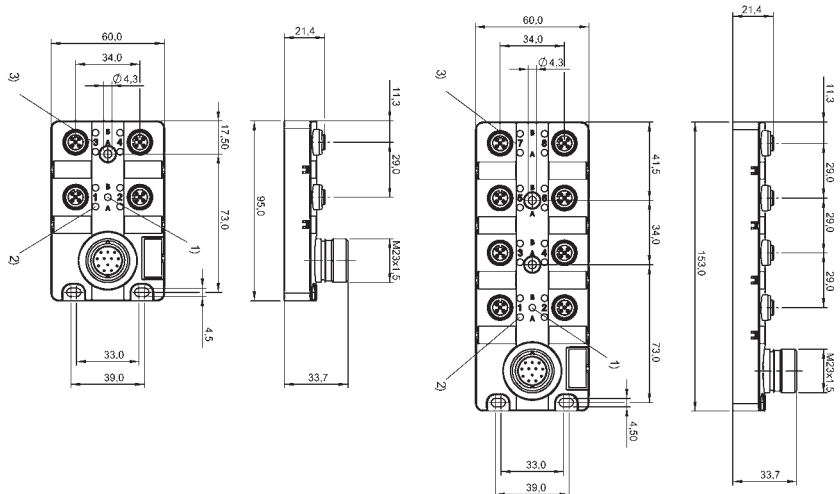
M12, 4-pin, with M23 plug connection



View of female/male side

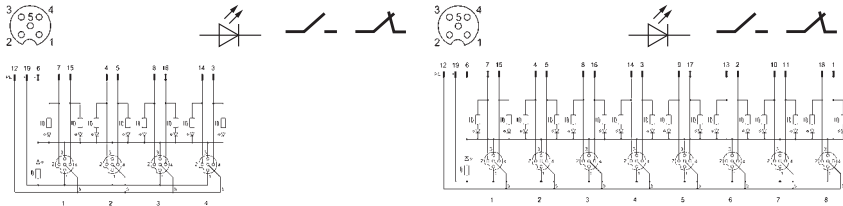


Type	4-way BPI004Y	8-way BPI0050
Rated operating voltage U_o	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Power-on indicator (LED)	1× (PNP), green	1× (PNP), green
Indicator switching function (LED)	4× (PNP), yellow	8× (PNP), yellow
Sensor connection	4-pin female, M12×1	4-pin female, M12×1
Controller connection	12-pin connector, M23	12-pin connector, M23
Number of sockets	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Ambient temperature T_a	-5...+60 °C	-5...+60 °C
Use	Normally open (NO) /-	Normally open (NO) /-



Passive splitters

M12, 5-pin, with M23 plug connection



4-way

BPI004Z

24 V DC
10...30 V DC
1× (PNP), green
8× (PNP), yellow
5-pin female, M12×1
19-pin connector, M23

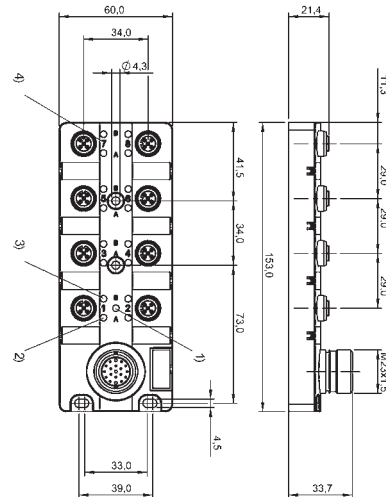
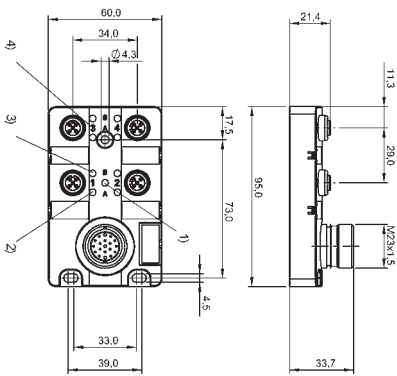
4
2 A
6 A
PBT, GF
IP 67 (when connected)
-5...+60 °C
Complementary (NO/NC)

8-way

BPI0051

24 V DC
10...30 V DC
1× (PNP), green
16× (PNP), yellow
5-pin female, M12×1
19-pin connector, M23

8
2 A
6 A
PBT, GF
IP 67 (when connected)
-5...+60 °C
Complementary (NO/NC)



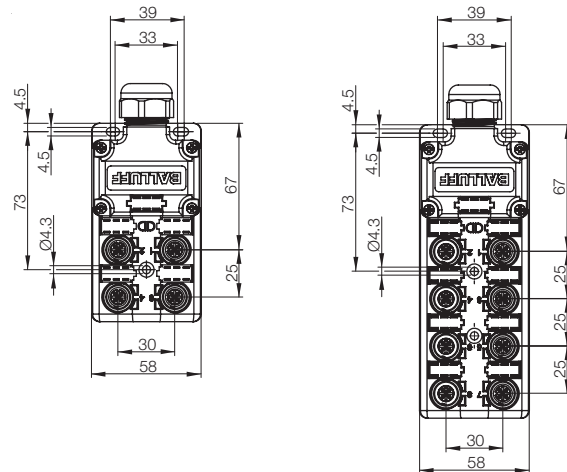
Passive splitters
Product
Topology
Passive
Splitters
M8
**Passive
Splitters
M12**
Passive interface
splitters
M12

In fully potted housing

The passive interface BPI connects sensors and actuators to the controller. It is especially ideal for harsh conditions and comes highly recommended for situations where coolants and lubricants are used. The fully potted housing provides a higher degree of protection as well as better shock and vibration resistance characteristics. Though excellent design, the passive interface BPI can be integrated in all systems and machines. The BPI can be flexibly mounted on all standard profiles and base plates. The mounting holes are centrally positioned. Flexible mounting is supported by highly visible LEDs. Setting up and adjusting your machines and systems is much easier as a result.



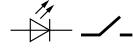
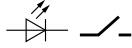
Type	4-way, M12	8-way, M12
	BPI007L	BPI007J
PUR, black	3 m	
PUR, black	5 m	
PUR, black	10 m	
PUR, black	15 m	
Rated operating voltage U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Power-on indicator (LED)	1× (PNP), green	1× (PNP), green
Indicator switching function (LED)	4× (PNP), yellow	8× (PNP), yellow
Sensor connection	4-pin female, M12×1	4-pin female, M12×1
Controller connection	Cap connection without cable	Cap connection without cable
Number of sockets	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Ambient temperature T_a	-25...+80 °C	-25...+80 °C
Use	Normally open (NO)	Normally open (NO)



Passive splitters
M12, 4-pin, with cap and cable



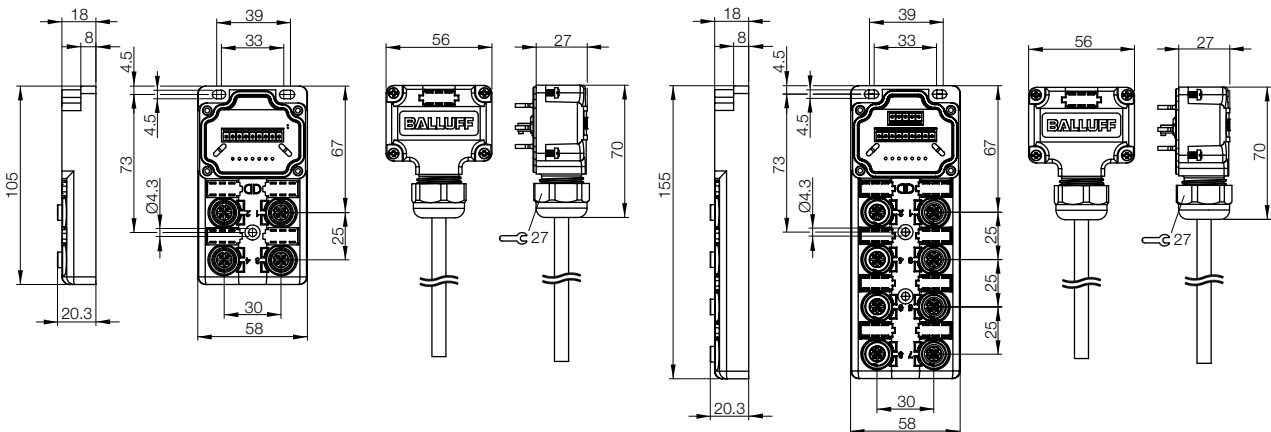
4-way, base 4-way, cap with cable 8-way, base 8-way, cap with cable



BPI007A	BPI007Z	BPI007E	BPI0083
	BPI0080		BPI0084
	BPI0081		BPI0085
	BPI0082		BPI0086
24 V DC		24 V DC	
10...30 V DC		10...30 V DC	
1× (PNP), green		1× (PNP), green	
4× (PNP), yellow		8× (PNP), yellow	
4-pin female, M12×1		4-pin female, M12×1	
Cap connection with/without cable	Cap connection with cable	Cap connection with/without cable	Cap connection with cable
4		8	
2 A		2 A	
6 A		6 A	
PBT, GF		PBT, GF	
IP 67 (when connected)		IP 67 (when connected)	
-25...+80 °C		-25...+80 °C	
Normally open (NO) —/—	for 4-way base, 4-pin	Normally open (NO) —/—	for 8-way base, 4-pin



Passive splitters
Product
Topology
Passive
Splitters
M8
Passive
Splitters
M12
Passive
Interface Splitters
M12



Passive splitters

M12, 5-pin, with cap and cable

Areas of application

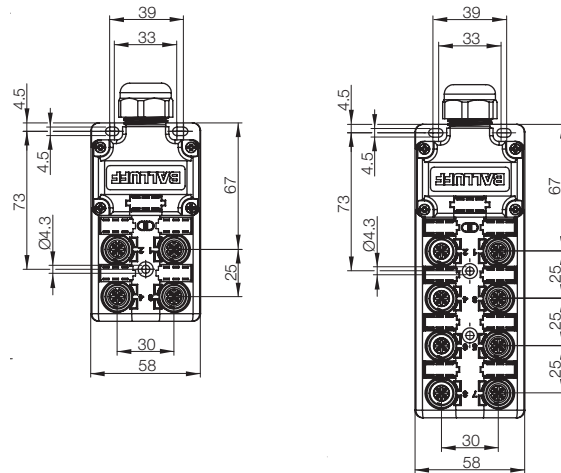
Passive splitter boxes are ideal for use in decentralized assembly and handling machine installations, packaging technology or special purpose machine manufacturing.

Balluff Passive Interface BPI – a multitasking solution, even under demanding conditions

- Outstanding design
- Fully potted housing
- High shock and vibration ratings
- Flexible mounting options
- High visibility of LEDs
- Large terminal compartment
- Modular design
- Quick to mount/detach for transportation



Type	4-way, M12	8-way, M12
	BPI007K	BPI007H
PUR, black	3 m	
PUR, black	5 m	
PUR, black	10 m	
PUR, black	15 m	
Rated operating voltage U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Power-on indicator (LED)	1× (PNP), green	1× (PNP), green
Indicator switching function (LED)	4× (PNP), yellow	8× (PNP), yellow
Sensor connection	5-pin female, M12×1	5-pin female, M12×1
Controller connection	Cap connection without cable	Cap connection without cable
Number of sockets	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Enclosure rating per IEC 60529	IP 67 (when connected)	IP 67 (when connected)
Ambient temperature T_a	-25...+80 °C	-25...+80 °C
Use	Complementary (NO/NC)	Complementary (NO/NC)





4-way, base



4-way, cap with cable



8-way, base



8-way, cap with cable

BPI007C

BPI007M
BPI007N
BPI007P
BPI007R

BPI007F

BPI007T
BPI007U
BPI007W
BPI007Y

24 V DC

10...30 V DC

1× (PNP), green

4× (PNP), yellow

5-pin female, M12×1

Cap connection with/without cable Cap connection with cable

4

2 A

6 A

PBT, GF

IP 67 (when connected)

-25...+80 °C

Complementary (NO/NC) for 4-way base, 5-pin

24 V DC

10...30 V DC

1× (PNP), green

8× (PNP), yellow

5-pin female, M12×1

Cap connection with/without cable Cap connection with cable

8

2 A

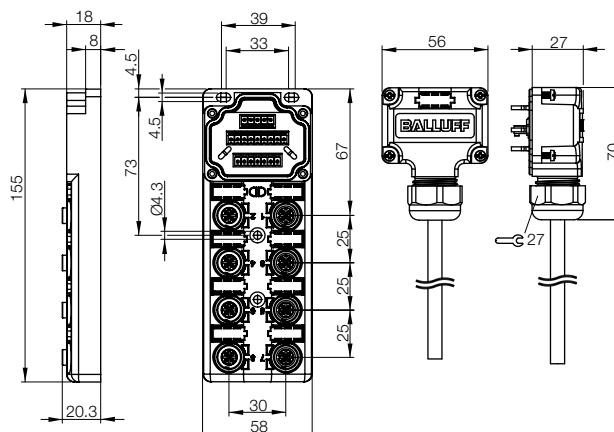
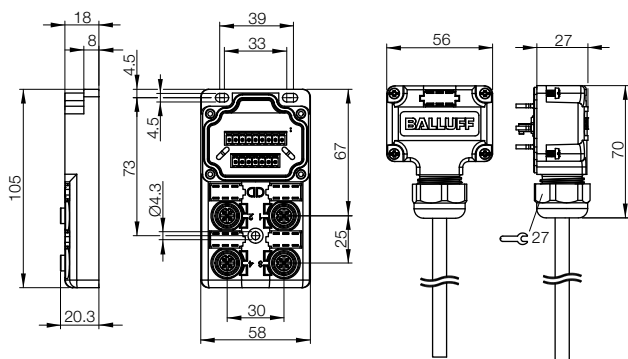
6 A

PBT, GF

IP 67 (when connected)

-25...+80 °C

Complementary (NO/NC) for 8-way base, 5-pin



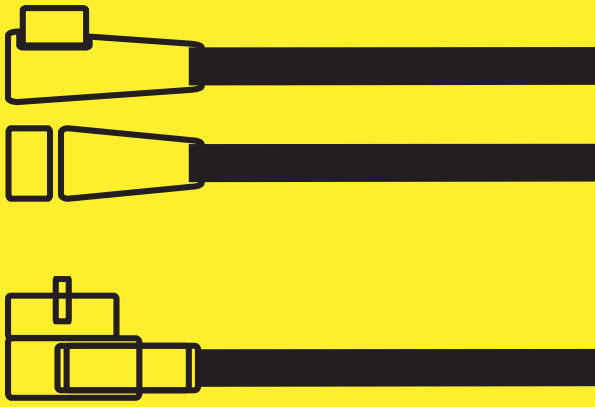
Passive splitters

Product
Topology

Passive
Splitters
M8

Passive
Splitters
M12

Passive
Interface Splitters
M12



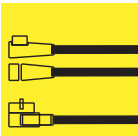
Connectors and Valve Connectors

Connectors and Valve Connectors

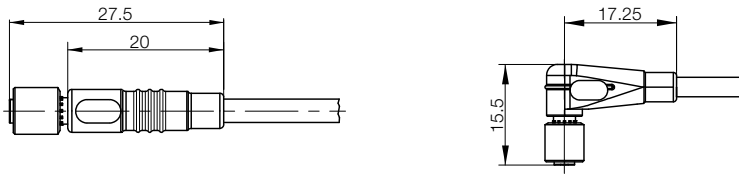




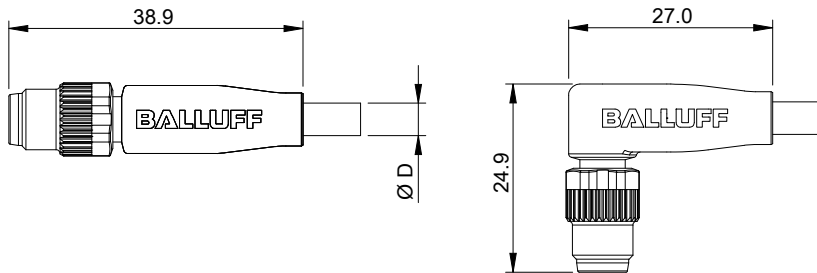
Dimensions	262
Connectors and Cables	
Connectors M5	266
Connection Cables M5 ↔ M8	268
Connectors M8	270
Connection Cables M8 ↔ M8	276
Connection Cables M8 ↔ M12	282
Connectors M12	294
Connection Cables M12 ↔ M8	312
Connection Cables M12 ↔ M12	318
Connectors M12	330
Connectors M23	344
Connection Cables M23 ↔ M12	346
Connectors 7/8"	348
Connection Cables 7/8" ↔ 7/8"	352
Special Properties	
High-temperature Resistant	362
IP 69K-ECOLAB	364
Weld Spatter resistant PUR cables	368
Y Connectors, Weld Spatter Resistant	380
Cables for Harsh Environments	382
Valve Connectors	
Style A	400
Style B	402
Style C	406
Connectors for Pressure Switches	408
Accessories for Connectors and Valve Connectors	
Tools	412
Screw Plugs	413
Label	414
Cable Clamp	414
Integrated Tamper Protection	414
Protective Cover	415
Anti-sabotage Protection, Coupling	415
Protective Sleeve/Jacket/Tape	416
Protective Cover, Adapter Plate	418



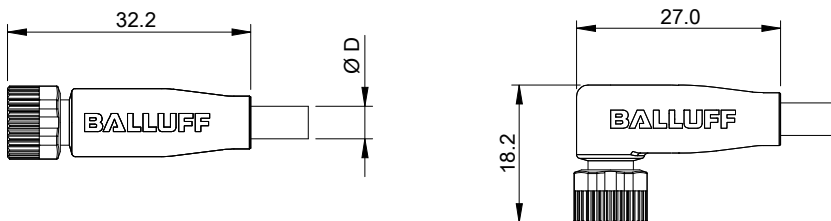
M5 connectors, female straight and angled



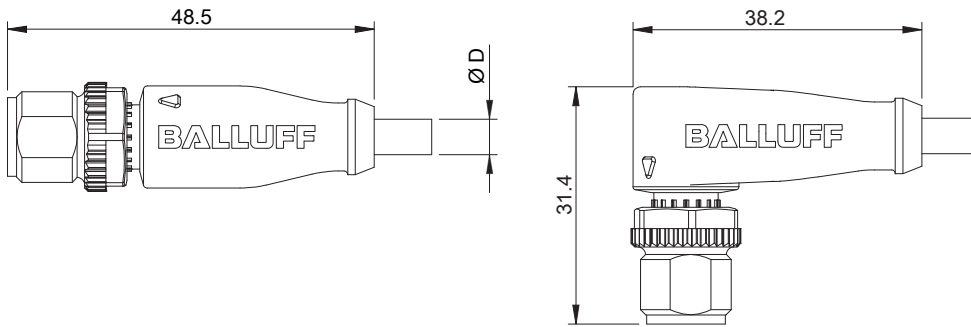
M8 connectors, male straight and angled



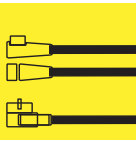
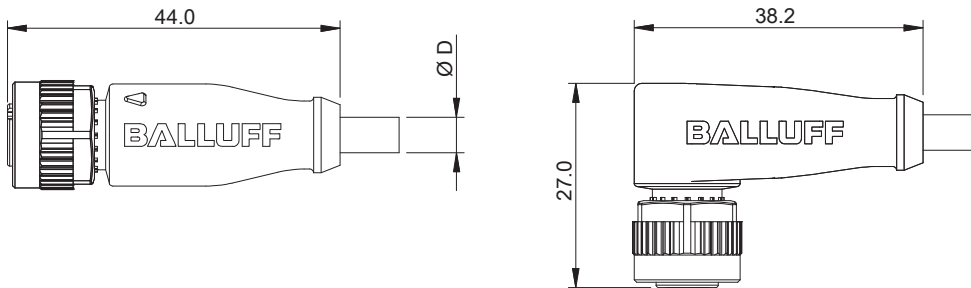
M8 connectors, female straight and angled

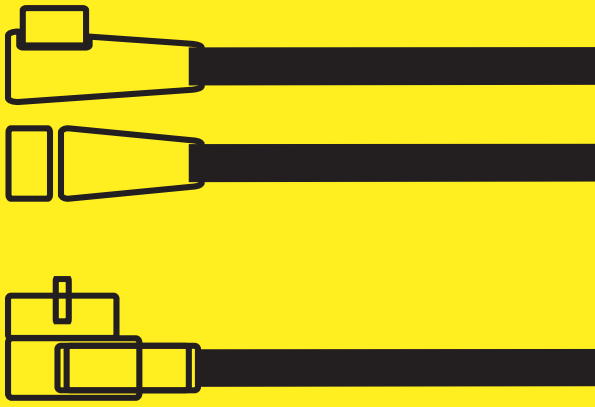


M12 connectors, male straight and angled



M12 connectors, female straight and angled



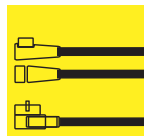


Connectors and Valve Connectors

Connectors and cables

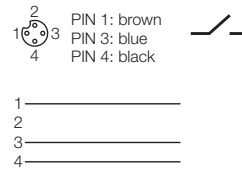


M5 Connectors	3-pin	266
	4-pin	267
Connection Cables M5 ↔ M8	3-pin	268
M8 Connectors	3-pin	270
	4-pin	273
Connection Cables M8 ↔ M8	3-pin	276
	4-pin	279
Connection Cables M8 ↔ M12	3-pin	282
	4-pin	283
M8 Connectors	Field-attachable	286
	Flange Socket/Plug	290
	Y Connectors	292
M12 Connectors	3-pin	295
	4-pin	300
	5-pin	304
	8-pin	306
	12-pin	310
Connection Cables M12 ↔ M8	3-pin	312
	4-pin	315
Connection Cables M12 ↔ M12	3-pin	318
	4-pin	320
	5-pin	324
	8-pin	328
	12-pin	329
M12 Connectors	Field-attachable	330
	Flange Socket/Plug	338
	Y Connectors	342
	Tees	343
M23 Connectors	12-pin	344
	19-pin	345
Connection Cables M23 ↔ M12	12-pin	346
Connector 7/8"	3-pin	348
	4-pin	349
	5-pin	351
Connection Cables 7/8" ↔ 7/8"	3-pin	352
	4-pin	353
	5-pin	354
Connectors 7/8"	Field-attachable	356
	Tees	358
Connectors	Push-Pull Power	100



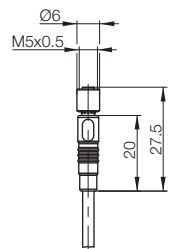


Connector diagram and wiring



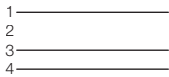
PUR, black	3 m	BCC00HE
PUR, black	5 m	
Supply voltage AC U_S	30 V AC	
Supply voltage DC U_S	30 V DC	
Cable	Molded	
No. of wires × conductor cross-section	3×0.14 mm ²	
Enclosure rating per IEC 60529	IP 67	
Ambient temperature T_a	-25...+80 °C/-5...+80 °C	
Static/moving		
Use	Normally open (NO) -/-	

Other cable materials, colors and lengths on request.

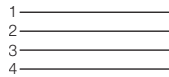




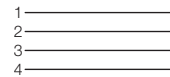
PIN 1: brown
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



BCC00HM

30 V AC

30 V DC

Molded

3x0.14 mm²

IP 67

-25...+80 °C/-5...+80 °C

Normally open (NO) / -

BCC00HK

30 V AC

30 V DC

Molded

4x0.14 mm²

IP 67

-25...+80 °C/-5...+80 °C

Complementary (NO/NC) / - / -

BCC00HP

30 V AC

30 V DC

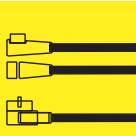
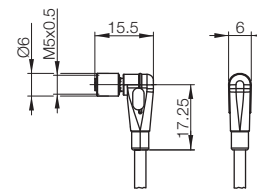
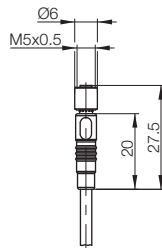
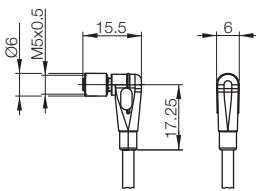
Molded

4x0.14 mm²

IP 67

-25...+80 °C/-5...+80 °C

Complementary (NO/NC) / - / -



Connectors and Cables

Connectors M5

Connection Cables M5↔M8

Connectors M8

Connection Cables M8↔M8

Connection Cables M8↔M12

M12 connectors

Connection Cables M12↔M8

Connection Cables M12↔M12

M23 connectors

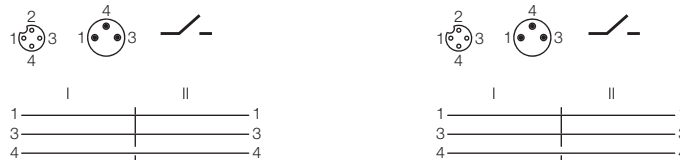
Connection Cables M23↔M12

Connectors 7/8"

Connection Cables 7/8"↔7/8"

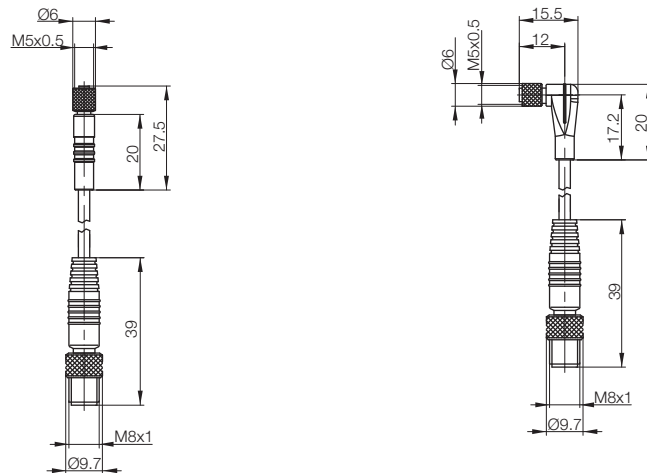


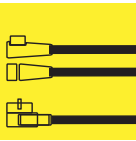
Connector diagram and wiring



PUR, black	0.3 m	BCC00HF	
PUR, black	0.6 m	BCC00HH	
PUR, black	1 m	BCC00HJ	BCC00HN
Supply voltage AC U_S		60 V AC	60 V AC
Supply voltage DC U_S		60 V DC	60 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		3×0.14 mm ²	3×0.14 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-25...+80 °C/-5...+80 °C	-25...+80 °C/-5...+80 °C
Use		Normally open (NO) /-/-	Normally open (NO) /-/-

Other cable materials, colors and lengths on request.





Connectors
and Cables

Connectors
M5

**Connection
Cables
M5↔M8**

Connectors
M8

Connection
Cables
M8↔M8

Connection
Cables
M8↔M12

M12 connectors

Connection
Cables
M12↔M8

Connection
Cables
M12↔M12

M23 connectors

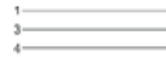
Connection
Cables
M23↔M12

Connector 7/8"

Connection
Cables
7/8"↔7/8"



Connector diagram and wiring

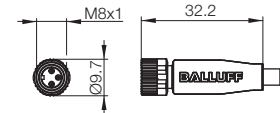


PUR, black	2 m	BCC02M8
PUR, black	5 m	BCC02M9
PUR, black	10 m	BCC02MA
PVC, gray	2 m	BCC02NU
PVC, gray	5 m	BCC02NW
PVC, gray	10 m	BCC02NY
Supply voltage AC U _S		60 V AC
Supply voltage DC U _S		60 V DC
Cable		Molded
No. of wires × conductor cross-section		3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67
Ambient temperature T _a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)
static/ moving	PVC	-25...+105 °C/-5...+90 °C (UL 80 °C)
LED		

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.





PIN 1: brown
PIN 3: blue
PIN 4: black



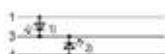
¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output



PIN 1: brown
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 3: blue
PIN 4: black



¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

BCC0AW9
BCC0AWA
BCC0AWC
BCC0C06
BCC0AY0
BCC0C07

BCC02ML
BCC02MM
BCC02MN
BCC02P5
BCC02P6
BCC02P7

BCC02MH
BCC02MJ
BCC02MK
BCC02P2
BCC02P3
BCC02P4

30 V DC

60 V DC

30 V DC

Molded

Molded

Molded

3x0.34 mm²

3x0.34 mm²

3x0.34 mm²

IP 67

IP 67

IP 67

-25...+90 °C/-25...+90 °C (UL 80 °C)

-25...+90 °C/-25...+90 °C (UL 80 °C)

-25...+90 °C/-25...+90 °C (UL 80 °C)

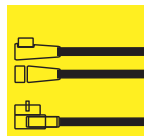
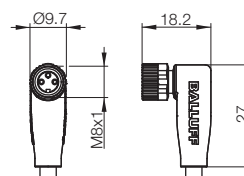
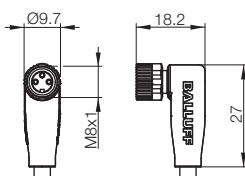
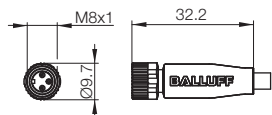
-25...+105 °C/-5...+90 °C (UL 80 °C)

-25...+105 °C/-5...+90 °C (UL 80 °C)

-25...+105 °C/-5...+90 °C (UL 80 °C)

2x (PNP), green, yellow

2x (PNP), green, yellow



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
7/8" Connectors
Connection Cables
7/8"↔7/8"



Connector diagram and wiring



PIN 1: brown
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 3: blue
PIN 4: black

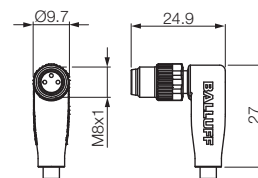
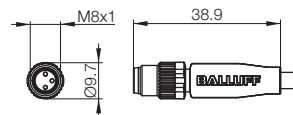


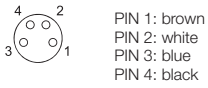
PUR, black	2 m	BCC02M2	BCC02M5
PUR, black	5 m	BCC02M3	BCC02M6
PUR, black	10 m	BCC02M4	BCC02M7
PVC, gray	2 m	BCC02NL	BCC02NP
PVC, gray	5 m	BCC02NM	BCC02NR
PVC, gray	10 m	BCC02NN	BCC02NT
Supply voltage AC U_S		60 V AC	60 V AC
Supply voltage DC U_S		60 V DC	60 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
	PVC	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Static/moving			
LED			

Other cable materials, colors and lengths on request.

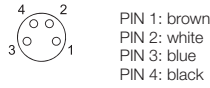
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

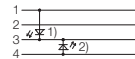
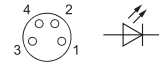




PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



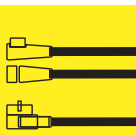
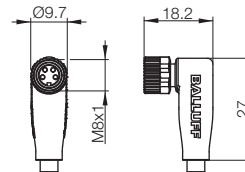
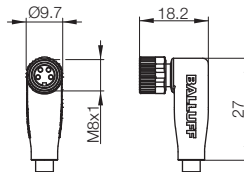
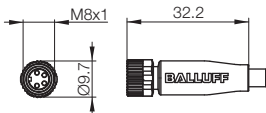
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

BCC02N2	BCC02NC	BCC02N8
BCC02N3	BCC02NE	BCC02N9
BCC02N4	BCC02NF	BCC02NA
BCC02PL	BCC02PZ	BCC02PU
BCC02PM	BCC02R0	BCC02PW
BCC02PN	BCC02R1	BCC02PY
30 V AC	30 V AC	
30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67	IP 67
-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)

2x (PNP), green, yellow



- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors**
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"



Connector diagram and wiring



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black

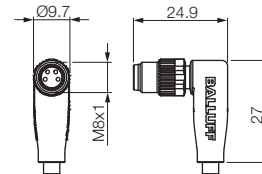
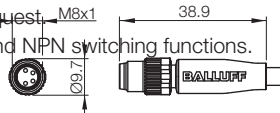


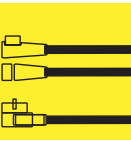
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PUR, black	2 m	BCC02MU	BCC02MZ
PUR, black	5 m	BCC02MW	BCC02N0
PUR, black	10 m	BCC02MY	BCC02N1
PVC, gray	2 m	BCC02PC	BCC02PH
PVC, gray	5 m	BCC02PE	BCC02PJ
PVC, gray	10 m	BCC02PF	BCC02PK
Supply voltage AC U_S		30 V AC	30 V AC
Supply voltage DC U_S		30 V DC	30 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
	PVC	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Static/moving			

Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors**
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

Connection cables

M8 female ↔ M8 male, 3-pin



Connector diagram and wiring



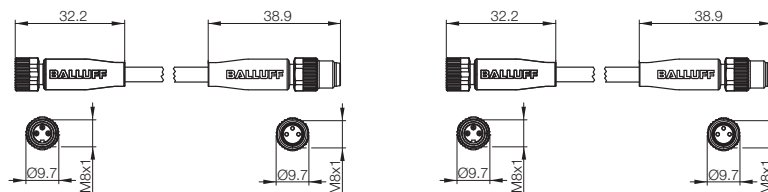
¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

PUR, black	0.3 m	BCC02R5	BCC0AZA
PUR, black	0.6 m	BCC02R6	BCC0AZC
PUR, black	1 m	BCC02R7	BCC0AZE
PUR, black	1.5 m	BCC02R8	BCC0AZF
PUR, black	2 m	BCC02R9	BCC0AZH
PUR, black	3 m	BCC02RA	BCC0AZJ
PUR, black	5 m	BCC02RC	BCC0AZK
PVC, gray	0.3 m	BCC02UR	
PVC, gray	0.6 m	BCC02UT	
PVC, gray	1 m	BCC02UU	
PVC, gray	1.5 m	BCC02UW	
PVC, gray	2 m	BCC02UY	
PVC, gray	3 m	BCC02UZ	
PVC, gray	5 m	BCC02W0	
Supply voltage AC U_S		60 V AC	
Supply voltage DC U_S		60 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-25...+105 °C/-5...+105 °C (UL 80 °C)	
LED			2× (PNP), green, yellow

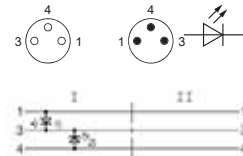
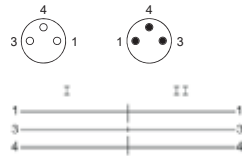
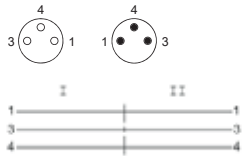
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

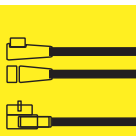


Connection cables M8 female ↔ M8 male, 3-pin

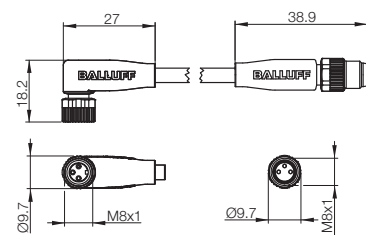
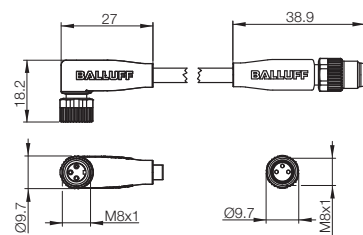
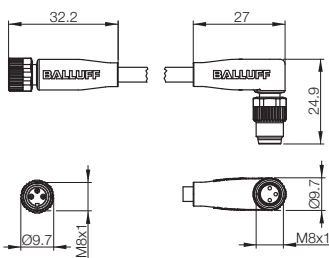


¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

BCC02RE	BCC02RZ	BCC02RN
BCC02RF	BCC02T0	BCC02RP
BCC02RH	BCC02T1	BCC02RR
BCC02RJ	BCC02T2	BCC02RT
BCC02RK	BCC02T3	BCC02RU
BCC02RL	BCC02T4	BCC02RW
BCC02RM	BCC02T5	BCC02RY
BCC02W1	BCC02WJ	BCC02W8
BCC02W2	BCC02WK	BCC02W9
BCC02W3	BCC02WL	BCC02WA
BCC02W4	BCC02WM	BCC02WC
BCC02W5	BCC02WN	BCC02WE
BCC02W6	BCC02WP	BCC02WF
BCC02W7	BCC02WR	BCC02WH
60 V AC	60 V AC	30 V DC
60 V DC	60 V DC	
Molded	Molded	Molded
3×0.34 mm ²	3×0.34 mm ²	3×0.34 mm ²
IP 67	IP 67	IP 67
-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
-25...+105 °C/-5...+105 °C (UL 80 °C)	-25...+105 °C/-5...+105 °C (UL 80 °C)	-25...+105 °C/-5...+105 °C (UL 80 °C)
		2× (PNP), green, yellow



- Connectors and Cables
- M5 connectors
- Connection Cables
- M5↔M8
- M8 connectors
- Connection Cables
- M8↔M8
- Connection Cables
- M8↔M12
- M12 connectors
- Connection Cables
- M12↔M8
- Connection Cables
- M12↔M12
- M23 connectors
- Connection Cables
- M23↔M12
- Connector 7/8"
- Connection Cables
- 7/8"↔7/8"



Connection cables
M8 female ↔ M8 male, 3-pin



Connector diagram and wiring

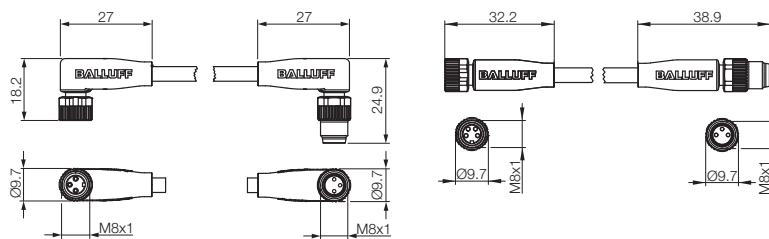


PUR, black	0.3 m	BCC02T6	BCC0CAH
PUR, black	0.6 m	BCC02T7	BCC0AUL
PUR, black	1 m	BCC02T8	BCC0A77
PUR, black	1.5 m	BCC02T9	
PUR, black	2 m	BCC02TA	BCC0A78
PUR, black	3 m	BCC02TC	BCC0C6A
PUR, black	5 m	BCC02TE	BCC0C6C
PVC, gray	0.3 m	BCC02WT	
PVC, gray	0.6 m	BCC02WU	
PVC, gray	1 m	BCC02WW	
PVC, gray	1.5 m	BCC02WY	
PVC, gray	2 m	BCC02WZ	
PVC, gray	3 m	BCC02Y0	
PVC, gray	5 m	BCC02Y1	
Supply voltage AC U_S		60 V AC	60 V AC
Supply voltage DC U_S		60 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
static/moving	PVC	-25...+105 °C/-5...+105 °C (UL 80 °C)	

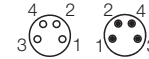
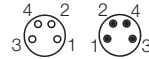
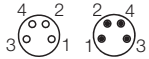
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

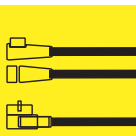
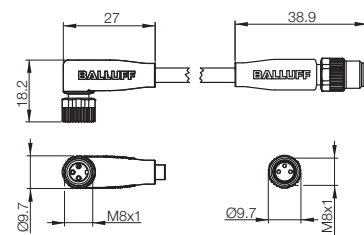
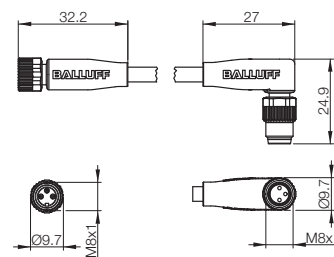
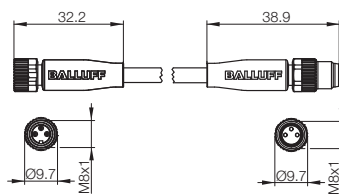
NPN versions with LED on request.



Connection cables
M8 female ↔ M8 male, 4-pin



BCC02TF	BCC02TP	BCC02U7
BCC02TH	BCC02TR	BCC02U8
BCC02TJ	BCC02TT	BCC02U9
BCC02TK	BCC02TU	BCC02UA
BCC02TL	BCC02TW	BCC02UC
BCC02TM	BCC02TY	BCC02UE
BCC02TN	BCC02TZ	BCC02UF
BCC02Y2	BCC02Y9	BCC02YU
BCC02Y3	BCC02YA	BCC02YW
BCC02Y4	BCC02YC	BCC02YY
BCC02Y5	BCC02YE	BCC02YZ
BCC02Y6	BCC02YF	BCC02Z0
BCC02Y7	BCC02YH	BCC02Z1
BCC02Y8	BCC02YJ	BCC02Z2
30 V AC	30 V AC	30 V AC
30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67	IP 67
-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
-25...+105 °C/-5...+105 °C (UL 80 °C)	-25...+105 °C/-5...+105 °C (UL 80 °C)	-25...+105 °C/-5...+105 °C (UL 80 °C)



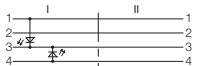
- Connectors and Cables
- Connection Cables
- M5 connectors
- M5 ↔ M8
- M8 connectors
- Connection Cables
- M8 ↔ M8
- Connection Cables
- M8 ↔ M12
- M12 connectors
- Connection Cables
- M12 ↔ M8
- Connection Cables
- M12 ↔ M12
- M23 connectors
- Connection Cables
- M23 ↔ M12
- Connector 7/8"
- Connection Cables
- 7/8" ↔ 7/8"

Connection cables

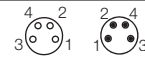
M8 female ↔ M8 male, 4-pin



Connector diagram and wiring



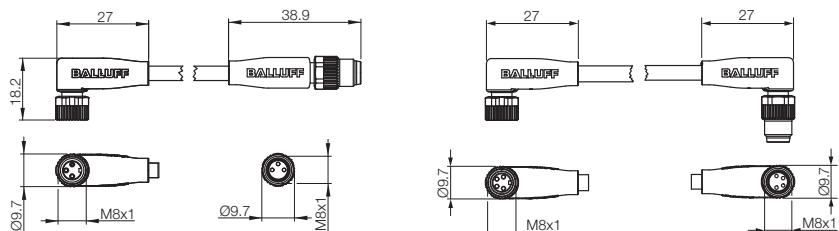
¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

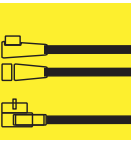


PUR, black	0.3 m	BCC02U0	BCC02UH
PUR, black	0.6 m	BCC02U1	BCC02UJ
PUR, black	1 m	BCC02U2	BCC02UK
PUR, black	1.5 m	BCC02U3	BCC02UL
PUR, black	2 m	BCC02U4	BCC02UM
PUR, black	3 m	BCC02U5	BCC02UN
PUR, black	5 m	BCC02U6	BCC02UP
PVC, gray	0.3 m	BCC02YK	BCC02Z3
PVC, gray	0.6 m	BCC02YL	BCC02Z4
PVC, gray	1 m	BCC02YM	BCC02Z5
PVC, gray	1.5 m	BCC02YN	BCC02Z6
PVC, gray	2 m	BCC02YP	BCC02Z7
PVC, gray	3 m	BCC02YR	BCC02Z8
PVC, gray	5 m	BCC02YT	BCC02Z9
Supply voltage AC U_S			60 V AC
Supply voltage DC U_S		30 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-25...+105 °C/-5...+105 °C (UL 80 °C)	-25...+105 °C/-5...+105 °C (UL 80 °C)
LED		2× (PNP), green, yellow	

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
 NPN versions with LED on request.

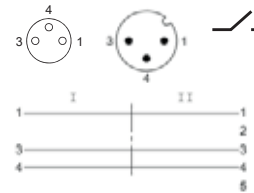
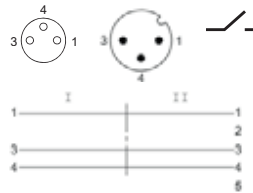




- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8**
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"



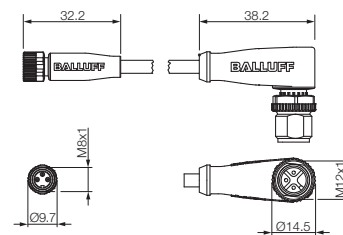
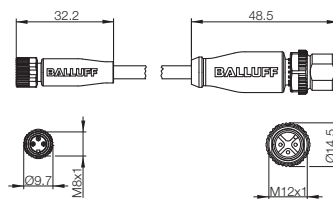
Connector diagram and wiring



PUR, black	0.3 m	BCC03F4	BCC03FC
PUR, black	0.6 m	BCC03F5	BCC03FE
PUR, black	1 m	BCC03F6	BCC03FF
PUR, black	1.5 m	BCC03F7	BCC03FH
PUR, black	2 m	BCC03F8	BCC03FJ
PUR, black	3 m	BCC03F9	BCC03FK
PUR, black	5 m	BCC03FA	BCC03FL
PVC, gray	0.3 m	BCC03HE	BCC03HN
PVC, gray	0.6 m	BCC03HF	BCC03HP
PVC, gray	1 m	BCC03HH	BCC03HR
PVC, gray	1.5 m	BCC03HJ	BCC03HT
PVC, gray	2 m	BCC03HK	BCC03HU
PVC, gray	3 m	BCC03HL	BCC03HW
PVC, gray	5 m	BCC03HM	BCC03HY
Supply voltage AC U_S		60 V AC	60 V AC
Supply voltage DC U_S		60 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Use		Normally open (NO) /-/-	Normally open (NO) /-/-
LED			

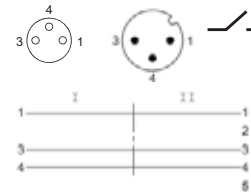
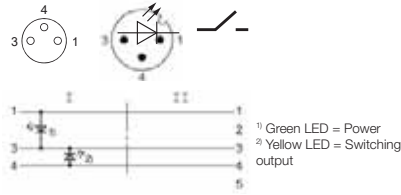
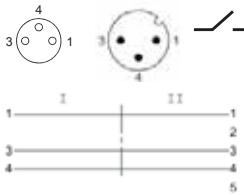
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.

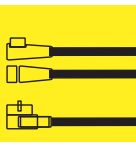


Connection cables

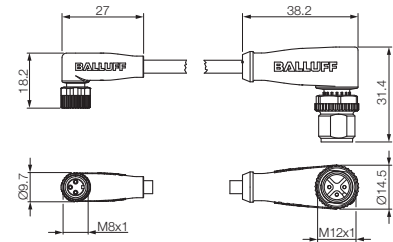
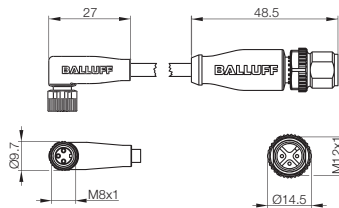
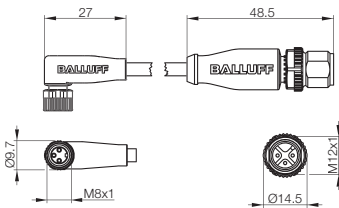
M8 female ↔ M12 male, 4-pin



BCC03FM	BCC03H5	BCC03FY
BCC03FN	BCC03H6	BCC03FZ
BCC03FP	BCC03H7	BCC03H0
BCC03FR	BCC03H8	BCC03H1
BCC03FT	BCC03H9	BCC03H2
BCC03FU	BCC03HA	BCC03H3
BCC03FW	BCC03HC	BCC03H4
BCC03HZ	BCC03JF	BCC03J6
BCC03J0	BCC03JH	BCC03J7
BCC03J1	BCC03JJ	BCC03J8
BCC03J2	BCC03JK	BCC03J9
BCC03J3	BCC03JL	BCC03JA
BCC03J4	BCC03JM	BCC03JC
BCC03J5	BCC03JN	BCC03JE
60 V AC		60 V AC
60 V DC	30 V DC	60 V DC
Molded	Molded	Molded
3×0.34 mm ²	3×0.34 mm ²	3×0.34 mm ²
IP 67	IP 67	IP 67
-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Normally open (NO) —	Normally open (NO) —	Normally open (NO) —
	2× (PNP), green, yellow	



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"

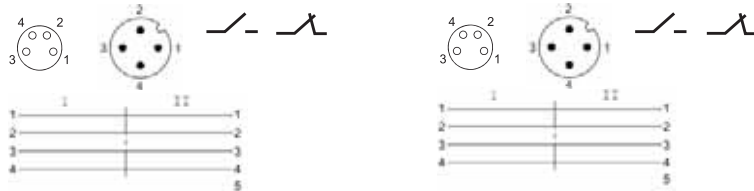


Connection cables

M8 female ↔ M12 male, 4-pin



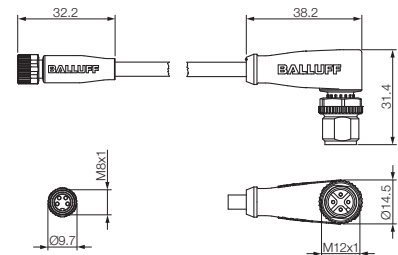
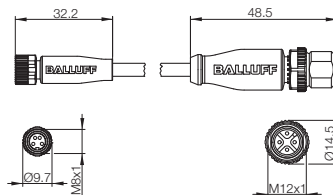
Connector diagram and wiring



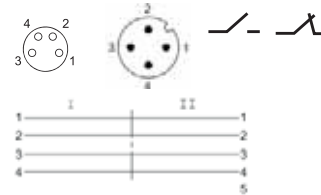
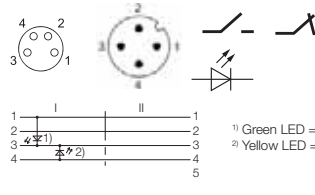
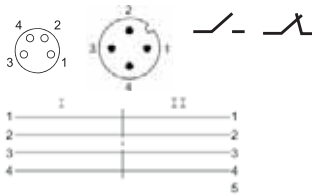
PUR, black	0.3 m	BCC03JP	BCC03K0
PUR, black	0.6 m	BCC03JR	BCC03K1
PUR, black	1 m	BCC03JT	BCC03K2
PUR, black	1.5 m	BCC03JU	BCC03K3
PUR, black	2 m	BCC03JW	BCC03K4
PUR, black	3 m	BCC03JY	BCC03K5
PUR, black	5 m	BCC03JZ	BCC03K6
PVC, gray	0.3 m	BCC03L1	BCC03L8
PVC, gray	0.6 m	BCC03L2	BCC03L9
PVC, gray	1 m	BCC03L3	BCC03LA
PVC, gray	1.5 m	BCC03L4	BCC03LC
PVC, gray	2 m	BCC03L5	BCC03LE
PVC, gray	3 m	BCC03L6	BCC03LF
PVC, gray	5 m	BCC03L7	BCC03LH
Supply voltage AC U_S		30 V AC	30 V AC
Supply voltage DC U_S		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Use		Complementary (NO/NC) \swarrow / \searrow	Complementary (NO/NC) \swarrow / \searrow
LED			

Other cable materials, colors and lengths on request.

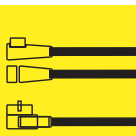
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



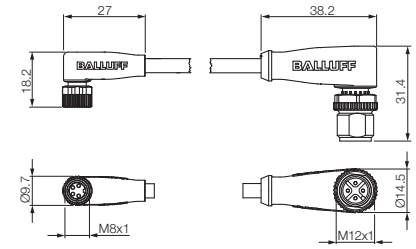
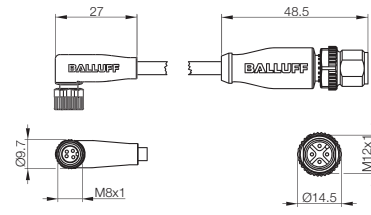
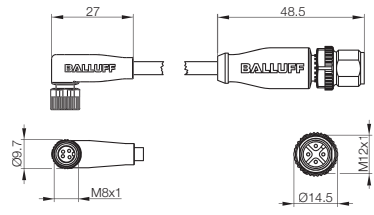
Connection cables M8 female ↔ M12 male, 4-pin



BCC03K0	BCC03KR	BCC03KH
BCC03K1	BCC03KT	BCC03KJ
BCC03K2	BCC03KU	BCC03KK
BCC03K3	BCC03KW	BCC03KL
BCC03K4	BCC03KY	BCC03KM
BCC03K5	BCC03KZ	BCC03KN
BCC03K6	BCC03L0	BCC03KP
BCC03L8	BCC03M2	BCC03LT
BCC03L9	BCC03M3	BCC03LU
BCC03LA	BCC03M4	BCC03LW
BCC03LC	BCC03M5	BCC03LY
BCC03LE	BCC03M6	BCC03LZ
BCC03LF	BCC03M7	BCC03M0
BCC03LH	BCC03M8	BCC03M1
30 V AC		30 V AC
30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67	IP 67
-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)	-25...+90 °C/-25...+90 °C (UL 80 °C)
-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)	-25...+105 °C/-5...+90 °C (UL 80 °C)
Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC)
	2x (PNP), green, yellow	



Connectors and Cables
M5 connectors
Connection Cables
M5 ↔ M8
M8 connectors
Connection Cables
M8 ↔ M8
Connection Cables
M8 ↔ M12
M12 connectors
Connection Cables
M12 ↔ M8
Connection Cables
M12 ↔ M12
M23 connectors
Connection Cables
M23 ↔ M12
Connector 7/8"
Connection Cables
7/8" ↔ 7/8"



Connectors
M8 female, field-attachable,
3-pin



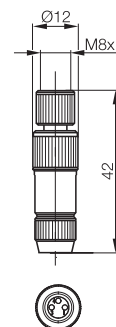
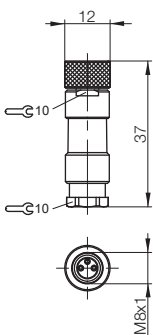
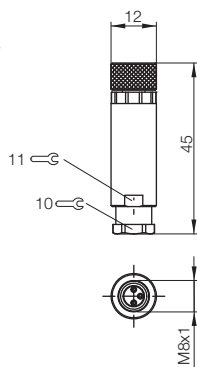
Quick-connect system

Connector diagram



No LED, NO or NC	BCC06Z1	BCC06YW	BCC02HC
Supply voltage AC U_S	60 V	60 V	32 V
Supply voltage DC U_S	60 V	60 V	32 V
Cable	field-attachable	field-attachable	field-attachable
No. of wires \times conductor cross-section	3 \times 0.14...0.5 mm ²	3 \times 0.14...0.5 mm ²	3 \times 0.14...0.34 mm ²
Cable diameter	\varnothing 3.5...5 mm	\varnothing 3.5...5 mm	\varnothing 3.2...5.4 mm
Connection	Screw terminal	Soldered connection	Insulation displacement connector technology
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C	-25...+85 °C*

* Cable installation on the plug in the temperature range -5...+50 °C

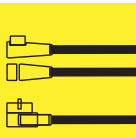
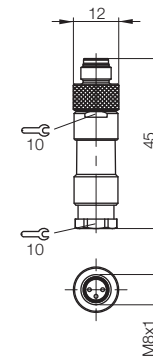
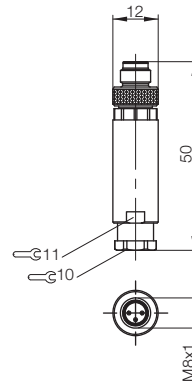
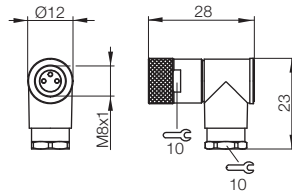
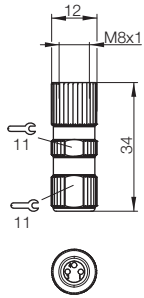




Quick-connect system



BCC09EU	BCC06YY	BCC0E7N	BCC06YZ
60 V	60 V	60 V	60 V
60 V	60 V	60 V	60 V
field-attachable	field-attachable	field-attachable	field-attachable
3×0.14...0.38 mm ²	3×0.14...0.5 mm ²	3×0.14...0.5 mm ²	3×0.14...0.5 mm ²
Ø 3...5 mm	Ø 3.5...5 mm	Ø 2.2...5 mm	Ø 3.5...5 mm
Penetration technology	Soldered connection	Screw terminal	Soldered connection
IP 67	IP 67	IP 67	IP 67
-25...+85 °C*	-25...+85 °C	-25...+85 °C	-25...+85 °C



- Connectors and Cables
- M5 connectors
- Connection Cables
- M5↔M8
- M8 connectors**
- Connection Cables
- M8↔M8
- Connection Cables
- M8↔M12
- M12 connectors
- Connection Cables
- M12↔M8
- Connection Cables
- M12↔M12
- M23 connectors
- Connection Cables
- M23↔M12
- Connector 7/8"
- Connection Cables
- 7/8"↔7/8"

Connectors
M8 male, field-attachable
3-pin

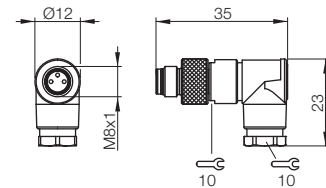
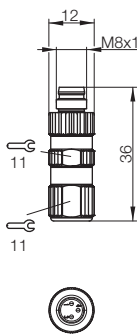
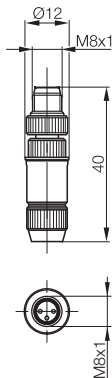


Connector diagram



	BCC02HE	BCC09EW	BCC06Z0
No LED, NO or NC	BCC02HE	BCC09EW	BCC06Z0
No LED, NO and NC			
Supply voltage AC U_S	32 V	60 V	60 V
Supply voltage DC U_S	32 V	60 V	60 V
Cable	field-attachable	field-attachable	field-attachable
No. of wires x conductor cross-section	3x0.14...0.34 mm ²	3x0.14...0.38 mm ²	3x0.14...0.5 mm ²
Cable diameter	Ø 3.2...5.4 mm	Ø 3...5 mm	Ø 3.5...5 mm
Connection	Insulation displacement connector technology	Penetration technology	Soldered connection
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C*	-25...+85 °C*	-25...+85 °C

* Cable installation on the plug in the temperature range -5...+50 °C





Quick-connect system



Quick-connect system



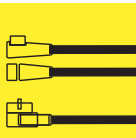
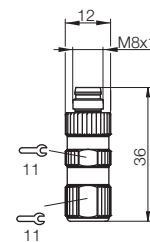
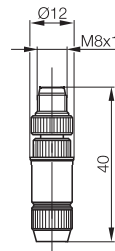
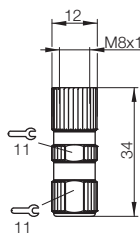
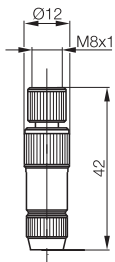
Quick-connect system



Quick-connect system



			BCC09EZ
BCC02HF	BCC09EY	BCC02HH	
32 V	30 V	32 V	30 V
32 V	30 V	32 V	30 V
field-attachable	field-attachable	field-attachable	field-attachable
4x0.14...0.34 mm ²	4x0.14...0.38 mm ²	4x0.14...0.34 mm ²	4x0.14...0.38 mm ²
Ø 3.2...5.4 mm	Ø 3...5 mm	Ø 3.2...5.4 mm	Ø 3...5 mm
Insulation displacement connector technology	Penetration technology	Insulation displacement connector technology	Penetration technology
IP 67	IP 67	IP 67	IP 67
-25...+85 °C*	-25...+85 °C	-25...+85 °C*	-25...+85 °C



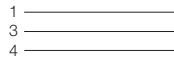
- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors**
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"



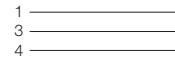
Connector diagram and wiring



PIN 1: brown
PIN 3: blue
PIN 4: black

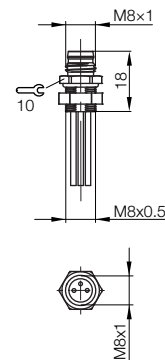
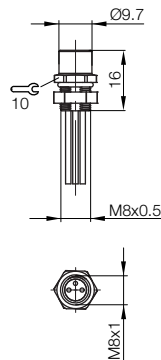


PIN 1: brown
PIN 2: black
PIN 3: blue



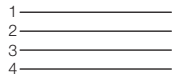
0.5 m	BCC0E4Y	BCC0E50
2 m	BCC0E4Z	BCC0E51
Supply voltage AC U_S	30 V	30 V
Supply voltage DC U_S	30 V	30 V
No. of wires x conductor cross-section	3x0.25 mm ²	3x0.25 mm ²
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C

Other cable lengths on request.

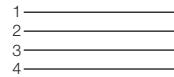




PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



BCC0E35

BCC0E38

30 V

30 V

4x0.25 mm²

IP 67

-25...+85 °C

BCC0E2Z

BCC0E32

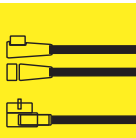
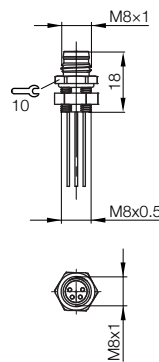
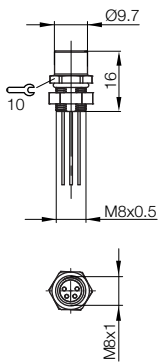
30 V

30 V

4x0.25 mm²

IP 67

-25...+85 °C



- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors**
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

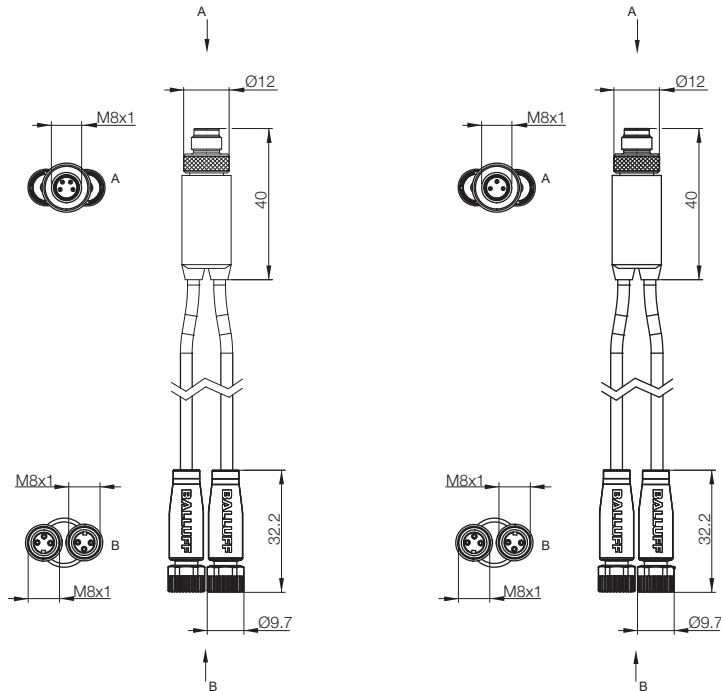


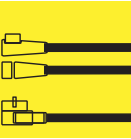
Connector diagram and wiring



PUR, black	0.3 m	BCC0AFL	BCC0A07
PUR, black	1 m	BCC0AFM	
Supply voltage AC U_S		30 V	30 V
Supply voltage DC U_S		30 V	30 V
Cable		Molded	Molded
No. of wires × conductor cross-section		3×0.14 mm ²	3×0.14 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+85 °C	-25...+85 °C

Other cable lengths on request.





- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors**
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"



Connector diagram and wiring



PUR, black	2 m
PUR, black	5 m
PUR, black	10 m
PUR shielded, black	2 m
PUR shielded, black	5 m
PUR shielded, black	10 m
PVC, gray	2 m
PVC, gray	5 m
PVC, gray	10 m
PVC shielded, gray	2 m
PVC shielded, gray	5 m
PVC shielded, gray	10 m
Supply voltage AC U_s	
Supply voltage DC U_s	
Cable	
Number of conductors × conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	PUR
Static/moving	PUR shielded
	PVC
	PVC shielded
Use	
LED	

Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



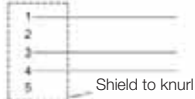
PIN 1: brown
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 3: blue
PIN 4: black



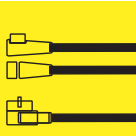
PIN 1: brown
PIN 3: blue
PIN 4: black



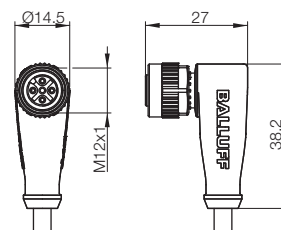
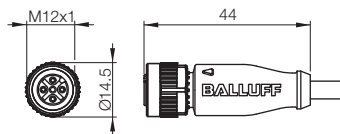
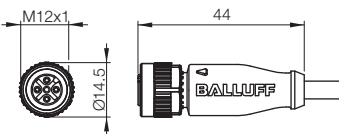
¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output



BCC030K	BCC030A	BCC0317
BCC030L	BCC030C	BCC0318
BCC030M	BCC030E	BCC0319
BCC030T		BCC031F
BCC030U		BCC031H
BCC030W		BCC031J
BCC034A	BCC0344	BCC0351
BCC034C	BCC0345	BCC0352
BCC034E	BCC0346	BCC0353
BCC034K		BCC0357
BCC034L		BCC0358
BCC034M		BCC0359
250 V AC		250 V AC
250 V DC	30 V DC	250 V DC
Molded	Molded	Molded
3x0.34 mm ²	3x0.34 mm ²	3x0.34 mm ²
IP 68	IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+80 °C/-25...+80 °C		-40...+80 °C/-25...+80 °C
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
-20...+105 °C (UL 80 °C)		-20...+105 °C (UL 80 °C)
Normally open (NO) —/—	Normally open (NO) —/— 2x (PNP), green, yellow	Normally open (NO) —/—

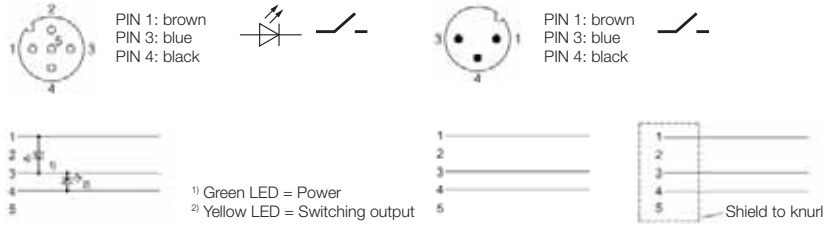


Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"





Connector diagram and wiring

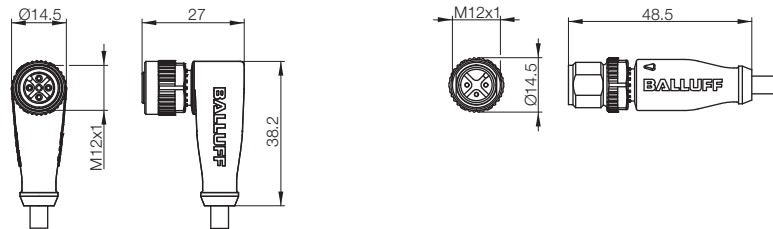


PUR, black	2 m	BCC0311	BCC02ZA
PUR, black	5 m	BCC0312	BCC02ZC
PUR, black	10 m	BCC0313	BCC02ZE
PUR shielded, black	2 m		BCC02ZK
PUR shielded, black	5 m		BCC02ZL
PUR shielded, black	10 m		BCC02ZM
PVC, gray	2 m	BCC034T	BCC0334
PVC, gray	5 m	BCC034U	BCC0335
PVC, gray	10 m	BCC034W	BCC0336
PVC shielded, gray	2 m		BCC033A
PVC shielded, gray	5 m		BCC033C
PVC shielded, gray	10 m		BCC033E
Supply voltage AC U_S			250 V AC
Supply voltage DC U_S		30 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	PUR shielded		-40...+80 °C/-25...+80 °C
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	PVC shielded		-20...+105 °C (UL 80 °C)
Use		Normally open (NO) /-	Normally open (NO) /-
LED		2× (PNP), green, yellow	

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.





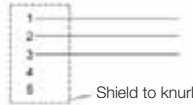
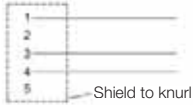
PIN 1: brown
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: black
PIN 3: blue



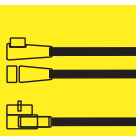
PIN 1: brown
PIN 2: black
PIN 3: blue



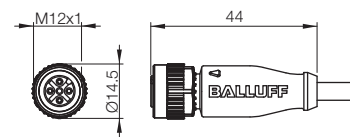
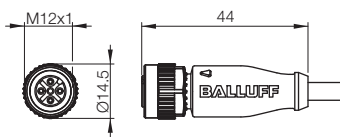
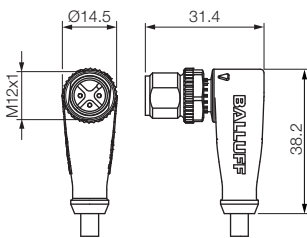
¹ Green LED = Power

² Yellow LED = Switching output

BCC02ZY	BCC030N	BCC030F
BCC02ZZ	BCC030P	BCC030H
BCC0300	BCC030R	BCC030J
BCC0304	BCC030Y	
BCC0305	BCC030Z	
BCC0306	BCC0310	
BCC033N	BCC034F	BCC0347
BCC033P	BCC034H	BCC0348
BCC033R	BCC034J	BCC0349
BCC033Y	BCC034N	
BCC033Z	BCC034P	
BCC0340	BCC034R	
250 V AC	250 V AC	
250 V DC	250 V DC	30 V DC
Molded	Molded	Molded
3x0.34 mm ²	3x0.34 mm ²	3x0.34 mm ²
IP 68	IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
-20...+105 °C (UL 80 °C)	-20...+105 °C (UL 80 °C)	
Normally open (NO)	Normally closed (NC)	Normally closed (NC) 2x (PNP), green, yellow

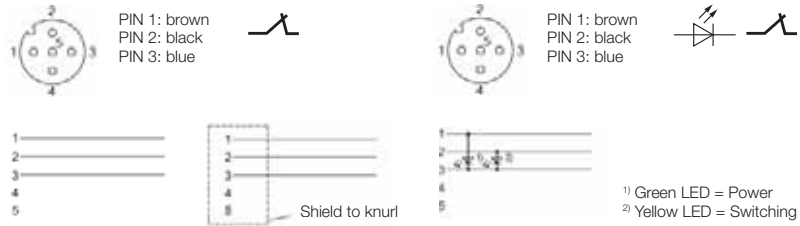


Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"





Connector diagram and wiring



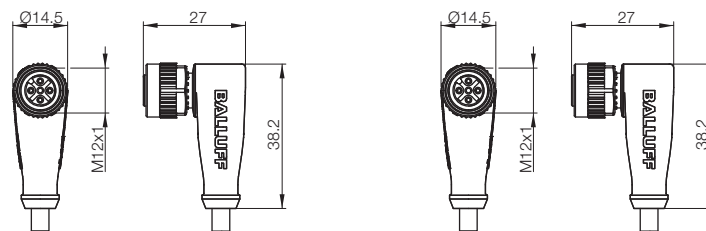
¹ Green LED = Power
² Yellow LED = Switching output

PUR, black	2 m	BCC031A	BCC0314
PUR, black	5 m	BCC031C	BCC0315
PUR, black	10 m	BCC031E	BCC0316
PUR shielded, black	2 m	BCC031K	
PUR shielded, black	5 m	BCC031L	
PUR shielded, black	10 m	BCC031M	
PVC, gray	2 m	BCC0354	BCC034Y
PVC, gray	5 m	BCC0355	BCC034Z
PVC, gray	10 m	BCC0356	BCC0350
PVC shielded, gray	2 m	BCC035A	
PVC shielded, gray	5 m	BCC035C	
PVC shielded, gray	10 m	BCC035E	
Supply voltage AC U_S		250 V AC	
Supply voltage DC U_S		250 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	PUR shielded	-40...+80 °C/-25...+80 °C	
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	PVC shielded	-20...+105 °C (UL 80 °C)	
Use		Normally closed (NC)	Normally closed (NC)
LED			2× (PNP), green, yellow

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

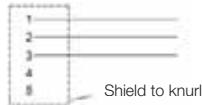
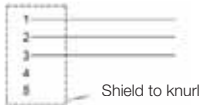




PIN 1: brown
PIN 2: black
PIN 3: blue

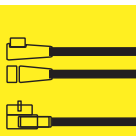


PIN 1: brown
PIN 2: black
PIN 3: blue

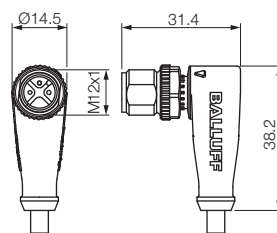
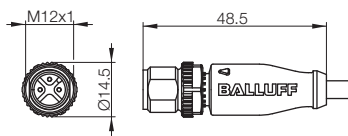


BCC02ZF	BCC0301
BCC02ZH	BCC0302
BCC02ZJ	BCC0303
BCC02ZN	BCC0307
BCC02ZP	BCC0308
BCC02ZR	BCC0309
BCC0337	BCC033T
BCC0338	BCC033U
BCC0339	BCC033W
BCC033F	BCC0341
BCC033H	BCC0342
BCC033J	BCC0343

250 V AC	250 V AC
250 V DC	250 V DC
Molded	Molded
3x0.34 mm ²	3x0.34 mm ²
IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
-20...+105 °C (UL 80 °C)	-20...+105 °C (UL 80 °C)
Normally closed (NC)	Normally closed (NC)

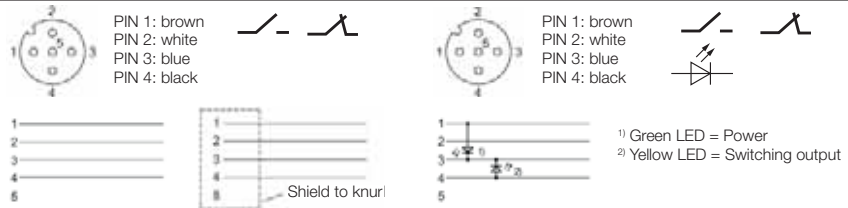


Connectors and Cables
M5 connectors
Connection Cables M5↔M8
M8 connectors
Connection Cables M8↔M8
Connection Cables M8↔M12
M12 connectors
Connection Cables M12↔M8
Connection Cables M12↔M12
M23 connectors
Connection Cables M23↔M12
Connector 7/8"
Connection Cables 7/8"↔7/8"





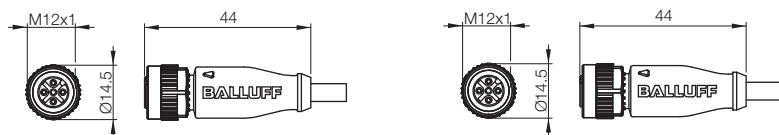
Connector diagram and wiring



PUR, black	2 m	BCC032F	BCC0327
PUR, black	5 m	BCC032H	BCC0328
PUR, black	10 m	BCC032J	BCC0329
PUR shielded, black	2 m	BCC032K	
PUR shielded, black	5 m	BCC032L	
PUR shielded, black	10 m	BCC032M	
PVC, gray	2 m	BCC0367	BCC0361
PVC, gray	5 m	BCC0368	BCC0362
PVC, gray	10 m	BCC0369	BCC0363
PVC shielded, gray	2 m	BCC036A	
PVC shielded, gray	5 m	BCC036C	
PVC shielded, gray	10 m	BCC036E	
Supply voltage AC U_S		250 V AC	
Supply voltage DC U_S		250 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	PUR shielded	-40...+80 °C/-25...+80 °C	
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	PVC shielded	-20...+105 °C (UL 80 °C)	
Use		Complementary (NO/NC)	Complementary (NO/NC)
LED			2× (PNP), green, yellow

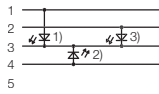
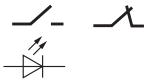
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





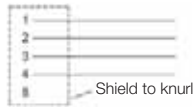
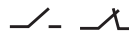
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



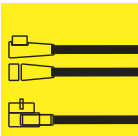
1) Green LED = Power
2) Yellow LED = Switching output
3) White LED = Switching output



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



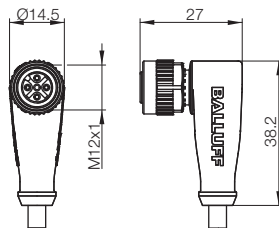
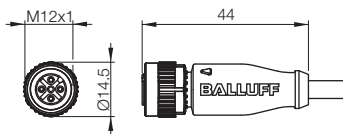
BCC032A	BCC032Y
BCC032C	BCC032Z
BCC032E	BCC0330
	BCC0331
	BCC0332
	BCC0333
BCC0364	BCC036N
BCC0365	BCC036P
BCC0366	BCC036R
	BCC036T
	BCC036U
	BCC036W
	250 V AC
30 V DC	250 V DC
Molded	Molded
4x0.34 mm ²	4x0.34 mm ²
IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	-40...+80 °C/-25...+80 °C
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	-20...+105 °C (UL 80 °C)
Complementary (NO/NC)	Complementary (NO/NC)
3x (PNP), green, yellow, white	



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12

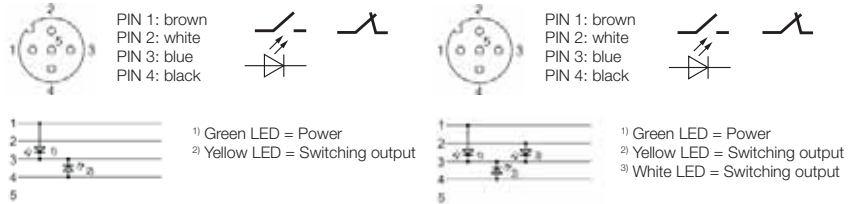
M12 connectors

Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"





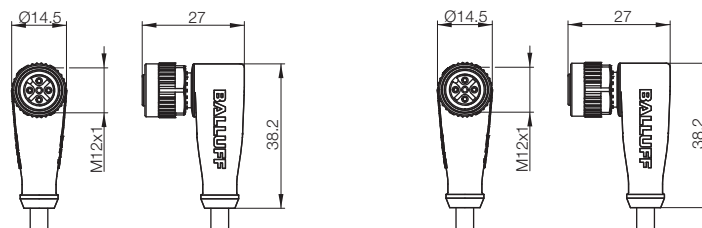
Connector diagram and wiring



PUR, black	2 m	BCC032N	BCC032T
PUR, black	5 m	BCC032P	BCC032U
PUR, black	10 m	BCC032R	BCC032W
PUR shielded, black	2 m		
PUR shielded, black	5 m		
PUR shielded, black	10 m		
PVC, gray	2 m	BCC036F	BCC036K
PVC, gray	5 m	BCC036H	BCC036L
PVC, gray	10 m	BCC036J	BCC036M
PVC shielded, gray	2 m		
PVC shielded, gray	5 m		
PVC shielded, gray	10 m		
Supply voltage AC U_S			
Supply voltage DC U_S		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PUR shielded		
	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	PVC shielded		
Use		Complementary (NO/NC)	Complementary (NO/NC)
LED		2× (PNP), green, yellow	3× (PNP), green, yellow, white

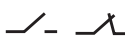
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.

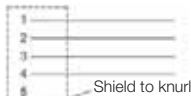
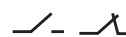




PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



BCC031N
BCC031P
BCC031R
BCC031T
BCC031U
BCC031W
BCC035F
BCC035H
BCC035J
BCC035K
BCC035L
BCC035M

BCC0321
BCC0322
BCC0323
BCC0324
BCC0325
BCC0326
BCC04ZU
BCC04ZW
BCC035W
BCC035Y
BCC035Z
BCC0360

250 V AC

250 V AC

250 V DC

250 V DC

Molded

Molded

4x0.34 mm²

4x0.34 mm²

IP 68

IP 68

-40...+90 °C/-25...+90 °C (UL 80 °C)

-40...+90 °C/-25...+90 °C (UL 80 °C)

-40...+80 °C/-25...+80 °C

-40...+80 °C/-25...+80 °C

-40...+105 °C/-5...+105 °C (UL 80 °C)

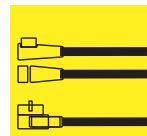
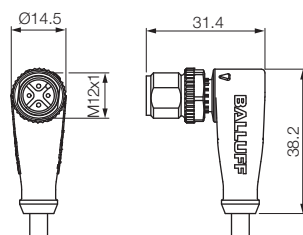
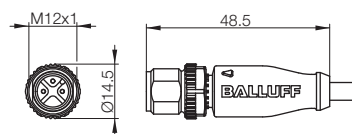
-40...+105 °C/-5...+105 °C (UL 80 °C)

-20...+105 °C (UL 80 °C)

-20...+105 °C (UL 80 °C)

Complementary (NO/NC) \swarrow / \searrow

Complementary (NO/NC) \swarrow / \searrow



Connectors and Cables

M5 connectors

Connection Cables

M5↔M8

M8 connectors

Connection Cables

M8↔M8

Connection Cables

M8↔M12

M12 connectors

Connection Cables

M12↔M8

Connection Cables

M12↔M12

M23 connectors

Connection Cables

M23↔M12

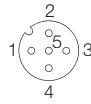
Connector 7/8"

Connection Cables

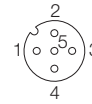
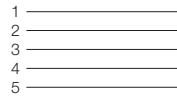
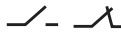
7/8"↔7/8"



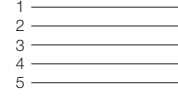
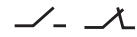
Connector diagram and wiring



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: gray or green/yellow



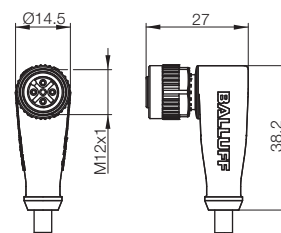
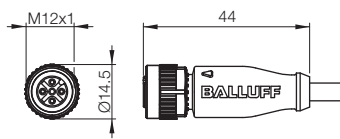
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: gray or green/yellow

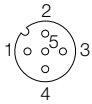


PUR (PIN 5: gray), black	2 m	BCC08FE	BCC09H7
PUR (PIN 5: gray), black	5 m	BCC098C	BCC08FC
PUR (PIN 5: gray), black	10 m	BCC0860	BCC08FA
PUR (Pin 5: green/yellow), black	2 m	BCC09H4	BCC08F9
PUR (Pin 5: green/yellow), black	5 m	BCC09H5	BCC08F8
PUR (Pin 5: green/yellow), black	10 m	BCC09H6	BCC08F7
PVC (PIN 5: gray), gray	2 m		
PVC (PIN 5: gray), gray	5 m	BCC0AT5	
PVC (PIN 5: gray), gray	10 m	BCC0AN9	
Supply voltage AC U_S		125 V AC	125 V AC
Supply voltage DC U_S		125 V DC	125 V DC
Cable		Molded	Molded
No. of wires x conductor cross-section		5x0.34 mm ²	5x0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	
Static/moving			
Use		Complementary (NO/NC) $\text{---}/\text{---}/\text{---}$	Complementary (NO/NC) $\text{---}/\text{---}/\text{---}$
LED			

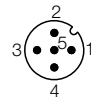
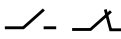
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.

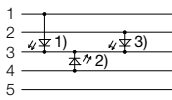
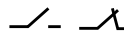




PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: gray or green/yellow



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: gray or green/yellow



1) Green LED = Power
2) Yellow LED = Switching output
3) White LED = Switching output



BCC08F6
BCC08F5
BCC08F4
BCC08HP
BCC08HR
BCC08HT

BCC0C76
BCC0C77
BCC0C78
BCC08JE
BCC08JC
BCC08JA
BCC0AU3
BCC0AT6
BCC0AUK

30 V DC
Molded
5x0.34 mm²

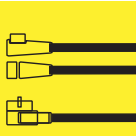
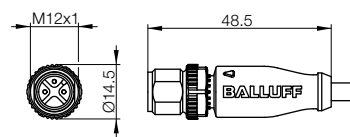
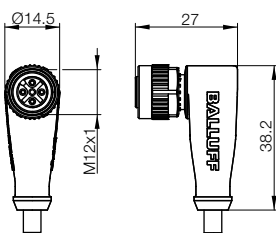
125 V AC
125 V DC
Molded
5x0.34 mm²

IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)

IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+105 °C (UL 80 °C)

Complementary (NO/NC)
3x (PNP), green, yellow, white

Complementary (NO/NC)



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"



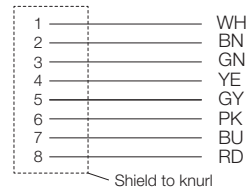
Connector diagram and wiring



- 1 _____ WH
- 2 _____ GN
- 3 _____ YE
- 4 _____ GY
- 5 _____ BN
- 6 _____ PK
- 7 _____ BU
- 8 _____ RD



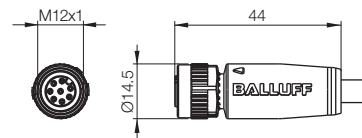
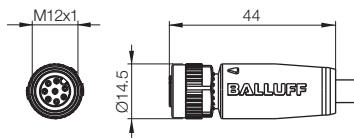
- 1 _____ WH
- 2 _____ BN
- 3 _____ GN
- 4 _____ YE
- 5 _____ GY
- 6 _____ PK
- 7 _____ BU
- 8 _____ RD



PUR, black	2 m	BCC06K1	BCC09J3
PUR, black	5 m	BCC06K2	BCC09J4
PUR, black	10 m	BCC06K3	BCC085Z
PUR shielded, black	2 m		BCC0994
PUR shielded, black	5 m		BCC0995
PUR shielded, black	10 m		BCC0996
Supply voltage AC U_S		60 V AC	60 V AC
Supply voltage DC U_S		60 V DC	60 V DC
Cable		Molded	Molded
No. of wires x conductor cross-section		8x0.25 mm ²	8x0.25 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
Static/moving	PUR shielded		-40...+80 °C/-25...+80 °C

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.

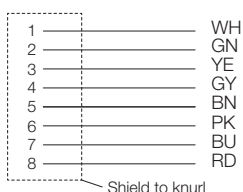




- 1 _____ BN
- 2 _____ WH
- 3 _____ BU
- 4 _____ BK
- 5 _____ GY
- 6 _____ PK
- 7 _____ VT
- 8 _____ OR



- 1 _____ WH
- 2 _____ GN
- 3 _____ YE
- 4 _____ GY
- 5 _____ BN
- 6 _____ PK
- 7 _____ BU
- 8 _____ RD



BCC09HC
BCC09HE
BCC09HF

BCC06K4
BCC06K5
BCC06K6
BCC0997
BCC0998
BCC0999

60 V AC
60 V DC
Molded
8x0.25 mm²

60 V AC
60 V DC
Molded
8x0.25 mm²

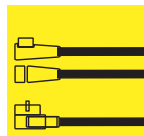
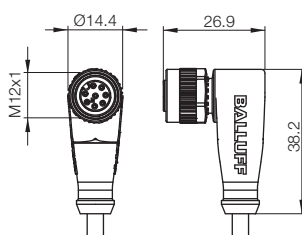
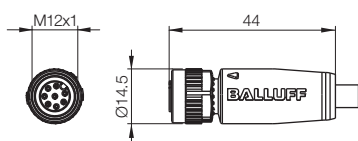
IP 68

IP 68

-40...+80 °C/-25...+80 °C

-40...+80 °C/-25...+80 °C

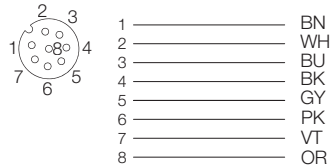
-40...+80 °C/-25...+80 °C



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"

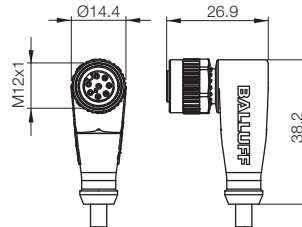


Connector diagram and wiring



PUR, black	2 m	BCC09H8
PUR, black	5 m	BCC09H9
PUR, black	10 m	BCC09HA
PVC, gray	2 m	
PVC, gray	5 m	
PVC, gray	10 m	
Supply voltage AC U _S		60 V AC
Supply voltage DC U _S		60 V DC
Cable		Molded
No. of wires x conductor cross-section		8x0.25 mm ²
Enclosure rating per IEC 60529		IP 68
Ambient temperature T _a	PUR PVC	-40...+80 °C/ -25...+80 °C
Static/moving		

Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





1	WH
2	GN
3	YE
4	GY
5	BN
6	PK
7	BU
8	RD



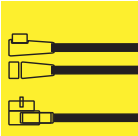
1	WH
2	GN
3	YE
4	GY
5	BN
6	PK
7	BU
8	RD

BCC06JT
BCC06JU
BCC06JW
BCC06K7
BCC06K8
BCC06K9
60 V AC
60 V DC
Molded
8x0.25 mm²

BCC06JY
BCC06JZ
BCC06K0
BCC06KA
BCC06KC
BCC06KE
60 V AC
60 V DC
Molded
8x0.25 mm²

IP 68
-40...+80 °C/-25...+80 °C
-40...+105 °C/-5...+105 °C (UL 80 °C)

IP 68
-40...+80 °C/-25...+80 °C
-40...+105 °C/-5...+105 °C (UL 80 °C)



Connectors
and Cables

M5 connectors

Connection

Cables

M5↔M8

M8 connectors

Connection

Cables

M8↔M8

Connection

Cables

M8↔M12

M12 connectors

Connection

Cables

M12↔M8

Connection

Cables

M12↔M12

M23 connectors

Connection

Cables

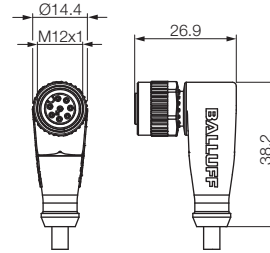
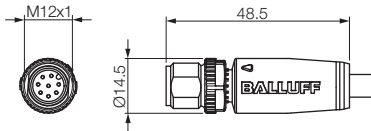
M23↔M12

Connector 7/8"

Connection

Cables

7/8"↔7/8"





Connector diagram and wiring



- 1 ————— BN
- 2 ————— BU
- 3 ————— WH
- 4 ————— GN
- 5 ————— PK
- 6 ————— YE
- 7 ————— BK
- 8 ————— GY
- 9 ————— RD
- 10 ————— VT
- 11 ————— GY/PK
- 12 ————— RD/BU

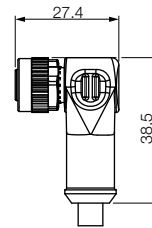
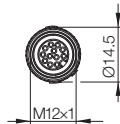
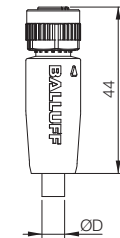


- 1 ————— BN
- 2 ————— BU
- 3 ————— WH
- 4 ————— GN
- 5 ————— PK
- 6 ————— YE
- 7 ————— BK
- 8 ————— GY
- 9 ————— RD
- 10 ————— VT
- 11 ————— GY/PK
- 12 ————— RD/BU

PUR, black	2 m	BCC06UK	
PUR, black	5 m	BCC06UL	BCC0942
PUR, black	10 m	BCC06UM	BCC0943
PVC, gray	2 m	BCC06UP	
PVC, gray	5 m	BCC06UR	
PVC, gray	10 m	BCC06UT	
Supply voltage AC U_S		30 V AC	30 V AC
Supply voltage DC U_S		30 V DC	30 V DC
Cable		Molded	Molded
No. of wires x conductor cross-section		12x0.25 mm ²	12x0.25 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	
Static/moving			

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



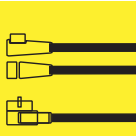


1	BN
2	BU
3	WH
4	GN
5	PK
6	YE
7	BK
8	GY
9	RD
10	VT
11	GY/PK
12	RD/BU

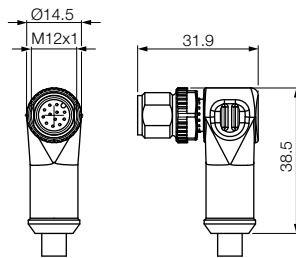
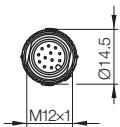
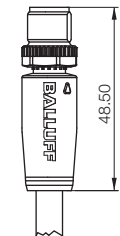


1	BN
2	BU
3	WH
4	GN
5	PK
6	YE
7	BK
8	GY
9	RD
10	VT
11	GY/PK
12	RD/BU

BCC06UU	BCC0941
BCC06UW	BCC09M5
BCC06UY	BCC09M4
BCC06UZ	
BCC06W0	
BCC06W1	
30 V AC	30 V AC
30 V DC	30 V DC
Molded	Molded
12x0.25 mm ²	12x0.25 mm ²
IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+105 °C (UL 80 °C)	



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"

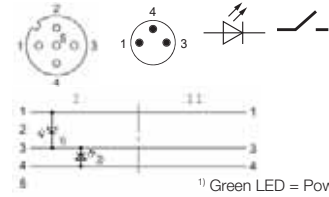
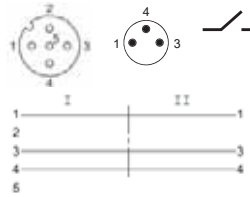


Connection cables

M12 female ↔ M8 male, 3-pin



Connector diagram and wiring

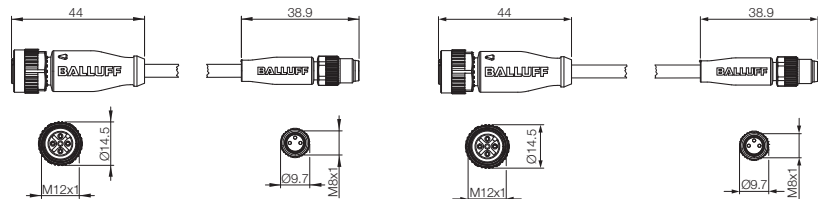


¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

PUR, black	0.3 m	BCC03M9	BCC0506
PUR, black	0.6 m	BCC03MA	BCC0507
PUR, black	1 m	BCC03MC	BCC0508
PUR, black	1.5 m	BCC03ME	BCC0509
PUR, black	2 m	BCC03MF	BCC050A
PUR, black	3 m	BCC03MH	BCC050C
PUR, black	5 m	BCC03MJ	BCC050E
PVC, gray	0.3 m	BCC03NW	
PVC, gray	0.6 m	BCC03NY	
PVC, gray	1 m	BCC03NZ	
PVC, gray	1.5 m	BCC03P0	
PVC, gray	2 m	BCC03P1	
PVC, gray	3 m	BCC03P2	
PVC, gray	5 m	BCC03P3	
Supply voltage U_B		60 V AC/DC	60 V AC/DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67/IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-40...+105 °C/-5...+90 °C (UL 80 °C)	
Use		Normally open (NO) —/—	Normally open (NO) —/—
LED			2× (PNP), green, yellow

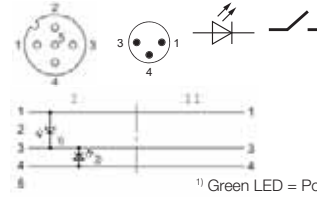
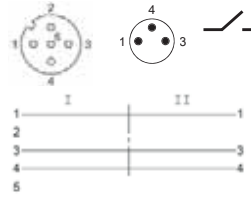
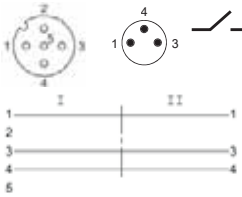
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



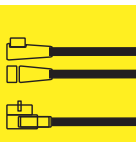
Connection cables

M12 female ↔ M8 male, 3-pin

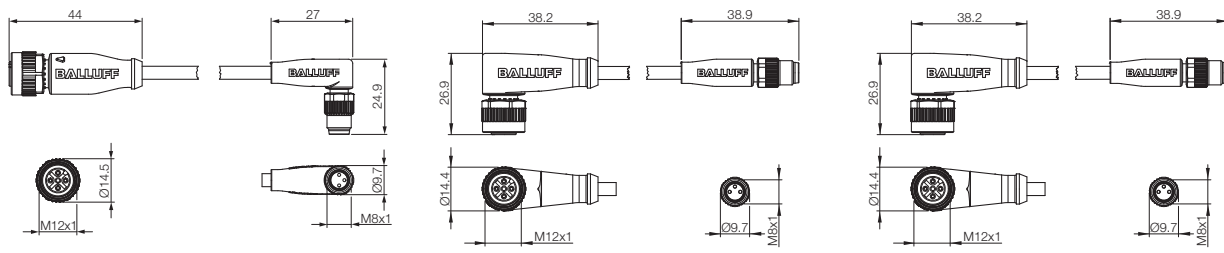


1) Green LED = Power
2) Yellow LED = Switching output

BCC03MK	BCC03MU	BCC03NA
BCC03ML	BCC03MW	BCC03NC
BCC03MM	BCC03MY	BCC03NE
BCC03MN	BCC03MZ	BCC03NF
BCC03MP	BCC03N0	BCC03NH
BCC03MR	BCC03N1	BCC03NJ
BCC03MT	BCC03N2	BCC03NK
BCC03P4	BCC03PC	BCC03PY
BCC03P5	BCC03PE	BCC03PZ
BCC03P6	BCC03PF	BCC03R0
BCC03P7	BCC03PH	BCC03R1
BCC03P8	BCC03PJ	BCC03R2
BCC03P9	BCC03PK	BCC03R3
BCC03PA	BCC03PL	BCC03R4
60 V AC/DC	60 V AC/DC	30 V DC
Molded	Molded	Molded
3×0.34 mm ²	3×0.34 mm ²	3×0.34 mm ²
IP 67/IP 68	IP 67	IP 67
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)
Normally open (NO) /-	Normally open (NO) /-	Normally open (NO) /- 2× (PNP), green, yellow



Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"

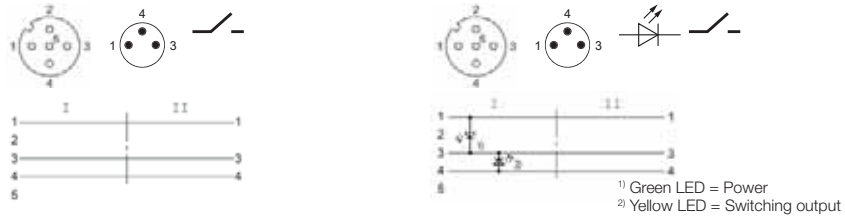


Connection cables

M12 female ↔ M8 male, 3-pin



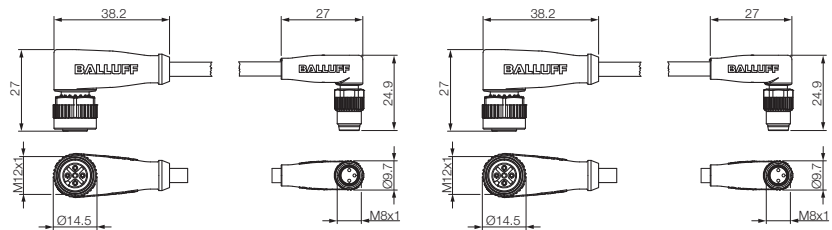
Connector diagram and wiring



PUR, black	0.3 m	BCC03N3	BCC03NL
PUR, black	0.6 m	BCC03N4	BCC03NM
PUR, black	1 m	BCC03N5	BCC03NN
PUR, black	1.5 m	BCC03N6	BCC03NP
PUR, black	2 m	BCC03N7	BCC03NR
PUR, black	3 m	BCC03N8	BCC03NT
PUR, black	5 m	BCC03N9	BCC03NU
PVC, gray	0.3 m	BCC03PM	BCC03R5
PVC, gray	0.6 m	BCC03PN	BCC03R6
PVC, gray	1 m	BCC03PP	BCC03R7
PVC, gray	1.5 m	BCC03PR	BCC03R8
PVC, gray	2 m	BCC03PT	BCC03R9
PVC, gray	3 m	BCC03PU	BCC03RA
PVC, gray	5 m	BCC03PW	BCC03RC
Supply voltage U_B		60 V AC/DC	30 V AC/DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)
Use		Normally open (NO) /-	Normally open (NO) /-
LED			2× (PNP), green, yellow

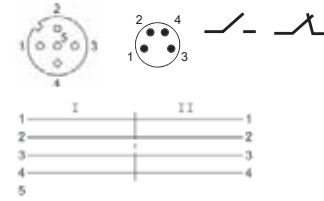
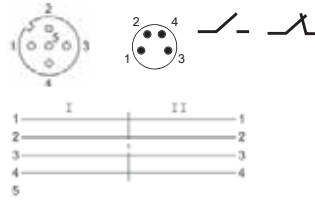
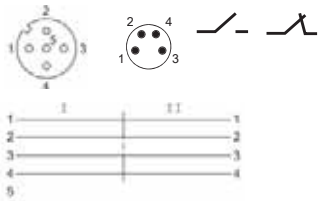
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

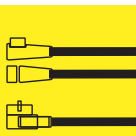


Connection cables

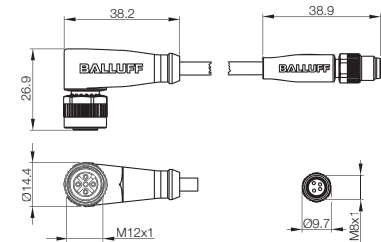
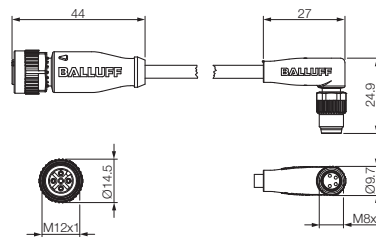
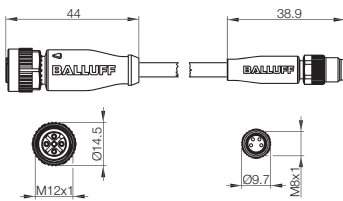
M12 female ↔ M8 male, 4-pin



BCC03RE	BCC03RN	BCC03RZ
BCC03RF	BCC03RP	BCC03T0
BCC03RH	BCC03RR	BCC03T1
BCC03RJ	BCC03RT	BCC03T2
BCC03RK	BCC03RU	BCC03T3
BCC03RL	BCC03RW	BCC03T4
BCC03RM	BCC03RY	BCC03T5
BCC03TP	BCC03U0	BCC03U7
BCC03TR	BCC03U1	BCC03U8
BCC03TT	BCC03U2	BCC03U9
BCC03TU	BCC03U3	BCC03UA
BCC03TW	BCC03U4	BCC03UC
BCC03TY	BCC03U5	BCC03UE
BCC03TZ	BCC03U6	BCC03UF
30 V AC/DC	30 V AC/DC	30 V AC/DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67/IP 68	IP 67
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)
Complementary (NO/NC) \swarrow \nearrow \searrow \nearrow	Complementary (NO/NC) \swarrow \nearrow \searrow \nearrow	Complementary (NO/NC) \swarrow \nearrow \searrow \nearrow



Connectors and Cables
 M5 connectors
 Connection Cables
 M5 ↔ M8
 M8 connectors
 Connection Cables
 M8 ↔ M8
 Connection Cables
 M8 ↔ M12
 M12 connectors
**Connection Cables
 M12 ↔ M8**
 Connection Cables
 M12 ↔ M12
 M23 connectors
 Connection Cables
 M23 ↔ M12
 Connector 7/8"
 Connection Cables
 7/8" ↔ 7/8"

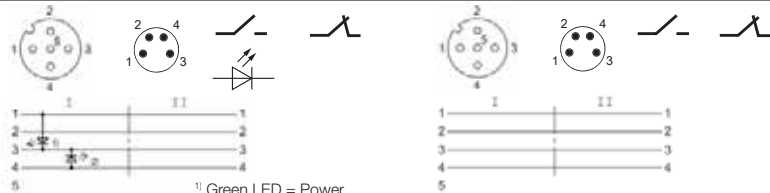


Connection cables

M12 female ↔ M8 male, 4-pin



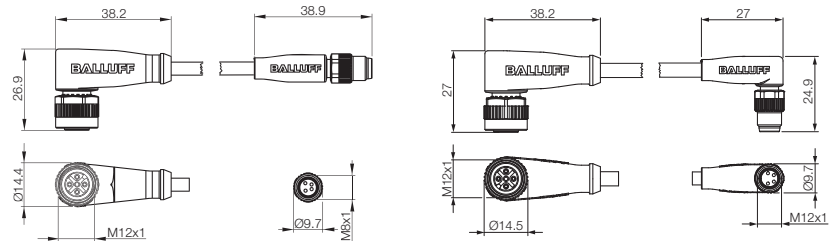
Connector diagram and wiring

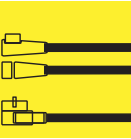


PUR, black	0.3 m	BCC03TF	BCC03T6
PUR, black	0.6 m	BCC03TH	BCC03T7
PUR, black	1 m	BCC03TJ	BCC03T8
PUR, black	1.5 m	BCC03TK	BCC03T9
PUR, black	2 m	BCC03TL	BCC03TA
PUR, black	3 m	BCC03TM	BCC03TC
PUR, black	5 m	BCC03TN	BCC03TE
PVC, gray	0.3 m	BCC03UR	BCC03UH
PVC, gray	0.6 m	BCC03UT	BCC03UJ
PVC, gray	1 m	BCC03UU	BCC03UK
PVC, gray	1.5 m	BCC03UW	BCC03UL
PVC, gray	2 m	BCC03UY	BCC03UM
PVC, gray	3 m	BCC03UZ	BCC03UN
PVC, gray	5 m	BCC03W0	BCC03UP
Supply voltage U_B		30 V DC	30 V AC/DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67/IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
static/moving	PVC	-40...+105 °C/-5...+90 °C (UL 80 °C)	-40...+105 °C/-5...+90 °C (UL 80 °C)
Use		Complementary (NO/NC) \swarrow / \searrow / \nearrow	Complementary (NO/NC) \swarrow / \searrow / \nearrow
LED		2× (PNP), green, yellow	

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8**
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

Connection cables
M12 female ↔ M12 male, 3-pin



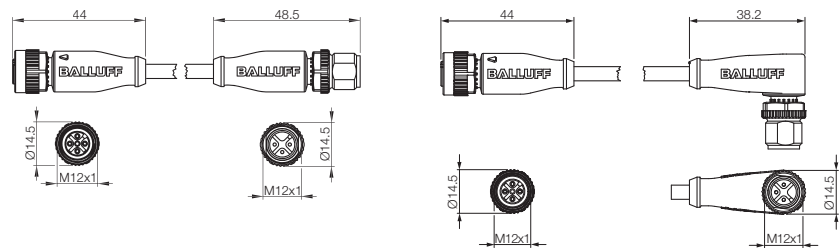
Connector diagram and wiring



PUR, black	0.3 m	BCC036Y	BCC0375
PUR, black	0.6 m	BCC036Z	BCC0376
PUR, black	1 m	BCC0370	BCC0377
PUR, black	1.5 m	BCC0371	BCC0378
PUR, black	2 m	BCC0372	BCC0379
PUR, black	3 m	BCC0373	BCC037A
PUR, black	5 m	BCC0374	BCC037C
PVC, gray	0.3 m	BCC0386	BCC038F
PVC, gray	0.6 m	BCC0387	BCC038H
PVC, gray	1 m	BCC0388	BCC038J
PVC, gray	1.5 m	BCC0389	BCC038K
PVC, gray	2 m	BCC038A	BCC038L
PVC, gray	3 m	BCC038C	BCC038M
PVC, gray	5 m	BCC038E	BCC038N
Supply voltage U_B		250 V AC/DC	250 V AC/DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
Use		Normally open (NO) ✓-	Normally open (NO) ✓-
LED			

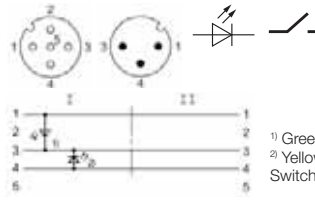
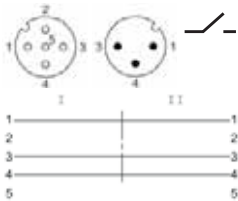
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



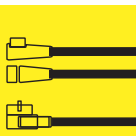
Connection cables

M12 female ↔ M12 male, 3-pin

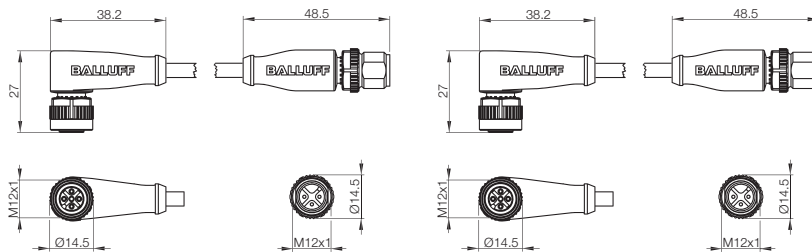


¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

BCC037E	BCC037Z
BCC037F	BCC0380
BCC037H	BCC0381
BCC037J	BCC0382
BCC037K	BCC0383
BCC037L	BCC0384
BCC037M	BCC0385
BCC038P	BCC0397
BCC038R	BCC0398
BCC038T	BCC0399
BCC038U	BCC039A
BCC038W	BCC039C
BCC038Y	BCC039E
BCC038Z	BCC039F
250 V AC/DC	30 V DC
Molded	Molded
3×0.34 mm ²	3×0.34 mm ²
IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
Normally open (NO) —/—	Normally open (NO) —/— 2× (PNP), green, yellow



Connectors and Cables
 M5 connectors
 Connection Cables
 M5↔M8
 M8 connectors
 Connection Cables
 M8↔M8
 Connection Cables
 M8↔M12
 M12 connectors
 Connection Cables
 M12↔M8
Connection Cables
M12↔M12
 M23 connectors
 Connection Cables
 M23↔M12
 Connector 7/8"
 Connection Cables
 7/8"↔7/8"

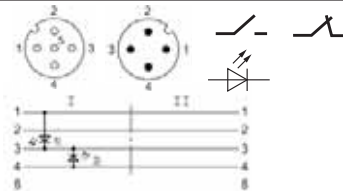
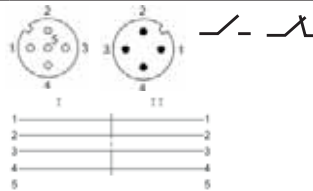


Connection cables

M12 female ↔ M12 male, 4-pin



Connector diagram and wiring

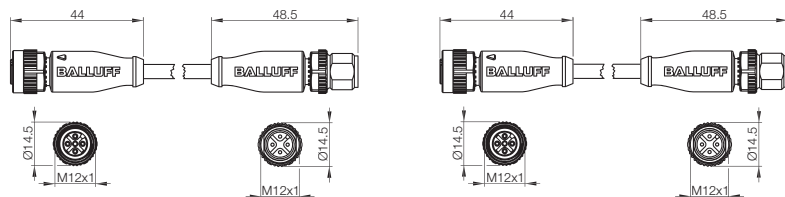


¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output

PUR, black	0.3 m	BCC039H	BCC03A1
PUR, black	0.6 m	BCC039J	BCC03A2
PUR, black	1 m	BCC039K	BCC03A3
PUR, black	1.5 m	BCC039L	BCC03A4
PUR, black	2 m	BCC039M	BCC03A5
PUR, black	3 m	BCC039N	BCC03A6
PUR, black	5 m	BCC039P	BCC03A7
PVC, gray	0.3 m	BCC03C9	BCC03CU
PVC, gray	0.6 m	BCC03CA	BCC03CW
PVC, gray	1 m	BCC03CC	BCC03CY
PVC, gray	1.5 m	BCC03CE	BCC03CZ
PVC, gray	2 m	BCC03CF	BCC03E0
PVC, gray	3 m	BCC03CH	BCC03E1
PVC, gray	5 m	BCC03CJ	BCC03E2
Supply voltage U_B		250 V AC/DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
Use		Complementary (NO/NC) \swarrow - \swarrow	Complementary (NO/NC) \swarrow - \swarrow
LED			2× (PNP), green, yellow

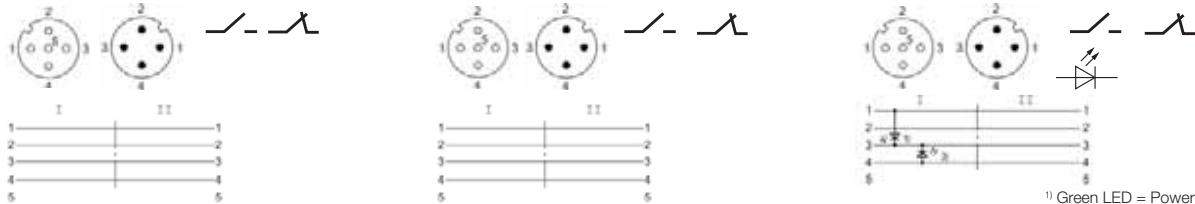
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
 NPN versions with LED on request.



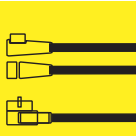
Connection cables

M12 female ↔ M12 male, 4-pin

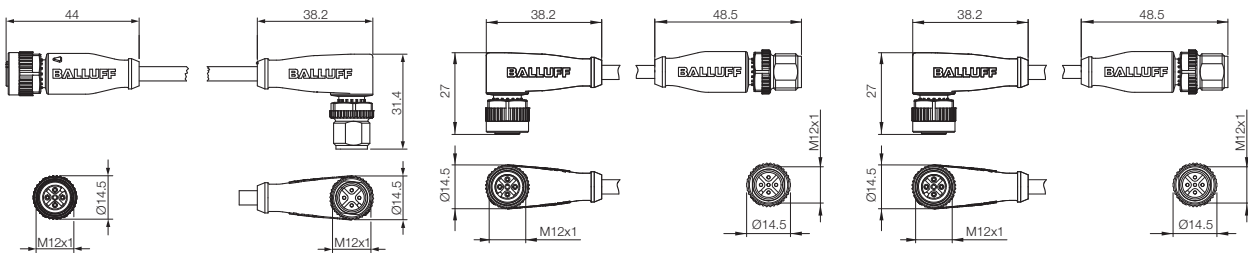


¹ Green LED = Power
² Yellow LED = Switching output

BCC039R	BCC03A8	BCC03AT
BCC039T	BCC03A9	BCC03AU
BCC039U	BCC03AA	BCC03AW
BCC039W	BCC03AC	BCC03AY
BCC039Y	BCC03AE	BCC03AZ
BCC039Z	BCC03AF	BCC03C0
BCC0390	BCC03AH	BCC03C1
BCC03CK	BCC03E3	BCC03EL
BCC03CL	BCC03E4	BCC03EM
BCC03CM	BCC03E5	BCC03EN
BCC03CN	BCC03E6	BCC03EP
BCC03CP	BCC03E7	BCC03ER
BCC03CR	BCC03E8	BCC03ET
BCC03CT	BCC03E9	BCC03EU
250 V AC/DC	250 V AC/DC	30 V DC
Molded	Molded	Molded
4×0.34 mm ²	4×0.34 mm ²	4×0.34 mm ²
IP 68	IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
Complementary (NO/NC) \swarrow -/ \swarrow	Complementary (NO/NC) \swarrow -/ \swarrow	Complementary (NO/NC) \swarrow -/ \swarrow 2× (PNP), green, yellow



Connectors and Cables
 M5 connectors
 Connection Cables
 M5↔M8
 M8 connectors
 Connection Cables
 M8↔M8
 Connection Cables
 M8↔M12
 M12 connectors
 Connection Cables
 M12↔M8
Connection Cables
M12↔M12
 M23 connectors
 Connection Cables
 M23↔M12
 Connector 7/8"
 Connection Cables
 7/8"↔7/8"

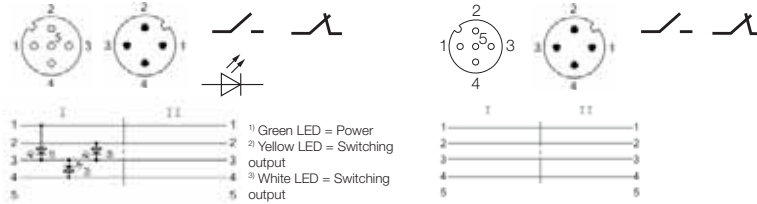


Connection cables

M12 female ↔ M12 male, 4-pin



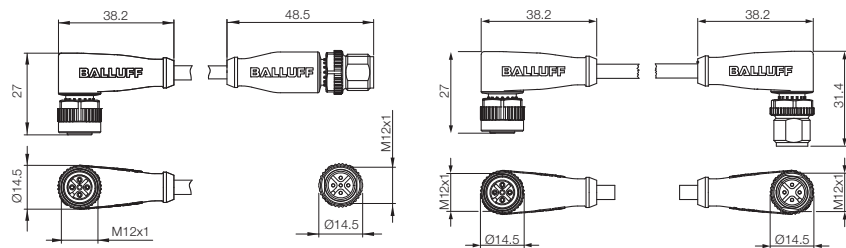
Connector diagram and wiring

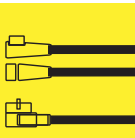


PUR, black	0.3 m	BCC03C2	BCC03AJ
PUR, black	0.6 m	BCC03C3	BCC03AK
PUR, black	1 m	BCC03C4	BCC03AL
PUR, black	1.5 m	BCC03C5	BCC03AM
PUR, black	2 m	BCC03C6	BCC03AN
PUR, black	3 m	BCC03C7	BCC03AP
PUR, black	5 m	BCC03C8	BCC03AR
PVC, gray	0.3 m	BCC03EW	BCC03EA
PVC, gray	0.6 m	BCC03Y4	BCC03EC
PVC, gray	1 m	BCC03EZ	BCC03EE
PVC, gray	1.5 m	BCC03F0	BCC03EF
PVC, gray	2 m	BCC03F1	BCC03EH
PVC, gray	3 m	BCC03F2	BCC03EJ
PVC, gray	5 m	BCC03F3	BCC03EK
Supply voltage U_B		30 V DC	250 V AC/DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
Use		Complementary (NO/NC) $\text{---}/\text{---}/\text{---}$	Complementary (NO/NC) $\text{---}/\text{---}/\text{---}$
LED		3× (PNP), green, yellow, white	

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





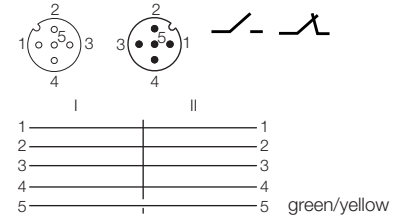
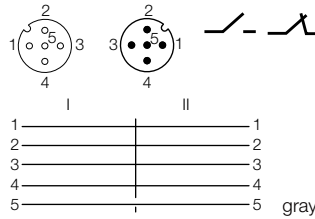
- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12**
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

Connection cables

M12 female ↔ M12 male, 5-pin



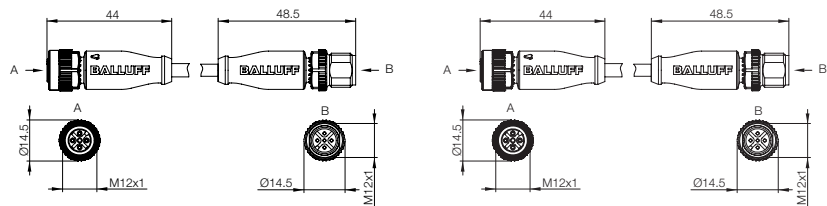
Connector diagram and wiring



PUR, black	0.3 m	BCC09FL	BCC09FW
PUR, black	0.6 m	BCC09FM	BCC09FY
PUR, black	1 m	BCC09FN	BCC09FZ
PUR, black	1.5 m	BCC09FP	BCC09H0
PUR, black	2 m	BCC09FR	BCC09H1
PUR, black	3 m	BCC09FT	BCC09H2
PUR, black	5 m	BCC09FU	BCC09H3
PUR, black	10 m		BCC0AJC
Supply voltage U_B		125 V AC/DC	125 V AC/DC
Cable		Molded	Molded
No. of wires × conductor cross-section		5×0.34 mm ²	5×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a static/moving		-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Use		Complementary (NO/NC)	Complementary (NO/NC)
LED			

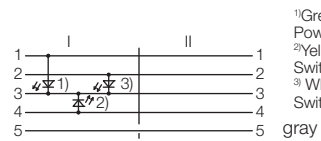
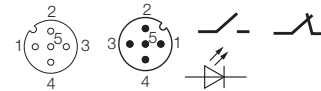
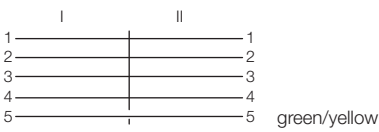
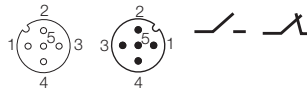
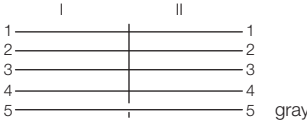
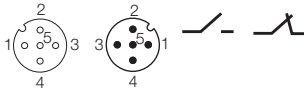
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



Connection cables

M12 female ↔ M12 male, 5-pin



¹Green LED = Power-on indicator
²Yellow LED = Switching output
³White LED = Switching output

BCC08H8
 BCC08H9
 BCC08HA
 BCC08HC
 BCC08HE
 BCC08HF
 BCC08HH

BCC08H0
 BCC08H1
 BCC08H2
 BCC08H3
 BCC08H4
 BCC08H5
 BCC08H6

BCC09FA
 BCC09FC
 BCC09FE
 BCC09FH
 BCC09FF
 BCC09FJ
 BCC09FK

125 V AC/DC
 Molded
 5x0.34 mm²

125 V AC/DC
 Molded
 5x0.34 mm²

30 V DC
 Molded
 5x0.34 mm²

IP 68
 -40...+90 °C/-25...+90 °C (UL 80 °C)

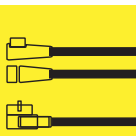
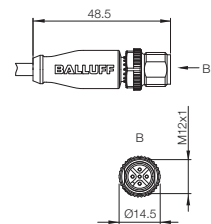
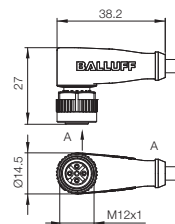
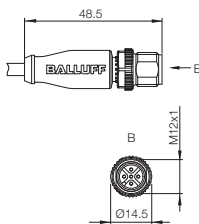
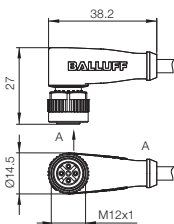
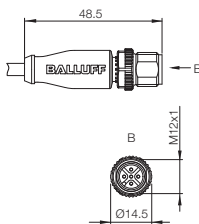
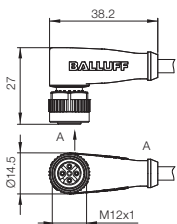
IP 68
 -40...+90 °C/-25...+90 °C (UL 80 °C)

IP 68
 -40...+90 °C/-25...+90 °C (UL 80 °C)

Complementary (NO/NC)

Complementary (NO/NC)

Complementary (NO/NC)
 3x (PNP), green, yellow, white



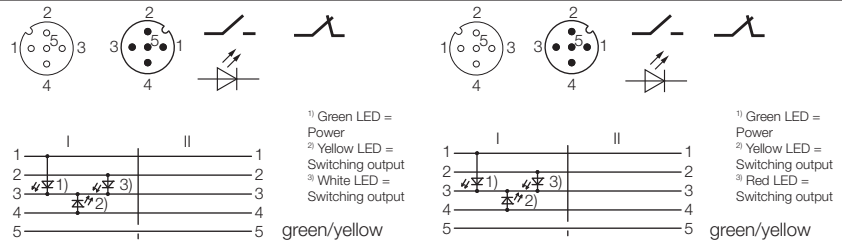
Connectors and Cables
 M5 connectors
 Connection Cables
 M5 ↔ M8
 M8 connectors
 Connection Cables
 M8 ↔ M8
 Connection Cables
 M8 ↔ M12
 M12 connectors
 Connection Cables
 M12 ↔ M8
Connection Cables
M12 ↔ M12
 M23 connectors
 Connection Cables
 M23 ↔ M12
 Connector 7/8"
 Connection Cables
 7/8" ↔ 7/8"

Connection cables

M12 female ↔ M12 male, 5-pin



Connector diagram and wiring

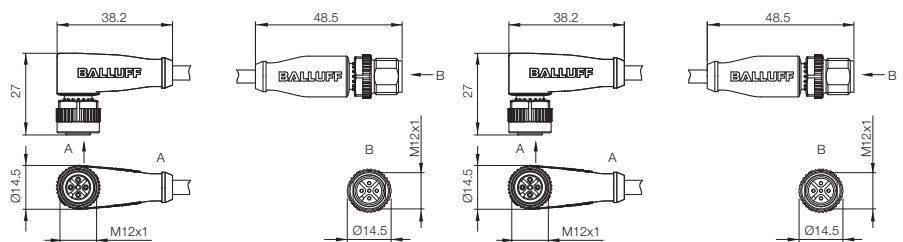


PUR, black	0.3 m	BCC09F9	BCC0C4J
PUR, black	0.6 m	BCC09F8	BCC0C4H
PUR, black	1 m	BCC09F7	BCC0C4F
PUR, black	1.5 m	BCC09F3	BCC0C4E
PUR, black	2 m	BCC09F4	BCC0C4C
PUR, black	3 m	BCC09F5	BCC0C4A
PUR, black	5 m	BCC09F6	BCC0C49
Supply voltage U_B		30 V DC	30 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		5×0.34 mm ²	5×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a static/moving		-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Use		Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow
LED		3× (PNP), green, yellow, white	3× (PNP), green, yellow, red

Other cable materials, colors and lengths on request.

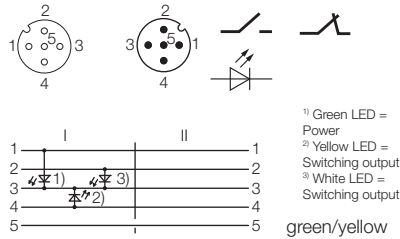
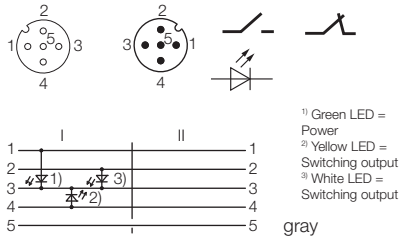
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

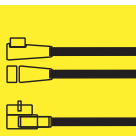
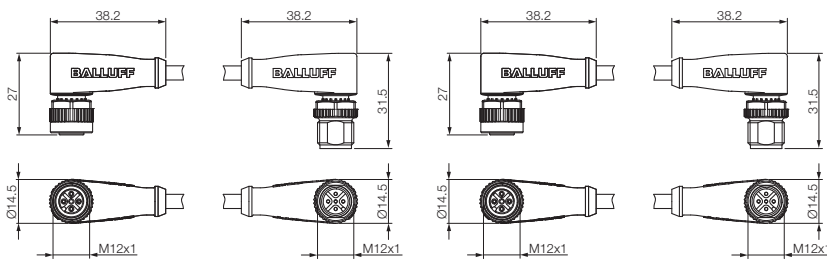


Connection cables

M12 female ↔ M12 male, 5-pin



BCC08FF	BCC08FP
BCC08FH	BCC08FR
BCC08FJ	BCC08FT
BCC08FK	BCC08FU
BCC08FL	BCC08FW
BCC08FM	BCC08FY
BCC08FN	BCC08FZ
30 V DC	30 V DC
Molded	Molded
5x0.34 mm ²	5x0.34 mm ²
IP 68	IP 68
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Complementary (NO/NC)	Complementary (NO/NC)
3x (PNP), green, yellow, white	3x (PNP), green, yellow, white

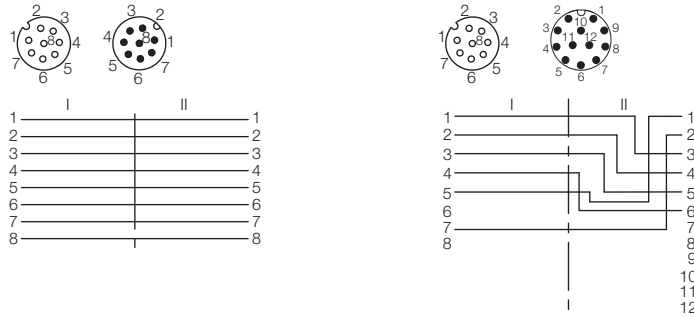


- Connectors and Cables
- Connection Cables
- M5 connectors
- M5 ↔ M8
- M8 connectors
- Connection Cables
- M8 ↔ M8
- Connection Cables
- M8 ↔ M12
- M12 connectors
- Connection Cables
- M12 ↔ M8
- Connection Cables**
- M12 ↔ M12**
- M23 connectors
- Connection Cables
- M23 ↔ M12
- Connector 7/8"
- Connection Cables
- 7/8" ↔ 7/8"

Connection cables
M12 female ↔ M12 male, 8-pin



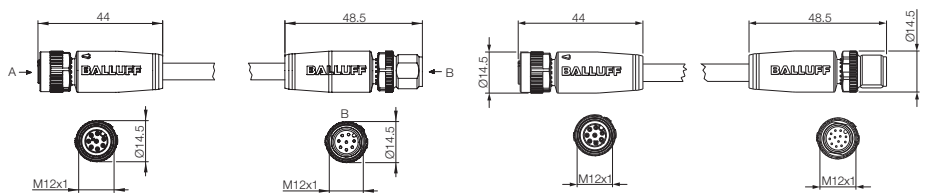
Connector diagram and wiring

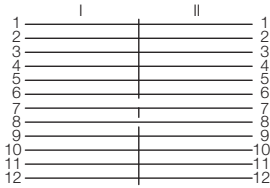
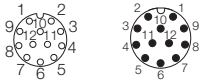


PUR, black	0.3 m	BCC0AC0	
PUR, black	0.6 m	BCC0AAZ	BCC088J
PUR, black	1 m	BCC0AC1	BCC088K
PUR, black	1.5 m	BCC0AC2	
PUR, black	2 m	BCC0AC3	BCC088L
PUR, black	3 m	BCC0AC4	
PUR, black	5 m	BCC0AC5	
PUR, black	10 m		
Supply voltage U_B		60 V AC/DC	60 V AC/DC
Cable		Molded	Molded
No. of wires x conductor cross-section		8x0.25 mm ²	8x0.25 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a		-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)
Static/moving			

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.





BCC0AY4

BCC088E

BCC088F

BCC088H

BCC0E9J

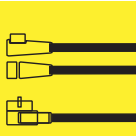
60 V AC/DC

Molded

12x0.25 mm²

IP 68

-40...+90 °C/-25...+90 °C (UL 80 °C)



Connectors
and Cables

M5 connectors

Connection
Cables

M5↔M8

M8 connectors

Connection
Cables

M8↔M8

Connection
Cables

M8↔M12

M12 connectors

Connection
Cables

M12↔M8

**Connection
Cables**

M12↔M12

M23 connectors

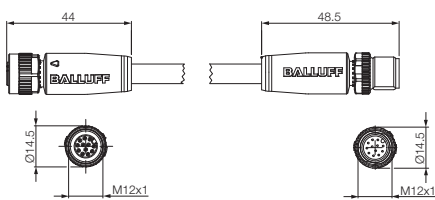
Connection
Cables

M23↔M12

Connector 7/8"

Connection
Cables

7/8"↔7/8"



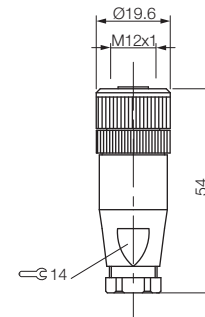
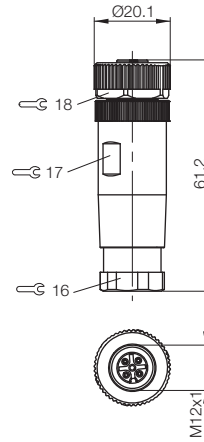
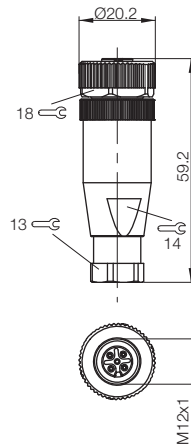
Connectors
M12 female, field-attachable
4-pin



Connector diagram



Cable break detector	Ø 4...6 mm Ø 6...8 mm	BCC06Z9 BCC06F6	BCC0F9N BCC06Y6	BCC0158
Type		No LED, NO and NC	No LED, NO and NC	No LED, NO and NC
Supply voltage AC U_S		250 V AC	250 V AC	
Supply voltage DC U_S		250 V DC	250 V DC	30 V DC
Cable		field-attachable	field-attachable	field-attachable
Number of conductors × Conductor cross-section		4×0.14...0.75 mm ²	4×0.14...0.50 mm ²	4×0.75 mm ²
Cable diameter			Ø 6...8 mm	Ø 4...6 mm
Connection		Screw terminal	Spring clamp terminal	Screw terminal
Enclosure rating per IEC 60529		IP 67	IP 67	IP 68
Ambient temperature T_a		-40...+85 °C	-25...+85 °C	-25...+100 °C
Use				



Connectors
M12 female, field-attachable
4-pin



Quick-connect system



Quick-connect system



Quick-connect system



BCC06ZY

BCC02H8

BCC06ZA
BCC06Y8

BCC02H6

No LED, NO and NC

No LED, NO and NC

No LED, NO and NC

No LED, NO and NC

125 V AC

30 V AC

250 V AC

30 V AC

125 V DC

30 V DC

250 V DC

30 V DC

field-attachable

field-attachable

field-attachable

field-attachable

4x0.14...0.34 mm²

4x0.14...0.34 mm²

4x0.14...0.75 mm²

4x0.25...0.5 mm²

Ø 3.5...6 mm

Ø 2.9...5.1 mm

Ø 4...6 mm

Ø 4...5.1 mm

Insulation displacement connector technology

Insulation displacement connector technology

Screw terminal

Insulation displacement connector technology

IP 67

IP 67

IP 67

IP 67

-25...+80 °C

-25...+85 °C

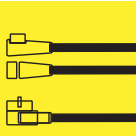
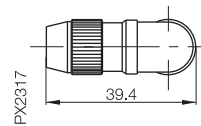
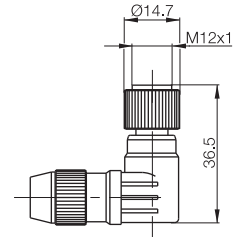
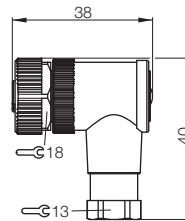
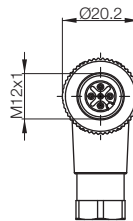
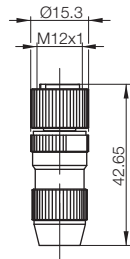
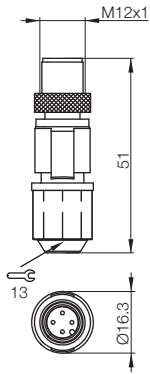
-40...+85 °C

-25...+85 °C

Plug sensor S4

Plug sensor S4

Plug sensor S4



Connectors
and Cables

M5 connectors

Connection
Cables

M5↔M8

M8 connectors

Connection
Cables

M8↔M8

Connection
Cables

M8↔M12

M12 connectors

Connection
Cables

M12↔M8

Connection
Cables

M12↔M12

M23 connectors

Connection
Cables

M23↔M12

Connector 7/8"

Connection
Cables

7/8"↔7/8"

Connectors
M12 male, field-attachable
4-pin

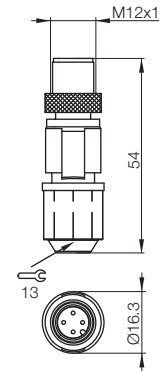
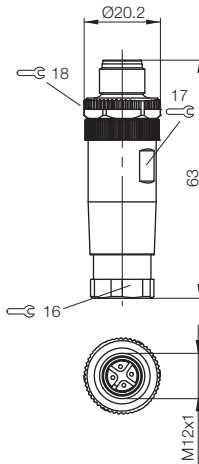
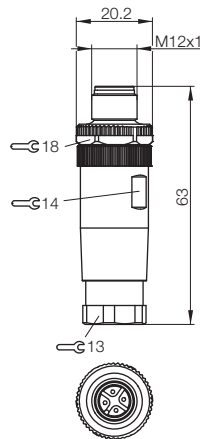


Quick-connect system

Connector diagram



Cable break detector	Ø 4...6 mm Ø 6...8 mm	BCC06M4 BCC06F7	BCC0F9M BCC06Y5	BCC08C0
Type		No LED, NO and NC	No LED, NO and NC	No LED, NO and NC
Supply voltage AC U_S		250 V AC	250 V AC	125 V AC
Supply voltage DC U_S		250 V DC	250 V DC	125 V DC
Cable		field-attachable	field-attachable	field-attachable
No. of wires x conductor cross-section		4x0.14...0.75 mm ²	4x0.14...0.50 mm ²	4x0.14...0.34 mm ²
Cable diameter				Ø 3.5...6 mm
Connection		Screw terminal	Spring clamp terminal	Insulation displacement connector technology
Enclosure rating per IEC 60529		IP 67	IP 67	IP 67
Ambient temperature T_a		-40...+85 °C	-25...+85 °C	-25...+80 °C
Use				Female S4



Connectors
M12 male, field-attachable
4-pin



Quick-connect system



Quick-connect system



BCC02H9

**BCC06ZC
BCC06ZE**

BCC02H7

No LED, NO and NC
30 V AC
30 V DC
field-attachable
4x0.14...0.34 mm²

No LED, NO and NC
250 V AC
250 V DC
field-attachable
4x0.14...0.75 mm²

No LED, NO and NC
30 V AC
30 V DC
field-attachable
4x0.25...0.5 mm²

No LED, NO and NC

Ø 2.9...5.1 mm

Insulation displacement connector technology

IP 67

-25...+85 °C

Female S4

Screw terminal

IP 67

-40...+85 °C

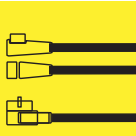
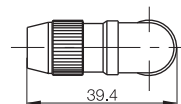
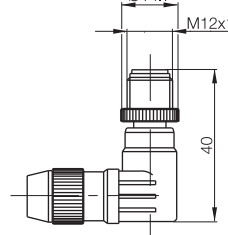
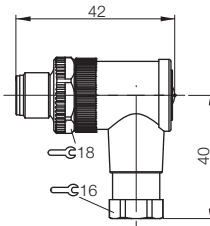
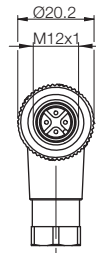
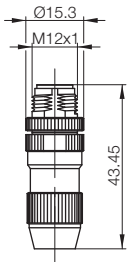
Ø 4...5.1 mm

Insulation displacement connector technology

IP 67

-25...+85 °C

Female S4



Connectors
and Cables

M5 connectors

Connection
Cables
M5↔M8

M8 connectors

Connection
Cables
M8↔M8

Connection
Cables
M8↔M12

M12 connectors

Connection
Cables
M12↔M8

Connection
Cables
M12↔M12

M23 connectors

Connection
Cables
M23↔M12

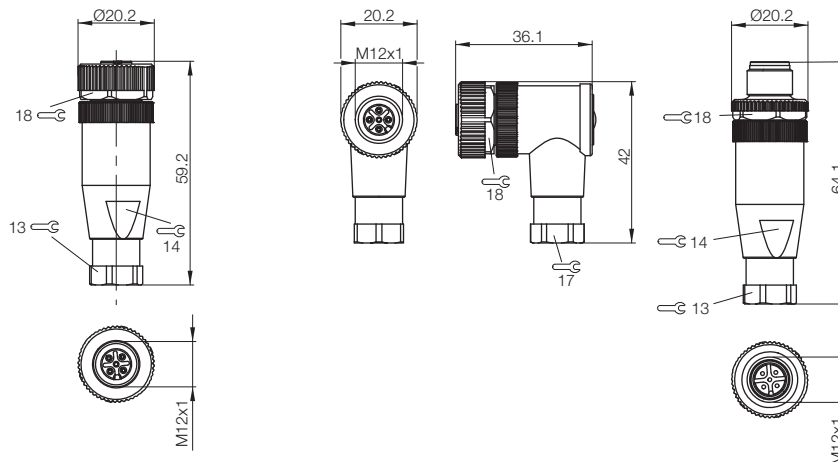
Connector 7/8"
Connection
Cables
7/8"↔7/8"



Connector diagram and wiring



Cable break detector	Ø 4...6 mm Ø 6...8 mm	BCC06ZF BCC06W9	BCC06ZH BCC06ZJ	BCC06YA BCC06EY
Type	No LED, NO and NC			No LED, NO and NC
Supply voltage AC U_S	125 V AC			125 V AC
Supply voltage DC U_S	125 V DC			125 V DC
Cable	field-attachable			field-attachable
No. of wires x conductor cross-section	5x0.14...0.75 mm ²			5x0.14...0.75 mm ²
Cable diameter	Ø 4...6 mm			Ø 4...6 mm
Connection	Screw terminal			Screw terminal
Enclosure rating per IEC 60529	IP 67			IP 67
Ambient temperature T_a	-40...+85 °C			-40...+85 °C



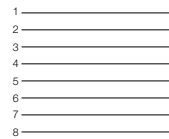
Connectors

M12 female, M12 male, field-attachable, 5 and 8-pin



Quick-connect system

Quick-connect system



BCC06ZK

BCC06ZL

BCC04MC

PUR

125 V AC

125 V DC

field-attachable

5×0.14...0.75 mm²

30 V AC

30 V DC

field-attachable

8×0.14...0.25 mm²

BCC04ME

PUR

30 V AC

30 V DC

field-attachable

8×0.14...0.25 mm²

Ø 4...8 mm

Insulation displacement connector technology

Screw terminal

IP 67

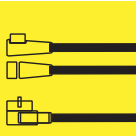
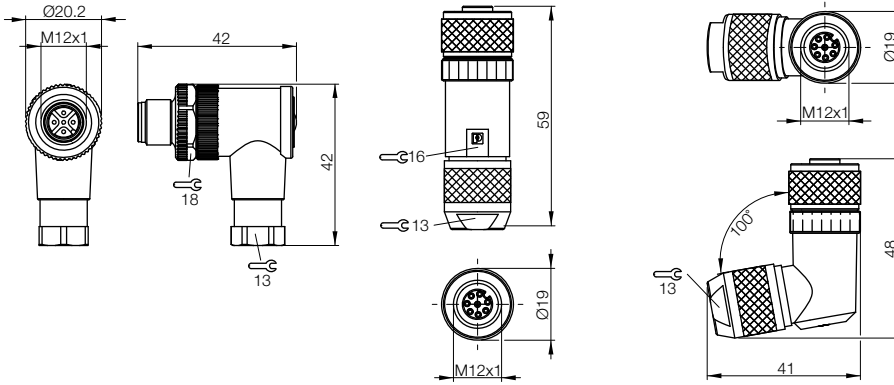
-40...+85 °C

Ø 4...8 mm

Insulation displacement connector technology

IP 67

-25...+85 °C



Connectors and Cables

M5 connectors

Connection Cables

M5↔M8

M8 connectors

Connection Cables

M8↔M8

Connection Cables

M8↔M12

M12 connectors

Connection Cables

M12↔M8

Connection Cables

M12↔M12

M23 connectors

Connection Cables

M23↔M12

Connector 7/8"

Connection Cables

7/8"↔7/8"

Connectors

M12 female, M12 male, field-attachable,
Duo connector, 5-pin



Duo connectors

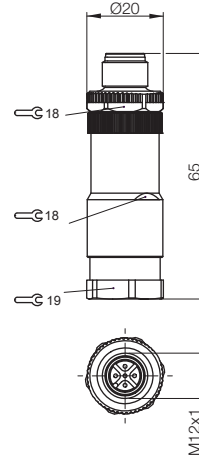
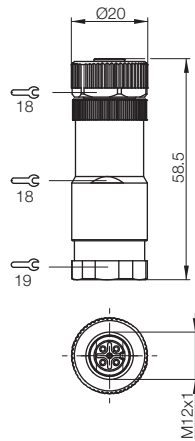


Duo connectors

Connector diagram



	BCC09JP	BCC09JW
Supply voltage AC U_S	125 V AC	125 V AC
Supply voltage DC U_S	125 V DC	125 V DC
Cable	field-attachable	field-attachable
No. of wires x conductor cross-section	5x0.14...0.75 mm ²	5x0.14...0.75 mm ²
Cable diameter, Insert 1/Insert 2	2.1...3 mm/4...5 mm	2.1...3 mm/4...5 mm
Connection	Screw terminal	Screw terminal
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-40...+85 °C	-40...+85 °C



Hook up, seal, forget

Until now, you had a difficult choice when installing plug connectors. Either you could use a plug with a molded cable and in this manner achieve higher leakproofness, or you could decide in favor of a field-attachable connector if you needed flexible cable length.

This either/or is now over. Because the field-attachable and moldable BCC0CAA plug provides both: higher leakproofness and flexible cable length. The cable is shortened, connected and the plug is easily molded (see drawing). With the BCC0CAA, you increase the reliability of your installation and simultaneously decide the cable length yourself.

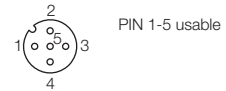
In harsh environments and extensive systems, the plug is therefore outstandingly well suited.

Features

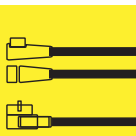
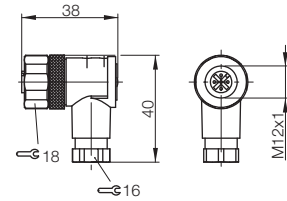
- Higher leakproofness
- Flexible cable length
- Reliable
- For harsh environments
- For extensive systems



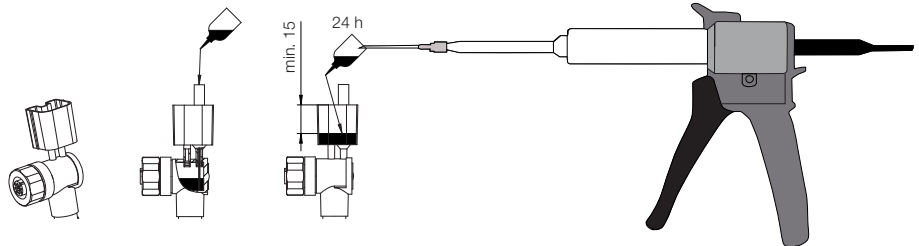
Connector diagram and wiring

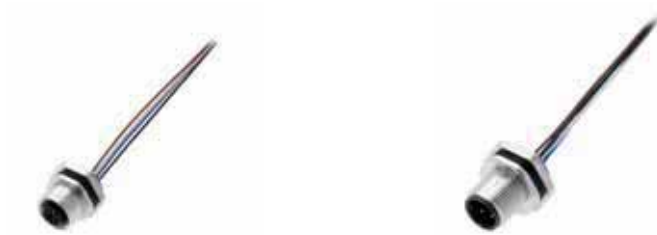


Connectors	M12
Use	Female
BCC0CAA	
Supply voltage AC U_S	125 V AC
Supply voltage DC U_S	125 V DC
Conductor cross-section	0.14...0.75 mm ²
Cable diameter	6...8 mm
Enclosure rating per IEC 60529	IP 67
Ambient temperature T_a	-25...+85 °C
Material	Grip body PBT, transparent
	Contact CuZn
	Contact holder PA



- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors**
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"





Connector diagram
and wiring



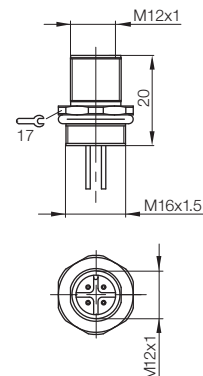
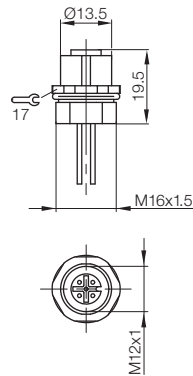
- 1 ————— PIN 1: brown
- 2 ————— PIN 2: white
- 3 ————— PIN 3: blue
- 4 ————— PIN 4: black
- 5



- 1 ————— PIN 1: brown
- 2 ————— PIN 2: white
- 3 ————— PIN 3: blue
- 4 ————— PIN 4: black
- 5

0.5 m	BCC099C	BCC099A
2 m	BCC0CAE	BCC0E53
Supply voltage AC U_S	250 V	250 V
Supply voltage DC U_S	250 V	250 V
No. of wires × conductor cross-section	4×0.25 mm ²	4×0.25 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68
Ambient temperature T_a	-25...+85 °C	-25...+85 °C

Other cable lengths on request.



Connectors
M12 flange socket, M12 flange plug
5-pin



- 1 ————— PIN 1: brown
- 2 ————— PIN 2: white
- 3 ————— PIN 3: blue
- 4 ————— PIN 4: black
- 5 ————— PIN 5: gray



- 1 ————— PIN 1: brown
- 2 ————— PIN 2: white
- 3 ————— PIN 3: blue
- 4 ————— PIN 4: black
- 5 ————— PIN 5: gray

BCC09JZ

BCC0E54

250 V

250 V

5x0.25 mm²

IP 68

-25...+85 °C

BCC09K0

BCC0E5F

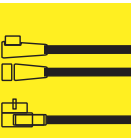
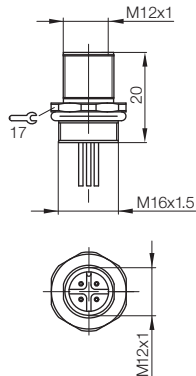
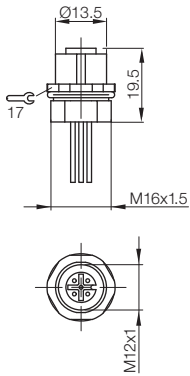
250 V

250 V

5x0.25 mm²

IP 68

-25...+85 °C



Connectors
and Cables

M5 connectors

Connection

Cables

M5↔M8

M8 connectors

Connection

Cables

M8↔M8

Connection

Cables

M8↔M12

M12 connectors

Connection

Cables

M12↔M8

Connection

Cables

M12↔M12

M23 connectors

Connection

Cables

M23↔M12

Connector 7/8"

Connection

Cables

7/8"↔7/8"



Connector diagram
and wiring

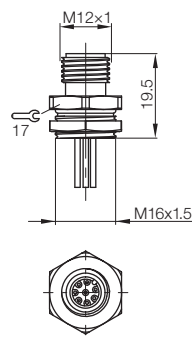
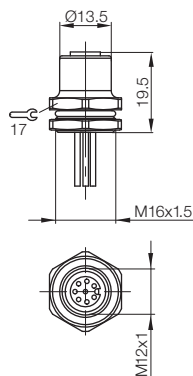


- 1 _____ PIN 1: white
- 2 _____ PIN 2: brown
- 3 _____ PIN 3: green
- 4 _____ PIN 4: yellow
- 5 _____ PIN 5: gray
- 6 _____ PIN 6: pink
- 7 _____ PIN 7: blue
- 8 _____ PIN 8: red

- 1 _____ PIN 1: white
- 2 _____ PIN 2: brown
- 3 _____ PIN 3: green
- 4 _____ PIN 4: yellow
- 5 _____ PIN 5: gray
- 6 _____ PIN 6: pink
- 7 _____ PIN 7: blue
- 8 _____ PIN 8: red

0.5 m	BCC0E55	BCC0E57
2 m	BCC0E56	BCC0E58
Supply voltage AC U_S	60 V	60 V
Supply voltage DC U_S	60 V	60 V
No. of wires × conductor cross-section	8×0.25 mm ²	8×0.25 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68
Ambient temperature T_a	-25...+85 °C	-25...+85 °C

Other cable lengths on request.



Connectors

M12 flange socket, M12 flange plug

12-pin

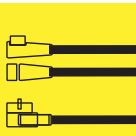


- 1 _____ PIN 1: brown
- 2 _____ PIN 2: blue
- 3 _____ PIN 3: white
- 4 _____ PIN 4: green
- 5 _____ PIN 5: pink
- 6 _____ PIN 6: yellow
- 7 _____ PIN 7: black
- 8 _____ PIN 8: gray
- 9 _____ PIN 9: red
- 10 _____ PIN 10: purple
- 11 _____ PIN 11: gray/pink
- 12 _____ PIN 12: red/blue

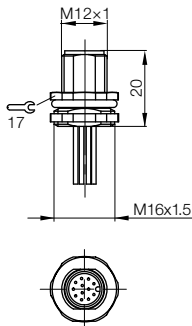
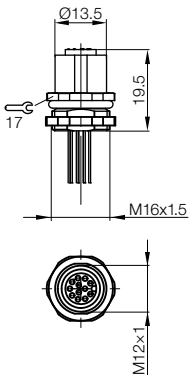


- 1 _____ PIN 1: brown
- 2 _____ PIN 2: blue
- 3 _____ PIN 3: white
- 4 _____ PIN 4: green
- 5 _____ PIN 5: pink
- 6 _____ PIN 6: yellow
- 7 _____ PIN 7: black
- 8 _____ PIN 8: gray
- 9 _____ PIN 9: red
- 10 _____ PIN 10: purple
- 11 _____ PIN 11: gray/pink
- 12 _____ PIN 12: red/blue

BCC0E59	BCC0E5C
BCC0E5A	BCC0E5E
30 V	30 V
30 V	30 V
12x0.25 mm ²	12x0.25 mm ²
IP 67	IP 67
-25...+85 °C	-25...+85 °C

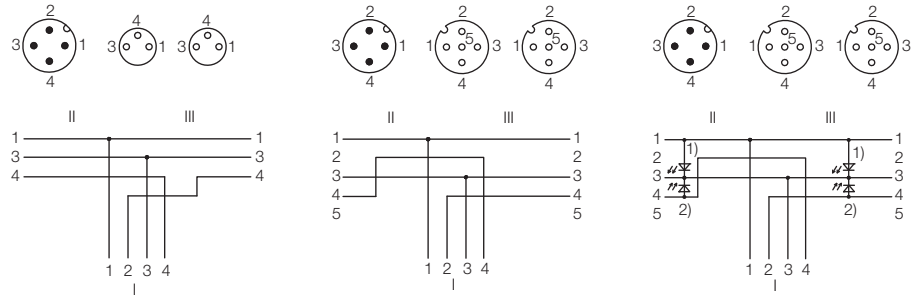


- Connectors and Cables
- M5 connectors
- Connection Cables
- M5↔M8
- M8 connectors
- Connection Cables
- M8↔M8
- Connection Cables
- M8↔M12
- M12 connectors**
- Connection Cables
- M12↔M8
- Connection Cables
- M12↔M12
- M23 connectors
- Connection Cables
- M23↔M12
- Connector 7/8"
- Connection Cables
- 7/8"↔7/8"

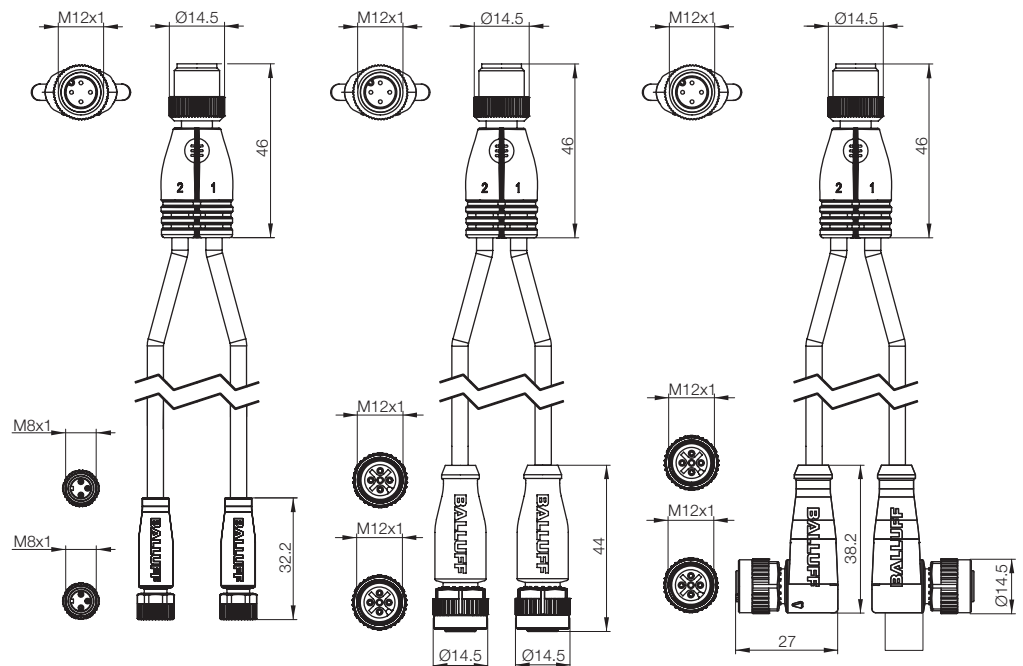




Connector diagram and wiring

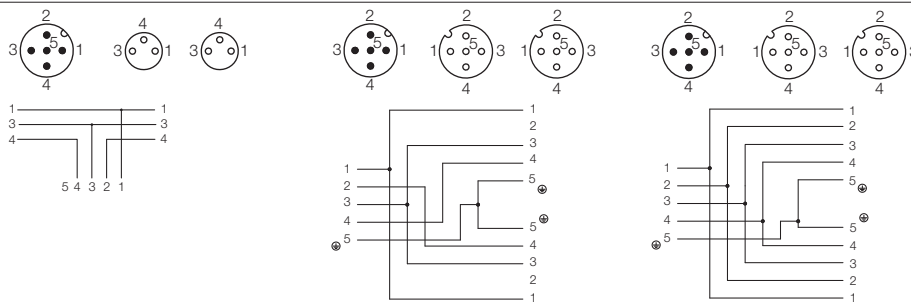


0.3 m		BCC0AUA	BCC0C9U
0.6 m	BCC0AFW	BCC0AUC	BCC0C9T
1 m	BCC0AFY	BCC0AUE	BCC0C9R
2 m	BCC0AFZ	BCC0AUF	BCC0C9P
3 m	BCC0AH0	BCC0AUH	BCC0C9N
Supply voltage AC U_S	60 V AC	250 V AC	
Supply voltage DC U_S	60 V DC	250 V DC	30 V DC
Cable	Molded in	Molded in	Molded in
No. of wires x conductor cross-section	4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68	IP 68
Ambient temperature T_a	-40...+90 °C/-25...+90 °C	-40...+90 °C/-25...+90 °C	-40...+90 °C/-25...+90 °C
Static/moving			

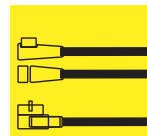
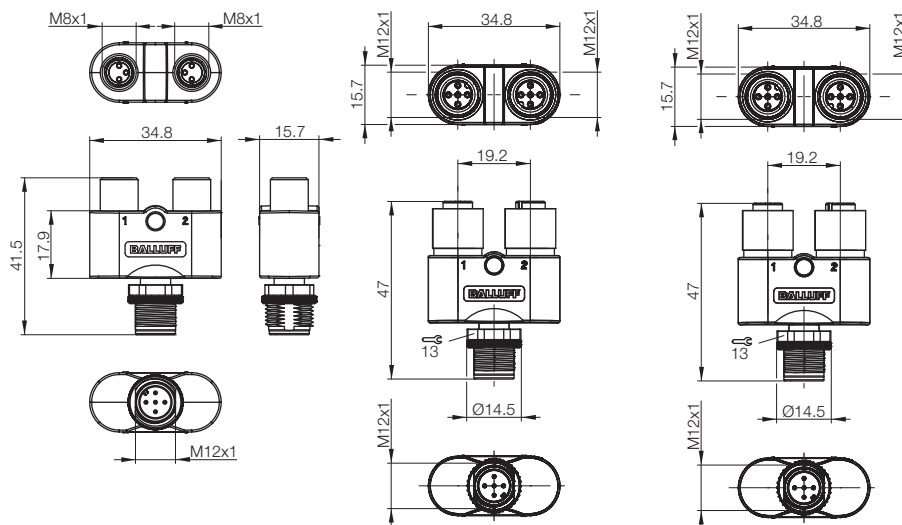




Connector diagram and wiring



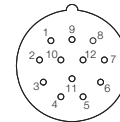
	BCC09JC	BCC089P	BCC09MU
Supply voltage U_S	60 V AC/DC	125 V AC/DC	125 V AC/DC
Rated operating current I_e	4 A	4 A	4 A
Enclosure rating per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	-25...+85 °C	-25...+85 °C	-25...+85 °C
Housing material	PA 6.6 + GF	PA 6.6 + GF	PA 6.6 + GF



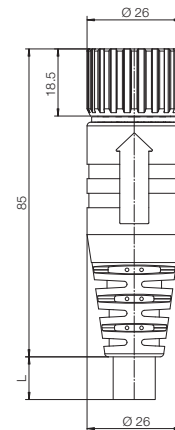
- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors**
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

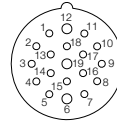
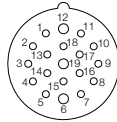
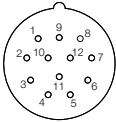


View of female side



PUR, black	2 m	BCC06KN
PUR, black	5 m	BCC06KP
PUR, black	10 m	BCC06KR
Supply voltage AC U_S	240 V AC	
Supply voltage DC U_S	240 V DC	
Cable	Molded	
No. of wires × conductor cross-section	8×0.50 mm ² and 3×1.0 mm ²	
Enclosure rating per IEC 60529	IP 67	
Ambient temperature T_a	-25...+80 °C	





BCC06KT
BCC06KU
BCC06KW

240 V AC
240 V DC
Molded
8×0.50 mm² and 3×1.0 mm²

IP 67
-25...+80 °C

BCC06KY
BCC06KZ
BCC06L0

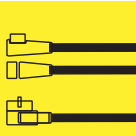
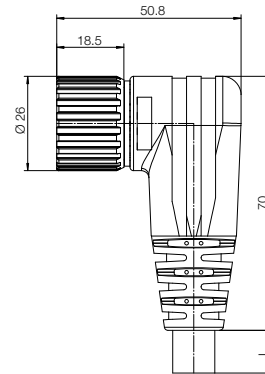
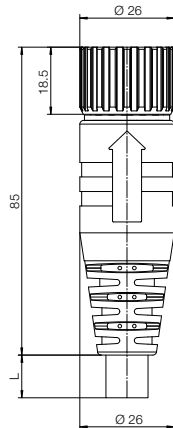
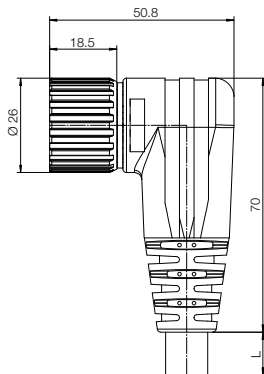
120 V AC
120 V DC
Molded
16×0.50 mm² and 3×1.0 mm²

IP 67
-25...+80 °C

BCC06L1
BCC06L2
BCC06L3

120 V AC
120 V DC
Molded
16×0.50 mm² and 3×1.0 mm²

IP 67
-25...+80 °C

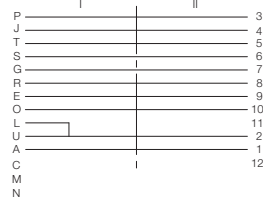
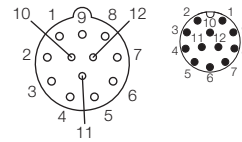
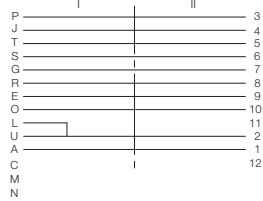
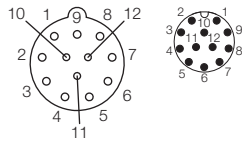


- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors**
- Connection Cables M23↔M12
- Connector 7/8"
- Connection Cables 7/8"↔7/8"

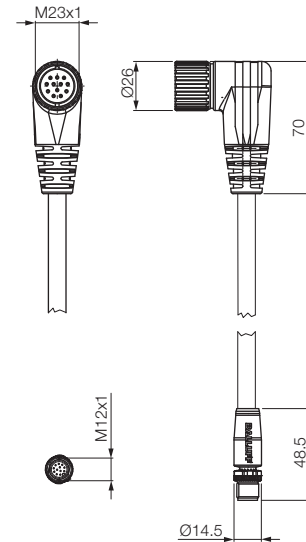
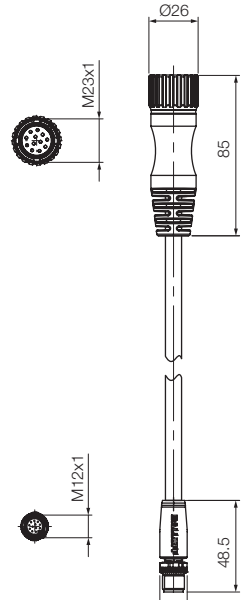
Connection cables
M23 female ↔ M12 male, 12-pin

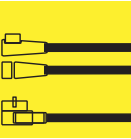


View of female/male side



PUR, black	0.6 m	BCC088M	BCC088R
PUR, black	1 m	BCC088N	BCC088T
PUR, black	2 m	BCC088P	BCC088U
Supply voltage DC U _S		30 V DC	30 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		12×0.25 mm ²	12×0.25 mm ²
Enclosure rating per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T _a		-25...+80 °C	-25...+80 °C





Connectors
and Cables

M5 connectors

Connection
Cables
M5↔M8

M8 connectors

Connection
Cables
M8↔M8

Connection
Cables
M8↔M12

M12 connectors

Connection
Cables
M12↔M8

Connection
Cables
M12↔M12

M23 connectors

**Connection
Cables
M23↔M12**

Connector 7/8"

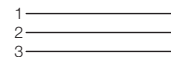
Connection
Cables
7/8"↔7/8"



Connector diagram and wiring

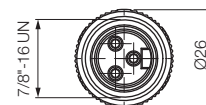


PIN 1: green/yellow
PIN 2: brown
PIN 3: blue



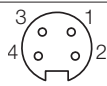
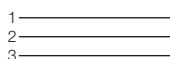
PUR, black	2 m	BCC0AHZ
PUR, black	5 m	BCC0AJ0
PUR, black	10 m	BCC0AJ1
Supply voltage AC U _S	300 V AC	
Supply voltage DC U _S	300 V DC	
Cable	Molded	
No. of wires × conductor cross-section	3×1.5 mm ²	
Enclosure rating per IEC 60529	IP 68	
Ambient temperature T _a	-25...+80 °C	

Other cable materials, colors and lengths on request.

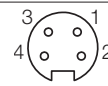
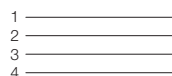




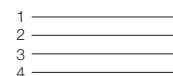
PIN 1: green/yellow
PIN 2: brown
PIN 3: blue



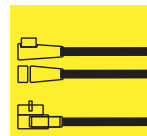
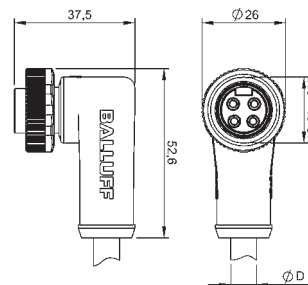
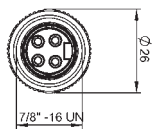
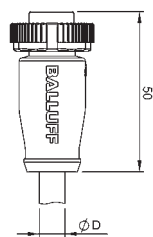
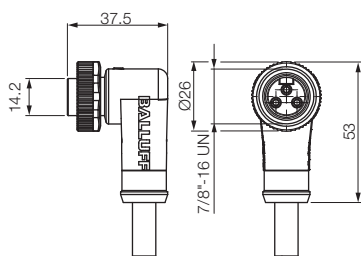
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



BCC0AJ2	BCC06HU	BCC06HZ
BCC0AJ3	BCC06HW	BCC06J0
BCC0AJ4	BCC06HY	BCC06J1
300 V AC	300 V AC	300 V AC
300 V DC	300 V DC	300 V DC
Molded	Molded	Molded
3x1.5 mm ²	4x1.5 mm ²	4x1.5 mm ²
IP 68	IP 68	IP 68
-25...+80 °C	-25...+80 °C	-25...+80 °C



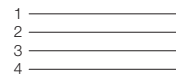
Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"



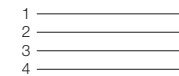
Connector diagram and wiring



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black

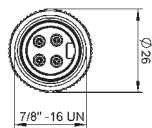
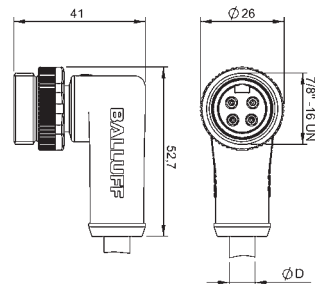
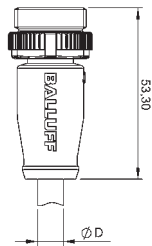


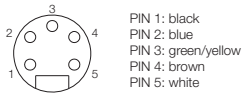
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



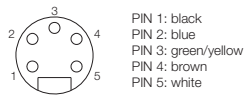
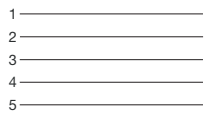
PUR, black	2 m	BCC06HL	BCC06HP
PUR, black	5 m	BCC06HM	BCC06HR
PUR, black	10 m	BCC06HN	BCC06HT
Supply voltage AC U_s		300 V AC	300 V AC
Supply voltage DC U_s		300 V DC	300 V DC
Number of conductors × conductor cross-section		4×1.5 mm ²	4×1.5 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a		-25...+80 °C	-25...+80 °C

Other cable materials, colors and lengths on request.

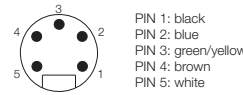
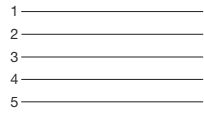




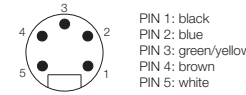
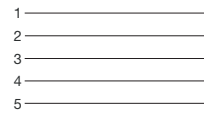
PIN 1: black
PIN 2: blue
PIN 3: green/yellow
PIN 4: brown
PIN 5: white



PIN 1: black
PIN 2: blue
PIN 3: green/yellow
PIN 4: brown
PIN 5: white



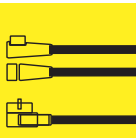
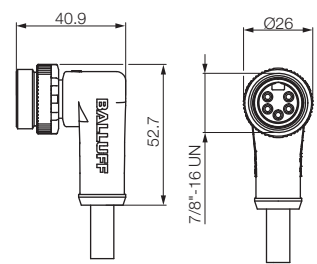
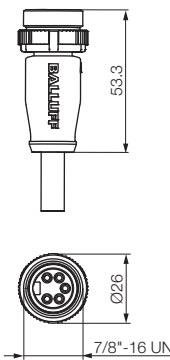
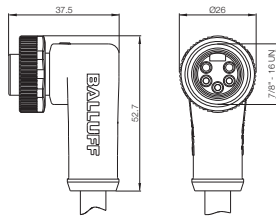
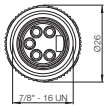
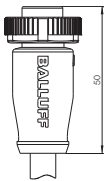
PIN 1: black
PIN 2: blue
PIN 3: green/yellow
PIN 4: brown
PIN 5: white



PIN 1: black
PIN 2: blue
PIN 3: green/yellow
PIN 4: brown
PIN 5: white



BCC06HC	BCC06HH	BCC0886	BCC0889
BCC06HE	BCC06HJ	BCC0887	BCC088A
BCC06HF	BCC06HK	BCC0888	BCC088C
300 V AC	300 V AC	300 V AC	300 V AC
300 V DC	300 V DC	300 V DC	300 V DC
5×1.5 mm ²	5×1.5 mm ²	5×1.5 mm ²	5×1.5 mm ²
IP 68	IP 68	IP 68	IP 68
-25...+80 °C	-25...+80 °C	-25...+80 °C	-25...+80 °C

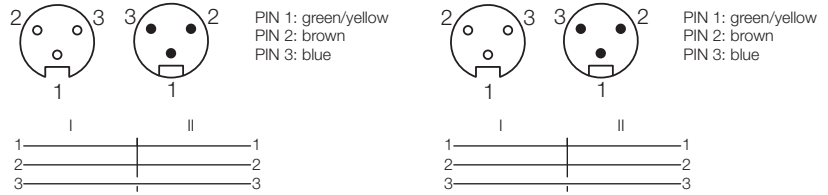


Connectors and Cables
M5 connectors
Connection Cables
M5↔M8
M8 connectors
Connection Cables
M8↔M8
Connection Cables
M8↔M12
M12 connectors
Connection Cables
M12↔M8
Connection Cables
M12↔M12
M23 connectors
Connection Cables
M23↔M12
Connector 7/8"
Connection Cables
7/8"↔7/8"

Connection cables
7/8" female ↔ 7/8" male, 3-pin

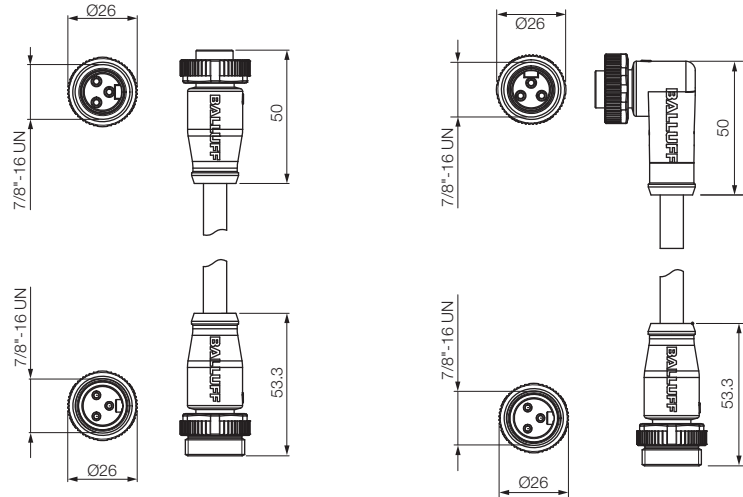


Connector diagram and wiring

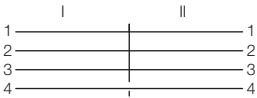
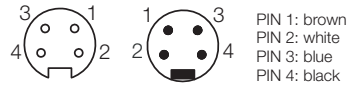
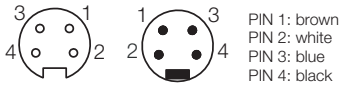


PUR, black	0.6 m	BCC0AR6	BCC0C3H
PUR, black	2 m	BCC0ARH	BCC0C3J
PUR, black	5 m	BCC0ARJ	BCC0C3K
PUR, black	10 m	BCC0ARK	BCC0C3L
PUR, black	15 m	BCC0ARL	BCC0C3M
Supply voltage AC U_S		300 V AC	300 V AC
Supply voltage DC U_S		300 V DC	300 V DC
Number of conductors × conductor cross-section		3×1.5 mm ²	3×1.5 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a		-25...+80 °C	-25...+80 °C

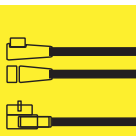
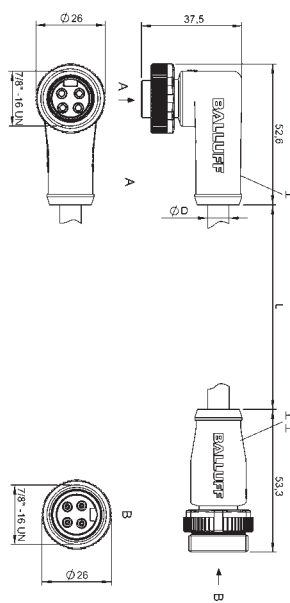
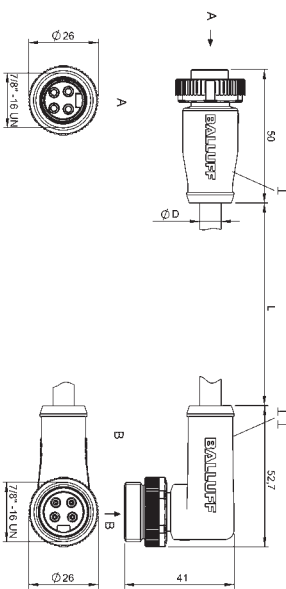
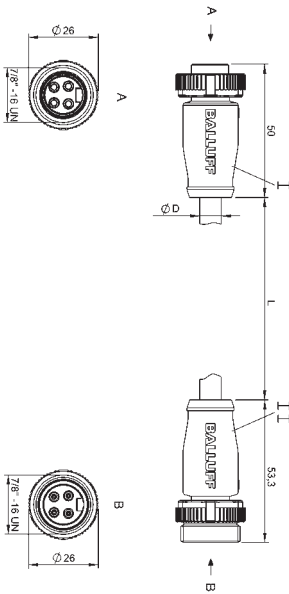
Other cable materials, colors and lengths on request.



Connection cables 7/8" female ↔ 7/8" male, 4-pin



BCC06J2	BCC06J7	BCC06JE
BCC06J3	BCC06J8	BCC06JF
BCC06J4	BCC06J9	BCC06JH
BCC06J5	BCC06JA	BCC06JJ
BCC06J6	BCC06JC	BCC06JK
300 V AC	300 V AC	300 V AC
300 V DC	300 V DC	300 V DC
4×1.5 mm ²	4×1.5 mm ²	4×1.5 mm ²
IP 68	IP 68	IP 68
-25...+80 °C	-25...+80 °C	-25...+80 °C

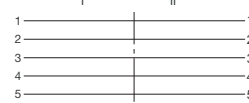
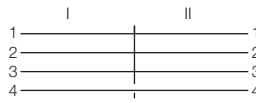
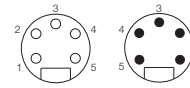


Connectors and Cables
M5 connectors
Connection Cables
M5 ↔ M8
M8 connectors
Connection Cables
M8 ↔ M8
Connection Cables
M8 ↔ M12
M12 connectors
Connection Cables
M12 ↔ M8
Connection Cables
M12 ↔ M12
M23 connectors
Connection Cables
M23 ↔ M12
Connector 7/8"
Connection Cables
7/8" ↔ 7/8"

Connection cables
7/8" female ↔ 7/8" male, 4 and 5-pin

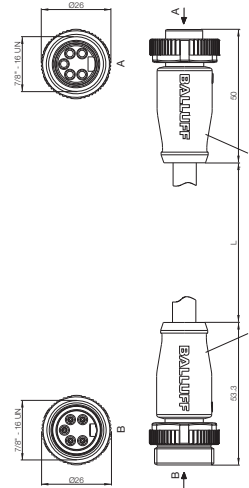
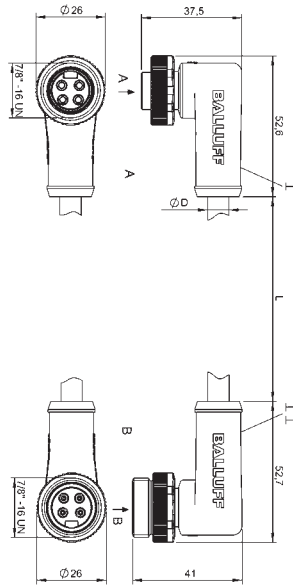


Connector diagram and wiring

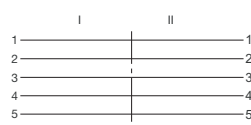
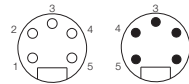
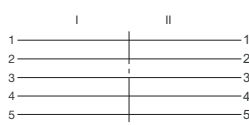
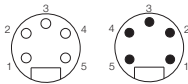
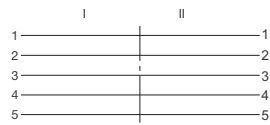
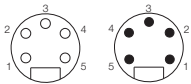


PUR, black	0.6 m	BCC06JL	BCC06FM
PUR, black	2 m	BCC06JM	BCC06FN
PUR, black	5 m	BCC06JN	BCC06FP
PUR, black	10 m	BCC06JP	BCC06FR
PUR, black	15 m	BCC06JR	BCC06FT
Supply voltage AC U_S		300 V AC	300 V AC
Supply voltage DC U_S		300 V DC	300 V DC
Number of conductors x conductor cross-section		4x1.5 mm ²	5x1.5 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68
Ambient temperature T_a		-25...+80 °C	-25...+80 °C

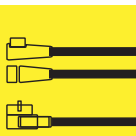
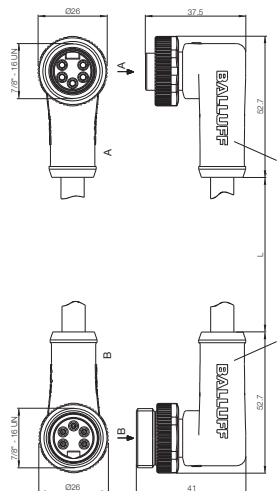
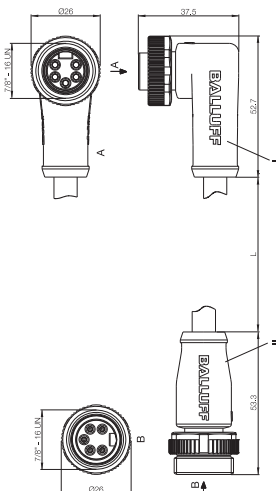
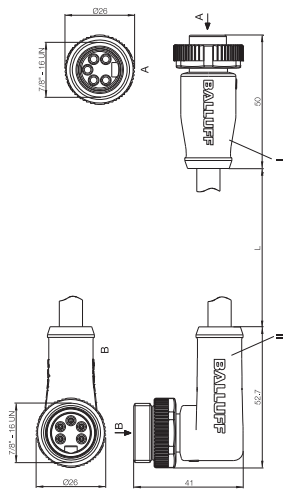
Other cable materials, colors and lengths on request.



Connection cables
7/8" female ↔ 7/8" male, 5-pin



BCC06FU	BCC06H1	BCC06H6
BCC06FW	BCC06H2	BCC06H7
BCC06FY	BCC06H3	BCC06H8
BCC06FZ	BCC06H4	BCC06H9
BCC06H0	BCC06H5	BCC06HA
300 V AC	300 V AC	300 V AC
300 V DC	300 V DC	300 V DC
5×1.5 mm ²	5×1.5 mm ²	5×1.5 mm ²
IP 68	IP 68	IP 68
-25...+80 °C	-25...+80 °C	-25...+80 °C



Connectors and Cables
M5 connectors
Connection Cables
M5 ↔ M8
M8 connectors
Connection Cables
M8 ↔ M8
Connection Cables
M8 ↔ M12
M12 connectors
Connection Cables
M12 ↔ M8
Connection Cables
M12 ↔ M12
M23 connectors
Connection Cables
M23 ↔ M12
Connector 7/8"
Connection Cables
7/8" ↔ 7/8"

Connectors

7/8" male, 7/8" female, user-fabricated
3-pin

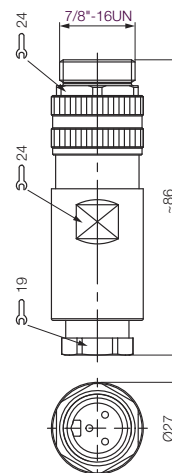
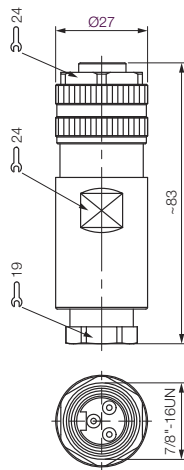


Connector diagram
and wiring

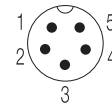
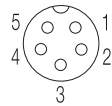
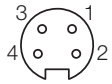


Cable diameter	Ø 6...8 mm		
	Ø 8...10 mm	BCC0AT9	BCC0ATC
	Ø 10...12 mm	BCC0ATA	BCC0ATE
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
No. of wires x conductor cross-section		3x max. 1.5 mm ²	3x max. 1.5 mm ²
Connection		Screw terminal	Screw terminal
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-25...+80 °C	-25...+80 °C

Other cable diameters on request.



Connectors
7/8" male, 7/8" female, user-fabricated
4 and 5-pin



BCC0706
BCC0707
BCC0708
 250 V AC
 250 V DC
 4x max. 1.5 mm²

BCC0709
BCC070A
BCC070C
 250 V AC
 250 V DC
 4x max. 1.5 mm²

BCC070E
BCC070F
BCC070H
 300 V AC
 300 V DC
 5x max. 1.5 mm²

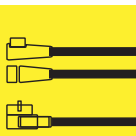
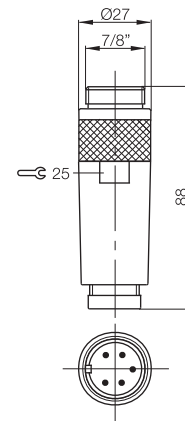
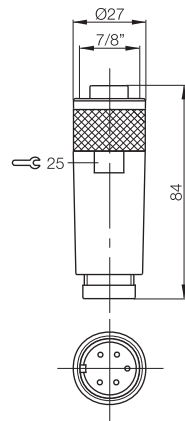
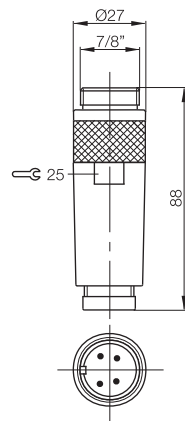
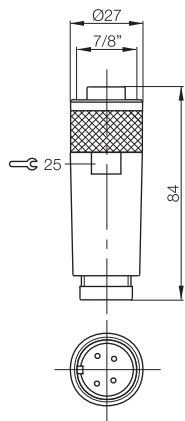
BCC070J
BCC070K
BCC070L
 300 V AC
 300 V DC
 5x max. 1.5 mm²

IP 67
 -25...+80 °C

Screw terminal
 IP 67
 -25...+80 °C

IP 67
 -25...+80 °C

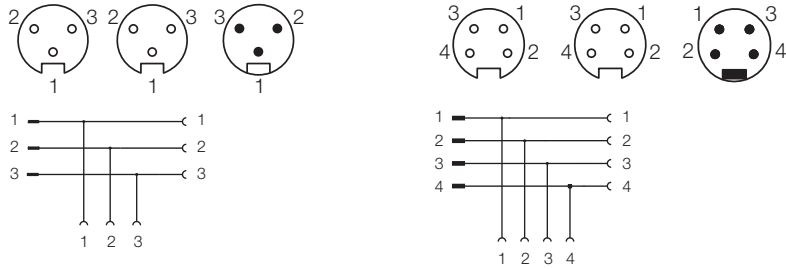
Screw terminal
 IP 67
 -25...+80 °C



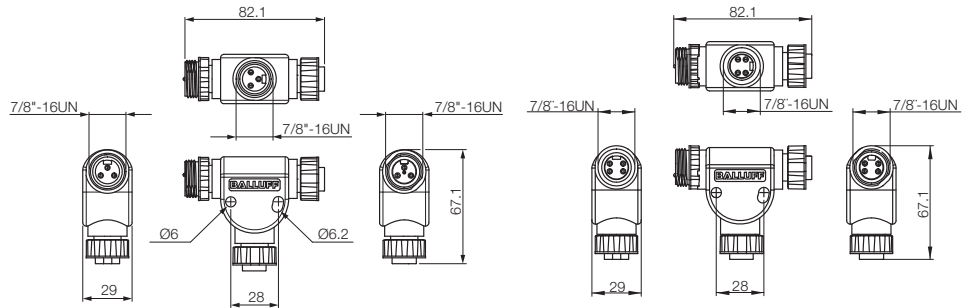
- Connectors and Cables
- M5 connectors
- Connection Cables M5↔M8
- M8 connectors
- Connection Cables M8↔M8
- Connection Cables M8↔M12
- M12 connectors
- Connection Cables M12↔M8
- Connection Cables M12↔M12
- M23 connectors
- Connection Cables M23↔M12
- Connector 7/8"**
- Connection Cables 7/8"↔7/8"



Connector diagram and wiring

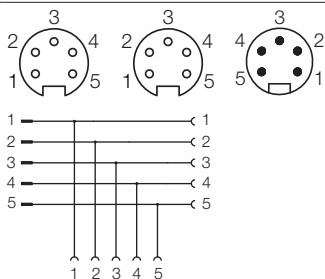


Configuration	7/8" splitter	7/8" splitter
Type	Female/male, 3-pin	Female/male, 4-pin
	BCC0AA5	BCC0AA6
Supply voltage AC U_s	300 V AC	300 V AC
Supply voltage DC U_s	300 V DC	300 V DC
Enclosure rating per IEC 60529	IP 67	IP 67
Ambient temperature T_a	-25...+80 °C	-20...+80 °C





CE



7/8" splitter

Female/male, 5-pin

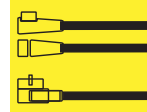
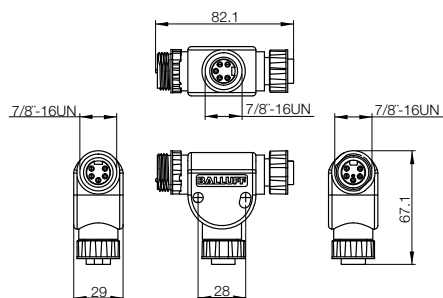
BCC0AA7

300 V AC

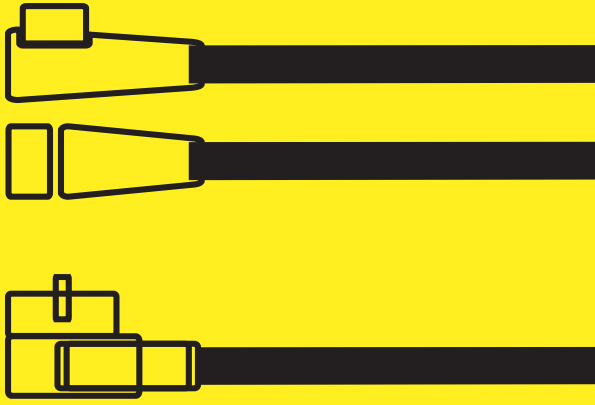
300 V DC

IP 67

-20...+80 °C



Connectors
and Cables
M5 connectors
Connection
Cables
M5↔M8
M8 connectors
Connection
Cables
M8↔M8
Connection
Cables
M8↔M12
M12 connectors
Connection
Cables
M12↔M8
Connection
Cables
M12↔M12
M23 connectors
Connection
Cables
M23↔M12
Connector 7/8"
Connection
Cables
7/8"↔7/8"

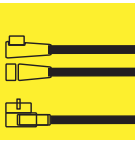


Connectors and Valve Connectors

Special Properties



High-temperature Resistant	362
IP 69K – Ecolab	364
Weld Spatter resistant PUR cables	368
Y Connectors, Weld Spatter Resistant	380
Cables for Harsh Environments	382



Special properties
for temperatures up to 120 °C
M8 socket, 3-pin

Connector BCC up to 120 °C

The durable connectors BCC with IP protection are ideally matched to the wiring and suitable for rapid connection of sensors/actuators in the industrial automation sector. New products include versions for high-temperature applications up to 120 °C, for example, for the connection of high-pressure resistant sensors in hydraulic applications.

Features

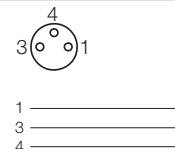
- Temperature range -25...+120 °C
- Flame-resistant
- Straight and right-angle
- 3-pin, 4-pin
- Easy to find notches on the handle body

120 °C

High Temperature



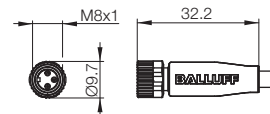
Connector diagram and wiring

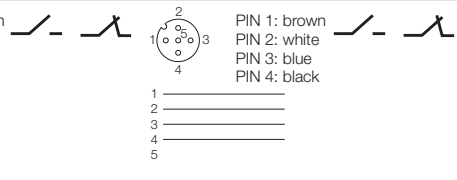
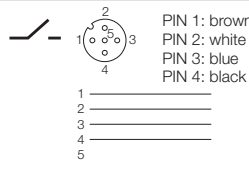
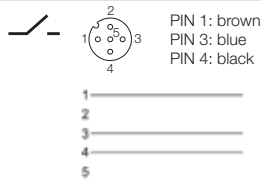
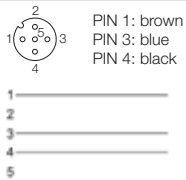


PUR, black	2 m	
PUR, black	5 m	BCC0836
PUR, black	10 m	
Supply voltage AC U _S	250 V AC	
Supply voltage DC U _S	250 V DC	
Cable	Molded	
Number of conductors × conductor cross-section	3×0.34 mm ²	
Enclosure rating per IEC 60529	IP 67	
Ambient temperature T _a	-25...+120 °C	
Use		

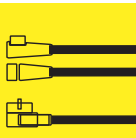
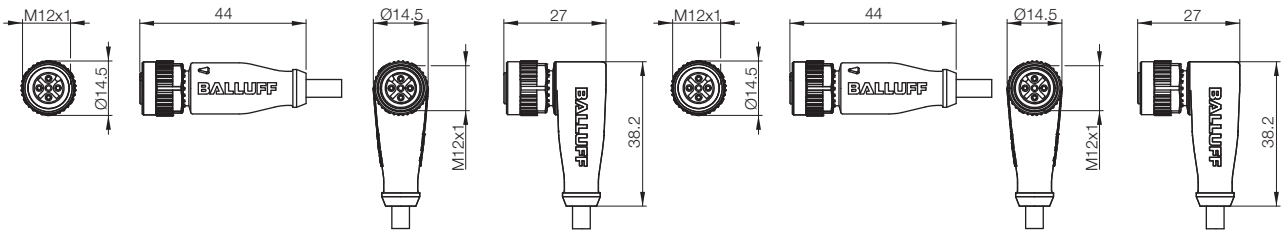
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.





BCC082W	BCC0832	BCC0AA9	BCC0AAE
BCC082Y	BCC0833	BCC0AAA	BCC0AAF
BCC082Z	BCC0AA8	BCC0AAC	BCC0AAH
250 V AC	250 V AC	250 V AC	250 V AC
250 V DC	250 V DC	250 V DC	250 V DC
Molded	Molded	Molded	Molded
3x0.34 mm ²	3x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 68	IP 68	IP 68	IP 68
-25...+120 °C	-25...+120 °C	-25...+120 °C	-25...+120 °C
Normally open (NO) /-	Normally open (NO) /-	Complementary (NO/NC) /-/	Complementary (NO/NC) /-/



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Connector BCC IP 69K-Ecolab

Food-safe stainless steel housing and certified resistance against aggressive chemicals and cleaning agents make Balluff BCC-IP-69K connectors the first choice for wet and hygienic applications in the pharmaceutical and food industry. Additional tests for resistance to hydrogen peroxide complete the application profile. The highest sealing quality to IP 69K as well as certifications by Ecolab guarantee the best quality for a long service life and process reliability.

Features

- IP 69K: Highest leakproofness
- Ecolab: Resistant to aggressive cleaning and disinfecting agents
- Resistant to hydrogen peroxide (H₂O₂)
- Screw connection made of stainless steel
- Certification to UL

H₂O₂ resistant
ECOLAB



Connector diagram and wiring

PUR, black	2 m
PUR, black	3 m
PUR, black	5 m
PUR, black	10 m
PUR, black	15 m
PUR, black	20 m
PUR, black	25 m
PUR, black	40 m
PVC, gray, black	5 m
PVC, gray, black	10 m
PVC, gray, black	15 m
PVC, gray, black	20 m
PVC, gray, black	25 m
PVC, gray	30 m
PVC, gray	35 m

Supply voltage AC U_S

Supply voltage DC U_S

Cable

Number of conductors × conductor cross-section

Enclosure rating per IEC 60529

Ambient temperature T_a PUR

Static/moving PVC

Use

LED

Other cable materials, colors and lengths on request.

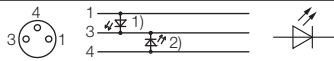
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

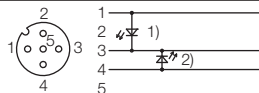




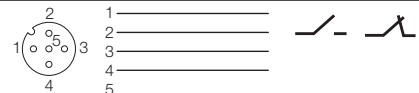
Special properties
IP 69K – Ecolab
 M8 female, M12 female, 3 and 4-pin



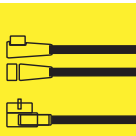
¹⁾ Green LED = Power
²⁾ Yellow LED = Function



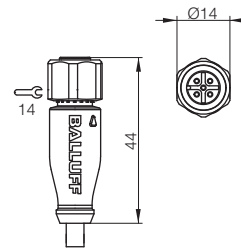
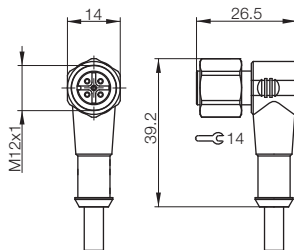
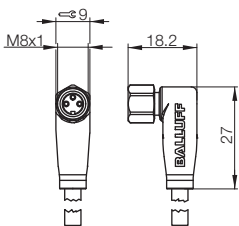
¹⁾ Green LED = Power
²⁾ Yellow LED = Function



BCC08CZ	BCC08CM	
BCC0A2F	BCC08CN	
BCC08E0	BCC08CP	
BCC0A2H	BCC08CR	
	BCC06UE	
	BCC06UF	
	BCC06UH	
	BCC06UJ	
	BCC0A2L	
	BCC0A2M	BCC06M7
	BCC06U9	BCC06M8
	BCC06UA	BCC06M9
	BCC06UC	BCC06MA
		BCC06MC
		BCC06ME
		250 V AC
30 V DC	30 V DC	250 V DC
Molded	Molded	Molded
3x0.34 mm ²	3x0.34 mm ²	4x0.34 mm ²
IP 69K	IP 69K	IP 69K
-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+90 °C/-25...+90 °C (UL 80 °C)	-40...+105 °C/-5...+105 °C (UL 80 °C)
	-40...+105 °C/-5...+105 °C (UL 80 °C)	
	Normally open (NO)	Complementary (NO/NC)
2x (PNP), green, yellow	2x (PNP), green, yellow	



Special properties
 High-temperature resistant
IP 69K–Ecolab
 Weld Spatter Resistant
 PUR Cables
 Y Connectors, Weld Spatter Resistant
 Cable for harsh environments



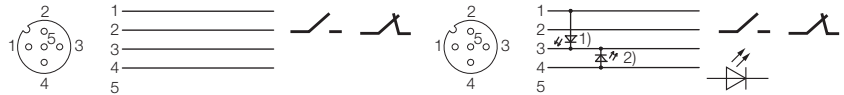
Special properties
IP 69K – Ecolab
M12 female, 4-pin

IP 69K

H₂O₂ resistant
ECOLAB



Connector diagram and wiring



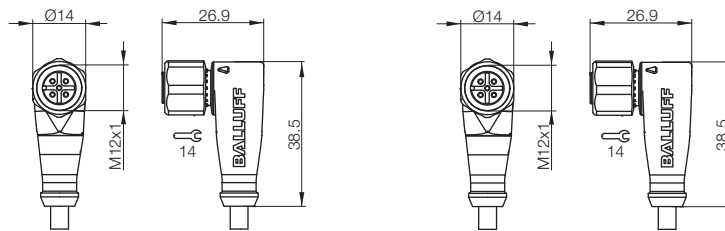
¹⁾ Green LED = Power
²⁾ Yellow LED = Function

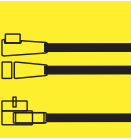
PUR, black	5 m		BCC08CU
PUR, black	10 m		BCC0A2K
PVC, gray, black	5 m		BCC0CTE
PVC, gray, black	10 m	BCC06MF	BCC0CTC
PVC, gray, black	15 m	BCC06MH	BCC0CTA
PVC, gray, black	20 m	BCC06MJ	BCC0CT9
PVC, gray, black	25 m	BCC06MK	BCC0CT8
PVC, gray	30 m	BCC06ML	
PVC, gray	35 m	BCC06MM	
Supply voltage AC U _S	250 V AC		
Supply voltage DC U _S	250 V AC		30 V DC
Cable	Molded		Molded
No. of wires x conductor cross-section	4x0.34 mm ²		4x0.34 mm ²
Enclosure rating per IEC 60529	IP 69K		IP 69K
Ambient temperature T _a	PUR	-40...+90 °C/-25...+90 °C (UL 80 °C)	
Static/moving	PVC	-40...+105 °C/-5...+105 °C (UL 80 °C)	
Use	Complementary (NO/NC) \swarrow -/ \swarrow		Complementary (NO/NC) \swarrow -/ \swarrow
LED			2x (PNP), green, yellow

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.





Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

PUR cables for especially tough conditions

Standard PUR cables have numerous advantages. They are resilient, wear-resistant, impact-resistant and resistant against solvents. With the new weld spatter resistant versions that meet ISO 14001, you can cost-effectively replace crosslinked cables that become expensive hazardous waste after use. Possible field of applications include automobile manufacturing, in particular, bodyshell work.

- Resistant to sparks and weld spatter
- ISO 14001 compliant – not hazardous waste
- Replacement for crosslinked lines
- Torsional stress $\pm 180^\circ/\text{m}$
- Fulfill all requirements of the automotive industry

Connector diagram and wiring

PUR, black	5 m
PUR, black	10 m
Supply voltage AC U_S	
Supply voltage DC U_S	
Cable	
Number of conductors \times conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a static/moving	

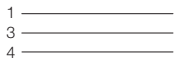
Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



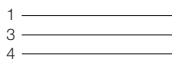
Special properties
 Weld spatter resistant PUR cables
 M8 female, 3 and 4-pin



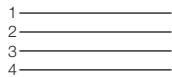
PIN 1: brown
 PIN 3: blue
 PIN 4: black



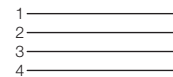
PIN 1: brown
 PIN 3: blue
 PIN 4: black



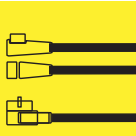
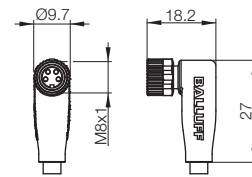
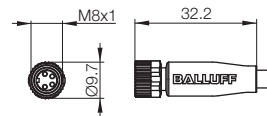
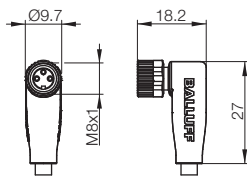
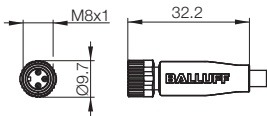
PIN 1: brown
 PIN 2: white
 PIN 3: blue
 PIN 4: black



PIN 1: brown
 PIN 2: white
 PIN 3: blue
 PIN 4: black



BCC0AJK	BCC0AJR	BCC0AJM	BCC0AJW
BCC0CAP			
60 V AC	60 V AC	30 V AC	30 V AC
60 V DC	60 V DC	30 V DC	30 V DC
Molded	Molded	Molded	Molded
3×0.34 mm ²	3×0.34 mm ²	4×0.34 mm ²	4×0.34 mm ²
IP 67	IP 67	IP 67	IP 68
-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C



Special properties
 High-temperature resistant
 IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
 Y Connectors, Weld Spatter Resistant
 Cable for harsh environments



Connector diagram and wiring

PUR, black	2 m
PUR, black	5 m
PUR, black	10 m

Supply voltage AC U_s

Supply voltage DC U_s

Cable

Number of conductors × conductor cross-section

Enclosure rating per IEC 60529

Ambient temperature T_a static/moving

Use

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



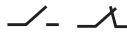
Special coatings protect cable against metal spatter and flying sparks.

Special properties
 Weld spatter resistant PUR cables
 M12 female, 4-pin



1
2
3
4
5

PIN 1: brown
 PIN 2: white
 PIN 3: blue
 PIN 4: black



1
2
3
4
5

PIN 1: brown
 PIN 2: white
 PIN 3: blue
 PIN 4: black



BCC0AK4

BCC0AK5

BCC0AK6

250 V AC

250 V DC

Molded

4x0.34 mm²

IP 68

-40...+80 °C/-25...+80 °C

Complementary (NO/NC)

BCC0AKE

BCC0AKF

250 V AC

250 V DC

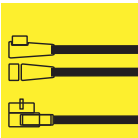
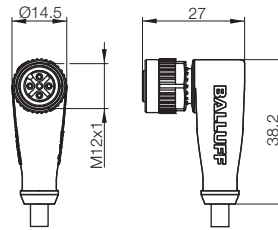
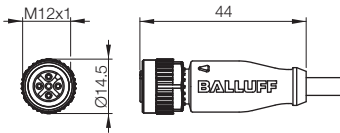
Molded

4x0.34 mm²

IP 68

-40...+80 °C/-25...+80 °C

Complementary (NO/NC)

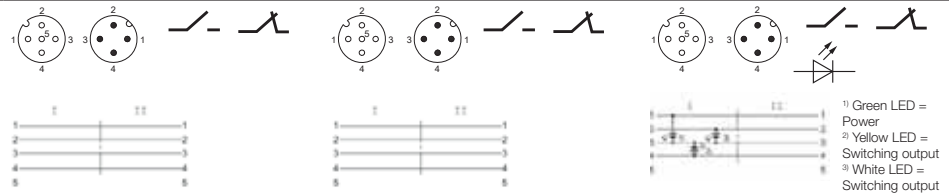


Special properties
 High-temperature resistant
 IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
 Y Connectors, Weld Spatter Resistant
 Cable for harsh environments

Special properties
Weld spatter resistant PUR cables
M12 female ↔ M12 male, 4-pin

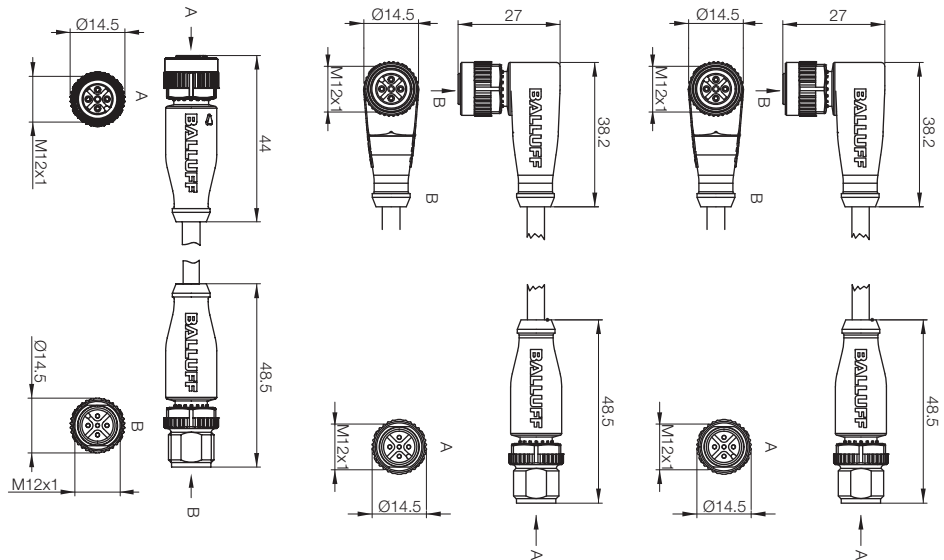


Connector diagram and wiring

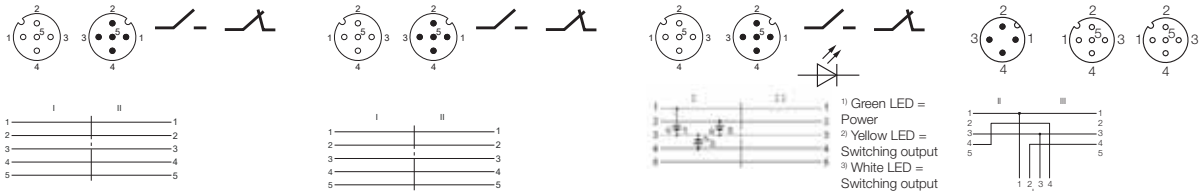


PUR, black	0.3 m	BCC0AP1	BCC0ANP	BCC0ANE
PUR, black	0.6 m	BCC0AP2	BCC0ANR	BCC0ANF
PUR, black	1 m	BCC0AP3	BCC0ANT	BCC0ANH
PUR, black	1.5 m	BCC0AP4	BCC0ANU	BCC0ANJ
PUR, black	2 m	BCC0AP5	BCC0ANW	BCC0ANK
PUR, black	3 m			
PUR, black	5 m	BCC0AP7	BCC0ANZ	BCC0ANM
Supply voltage U_B		250 V AC/DC	250 V AC/DC	30 V DC
Cable		Molded	Molded	Molded
No. of wires × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68	IP 68
Ambient temperature T_a		-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
static/moving				
Use		Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow
LED				3× (PNP), green, yellow, white

Other cable lengths on request.
 Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

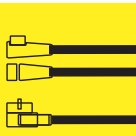
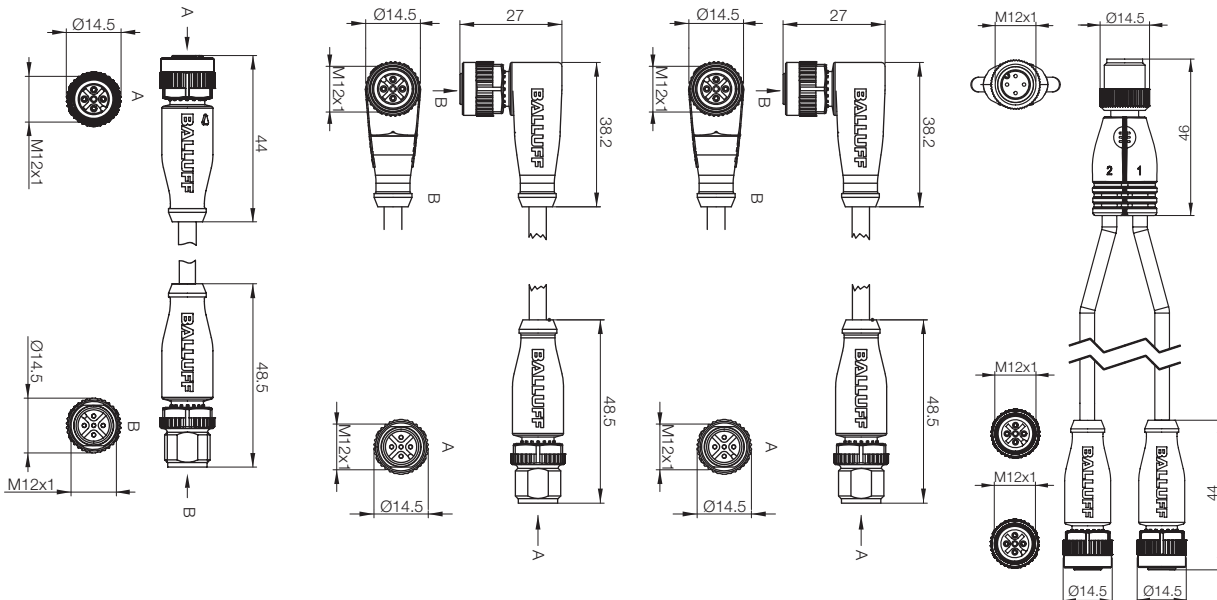


Special properties
Weld spatter resistant PUR cables
M12 female ↔ M12 male, 3 and 5-pin



BCC0AJJ	BCC0AKH	BCC0C0N	BCC0AK1
BCC0AK7	BCC0AKJ	BCC0C0P	BCC0AK2
BCC0C0M		BCC0C0R	BCC0AK3
BCC0AK8	BCC0AKK	BCC0C0T	BCC0C27
BCC0AK9	BCC0AKL	BCC0C0U	
BCC0AKA	BCC0AKM	BCC0C0W	
125 V AC/DC	125 V AC/DC	30 V DC	250 V AC/DC
Molded	Molded	Molded	Molded
5×0.34 mm ²	5×0.34 mm ²	5×0.34 mm ²	3×0.34 mm ²
IP 68	IP 68	IP 68	IP 67
-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C

Complementary (NO/NC) Complementary (NO/NC) Complementary (NO/NC) 3x (PNP), green, yellow, white



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Connector diagram and wiring

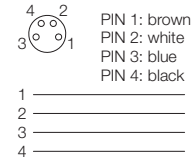
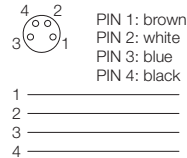
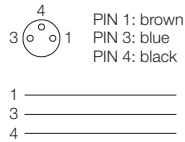
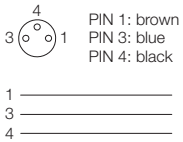
PUR, orange	5 m
Supply voltage AC U_S	
Supply voltage DC U_S	
Cable	
Number of conductors × conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a static/moving	

Other cable lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

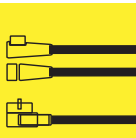
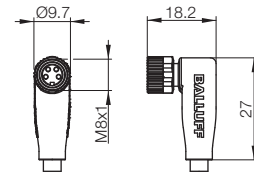
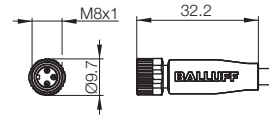
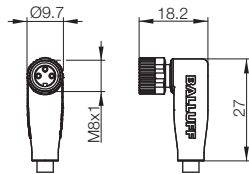
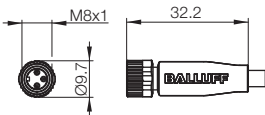


Metal spatter and flying sparks have no effect.

Special properties
Weld spatter resistant PUR cables
M8 socket, 3 and 4-pin



BCC0C3A	BCC0C24	BCC0C21	BCC0C20
60 V AC	60 V AC	30 V AC	30 V AC
60 V DC	60 V DC	30 V DC	30 V DC
Molded	Molded	Molded	
3x0.34 mm ²	3x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67	IP 67	IP 67
-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C	-25...+80 °C/-25...+80 °C

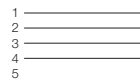
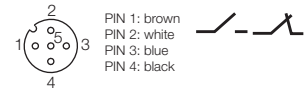
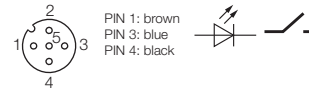
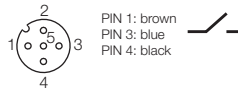


Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Special properties
Weld spatter resistant PUR cables
M12 female, 3 and 4-pin

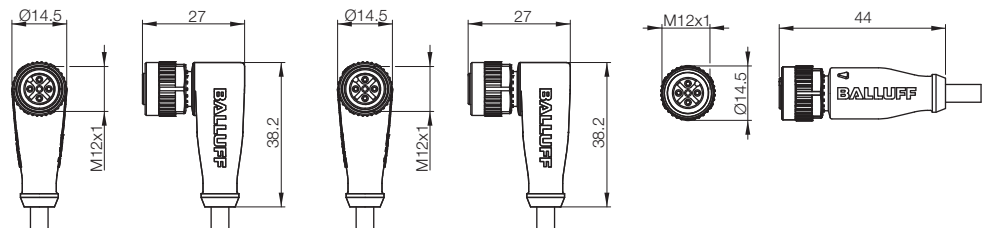


Connector diagram and wiring



PUR, orange	2 m	BCC086T	BCC09J8	BCC09J6
PUR, orange	5 m	BCC086U	BCC0C7P	BCC0C23
PUR, orange	10 m	BCC086W	BCC08LE	BCC0C7W
Supply voltage U_B		250 V AC/DC	30 V DC	250 V AC/DC
Cable		Molded	Molded	Molded
No. of wires x conductor cross-section		3x0.34 mm ²	3x0.34 mm ²	4x0.34 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68	IP 68	IP 68
Ambient temperature T_a static/moving	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
Use	Normally open (NO) —/—	Normally open (NO) —/—	Complementary (NO/NC) —/—/—	
LED		2x (PNP), green, yellow		

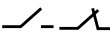
Other cable lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



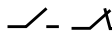
Special properties
Weld spatter resistant PUR cables
M12 female, 4 and 5-pin



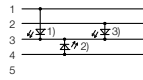
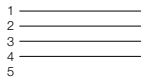
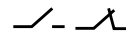
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



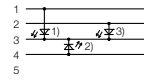
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black



¹ Green LED = Power
² Yellow LED = Switching output
³ Red LED = Switching output



¹ Green LED = Power indicator
² Yellow LED = Switching output
³ LED White LED = Switching output

BCC0ERL
BCC0C22

BCC0C3Z
BCC0C41
BCC0C42

BCC0A0W

250 V AC/DC
Molded
4x0.34 mm²

30 V DC
Molded
4x0.34 mm²

30 V DC
Molded
4x0.34 mm²

IP 68
-40...+80 °C/-25...+80 °C

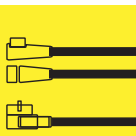
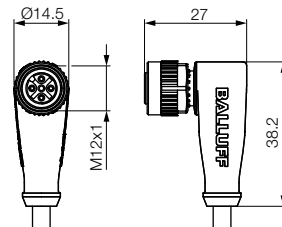
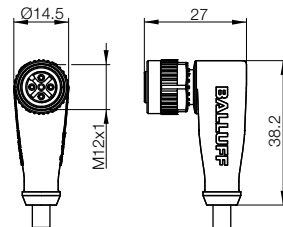
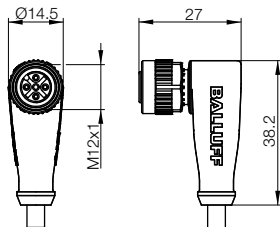
IP 68
-40...+80 °C/-25...+80 °C

IP 68
-40...+80 °C/-25...+80 °C

Complementary (NO/NC) \swarrow -/ \searrow \swarrow

Complementary (NO/NC) \swarrow -/ \searrow \swarrow
3x (PNP), green, yellow, red

Complementary (NO/NC) \swarrow -/ \searrow \swarrow
3x (PNP), green, yellow, white

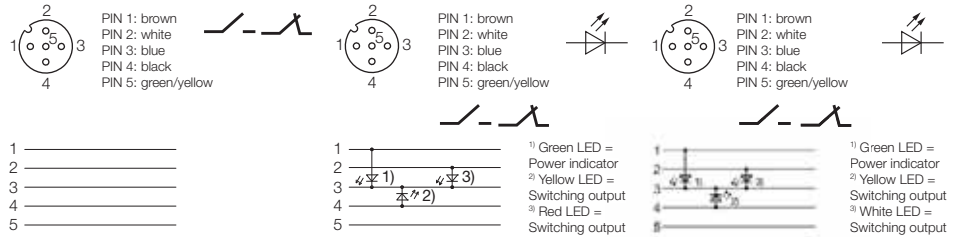


Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Special properties
Weld spatter resistant PUR cables
M12 female, 5-pin

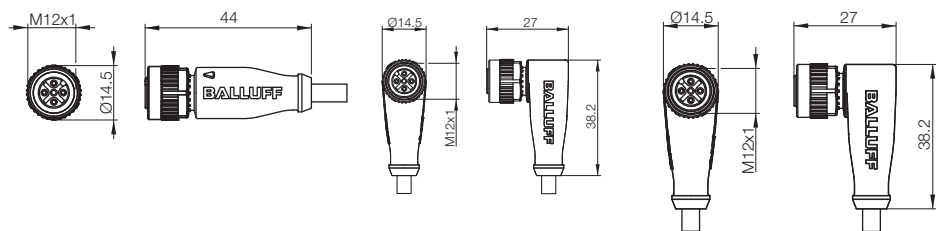


Connector diagram and wiring

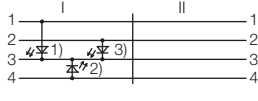
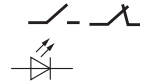
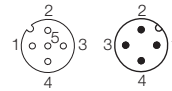
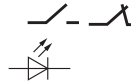
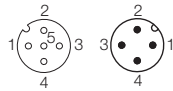
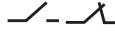
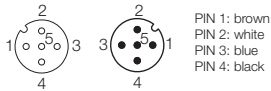


PUR, orange	0.3 m		
PUR, orange	0.6 m		
PUR, orange	1 m		
PUR, orange	1.5 m	BCC087F	BCC087L
PUR, orange	2 m		BCC0C7U
PUR, orange	3 m		
PUR, orange	5 m	BCC087H	BCC0C7T
PUR, orange	7.5 m	BCC087J	BCC087M
PUR, orange	10 m	BCC087K	BCC087P
Supply voltage DC U _S	125 V AC/DC	30 V DC	30 V DC
Cable	Molded	Molded	Molded
Number of conductors x Conductor cross-section	5x0.34 mm ²	5x0.34 mm ²	5x0.34 mm ²
Enclosure rating per IEC 60529	IP 68	IP 68	IP 68
Ambient temperature T _a static/moving	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
Use	Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow
LED		3x (PNP), green, yellow, red	3x (PNP), green, yellow, white

Other cable materials, colors and lengths on request. Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



Special properties
Weld spatter resistant PUR connection cables
M12 female ↔ M12 male, 4 or 5-pin

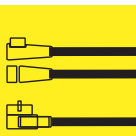
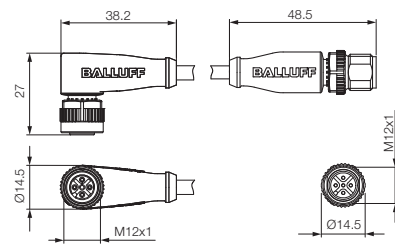
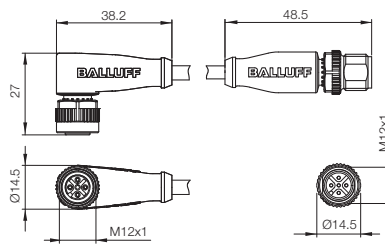
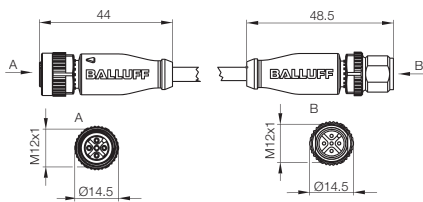


¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output
³⁾ White LED = Switching output



¹⁾ Green LED = Power
²⁾ Yellow LED = Switching output
³⁾ Red LED = Switching output

BCC086Y	BCC0C4K	BCC0878
BCC086Z	BCC0C52	BCC0879
BCC0870	BCC0C4L	BCC087A
BCC09RC	BCC0C4M	BCC0AMH
BCC0871	BCC0C4N	BCC087C
BCC09RE	BCC0C4P	BCC0CAC
BCC0872	BCC0C4R	BCC087E
BCC09RF		BCC0A0N
30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 68	IP 68	IP 68
-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
Complementary (NO/NC)	Complementary (NO/NC) 3x (PNP), green, yellow, red	Complementary (NO/NC) 3x (PNP), green, yellow, white

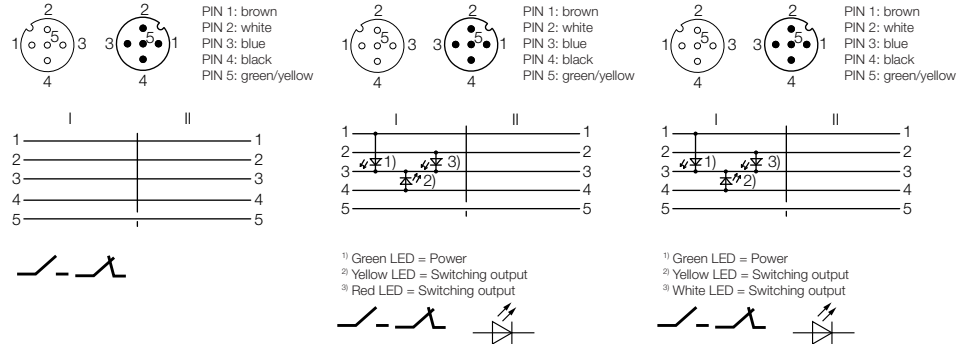


Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Special properties
Weld spatter resistant PUR cables
Y connectors

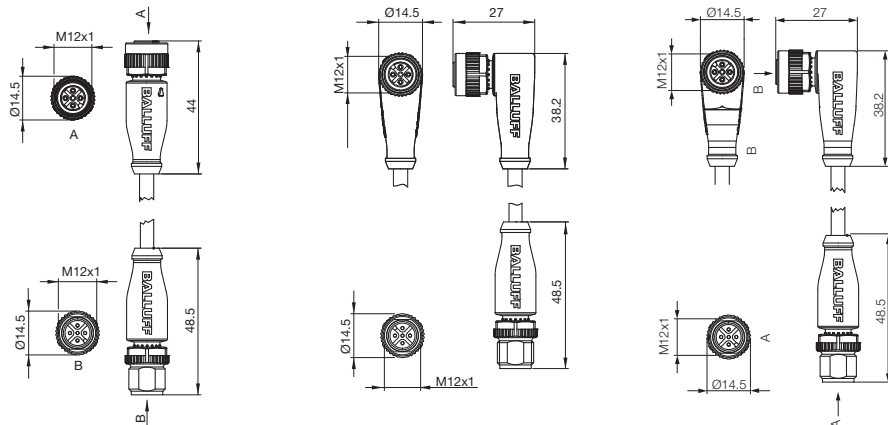


Connector diagram and wiring



PUR, orange	0.3 m	BCC0FFT	BCC0C4T	
PUR, orange	0.6 m	BCC087R	BCC0C4U	BCC0882
PUR, orange	1 m	BCC087T	BCC0C4W	BCC0883
PUR, orange	1.5 m	BCC087U	BCC0C4Y	BCC0884
PUR, orange	2 m	BCC087W	BCC0C4Z	BCC0885
PUR, orange	3 m	BCC09M2	BCC0C50	
PUR, orange	5 m	BCC09M1	BCC0C51	
PUR, orange	10 m	BCC09MR		
Supply voltage DC U_S		30 V DC	30 V DC	30 V DC
Cable		Molded	Molded	Molded
Number of conductors × Conductor cross-section		5×0.34 mm ²	5×0.34 mm ²	5×0.34 mm ²
Enclosure rating per IEC 60529		IP 68	IP 68	IP 68
Ambient temperature T_a		-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
static/moving				
Use		Complementary (NO/NC) \neg -/ \neg - \neg	Complementary (NO/NC) \neg -/ \neg - \neg	Complementary (NO/NC) \neg -/ \neg - \neg
LED			3× (PNP), green, yellow, red	3× (PNP), green, yellow, red

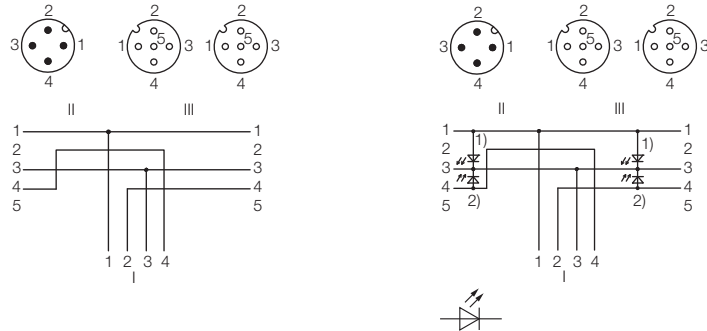
Other cable materials, colors and lengths on request. Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



Special properties
Weld spatter resistant PUR cables
Y connectors

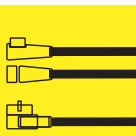
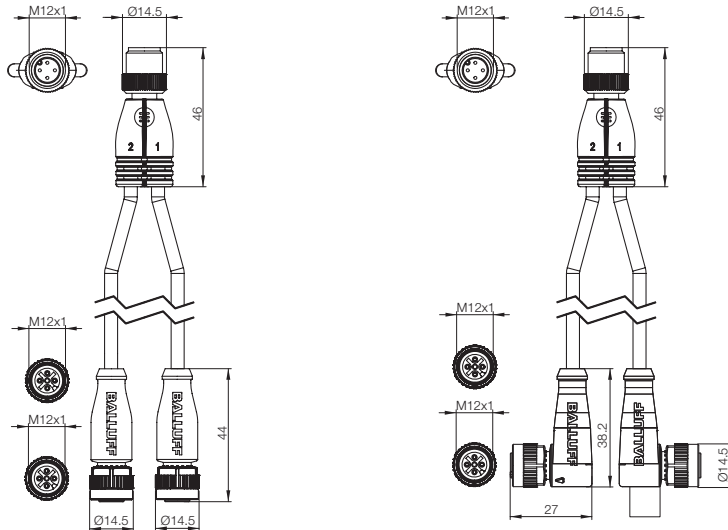


Connector diagram and wiring



PUR, orange	0.3 m	BCC0C7A	BCC0CA2
PUR, orange	0.6 m	BCC0C7C	BCC0CA3
PUR, orange	1 m	BCC0C7E	BCC0CA4
PUR, orange	2 m		BCC0CA5
PUR, orange	3 m		BCC0CA6
Supply voltage AC U_S		250 V AC	
Supply voltage DC U_S		250 V DC	30 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-40...+80 °C/-25...+80 °C	-40...+80 °C/-25...+80 °C
LED			2× (PNP), green, yellow

Other cable lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Weld-immune

Wherever connectors and cables are used in the immediate vicinity of welding work, they are subjected to high stress. This is due to the presence of scorching welding residue such as weld spatter and slag. Conventional cables become unusable in this harsh environment within a very short time. Weld-immune cable versions provide a solution. These cables fulfill various regional requirements worldwide.

Five types made of different material—highly versatile

Five different cable variants cover almost all application areas. Thus, fiberglass-coated and stainless steel-coated cables are available as required in pressing plants and for machining applications. The full-silicone and PTFE cables, as used in welding systems, for example, meet the most stringent demands. Silicone-free cables are available for areas where silicone must not be used. These cables meet the same technical prerequisites.

All cables have been developed for extremely difficult environments and withstand hundreds of thousands of welding cycles without difficulty.

Benefits

- Extremely resistant to sparks and weld spatter
- Reduction in machine downtime
- Resistant to short-time high temperature loads

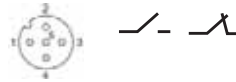
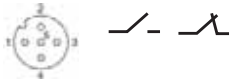
Connector diagram and wiring

Silicon, black	0.6 m
Silicon, black	1 m
Silicon, black	2 m
Silicon, black	3 m
Silicon, black	5 m
Supply voltage AC U_S	
Supply voltage DC U_S	
Cable	
Number of conductors × conductor cross-section	
Enclosure rating per IEC 60529	
Ambient temperature T_a	
Maximum temperature at outer jacket caused by weld spatter/beads/flames	
Use	
Application	

Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions with LED on request.



Special properties
Cables for harsh environments, silicone cables
M12 male, 4-pin



BCC0F3A

BCC0F3C

BCC0EFY

BCC0EUY

BCC0EUZ

250 V AC

250 V DC

Molded

4×0.34 mm²

IP 67

-60 °C...+200 °C

Short-time 800 °C

BCC0EFZ

BCC0EW0

BCC0EW1

250 V AC

250 V DC


Molded


4×0.34 mm²

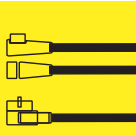
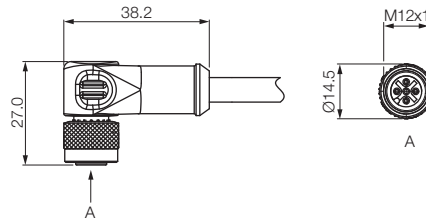
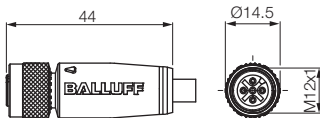
IP 67

-60 °C...+200 °C

Short-time 800 °C

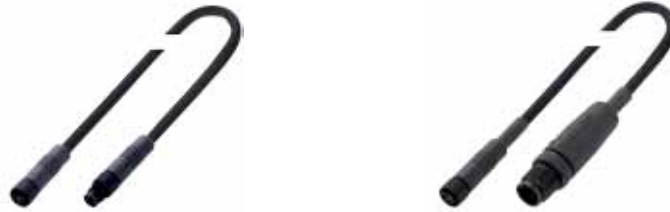
Complementary (NO/NC) 
For high welding loads,
high temperature, flame-resistant

Complementary (NO/NC) 
For high welding loads,
high temperature, flame-resistant

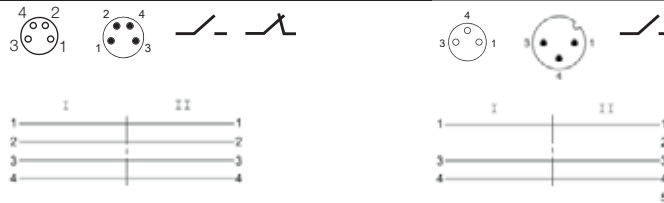


Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

Special properties
Cables for harsh environments, silicone cables
M8 female ↔ M8 or M12 male, 3 and 4-pin



Connector diagram and wiring

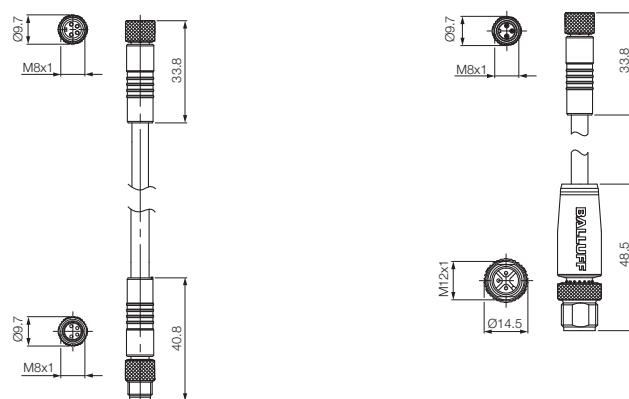


Silicon, black	0.3 m	BCC0EH7	BCC0EMH
Silicon, black	0.6 m	BCC0EH8	BCC0EMJ
Silicon, black	1 m	BCC0EH9	BCC0EMK
Silicon, black	1.5 m	BCC0EHA	
Silicon, black	2 m	BCC0EHC	BCC0F4E
Silicon, black	3 m	BCC0EHE	
Silicon, black	5 m	BCC0EHF	
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		4×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-60 °C...+200 °C	-60 °C...+200 °C
Maximum temperature at outer jacket caused by weld spatter/beads/flames		Short-time 800 °C	Short-time 800 °C
Use		Complementary (NO/NC)	Normally open (NO)
Application		For high welding loads, high temperature, flame-resistant, flexible	For high welding loads, high temperature, flame-resistant, flexible

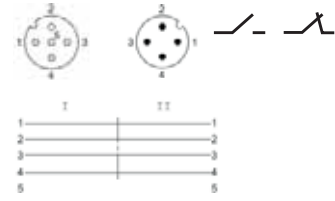
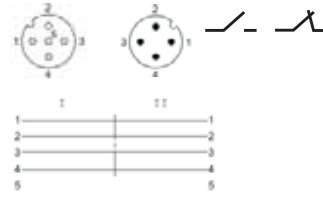
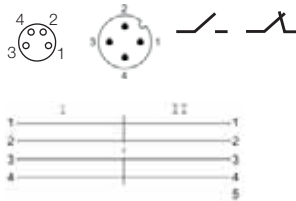
Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.



Special properties
Cables for harsh environments, silicone cables
M8 or M12 female ↔ M12 male, 4-pin



BCC0EH0

BCC0EH1

BCC0EH2

BCC0EH3

BCC0EH4

BCC0EH5

BCC0EH6

250 V AC

250 V DC

Molded

4x0.34 mm²

IP 67

-60 °C...+200 °C

Short-time 800 °C

Complementary (NO/NC)

For high welding loads, high temperature, flame-resistant, flexible

BCC0ELW

BCC0ELY

BCC0ELZ

BCC0EM0

BCC0EM1

BCC0EUU

BCC0EUW

250 V AC

250 V DC

Molded

4x0.34 mm²

IP 67

-60 °C...+200 °C

Short-time 800 °C

Complementary (NO/NC)

For high welding loads, high temperature, flame-resistant, flexible

BCC0EU7

BCC0EU8

BCC0EU9

BCC0EUA

BCC0EUC

BCC0FHC

BCC0FHF

250 V AC

250 V DC

Molded

4x0.34 mm²

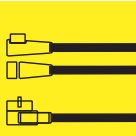
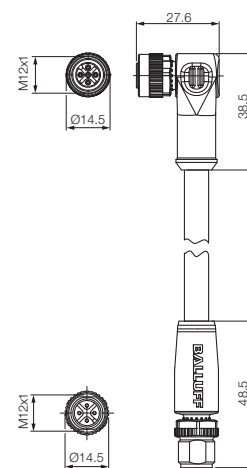
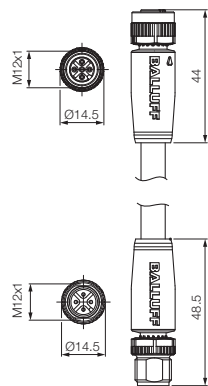
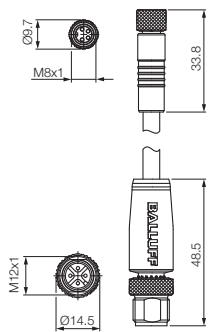
IP 67

-60 °C...+200 °C

Short-time 800 °C

Complementary (NO/NC)

For high welding loads, high temperature, flame-resistant, flexible

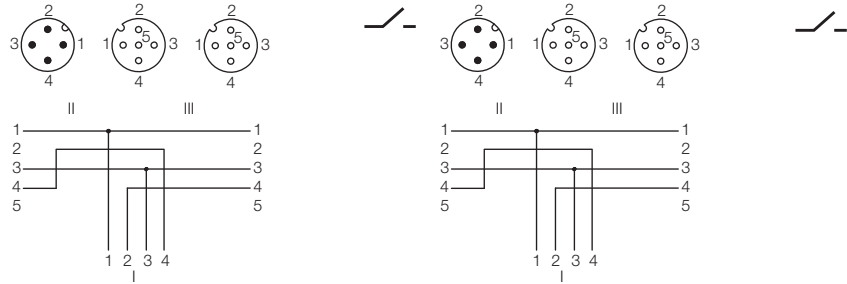


Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments

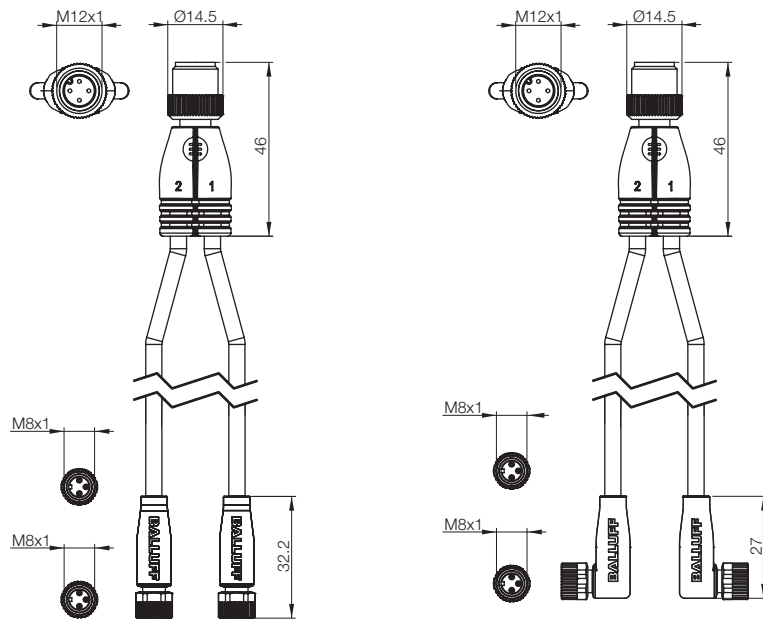
Special properties
Cables for harsh environments, silicone cables
Y connector, 3-pin



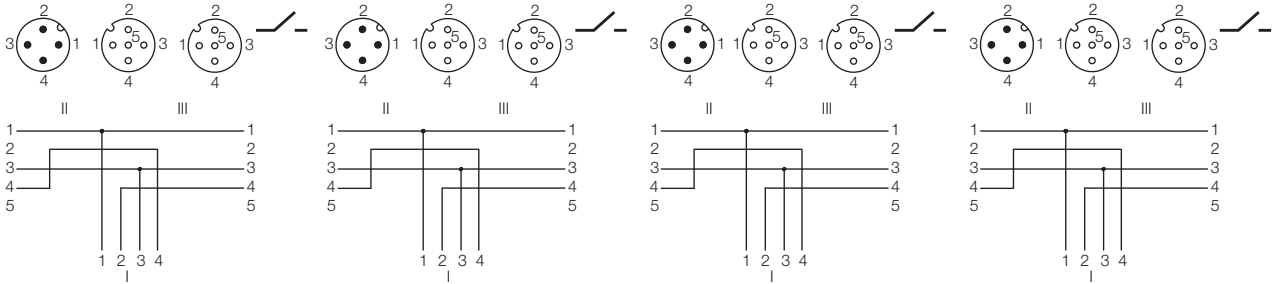
Connector diagram and wiring



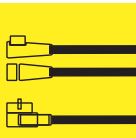
Silicon, black	0.3 m	BCC0EW7	BCC0EW9
Silicon, black	0.6 m	BCC0EW8	BCC0EWA
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		3×0.34 mm ²	3×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-60...+200 °C	-60...+200 °C
Maximum temperature at outer jacket caused by weld spatter/beads/flames		Short-time 800 °C	Short-time 800 °C
Use		Normally open (NO)	Normally open (NO)
Application		For high welding loads, high temperature, flame-resistant	For high welding loads, high temperature, flame-resistant



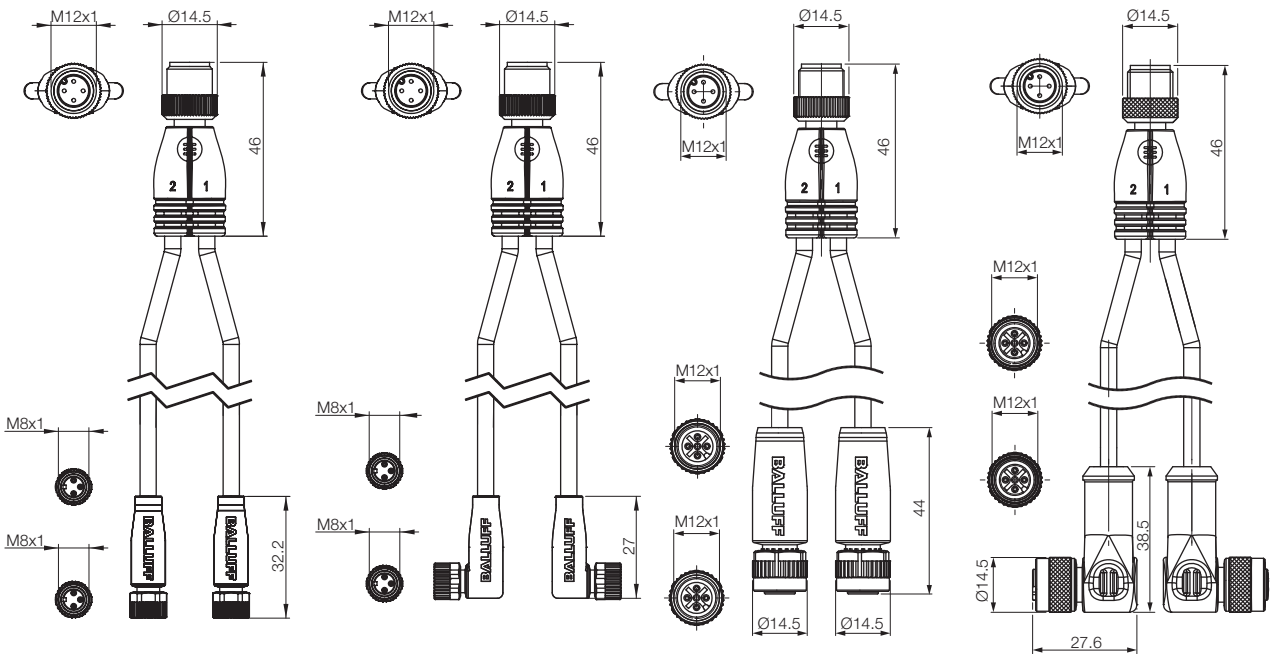
Special properties
Cables for harsh environments, silicone cables
Y connector, 3-pin



BCC0EW3 BCC0EW4	BCC0EW5 BCC0EW6	BCC0EHM BCC0EHN	BCC0EHP BCC0EHR
250 V AC	250 V AC	250 V AC	250 V AC
250 V DC	250 V DC	250 V DC	250 V DC
Molded	Molded	Molded	Molded
3x0.34 mm ²	3x0.34 mm ²	3x0.34 mm ²	3x0.34 mm ²
IP 67	IP 67	IP 67	IP 67
-60...+200 °C	-60...+200 °C	-60...+200 °C	-60...+200 °C
Short-time 800 °C	Short-time 800 °C	Short-time 800 °C	Short-time 800 °C
Normally open (NO) \swarrow -	Normally open (NO) \swarrow -	Normally open (NO) \swarrow -	Normally open (NO)
For high welding loads, high temperature, flame-resistant, flexible	For high welding loads, high temperature, flame-resistant, flexible	For high welding loads, high temperature, flame-resistant, flexible	For high welding loads, high temperature, flame-resistant, flexible



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



Special properties
Cables for harsh environments, silicone-free cables
M8 and M12 female ↔ M12 male, 3 and 4-pin



Connector diagram and wiring

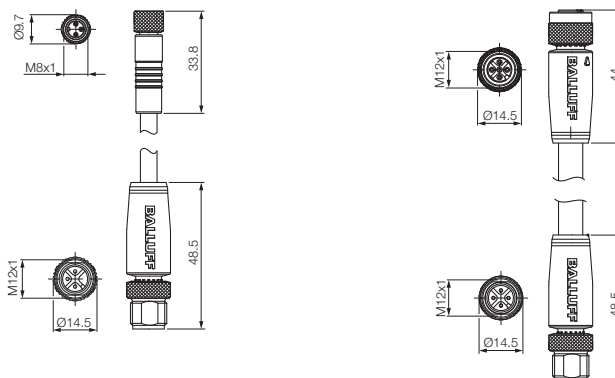


TPE, black	0.3 m	BCC0EHY	BCC0EJA
TPE, black	0.6 m	BCC0EHZ	BCC0EJC
TPE, black	1 m	BCC0EJ0	BCC0EJE
TPE, black	1.5 m		BCC0EJF
TPE, black	2 m		BCC0EJH
TPE, black	5 m		BCC0EJJ
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-50 °C...+130 °C / -40 °C...+125 °C	-50 °C...+130 °C / -40 °C...+125 °C
Maximum temperature at outer jacket caused by weld spatter/beads/flames		Short-time 800 °C	Short-time 800 °C
Use		Normally open (NO)	Complementary (NO/NC)
Application		For high welding loads, flame-resistant	For high welding loads, flame-resistant

Other cable materials, colors and lengths on request.

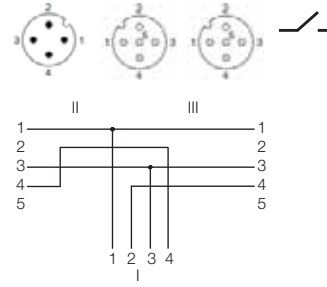
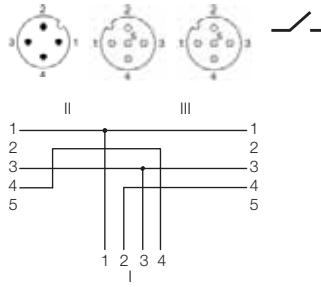
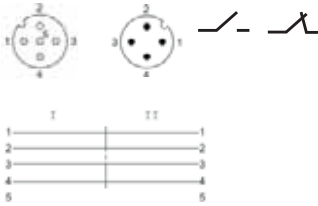
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.



Special properties

Cables for harsh environments, silicone-free cables
M12 female ↔ M12 male, Y connector, 4-pin



BCC0EM8
BCC0EM9
BCC0EMA
BCC0EMC
BCC0EME
BCC0EMF

BCC0EHH
BCC0EHJ

BCC0EHK
BCC0EHL

250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-50 °C...+130 °C / -40 °C...+125 °C
Short-time 800 °C

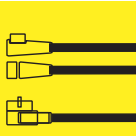
250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-50 °C...+130 °C / -40 °C...+125 °C
Short-time 800 °C

250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-50 °C...+130 °C / -40 °C...+125 °C
Short-time 800 °C

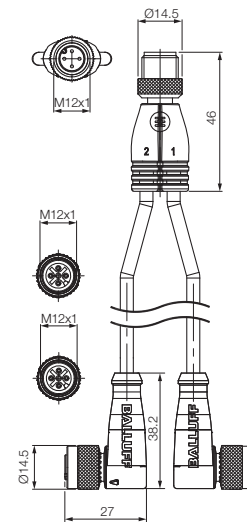
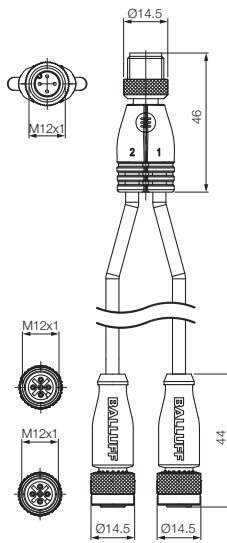
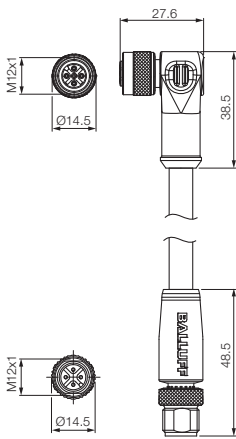
Complementary (NO/NC)
For high welding loads, flame-resistant

Normally open (NO)
For high welding loads, flame-resistant

Normally open (NO)
For high welding loads, flame-resistant



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



Special properties

Cables for harsh environments, PTFE cables
M8 and M12 female ↔ M12 male, 3 and 4-pin



Connector diagram and wiring

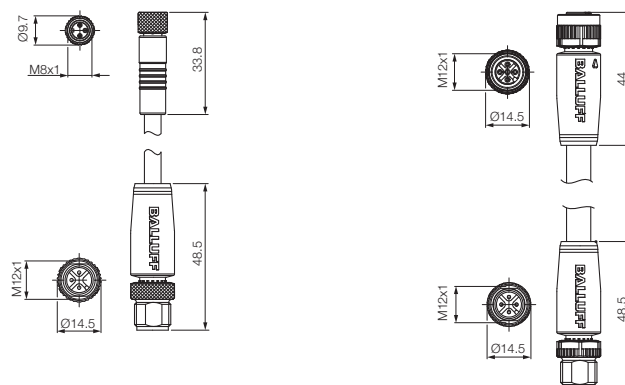


FEP, black	0.3 m	BCC0EH4	BCC0EJ4
FEP, black	0.6 m	BCC0EHU	BCC0EJ5
FEP, black	1 m	BCC0EHW	BCC0EJ6
FEP, black	1.5 m		BCC0EJ7
FEP, black	2 m		BCC0EJ8
FEP, black	5 m		BCC0EJ9
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a		-40 °C...+200 °C	-40 °C...+200 °C
Maximum temperature at outer jacket caused by weld spatter/beads/flames		Short-time 800 °C	Short-time 800 °C
Use		Normally open (NO)	Complementary (NO/NC)
Application		For high welding loads, temperature, flame-resistant, very flexible	For high welding loads, temperature, flame-resistant, very flexible

Other cable materials, colors and lengths on request.

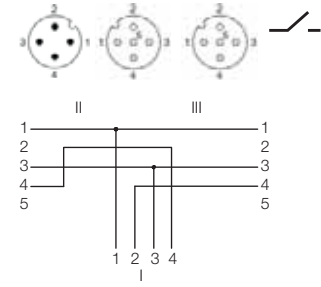
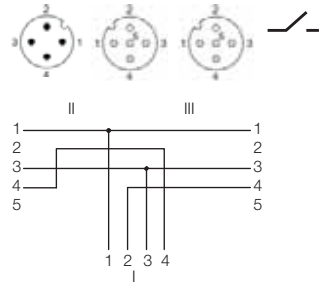
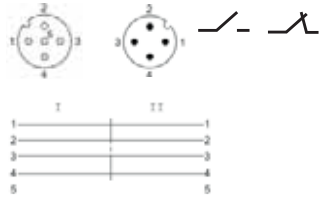
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

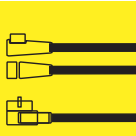


Special properties

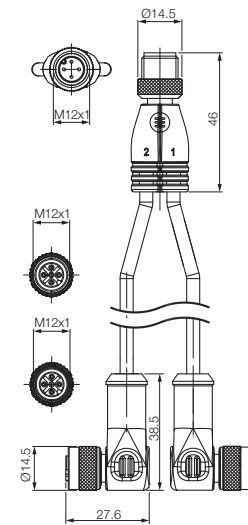
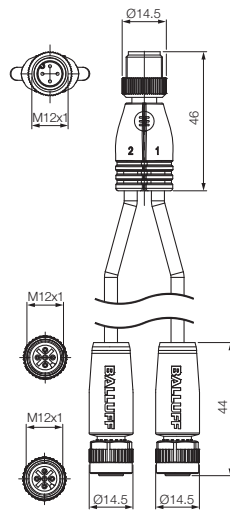
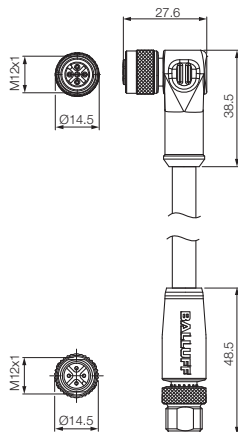
Cables for harsh environments, PTFE cables
M12 female ↔ M12 male, Y connector, 4-pin



BCC0EM2	BCC0EFF	BCC0EFJ
BCC0EM3	BCC0EFH	BCC0EFK
BCC0EM4		
BCC0EM5		
BCC0EM6		
BCC0EM7		
250 V AC	250 V AC	250 V AC
250 V DC	250 V DC	250 V DC
Molded	Molded	Molded
4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67	IP 67
-40 °C...+200 °C	-40 °C...+200 °C	-40 °C...+200 °C
Short-time 800 °C	Short-time 800 °C	Short-time 800 °C
Complementary (NO/NC)	Normally open (NO)	Normally open (NO)
For high welding loads, temperature, flame-resistant, very flexible	For high welding loads, temperature, flame-resistant, very flexible	For high welding loads, temperature, flame-resistant, very flexible



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



Special properties

Cables for harsh environments, fiberglass braid hose cables
M8 and M12 female ↔ M12 male, 3 and 4-pin



Connector diagram and wiring

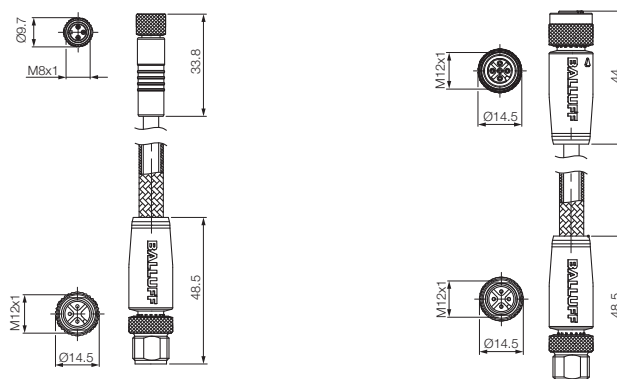


PUR/fiberglass braid, black	0.3 m	BCC0EJ1	BCC0ELM
PUR/fiberglass braid, black	0.6 m	BCC0EJ2	BCC0ELN
PUR/fiberglass braid, black	1 m	BCC0EJ3	BCC0ELP
PUR/fiberglass braid, black	1.5 m		BCC0ELR
PUR/fiberglass braid, black	2 m		BCC0ELT
PUR/fiberglass braid, black	5 m		BCC0ELU
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-40 °C...+180 °C/-25 °C...+180 °C	-40 °C...+180 °C/-25 °C...+180 °C
Maximum temperature at outer jacket caused by weld spatter/beads/flames		Short-time 800 °C	Short-time 800 °C
Use		Normally open (NO)	Complementary (NO/NC)
Application		Weld resistant, flame resistant, very flexible	Weld resistant, flame resistant, very flexible

Other cable materials, colors and lengths on request.

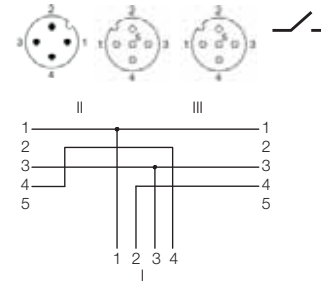
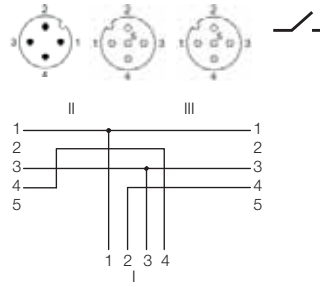
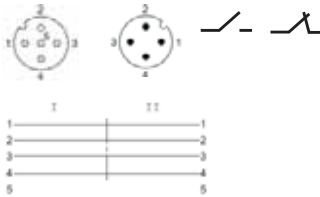
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.



Special properties

Cables for harsh environments, fiberglass braid nose cables
M12 female ↔ M12 male, Y connector, 4-pin



BCC0EL7
BCC0EL8
BCC0EL9
BCC0ELA
BCC0ELC
BCC0ELE

BCC0EL3
BCC0EL4

BCC0EL5
BCC0EL6

250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-40 °C...+180 °C/-25 °C...+180 °C
Short-time 800 °C

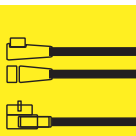
250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-40 °C...+180 °C/-25 °C...+180 °C
Short-time 800 °C

250 V AC
250 V DC
Molded
4x0.34 mm²
IP 67
-40 °C...+180 °C/-25 °C...+180 °C
Short-time 800 °C

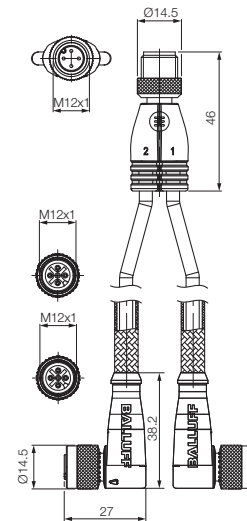
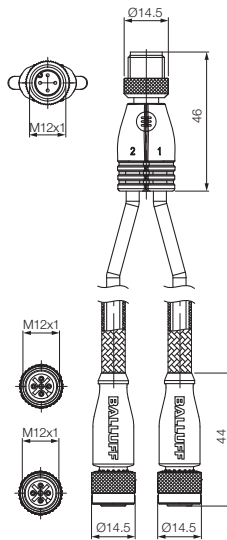
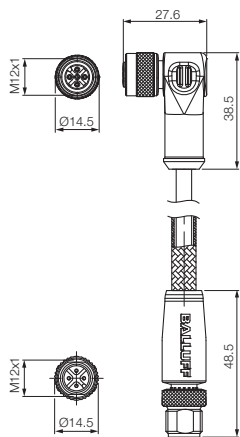
Complementary (NO/NC)
Weld resistant, flame resistant, very flexible

Normally open (NO)
Weld resistant, flame resistant, very flexible

Normally open (NO)
Weld resistant, flame resistant, very flexible



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



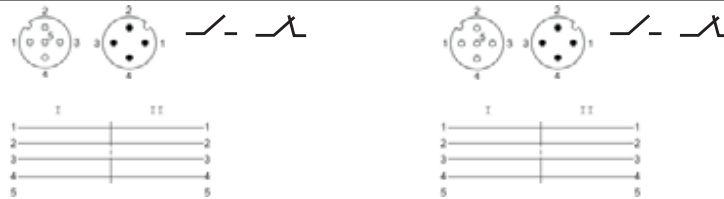
Special properties

Cable for harsh environments, metal mesh hose cables

M12 female ↔ M12 male, 4-pin



Connector diagram and wiring

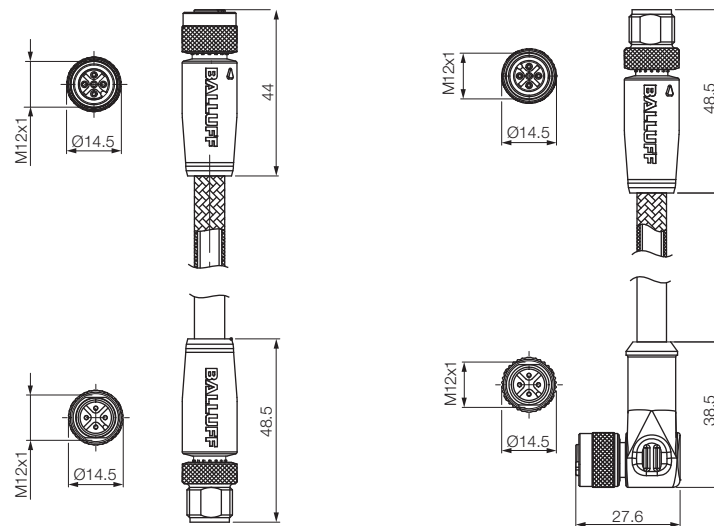


PUR/stainless steel braid, silver	0.3 m	BCC0EKP	BCC0EKA
PUR/stainless steel braid, silver	0.6 m	BCC0EKR	BCC0EKC
PUR/stainless steel braid, silver	1 m	BCC0EKT	BCC0EKE
PUR/stainless steel braid, silver	1.5 m	BCC0EKU	BCC0EKF
PUR/stainless steel braid, silver	2 m	BCC0EKW	BCC0EKH
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-40 °C...+80 °C/-25 °C...+80 °C	-40 °C...+80 °C/-25 °C...+80 °C
Use		Complementary (NO/NC) \swarrow / \nearrow	Complementary (NO/NC) \swarrow / \nearrow
Application		High mechanical protection, very flexible	High mechanical protection, very flexible

Other cable materials, colors and lengths on request.

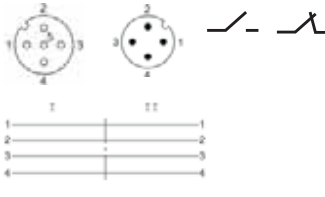
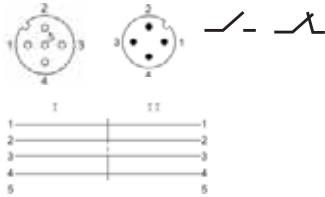
Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

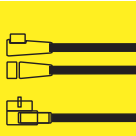


Special properties

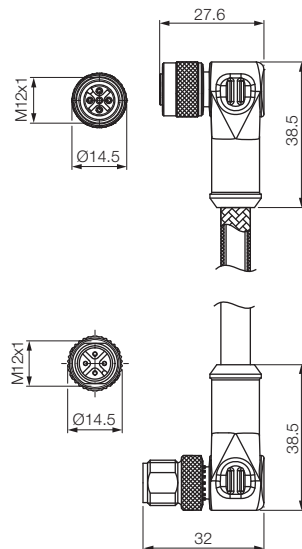
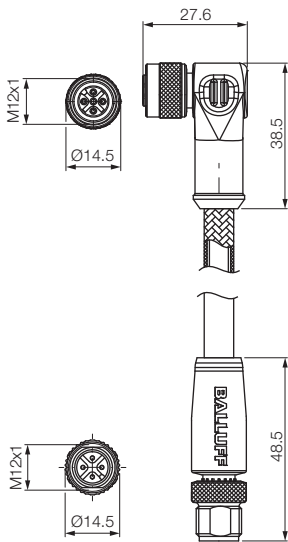
Cable for harsh environments, metal mesh hose cables
M12 female ↔ M12 male, 4-pin



BCC0EKY	BCC0EKJ
BCC0EKZ	BCC0EKK
BCC0EL0	BCC0EKL
BCC0EL1	BCC0EKM
BCC0EL2	BCC0EKN
250 V AC	250 V AC
250 V DC	250 V DC
Molded	Molded
4×0.34 mm ²	4×0.34 mm ²
IP 67	IP 67
-40 °C...+80 °C/-25 °C...+80 °C	-40 °C...+80 °C/-25 °C...+80 °C
Complementary (NO/NC)	Complementary (NO/NC)
High mechanical protection, very flexible	High mechanical protection, very flexible



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



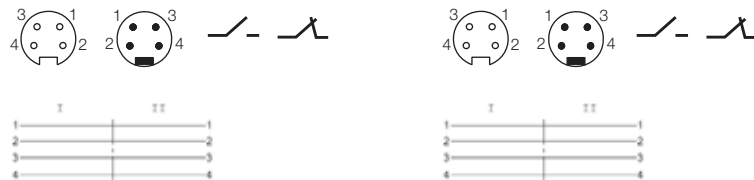
Special properties

Cable for harsh environments, metal mesh hose cables

7/8" female ↔ 7/8" male, 4-pin



Connector diagram and wiring

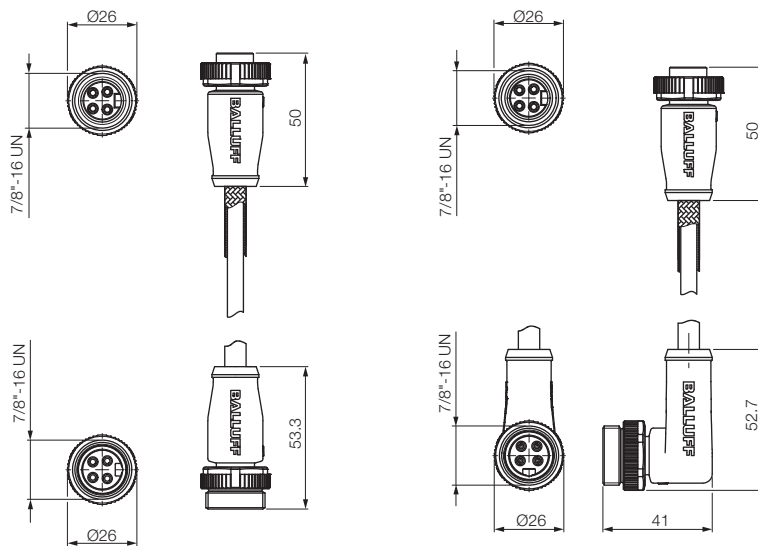


PUR/stainless steel braid, silver	0.3 m	BCC0EJT	BCC0EK5
PUR/stainless steel braid, silver	0.6 m	BCC0EJU	BCC0EK6
PUR/stainless steel braid, silver	1 m	BCC0EJW	BCC0EK7
PUR/stainless steel braid, silver	1.5 m	BCC0EJY	BCC0EK8
PUR/stainless steel braid, silver	2 m	BCC0EJZ	BCC0EK9
Supply voltage AC U_S		250 V AC	250 V AC
Supply voltage DC U_S		250 V DC	250 V DC
Cable		Molded	Molded
No. of wires × conductor cross-section		4×0.34 mm ²	4×0.34 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a static/moving		-40 °C...+80 °C/-25 °C...+80 °C	-40 °C...+80 °C/-25 °C...+80 °C
Use		Complementary (NO/NC) \swarrow -/ \searrow	Complementary (NO/NC) \swarrow -/ \searrow
Application		High mechanical protection, very flexible	High mechanical protection, very flexible

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions with LED on request.

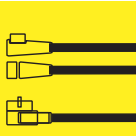


Special properties

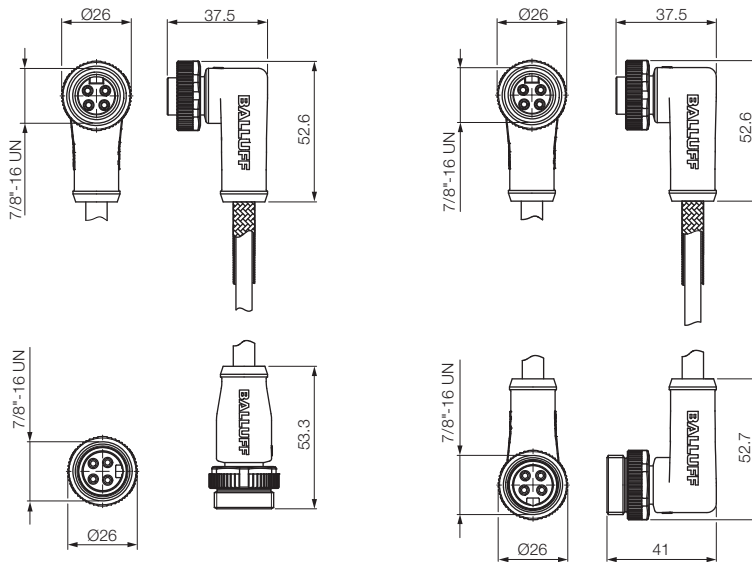
Cable for harsh environments, metal mesh hose cables
7/8" female ↔ 7/8" male, 4-pin

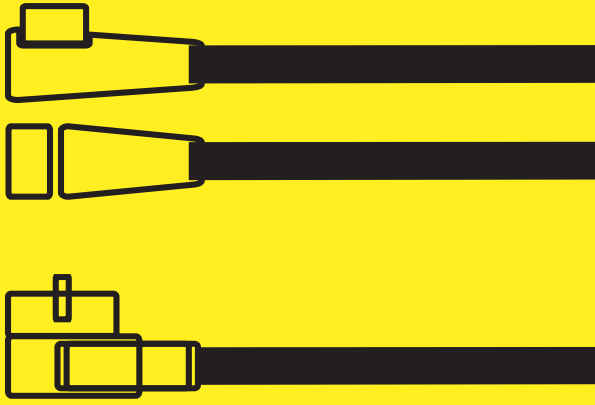


BCC0EK0	BCC0EJL
BCC0EK1	BCC0EJM
BCC0EK2	BCC0EJN
BCC0EK3	BCC0EJP
BCC0EK4	BCC0EJR
250 V AC	250 V AC
250 V DC	250 V DC
Molded	Molded
4x0.34 mm ²	4x0.34 mm ²
IP 67	IP 67
-40 °C...+80 °C/-25 °C...+80 °C	-40 °C...+80 °C/-25 °C...+80 °C
Complementary (NO/NC)	Complementary (NO/NC)
High mechanical protection, very flexible	High mechanical protection, very flexible



Special properties
High-temperature resistant
IP 69K-Ecolab
Weld Spatter Resistant
PUR Cables
Y Connectors, Weld Spatter Resistant
Cable for harsh environments



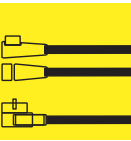


Connectors and Valve Connectors

Valve Connectors



Valve Connectors		
Style A	DIN	400
Style B	DIN	402
Style B	Industry	404
Style C	DIN	406
Style C	Industry	407
Connectors for Pressure Switches		408





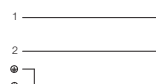
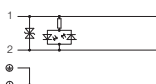
Connector diagram
and wiring



PIN 1: brown
PIN 2: blue
PIN PE: green/yellow

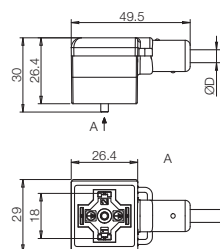
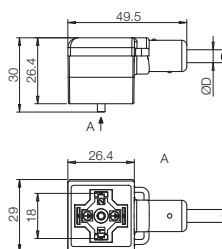


PIN 1: brown
PIN 2: blue
PIN PE: green/yellow



PUR, black	2 m	BCC04W0	BCC04W6
PUR, black	5 m	BCC04W1	BCC04W7
PUR, black	10 m	BCC04W2	BCC04W8
PVC, gray	2 m	BCC04W3	BCC04W9
PVC, gray	5 m	BCC04W4	BCC04WA
PVC, gray	10 m	BCC04W5	BCC04WC
Cable outlet		0°/180°	0°/180°
Supply voltage AC U_S		24 V AC	230 V AC
Supply voltage DC U_S		24 V DC	230 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	no
No. of wires x conductor cross-section		3x0.5 mm ²	3x0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
static/moving	PVC	-25...+105 °C/-25...+105 °C	-25...+105 °C/-25...+105 °C
LED		1x (PNP), yellow	

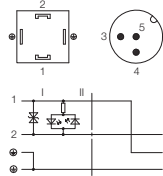
Other cable materials, colors and lengths
on request.



Valve connectors
Style A, DIN, 18 mm, 4-pin
M12 male

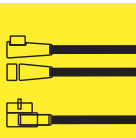
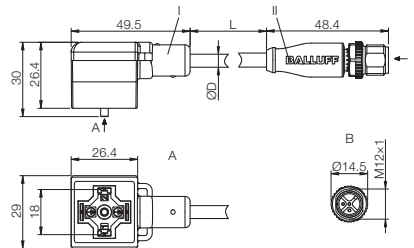


Connector diagram
 and wiring



PUR, black	0.3 m	BCC04WF
PUR, black	0.6 m	BCC04WH
PUR, black	1 m	BCC0502
PUR, black	1.5 m	BCC04WJ
PUR, black	2 m	BCC04WK
PUR, black	3 m	BCC04WL
PUR, black	5 m	BCC04WM
Cable outlet		0°/180°
Supply voltage AC U _S		24 V AC
Supply voltage DC U _S		24 V DC
Cable		Molded/molded
Current rating		4.0 A
Suppressor		Suppressor diode
No. of wires × conductor cross-section		3×0.5 mm ²
Enclosure rating per IEC 60529		IP 67/IP 68
Ambient temperature T _a		-25...+90 °C/-25...+80 °C
Static/moving		
LED		1× (PNP), yellow

Other cable materials, colors and lengths
 on request.



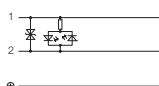
Connectors
Style A
DIN
 Style B
 DIN
 Style B
 Industry
 Style C
 DIN
 Style C
 Industry
 Connectors
 for pressure
 switches



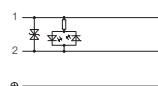
Connector diagram and wiring



PIN 1: brown
PIN 2: blue
PIN PE: green/yellow

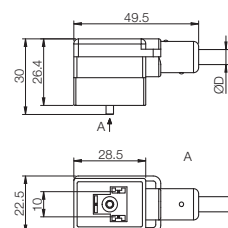
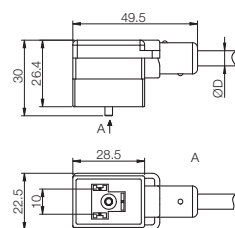


PIN 1: brown
PIN 2: blue
PIN PE: green/yellow



PUR, black	2 m	BCC03YC	BCC03YH
PUR, black	5 m	BCC03YE	BCC03YJ
PUR, black	10 m	BCC03YF	BCC03YK
PVC, gray	2 m	BCC03ZZ	BCC0402
PVC, gray	5 m	BCC0400	BCC0403
PVC, gray	10 m	BCC0401	BCC0404
Cable outlet		0°	180°
Supply voltage AC U_S		24 V AC	24 V AC
Supply voltage DC U_S		24 V DC	24 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires x conductor cross-section		3x0.5 mm ²	3x0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
static/moving	PVC	-25...+105 °C/-25...+105 °C	-25...+105 °C/-25...+105 °C
LED		1x (PNP), yellow	1x (PNP), yellow

Other cable materials, colors and lengths on request.



Valve connectors
Style B, DIN, 10 mm, 3-pin

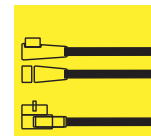
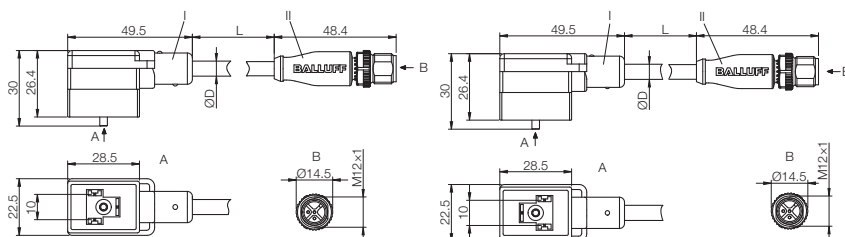


Connector diagram and wiring



PUR, black	0.3 m	BCC064E	BCC064N
PUR, black	0.6 m	BCC064F	BCC064P
PUR, black	1 m	BCC064H	BCC064R
PUR, black	1.5 m	BCC064J	BCC064T
PUR, black	2 m	BCC064K	BCC064U
PUR, black	3 m	BCC064L	BCC064W
PUR, black	5 m	BCC064M	BCC064Y
Cable outlet		0°	180°
Supply voltage AC U_S		24 V AC	24 V AC
Supply voltage DC U_S		24 V DC	24 V DC
Cable		Molded/molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires × conductor cross-section		3×0.5 mm ²	3×0.5 mm ²
Enclosure rating per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T_a static/moving		-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
LED		1× (PNP), yellow	1× (PNP), yellow

Other cable materials, colors and lengths on request.



Connectors

Style A
DIN

Style B
DIN

Style B
Industry

Style C
DIN

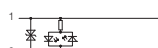
Style C Industry
Connectors for pressure switches



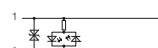
Connector diagram and wiring



PIN 1: brown
PIN 2: blue
PIN PE: green/yellow

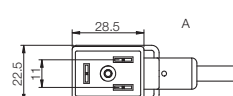
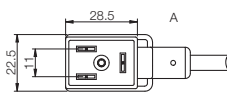
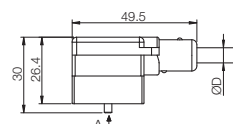
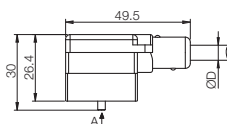


PIN 1: brown
PIN 2: blue
PIN PE: green/yellow



PUR, black	2 m	BCC03YL	BCC03YP
PUR, black	5 m	BCC03YM	BCC03YR
PUR, black	10 m	BCC03YN	BCC03YT
PVC, gray	2 m	BCC0405	BCC0408
PVC, gray	5 m	BCC0406	BCC0409
PVC, gray	10 m	BCC0407	BCC040A
Cable outlet		0°	180°
Supply voltage AC U_S		24 V AC	24 V AC
Supply voltage DC U_S		24 V DC	24 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires x conductor cross-section		3x0.5 mm ²	3x0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T_a	PUR	-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
Static/moving	PVC	-25...+105 °C/-25...+105 °C	-25...+105 °C/-25...+105 °C
LED		1x (PNP), yellow	1x (PNP), yellow

Other cable materials, colors and lengths on request.



Valve connectors
Style B, Industry, 11 mm, 3-pin
M12 male

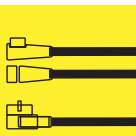
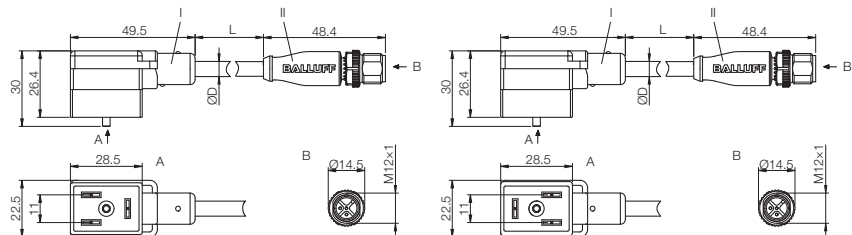


Connector diagram and wiring



PUR, black	0.3 m	BCC064Z	BCC0656
PUR, black	0.6 m	BCC0650	BCC0657
PUR, black	1 m	BCC0651	BCC0658
PUR, black	1.5 m	BCC0652	BCC0659
PUR, black	2 m	BCC0653	BCC065A
PUR, black	3 m	BCC0654	BCC065C
PUR, black	5 m	BCC0655	BCC065E
Cable outlet		0°	180°
Supply voltage AC U_S		24 V AC	24 V AC
Supply voltage DC U_S		24 V DC	24 V DC
Cable		Molded/molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires × conductor cross-section		3×0.5 mm ²	3×0.5 mm ²
Enclosure rating per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T_a		-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
Static/moving			
LED		1× (PNP), yellow	1× (PNP), yellow

Other cable materials, colors and lengths on request.



Connectors

Style A

DIN

Style B

DIN

Style B

Industry

Style C

DIN

Style C Industry

Connectors

for pressure

switches

Valve connectors

Style C, DIN, 8 mm, 4-pin

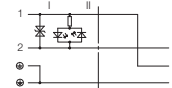
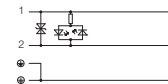
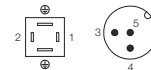
Style C, DIN, 8 mm, 4-pin, M12 male



Connector diagram and wiring

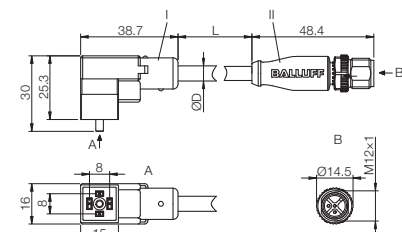
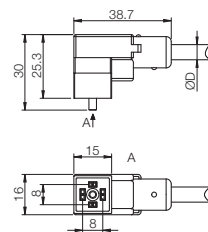


PIN 1: brown
PIN 2: blue
PIN PE: green/yellow



PUR, black	0.3 m		BCC04NC
PUR, black	0.6 m		BCC04NE
PUR, black	1 m		BCC04NF
PUR, black	1.5 m		BCC04NH
PUR, black	2 m	BCC04MZ	BCC04NJ
PUR, black	3 m		BCC04NK
PUR, black	5 m	BCC04N0	BCC04NL
PUR, black	10 m	BCC04N1	
PVC, gray	2 m	BCC04N2	
PVC, gray	5 m	BCC04N3	
PVC, gray	10 m	BCC04N4	
Cable outlet		0°/180°	0°/180°
Supply voltage AC U_S		24 V AC	24 V AC
Supply voltage DC U_S		24 V DC	24 V DC
Cable		Molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires x conductor cross-section		3x0.5 mm ²	3x0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67/IP 68
Ambient temperature T_a	PUR	-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
Static/moving	PVC	-25...+105 °C/-25...+105 °C	
LED		1x (PNP), yellow	1x (PNP), yellow

Other cable materials, colors and lengths on request.



Valve connectors

Style C, Industry, 9.4 mm, 4-pin

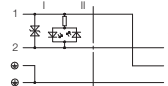
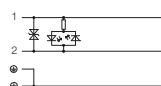
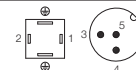
Style C, industry, 9.4 mm, 4-pin, M12 male



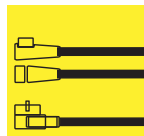
Connector diagram and wiring



PIN 1: brown
PIN 2: blue
PIN PE: green/yellow



PUR, black	0.3 m		BCC04RY
PUR, black	0.6 m		BCC04RZ
PUR, black	1 m		BCC04T0
PUR, black	1.5 m		BCC04T1
PUR, black	2 m	BCC04RF	BCC04T2
PUR, black	3 m		BCC04T3
PUR, black	5 m	BCC04RH	BCC04T4
PUR, black	10 m	BCC04RJ	
PVC, gray	2 m	BCC04RK	
PVC, gray	5 m	BCC04RL	
PVC, gray	10 m	BCC04RM	
Cable outlet		0°/180°	0°/180°
Supply voltage AC U _S		24 V AC	24 V AC
Supply voltage DC U _S		24 V DC	24 V DC
Cable		Molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
No. of wires x conductor cross-section		3x0.5 mm ²	3x0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67/IP 68
Ambient temperature T _a	PUR	-25...+90 °C/-25...+80 °C	-25...+90 °C/-25...+80 °C
static/moving	PVC	-25...+105 °C/-25...+105 °C	
LED		1x (PNP), yellow	1x (PNP), yellow



Connectors

Style A
DIN

Style B
DIN

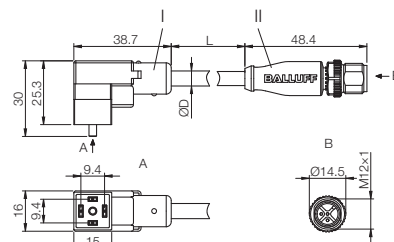
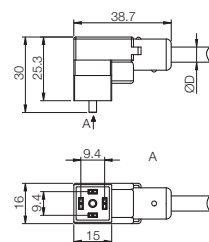
Style B
Industry

Style C
DIN

Style C Industry

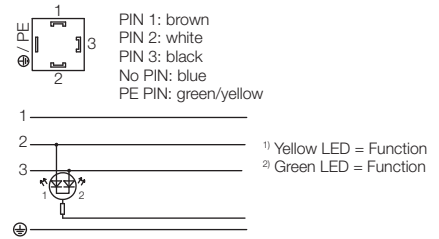
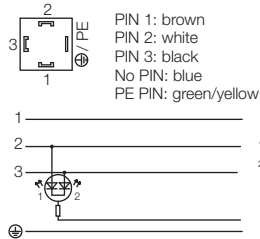
Connectors
for pressure
switches

Other cable materials, colors and lengths on request.



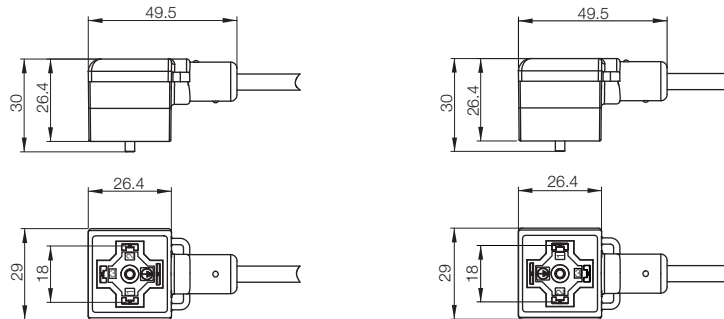


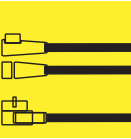
Connector diagram and wiring



PUR, black	2 m	BCC071A	BCC071F
PUR, black	5 m	BCC071C	BCC071H
PUR, black	10 m	BCC071E	BCC071J
Cable outlet		0°	180°
Supply voltage DC U _S		24 V DC	24 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		no	no
Number of conductors × conductor cross-section		5×0.5 mm ²	5×0.5 mm ²
Enclosure rating per IEC 60529		IP 67	IP 67
Ambient temperature T _a static/moving		-30...+90 °C/-5...+80 °C	-30...+90 °C/-5...+80 °C
LED		2× (PNP), green, yellow	2× (PNP), green, yellow

Other cable materials, colors, and lengths on request.





Connectors

Style A
DIN

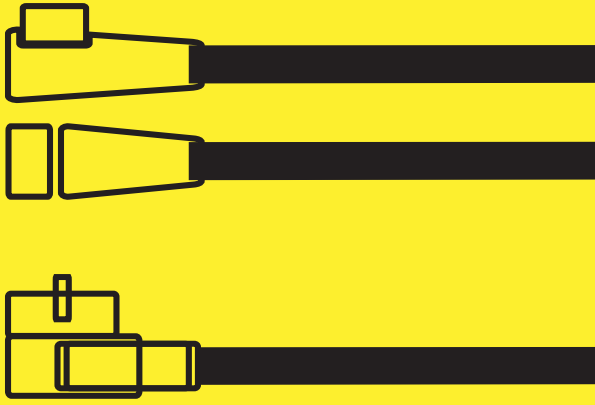
Style B
DIN

Style B
Industry

Style C
DIN

Style C Industry

**Connectors
for pressure
switches**

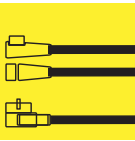


Connectors and Valve Connectors

Accessories for Connectors and Valve Connectors

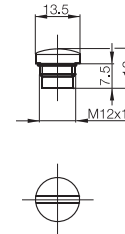
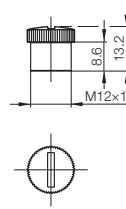
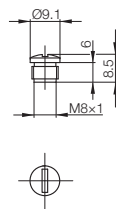


Screw Plugs	412
Tools	413
Integrated Tamper Protection	414
Label	414
Cable Clamp	414
Protective Cover	416
Anti-sabotage Protection, Coupling	416
Protective Cover, Adapter Plate	417
Protective Hose/Jacket/Sleeve	418

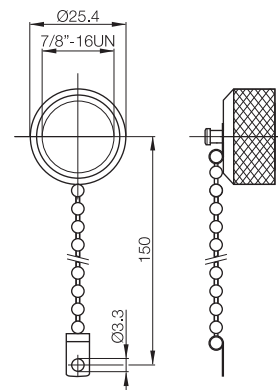
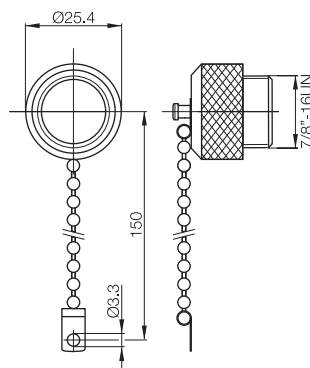




Description	M8 locking screw	M12 locking screw	M12 locking screw
	BAM01C1	BAM01C2	BAM0114
Use	IP 65 screw plug for unused ports	IP 65 screw plug for unused ports	for connector type M12x1
Ambient temperature T_a	-20...+80 °C	-20...+80 °C	
Housing material	Plastic	Plastic	Brass



Description	Screw plug 7/8"	Screw plug 7/8"
	BAM012T	BAM012U
Use	Cover for the power ports	Cover for the power ports
Ambient temperature T_a	-20...+80 °C	-20...+80 °C
Housing material	Nickel-plated CuZn	Nickel-plated CuZn





Description		Torque wrench
Thread	Tightening torque	
M8	0.4 Nm	BAM00ZL
M12	0.6 Nm	BAM00ZM
7/8"	1.5 Nm	BAM00ZN
Use		For large quantities or torque adjustments

Assembly wrench

Field-attachable M23 connectors are easy to assemble due to their size. After the components are assembled, the top and bottom section must be secured to one another to guarantee the high degree of protection.



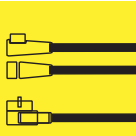
Description		Assembly wrench
		BAM01TY
Use		for 12 and 19-pin M23 connectors



Description		Crimping tongs
		FHW0003
Use		for RJ45



Using the torque wrench



Accessories for Connectors and Valve Connectors

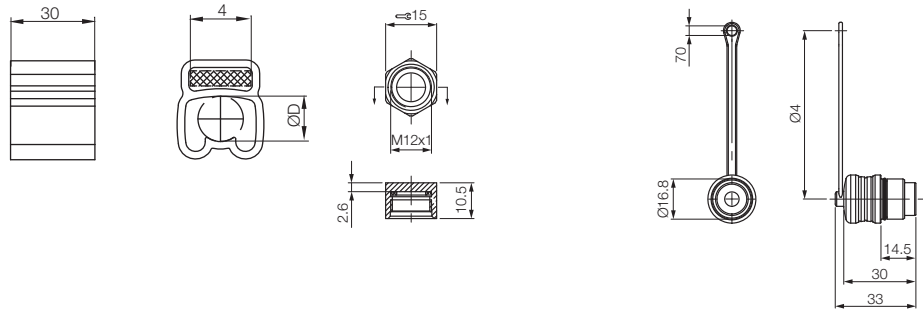
Tool

Screw Plugs

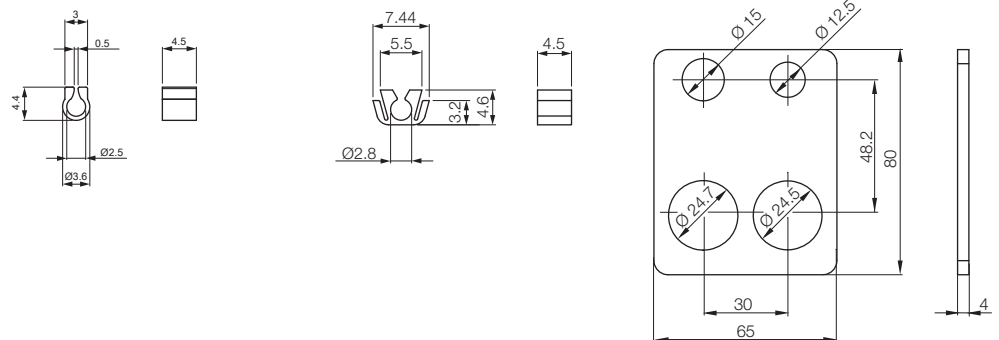
- Integrated tamper protection
- Labeling
- Cable clamp
- Protective cover
- Anti-sabotage protection, coupling
- Protective sleeve/jacket/tape

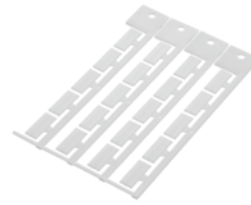


Description	Marking sleeve		Protective cover	Protective cover
Type				Push-Pull protective cap
			BAM01YN	BAM020N
Cable diameter	2...4 mm	BAM023F		
	4...7 mm	BAM023H		
	6...10 mm	BAM023J		
Use	For labeling connectors		for connector type M12x1	for series BCC H47_
Housing material	PVC		Brass	Stainless steel

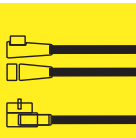
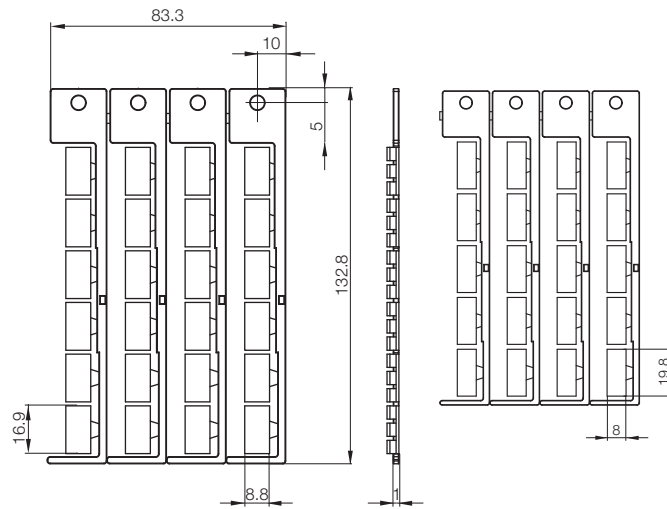


Description	Cable clamp Ø 2.5 mm	Cable clamp Ø 2.8 mm	Integrated tamper protection
	BAM01EC	BAM01EA	BAM01J0
Use	for C-slot	for T-slot	with 4 openings
Size	2.5 ±0.1 mm	2.8 ±0.1 mm	
Housing material	PUR		





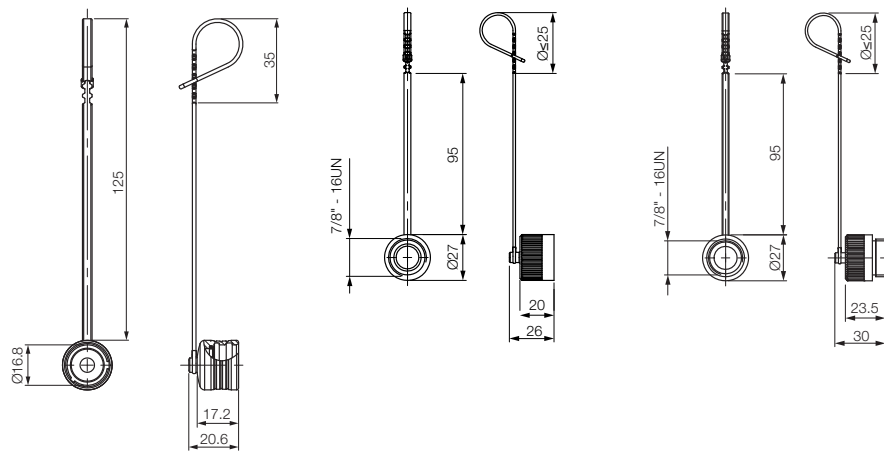
Description	Label set BAM01JU	Label set BAM01JT
Use	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...
Housing material	Plastic	Plastic



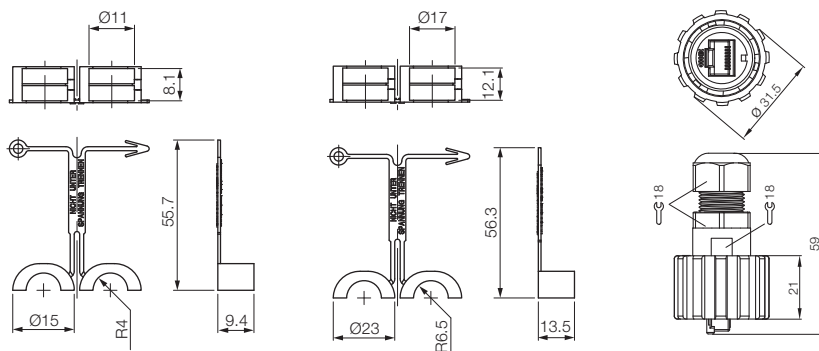
- Accessories for Connectors and Valve Connectors
- Tool
- Screw Plugs
- Integrated tamper protection**
- Labeling**
- Cable Clamp**
- Protective cover
- Anti-sabotage protection, coupling**
- Protective sleeve/jacket/tape



Description	Protective cover BAM020M	Protective cover BAM01LE	Protective cover BAM01LF
Type	Push-Pull protective cap	Protective cap	Protective cap
Use	for series BCC H43_ -	for 7/8"	for 7/8"
Housing material	Stainless steel	PA	PA

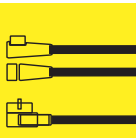
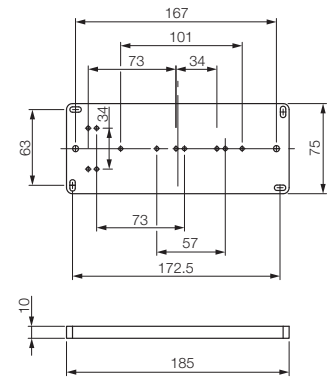
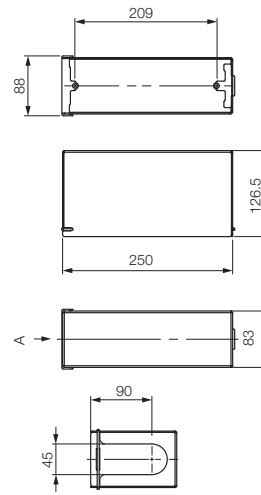
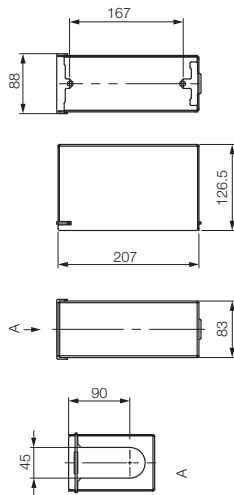


Description	Anti-sabotage protection BAM01Z5	Anti-sabotage protection BAM01Z4	RJ45 coupling BCC09N2
Use	for molded connectors M8	for molded connectors M12	for Ethernet TCP/IP
Housing material	PA	PA	





Description	Protective cover BAM020Z	Protective cover BAM0210	Adapter plate BAM0222
Use	207×126.5×83 mm, for BNI L < 200 mm	250×126.5×83 mm, for BNI L = 200 – 225 mm	for BNI/BPI L < 200 mm for cover hood BNI L = 207 mm
Housing material	Anodized aluminum	Anodized aluminum	Sandblasted aluminum



- Accessories for Connectors and Valve Connectors
- Tool
- Screw plugs
- Integrated tamper protection
- Labeling
- Cable clamp
- Protective cover**
- Anti-sabotage Protection, Coupling**
- Protective sleeve/jacket/tape

Accessories for Connectors and Valve Connectors

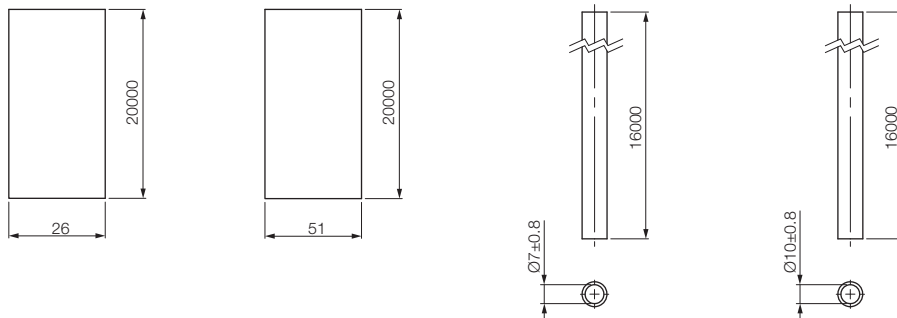
Protective sleeve/jacket/tape



Description	Protective sleeve/jacket/tape	Protective sleeve/jacket/tape
	BAM022Z	BAM0230
Use	for cable guard	for cable guard
Inside diameter	10 mm	13 mm
Length	15 m	15 m
Ambient temperature T _a	-40...+250 °C	-40...+250 °C
Housing material	Fiberglass with silicon rubber	Fiberglass with silicon rubber



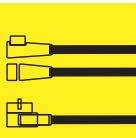
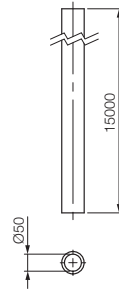
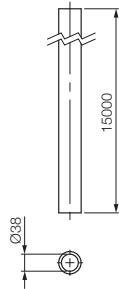
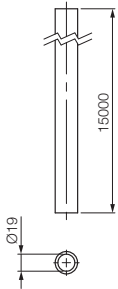
Description	Protective tape	Protective tape	Protective sleeve/jacket	Protective sleeve/jacket
	BAM021E	BAM021F	BAM0212	BAM0213
Use	for cable guard	for cable guard	for cable guard	for cable guard
Inside diameter			7 ±0.8 mm	10 ±0.8 mm
Length	20 m	20 m	16 m	16 m
Ambient temperature T _a	-40...+180 °C	-40...+180 °C	-40...+200 °C	-40...+200 °C
Housing material	Silicone 60 white	Silicone 60 white	Silicone 60 translucent	Silicone 60 translucent



Protective sleeve/jacket/tape



Protective sleeve/jacket/tape	Protective sleeve/jacket/tape	Protective hose/jacket/sleeve
BAM0231	BAM0232	BAM0233
for cable guard	for cable guard	for cable guard
19 mm	38 mm	50 mm
15 m	15 m	15 m
-40...+250 °C	-40...+250 °C	-40...+250 °C
Fiberglass with silicon rubber	Fiberglass with silicon rubber	Fiberglass with silicon rubber

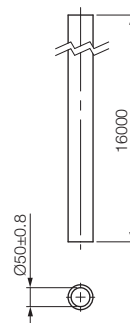
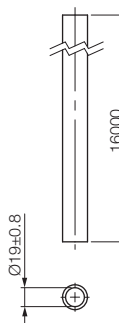
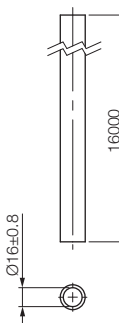
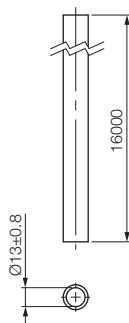


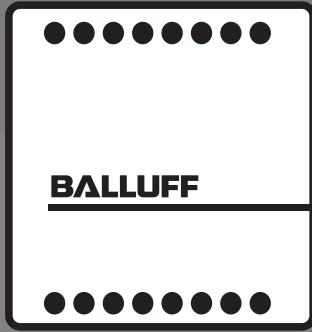
Accessories for Connectors and Valve Connectors

- Tool
- Screw plugs
- Integrated tamper protection
- Labeling
- Cable clamp
- Protective cover
- Anti-sabotage Protection, Coupling
- Protective sleeve/jacket/tape**



Protective sleeve/jacket	Protective sleeve/jacket	Protective sleeve/jacket	Protective sleeve/jacket
BAM0214	BAM0215	BAM0216	BAM0217
for cable guard	for cable guard	for cable guard	for cable guard
13 ±0.8 mm	16 ±0.8 mm	19 ±0.8 mm	50 ±0.8 mm
16 m	16 m	16 m	16 m
-40...+200 °C	-40...+200 °C	-40...+200 °C	-40...+200 °C
Silicone 60 translucent	Silicone 60 translucent	Silicone 60 translucent	Silicone 60 translucent





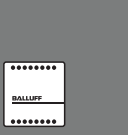
Electrical Devices

Electrical Devices

A wide selection of accessories, such as pulse extender, digital display and testers for all applications and the areas of inspection, testing, function and monitoring.



Power Supplies	
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High performance – for faultless system operation

- Take advantage of the special benefits of Balluff power supplies
- Full product line – choose just what you need
- Short-circuit and overload protection in industrial environments
- High system availability of all devices
- Unlimited, precise power for increased demands
- Long service life for reliable operation
- Worldwide approvals for use anywhere

Every industrial automation system needs a reliable, clean and controlled source of power without spikes. Only then can these systems deliver the expected performance. With the Balluff power supplies you get what you expect and more. They ensure reliable power even under demanding conditions.

■ **Ultra-reliable power supplies**

for protecting sensitive control electronics

■ **Protection against unforeseen events**

Integrated overload and overvoltage protection

■ **Wide selection of models**

Whether stand-alone or an individual combination of various models, these solutions are perfect for your requirements

■ **Clean, precise power supply for particularly demanding systems**

Load regulation $\pm 1\%$ for all models, ripple and noise under 50 mV for most models

■ **Long service life for less system downtime**

MTBF (Mean Time Between Failure) up to 800,000 hours/ 91 years



Parallel/single mode

If more power is required, multiple units can be combined in parallel (most models)

Adjustable output

The output voltage can be adjusted to compensate for losses from wiring and distributed components



Status indicator

LED for DC ON and DC LO indicator (for most models)

Terminals with contact protection

No additional protection necessary



Ready output

Notifies the control system that the power supply is ready (included with most models)



Rugged DIN rail mounting

CE, UL/cUL and TÜV approvals

IP 20 metal housing (most models)

Type	Output power	Features		Product information	Page							
		Housing material	Parallel mode Ready output									
Standard IP 20	12 V	0.75 A/18 W					Single-phase ¹	Plastic		BAE0036	432	
		1.25 A/30 W					Single-phase ¹	Plastic	■	BAE0039	433	
		1.5 A/18 W	■				Single-phase ¹	Metal	■	BAE003E	435	
		2.5 A/30 W		■			Single-phase ²	Metal	■ ■	BAE003H	437	
	24 V	2.5 A/60 W					Single-phase ¹	Plastic			BAE0001	432
		2.5 A/120 W					Single-phase ¹	Plastic	■		BAE0004	433
		3.8 A/91.20 W					Single-phase ¹	Plastic	■		BAE0005	434
		5 A/60 W				■	Single-phase ²	Metal	■ ■		BAE003J	436
		5 A/120 W					Single-phase ²	Metal	■ ■		BAE0006	437
		5 A/240 W					Single-phase ²	Metal	■ ■		BAE0002	438
		8 A/192 W					Single-phase ²	Metal	■ ■		BAE0003	439
		10 A/120 W					3-phase ³	Metal	■		BAE0007	440
		10 A/240 W					3-phase ³	Metal	■ ■		BAE0008	441
		10 A/480 W					3-phase ³	Metal	■ ■		BAE0009	441
	48 V	20 A/480 W					3-phase ³	Metal	■ ■		BAE003R	442
		40 A/960 W				■	Single-phase ²	Plastic	■ ■		BAE003K	436
							Single-phase ²	Metal	■ ■		BAE003L	438
							Single-phase ²	Metal	■ ■		BAE003M	439
							Single-phase ¹	Metal	■		BAE00EK	427
							Single-phase ¹	Metal	■		BAE00EU	427
	Intelligent devices IP 20	24 V										
Intelligent devices IP 67	24 V						Single-phase ¹	Metal		BAE00EN	428	
							Single-phase ¹	Metal		BAE00EP	428	
							Single-phase ¹	Metal		BAE00ER	429	
							Single-phase ¹	Metal		BAE00FW	429	
							Single-phase ¹	Metal		BAE00ET	429	
							Single-phase ¹	Metal		BAE00FL	430	
					Single-phase ¹	Metal		BAE00FY	430			

¹ = 100...240 V AC
² = 115/230 V AC (Auto-Select)
³ = 340...575 V AC



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Intelligent power supply units –

For outstanding system availability

If you want to operate your systems and machines with maximum efficiency, the power supply you use must be reliable. Intelligent power supply units from Balluff guarantee a high degree of reliability. This is because they enable you to monitor their environment continuously by providing a complete picture of it wherever they are installed.

LEDs for easy monitoring

- Load level
- Stress level
- Lifetime

LEDs indicate the load level and stress level so the operator knows immediately when the unit is operating at maximum performance. LEDs also show the service life of the devices, simplifying maintenance and operation. The user can also see when a device has to be replaced. This is how Balluff power supply units contribute to increased system availability.

Your advantages

- Continuous monitoring of machines and systems
 - Reliable power supply units guarantee efficient operation
 - Optimized use of devices and a longer service life
 - Maintenance planning
- Devices only replaced when necessary

Versions

Intelligent power supply units from Balluff are available in two versions

IP 20 (with screw terminal)

- With a wide input voltage range from 90...264 V AC
- Designed for versatile use in industrial automation
- Also satisfies all wind turbine requirements

IP 67 (with connector)

- Can be used directly in harsh environments
- Fully potted housing
- High shock and vibration ratings

Power for controllers and networks

Specially developed for controller units, Balluff power supply units can be perfectly integrated into your control package.

The PS series of ultra-reliable power supply units is available in a wide range of 12, 24, and 48 V DC models with single or 3-phase input. With a bandwidth of 18 W to 960 W, they truly leave nothing to be desired. For even greater power, multiple power supplies are interconnected (parallel switching mode).

Do you need a different voltage? Please contact us.



Trouble-free installation

Reliable power has never been so simple to install. It starts with the convenient DIN rail mounting using the integrated Balluff high-performance mounting system. The screw terminals are aligned to enable the integration of an AC input from below and a DC output from above. Connections with contact protection render additional safety equipment superfluous.



Load level:



Load level

■ Reversible in short term

Load level indicates the current load on the device. The display indicates the load without delay.

Heartbeat:



Stress level

■ Reversible in medium term

Stress level indicates the physical and thermal loads. Changing the load has an effect on device wear.

Wear indicator:



Lifetime

■ Irreversible in long term

Lifetime shows the remaining service life of the device, based on the total of all loads.

All indicators are multi-colored – green, yellow, or red – and show the status of the device.



Intelligent power supplies in IP 67



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Intelligent power supplies from Balluff

The installation of local power supply units without switch cabinets with the IP 67 degree of protection is becoming more popular in industrial automation. Although local power supply units are already available, they are generally difficult to access once installed. To further complicate matters, it is practically impossible to monitor the operating state. As a result, operators rely on preventive maintenance concepts to guarantee maximum possible availability. This procedure is reliable, but also expensive, because devices are frequently replaced during the maintenance cycle well before the end of their service life, as there is no alternative system available.

For the first time, intelligent, energy-saving power supply units from Balluff promise to remedy this situation. Their condition is visualized by means of optical indicators.

This novel concept allows detection of the condition of the device at a glance. Since it tracks dynamic loads, it can be operated continuously even under high load conditions. This makes typical reserves of 30 to 50% superfluous.

The intelligence supports continuous high utilization of the devices. Their operational status is indicated via:

- Load level
- Stress level
- Lifetime

display. The displays provide an easy way for the operator to quickly ascertain the status.

General key information about the IP 20 and IP 67 power supply units

- High efficiency of 92%
- Minimal heat loss and generation
- Increasing efficiency of the systems
- 3-stage status indication
- Power boost (150% for 4 sec.)
- Extremely compact
- More efficient utilization of the power supply units
- Planned reserves are not wasted
- Prevention of failures caused by continuous overload
- Scheduled maintenance and repairs no longer necessary
- Higher productivity
- PSU replaced only at the end of its service life
- Service life of 15 years (at 80% load and 40 °C), MTBF > 800,000 h
- Enclosed housing guarantees high degree of resistance to vibration and shock loads
- With IP 20, also with floating alarm contacts

Ideal areas of application for these intelligent power supply units include decentralized installations in the automobile industry, machine construction, wind turbines, etc.



Intelligent power supplies enable monitoring of the operating status in demanding applications.



IP 20

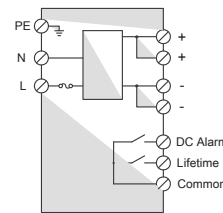
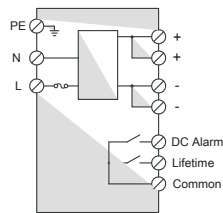


IP 67

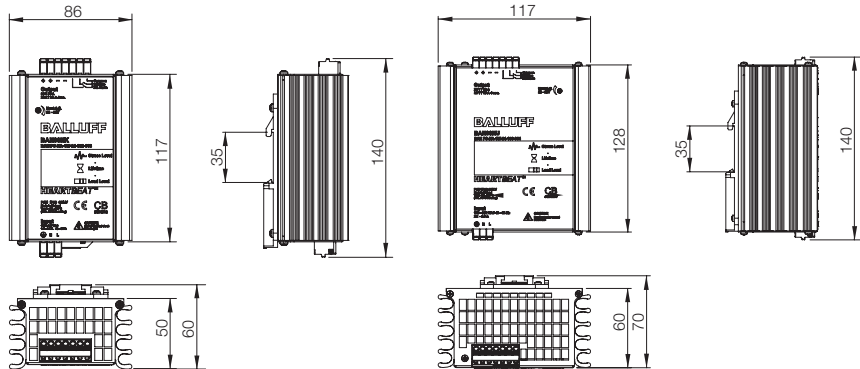


	5 A	10 A
Output current	5 A	10 A
Output power	120 W	240 W
Output voltage	24 V DC (SELV)	24 V DC (SELV)
Input voltage	100...240 V AC single-phase	100...240 V AC single-phase
	BAE00EK	BAE00EU
Input voltage range	90...264 V AC/135...340 V DC	90...264 V AC/135...340 V DC
Inrush current	1.14 at 230 V AC / 2.1 A at 110 V AC	2.11 at 230 V AC/4.4 A at 110 V AC
Frequency range	48...62 Hz	48...62 Hz
Input fuse	6.3 A/250 V AC internal	6.3 A/250 V AC internal
Voltage adjustment range	22...28 V DC	22...28 V DC
Temperature coefficient max.	±0.03%/°C	0.03%/°C
Hold-up time	> 150 ms at 230 V AC/> 25 ms at 115 V AC	> 120 ms at 230 V AC/> 15 ms at 115 V AC
Status indicator	Stress level, lifetime, load level	Stress level, lifetime, load level
Power boost	150% for 4 s	150% for 4 s
Efficiency	High efficiency, typically > 89%	High efficiency, typically > 91%
Response	Forward characteristic	Forward characteristic
Ambient temperature	-25...+70 °C	-25...+70 °C
Storage temperature	-40...+80 °C	-40...+80 °C
Fastening	DIN rail mounting	DIN rail mounting
Parallel mode	Yes (with external diodes)	Yes (with external diodes)
Enclosure rating per IEC 60529	IP 20	IP 20
Derating	-2.5%/ °C above +60 °C	-2.5%/ °C above +60 °C
Cooling	Free convection	Free convection
Housing material	Metal, semi-potted	Metal, semi-potted
Service life (at 80% load and 40 °C)	15 years	15 years
Warranty	2 years	2 years
Weight	0.80 kg	1.15 kg
Approvals	CE	CE

Wiring diagram



*SELV = Safety Extra Low Voltage

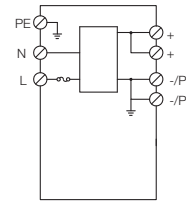
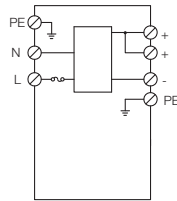


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Output current	3.8 A	3.8 A
Output power	91.2 W	91.2 W
Output voltage	24 V DC (SELV)	24 V DC (PELV)
Input voltage	100...240 V AC single-phase	100...240 V AC single-phase
	BAE00EN	BAE00EP
Input voltage range	90...264 V AC/135...340 V DC	90...264 V AC/135...340 V DC
Inrush current	< 30 A	< 30 A
Frequency range	48...62 Hz	48...62 Hz
Input fuse	6.3 A/250 V AC internal	6.3 A/250 V AC internal
Voltage adjustment range	24 V DC fixed adjustment	24 V DC fixed adjustment
Temperature coefficient max.	±0.03%/°C	±0.03%/°C
Hold-up time	> 200 ms at 230 V AC/> 40 ms at 115 V AC	> 200 ms at 230 V AC/> 40 ms at 115 V AC
Status indicator	Stress level, lifetime, load level	Stress level, lifetime, load level
Power boost	150% for 4 s	150% for 4 s
Efficiency	High efficiency, typically > 88%	High efficiency, typically > 88%
Input	3-pin (male)	3-pin (male)
Output	4-pin (female)	4-pin (female) e.g. for DeviceNet, Ethernet/IP modules
Response	Forward characteristic	Forward characteristic
Ambient temperature	-25...+70 °C	-25...+70 °C
Storage temperature	-40...+80 °C	-40...+80 °C
Fastening	Panel, wall, and field mounting	Panel, wall, and field mounting
Enclosure rating per IEC 60529	IP 67	IP 67
Derating	-2.5%/ °C above +60 °C	-2.5%/ °C above +60 °C
Cooling	Free convection	Free convection
Housing material	Metal, fully potted	Metal, fully potted
Service life (at 80% load and 40 °C)	15 years	15 years
Warranty	2 years	2 years
Weight	1 kg	1 kg
Approvals	CE	CE

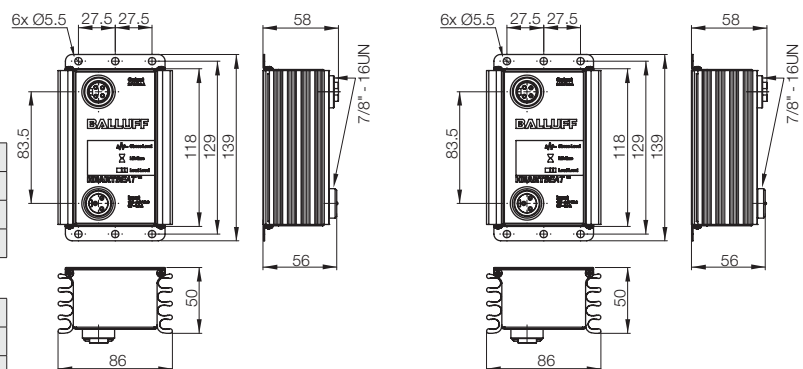
Wiring diagram



*SELV = Safety Extra Low Voltage

Appropriate cables	Length	
Input 3-pin	2 m	BCC0AHZ
Output 4-pin	2 m	BCC06HL
Output 5-pin	2 m	BCC06HC

Tee	
3-pin	BCC0AA5
4-pin	BCC0AA6
5-pin	BCC0AA7



Power Supplies

Intelligent devices

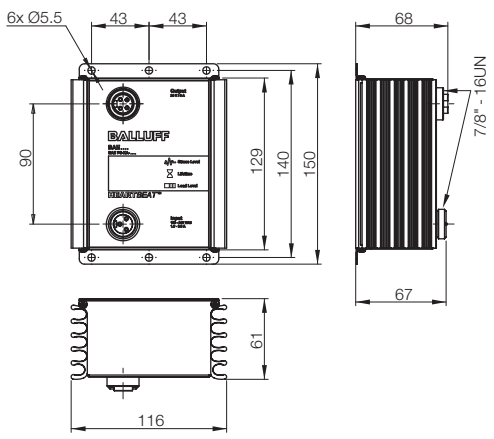
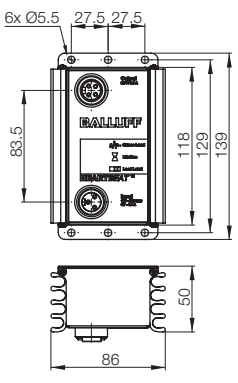
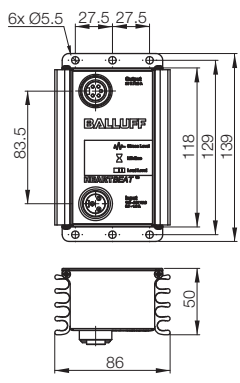
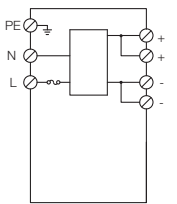
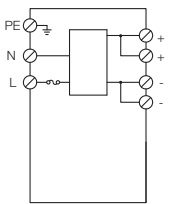
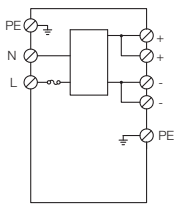
3.8 A, 8 A



3.8 A	3.8 A	8 A
91.2 W	91.2 W	192 W
24 V DC (SELV)	24 V DC (SELV)	24 V DC (SELV)
100...240 V AC single-phase	100...240 V AC single-phase	100...240 V AC single-phase
BAE00ER	BAE00FW	BAE00ET
90...264 V AC/135...340 V DC	90...264 V AC/135...340 V DC	90...264 V AC/135...340 V DC
< 30 A	< 30 A	< 20 A
48...62 Hz	48...62 Hz	48...62 Hz
6.3 A/250 V AC internal	6.3 A/250 V AC internal	6.3 A/250 V AC internal
24 V DC fixed adjustment	24 V DC fixed adjustment	24 V DC fixed adjustment
±0.03%/°C	±0.03%/°C	±0.03%/°C
> 200 ms at 230 V AC/> 40 ms at 115 V AC	> 200 ms at 230 V AC/> 40 ms at 115 V AC	> 150 ms at 230 V AC/> 20 ms at 115 V AC
Stress level, lifetime, load level	Stress level, lifetime, load level	Stress level, lifetime, load level
150% for 4 s	150% for 4 s	150% for 4 s
High efficiency, typically > 88%	High efficiency, typically > 88%	High efficiency, typically > 90%
3-pin (male)	3-pin (male)	3-pin (male)
5-pin (female) e.g. for Profibus, Profinet, CC-Link modules	4-pin (female) e.g. for DeviceNet, Ethernet/IP modules	4-pin (female) e.g. for DeviceNet, Ethernet/IP modules
Forward characteristic	Forward characteristic	Forward characteristic
-25...+70 °C	-25...+70 °C	-25...+70 °C
-40...+80 °C	-40...+80 °C	-40...+80 °C
Panel, wall, and field mounting	Panel, wall, and field mounting	Panel, wall, and field mounting
IP 67	IP 67	IP 67
-2.5%/ °C above +60 °C	-2.5%/ °C above +60 °C	-2.5%/ °C above +60 °C
Free convection	Free convection	Free convection
Metal, fully potted	Metal, fully potted	Metal, fully potted
15 years	15 years	15 years
2 years	2 years	2 years
1 kg	1 kg	1.65 kg
CE	CE	CE



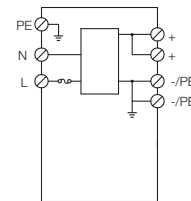
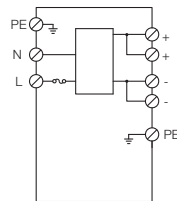
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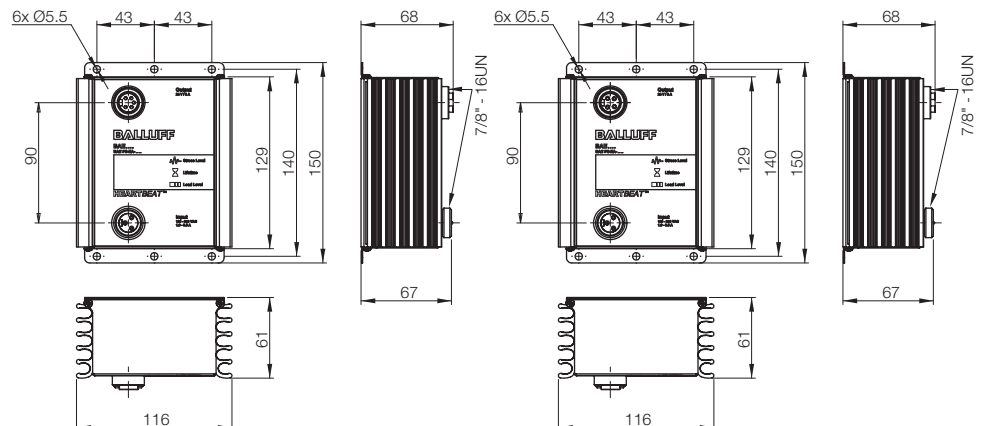


Output current	8 A	8 A
Output power	192 W	192 W
Output voltage	24 V DC (SELV)	24 V DC (PELV)
Input voltage	100...240 V AC single-phase	100...240 V AC single-phase
	BAE00FL	BAE00FY
Input voltage range	90...264 V AC/135...340 V AC	90...264 V AC/135...340 V AC
Inrush current	< 20 A	< 20 A
Frequency range	48...62 Hz	48...62 Hz
Input fuse	6.3 A/250 V AC internal	6.3 A/250 V AC internal
Voltage adjustment range	24 V DC fixed adjustment	24 V DC fixed adjustment
Temperature coefficient max.	±0.03%/°C	±0.03%/°C
Hold-up time	> 150 ms at 230 V AC/> 20 ms at 115 V AC	> 150 ms at 230 V AC/> 20 ms at 115 V AC
Status indicator	Stress level, lifetime, load level	Stress level, lifetime, load level
Power boost	150% for 4 s	150% for 4 s
Efficiency	High efficiency, typically > 90%	High efficiency, typically > 90%
Input	3-pin (male)	3-pin (male)
Output	5-pin (female) e.g. for Profibus, Profinet, CC-Link modules	4-pin (female) e.g. for DeviceNet, Ethernet/IP modules
Response	Forward characteristic	Forward characteristic
Ambient temperature	-25...+70 °C	-25...+70 °C
Storage temperature	-40...+80 °C	-40...+80 °C
Fastening	Panel, wall, and field mounting	Panel, wall, and field mounting
Enclosure rating per IEC 60529	IP 67	IP 67
Derating	-2.5%/ °C above +60 °C	-2.5%/ °C above +60 °C
Cooling	Free convection	Free convection
Housing material	Metal, fully potted	Metal, fully potted
Service life (at 80% load and 40 °C)	15 years	15 years
Warranty	2 years	2 years
Weight	1.65 kg	1.65 kg
Approvals	CE	CE

Wiring diagram



*SELV = Safety Extra Low Voltage





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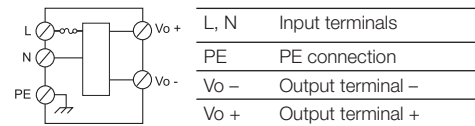
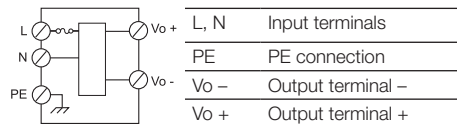
Class 2



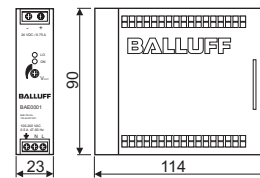
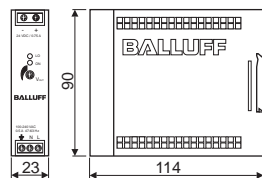
Class 2

Output current	0.75 A	1.5 A
Output power	18 W	18 W
Output voltage	24 V DC (SELV)	12 V DC (SELV)
Input voltage	100...240 V AC	100...240 V AC
	BAE0001	BAE0036
Input voltage range	90...264 V AC/120...375 V DC	90...264 V AC/120...375 V DC
Inrush current	115 V AC < 10 A/230 V AC < 18 A	115 V AC < 10 A/230 V AC < 18 A
Frequency range	47...63 Hz	47...63 Hz
Input fuse	T2 A/250 V AC internal	T2 A/250 V AC internal
Voltage adjustment range	22.5...28.5 V DC	11...14 V DC
Temperature coefficient max.	±0.03%/°C	±0.03%/°C
Ripple and noise	50 mV	50 mV
Hold-up time	115 V AC > 20 ms/230 V AC > 30 ms	115 V AC > 20 ms/230 V AC > 30 ms
Status indicator DC ON	Green LED	Green LED
Status indicator DC LOW	Red LED	Red LED
Efficiency	77 %	77 %
Response	Hiccup mode	Hiccup mode
Switching frequency	> 100 kHz	> 100 kHz
Input/output isolation voltage	3000 V AC	3000 V AC
Isolation resistance	100 MΩ	100 MΩ
Switch-on delay	< 1 s	< 1 s
Ambient temperature	-20...+70 °C	-20...+70 °C
Derating	-2.5%/°C of +61 °C	-2.5%/°C of +61 °C
Parallel mode	Yes (with external diodes)	Yes (with external diodes)
Enclosure rating per IEC 60529	IP 20	IP 20
Ready output	no	no
Cooling	Free convection	Free convection
Housing material	Plastic	Plastic
Weight	0.15 kg	0.15 kg
Approvals	CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

Wiring diagram



*SELV = Safety Extra Low Voltage



Power Supplies
Single-phase input voltage
1.25 A, 2.5 A



Class 2



Class 2

1.25 A

30 W
24 V DC (SELV)
100...240 V AC
BAE0004
85...264 V AC/90...375 V DC
115 V AC < 20 A/230 V AC < 40 A
47...63 Hz
T2 A/250 V AC internal
22.5...28.5 V DC
±0.03%/°C
50 mV
115 V AC > 20 ms/230 V AC > 30 ms
Green LED

2.5 A

30 W
12 V DC (SELV)
100...240 V AC
BAE0039
85...264 V AC/90...375 V DC
115 V AC < 20 A/230 V AC < 40 A
47...63 Hz
T2 A/250 V AC internal
11...14 V DC
±0.03%/°C
50 mV
115 V AC > 20 ms/230 V AC > 30 ms
Green LED

86 %

Forward characteristic

> 80 kHz

3000 V AC

100 MΩ

< 1 s

-40...+70 °C

-2.5%/°C of +61 °C

Yes (with external diodes)

IP 20

DC OK output

Free convection

Plastic

0.29 kg

CE, UL/cUL, TÜV

84 %

Forward characteristic

> 80 kHz

3000 V AC

100 MΩ

< 1 s

-40...+70 °C

-2.5%/°C of +61 °C

Yes (with external diodes)

IP 20

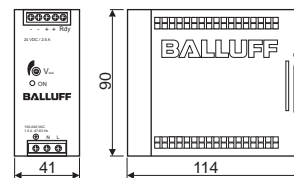
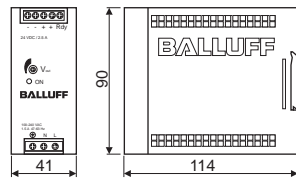
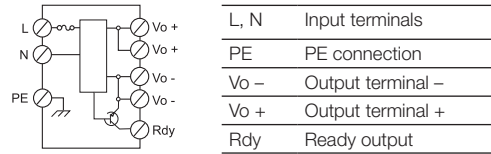
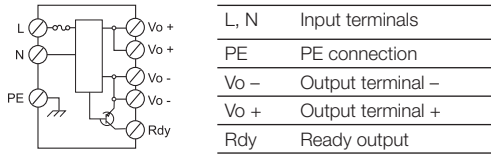
DC OK output

Free convection

Plastic

0.29 kg

CE, UL/cUL, TÜV

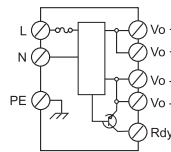


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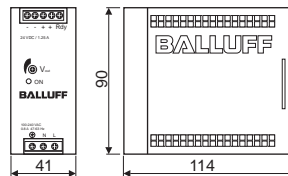
Class 2

Output current	2.5 A
Output power	60 W
Output voltage	24 V DC (SELV)
Input voltage	100...240 V AC
BAE0005	
Input voltage range	85...264 V AC/90...375 V DC
Inrush current	115 V AC < 30 A/230 V AC < 60 A
Frequency range	47...63 Hz
Input fuse	T2 A/250 V AC internal
Voltage adjustment range	22.5...28.5 V DC
Temperature coefficient max.	±0.03%/°C
Ripple and noise	50 mV
Hold-up time	115 V AC > 20 ms/230 V AC > 30 ms
Status indicator DC ON	Green LED
Efficiency	89 %
Response	Forward characteristic
Switching frequency	> 55 kHz
Input/output isolation voltage	3000 V AC
Isolation resistance	100 MΩ
Switch-on delay	< 1 s
Ambient temperature	-40...+70 °C
Derating	-2.5%/°C of +61 °C
Parallel mode	Yes (with external diodes)
Enclosure rating per IEC 60529	IP 20
Ready output	DC OK output
Cooling	Free convection
Housing material	Plastic
Weight	0.36 kg
Approvals	CE, UL/cUL, TÜV
Wiring diagram	



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output

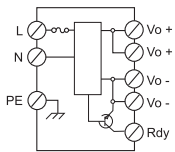
*SELV = Safety Extra Low Voltage



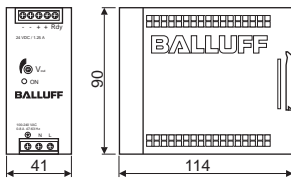
Power Supplies
Single-phase input voltage
5 A



5 A
60 W
12 V DC (SELV)
100...240 V AC
BAE003E
85...264 V AC/90...375 V DC
115 V AC < 30 A/230 V AC < 60 A
47...63 Hz
T2 A/250 V AC internal
11...14 V DC
±0.03%/°C
50 mV
115 V AC > 20 ms/230 V AC > 30 ms
Green LED
86 %
Forward characteristic
> 55 kHz
3000 V AC
100 MΩ
< 1 s
-40...+70 °C
-2.5%/°C of +61 °C
Yes (with external diodes)
IP 20
DC OK output
Free convection
Plastic
0.36 kg
CE, UL/cUL, TÜV



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



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Power Supplies
Single-phase input voltage
2.5 A, 3.8 A

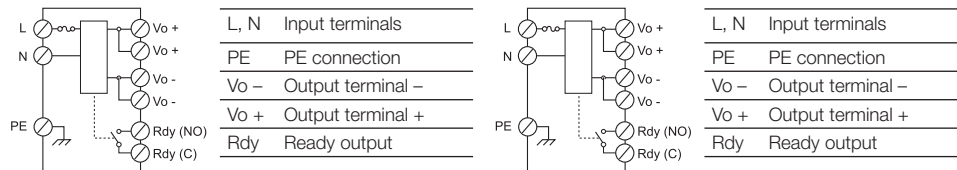


Class 2

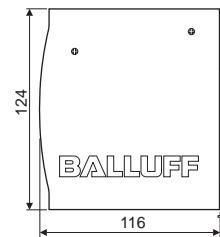
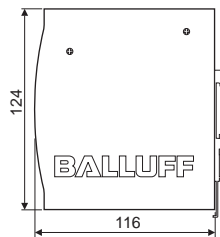
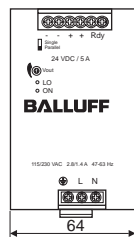


Output current	3.8 A	2.5 A
Output power	91.20 W	120 W
Output voltage	24 V DC (SELV)	48 V DC (SELV)
Input voltage	115/230 V AC (Auto-Select)	115/230 V AC (Auto-Select)
	BAE003J	BAE003K
Input voltage range	90...132 V AC; 180...264 V AC/210...375 V DC	90...132 V AC; 180...264 V AC/210...375 V DC
Inrush current	115 V AC < 24 A/230 V AC < 48 A	115 V AC < 24 A/230 V AC < 48 A
Frequency range	47...63 Hz	47...63 Hz
Input fuse	T3.15 A/250 V AC internal	T3.15 A/250 V AC internal
Voltage adjustment range	22.5...24.5 V DC	47...55 V DC
Temperature coefficient max.	±0.03%/°C	±0.03%/°C
Ripple and noise	50 mV	50 mV
Hold-up time	115 V AC > 25 ms/230 V AC > 30 ms	115 V AC > 25 ms/230 V AC > 30 ms
Status indicator DC ON	Green LED	Green LED
Status indicator DC LOW	Red LED	Red LED
Efficiency	86 %	87 %
Response	Forward characteristic	Forward characteristic
Switching frequency	> 55 kHz (typically)	> 55 kHz (typically)
Input/output isolation voltage	3000 V AC	3000 V AC
Isolation resistance	100 MΩ	100 MΩ
Switch-on delay	< 1 s	< 1 s
Ambient temperature	-35...+70 °C	-35...+70 °C
Derating	-2.5%/°C of +61 °C	-2.5%/°C of +61 °C
Parallel mode	no	yes
Enclosure rating per IEC 60529	IP 20	IP 20
Ready output	DC OK output relay	DC OK output relay
Cooling	Free convection	Free convection
Housing material	Metal	Metal
Weight	0.92 kg	0.92 kg
Approvals	CE, UL/cUL, TÜV, ODVA	CE, UL/cUL, TÜV

Wiring diagram



*SELV = Safety Extra Low Voltage



Power Supplies
Single-phase input voltage
5 A, 10 A

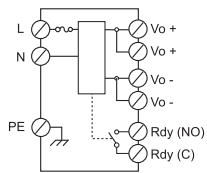


5 A

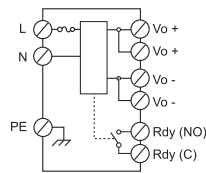
120 W
24 V DC (SELV)
115/230 V AC (Auto-Select)
BAE0006
90...132 V AC; 180...264 V AC/210...375 V DC
115 V AC < 24 A/230 V AC < 48 A
47...63 Hz
T3.15 A/250 V AC internal
22.5...28.5 V DC
±0.03%/°C
50 mV
115 V AC > 25 ms/230 V AC > 30 ms
Green LED
Red LED
86 %
Forward characteristic
> 55 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-35...+70 °C
-2.5%/°C of +61 °C
yes
IP 20
DC OK output relay
Free convection
Metal
0.92 kg
CE, UL/cUL, TÜV

10 A

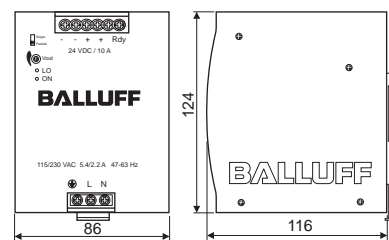
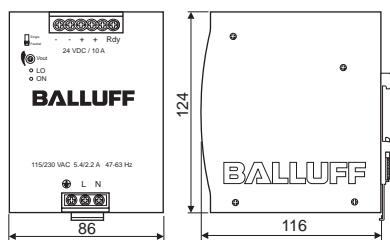
120 W
12 V DC (SELV)
115/230 V AC (Auto-Select)
BAE003H
90...132 V AC; 180...264 V AC/210...375 V DC
115 V AC < 24 A/230 V AC < 48 A
47...63 Hz
T3.15 A/250 V AC internal
11...14 V DC
±0.03%/°C
50 mV
115 V AC > 25 ms/230 V AC > 30 ms
Green LED
Red LED
84 %
Forward characteristic
> 55 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-35...+70 °C
-2.5%/°C of +61 °C
yes
IP 20
DC OK output relay
Free convection
Metal
0.92 kg
CE, UL/cUL, TÜV



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output

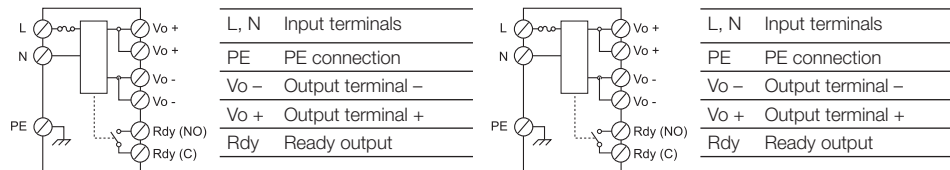


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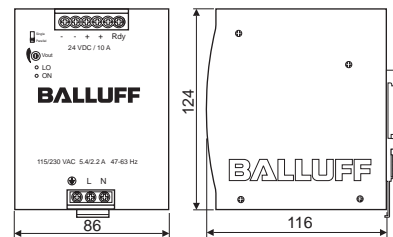
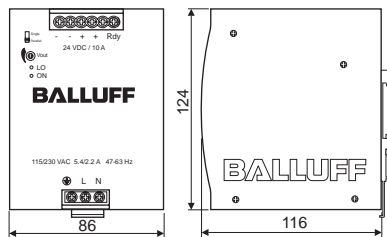


Output current	5 A	10 A
Output power	240 W	240 W
Output voltage	48 V DC (SELV)	24 V DC (SELV)
Input voltage	115/230 V AC (Auto-Select)	115/230 V AC (Auto-Select)
	BAE003L	BAE0002
Input voltage range	90...132 V AC; 180...264 V AC/210...375 V DC	90...132 V AC; 180...264 V AC/210...375 V DC
Inrush current	115 V AC < 30 A/230 V AC < 60 A	115 V AC < 30 A/230 V AC < 60 A
Frequency range	47...63 Hz	47...63 Hz
Input fuse	T6.3 A/250 V AC internal	T6.3 A/250 V AC internal
Voltage adjustment range	47...55 V DC	22.5...28.5 V DC
Temperature coefficient max.	±0.03%/°C	±0.03%/°C
Ripple and noise	100 mV	100 mV
Hold-up time	115 V AC > 25 ms/230 V AC > 30 ms	115 V AC > 25 ms/230 V AC > 30 ms
Status indicator DC ON	Green LED	Green LED
Status indicator DC LOW	Red LED	Red LED
Efficiency	90 %	89 %
Response	Forward characteristic	Forward characteristic
Switching frequency	> 40 kHz (typically)	> 40 kHz (typically)
Input/output isolation voltage	3000 V AC	3000 V AC
Isolation resistance	100 MΩ	100 MΩ
Switch-on delay	< 1 s	< 1 s
Ambient temperature	-40...+70 °C	-40...+70 °C
Derating	-2.5%/°C of +61 °C	-2.5%/°C of +61 °C
Parallel mode	yes	yes
Enclosure rating per IEC 60529	IP 20	IP 20
Ready output	DC OK output relay	DC OK output relay
Cooling	Free convection	Free convection
Housing material	Metal	Metal
Weight	1.0 kg	1.0 kg
Approvals	CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

Wiring diagram



*SELV = Safety Extra Low Voltage



Power Supplies

Single-phase input voltage

10 A, 20 A

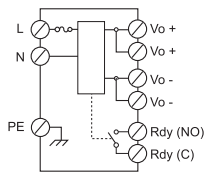


10 A

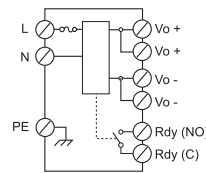
480 W
48 V DC (SELV)
115/230 V AC (Auto-Select)
BAE003M
90...264 V AC/120...370 V DC
115 V AC < 25 A/230 V AC < 50 A
47...63 Hz
T10 A/250 V AC internal
47...55 V DC
±0.03%/°C
100 mV
115 V AC > 25 ms/230 V AC > 30 ms
Green LED
Red LED
90 %
Forward characteristic
> 65 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-40...+70 °C
-2.5%/°C of +56 °C
yes
IP 20
DC OK output relay
Free convection
Metal
1.92 kg
CE, UL/cUL, TÜV

20 A

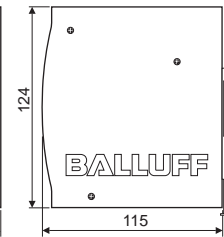
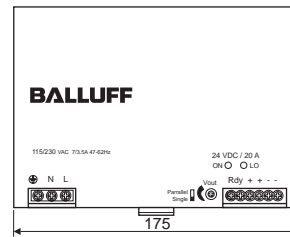
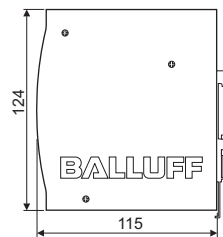
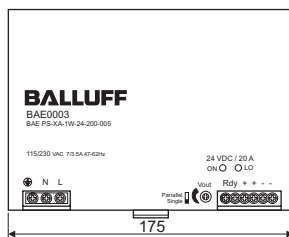
480 W
24 V DC (SELV)
115/230 V AC (Auto-Select)
BAE0003
90...264 V AC/120...370 V DC
115 V AC < 25 A/230 V AC < 50 A
47...63 Hz
T10 A/250 V AC internal
22.5...28.5 V DC
±0.03%/°C
100 mV
115 V AC > 25 ms/230 V AC > 30 ms
Green LED
Red LED
89 %
Forward characteristic
> 65 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-40...+70 °C
-2.5%/°C of +56 °C
yes
IP 20
DC OK output relay
Free convection
Metal
1.92 kg
CE, UL/cUL, TÜV



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



L, N	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



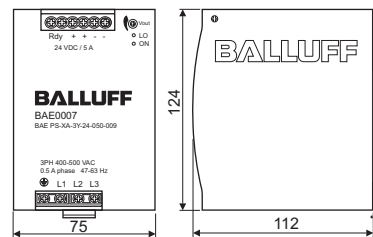
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Output current	5 A
Output power	120 W
Output voltage	24 V DC (SELV)
Input voltage	3x 400...500 V AC
BAE0007	
Input voltage range	340...575 V AC/480...820 V DC
Inrush current	< 10 A
Frequency range	47...63 Hz
Input fuse	2 A/600 V AC internal/phase
Voltage adjustment range	22.5...28.5 V DC
Temperature coefficient max.	±0.03%/°C
Ripple and noise	100 mV
Hold-up time	> 20 ms
Status indicator DC ON	Green LED
Status indicator DC LOW	Red LED
Efficiency	89 %
Response	Hiccup mode
Switching frequency	> 65 kHz (typically)
Input/output isolation voltage	3000 V AC
Isolation resistance	100 MΩ
Switch-on delay	< 1 s
Ambient temperature	-40...+70 °C
Derating	-2.5%/°C of +61 °C
Parallel mode	Yes (with external diodes)
Enclosure rating per IEC 60529	IP 20
Ready output	DC OK output relay
Cooling	Free convection
Housing material	Metal
Weight	0.8 kg
Approvals	CE, UL/cUL, TÜV
Wiring diagram	

L	Input terminals
PE	PE connection
V0 -	Output terminal -
V0 +	Output terminal +
Rdy	Ready output

*SELV = Safety Extra Low Voltage



Power Supplies

3-phase input voltage

10 A, 20 A

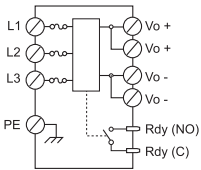


10 A

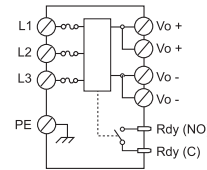
240 W
24 V DC (SELV)
3x 400...500 V AC
BAE0008
340...575 V AC/480...820 V DC
< 20 A
47...63 Hz
T2 A/600 V AC internal/phase
22.5...28.5 V DC
±0.03%/°C
100 mV
> 20 ms
Green LED
Red LED
90 %
Hiccup mode
> 30 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-40...+70 °C
-2.5%/°C of +61 °C
yes
IP 20
DC OK output relay
Free convection
Metal
1.1 kg
CE, UL/cUL, TÜV

20 A

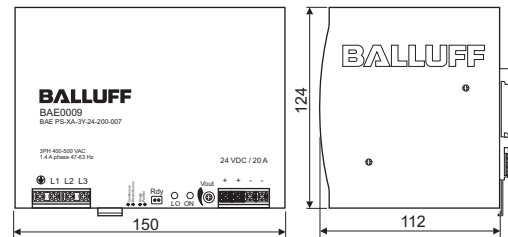
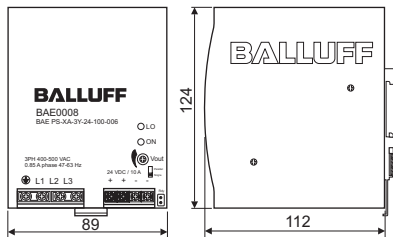
480 W
24 V DC (SELV)
3x 400...500 V AC
BAE0009
340...575 V AC/480...820 V DC
< 20 A
47...63 Hz
3.15 A/500 V AC internal/phase
22.5...28.5 V DC
±0.03%/°C
100 mV
> 20 ms
Green LED
Red LED
90 %
Forward characteristic (C), restart after 30 s (D), Shutoff within 3 s, (C)/(D) toggleable
> 75 kHz (typically)
3000 V AC
100 MΩ
< 1 s
-30...+70 °C
-2.5%/°C of +61 °C
yes
IP 20
DC OK output relay
Free convection
Metal
1.75 kg
CE, UL/cUL, TÜV



L	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



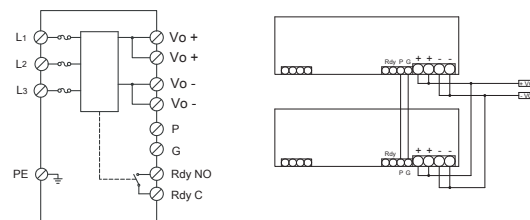
L	Input terminals
PE	PE connection
Vo -	Output terminal -
Vo +	Output terminal +
Rdy	Ready output



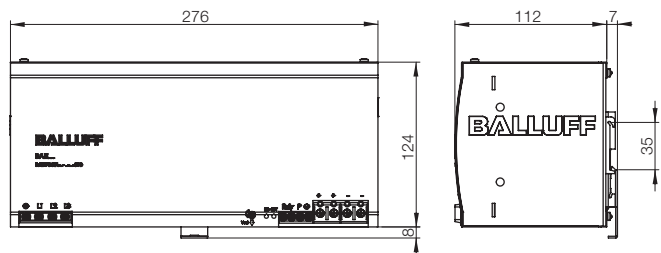
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Output current	40 A
Output power	960 W
Output voltage	24 V DC (SELV)
Input voltage	3x 400...500 V AC
BAE003R	
Input voltage range	340...575 V AC/480...820 V DC
Inrush current	< 30 A
Frequency range	47...63 Hz
Input fuse	T5 A/500 V AC internal/phase
Voltage adjustment range	22.5...28.5 V DC
Temperature coefficient max.	±0.03%/°C
Ripple and noise	80 mV
Hold-up time	> 15 ms
Status indicator DC ON	Green LED
Status indicator DC LOW	Red LED
Efficiency	92 %
Response	Hiccup mode
Switching frequency	> 50 kHz (typically)
Input/output isolation voltage	3000 V AC
Isolation resistance	100 MΩ
Switch-on delay	< 1 s
Ambient temperature	-40...+70 °C
Derating	-3.5%/°C above +61 °C
Parallel mode	yes
Enclosure rating per IEC 60529	IP 20
Ready output	no
Cooling	Free convection
Housing material	Metal
Weight	3.2 kg
Approvals	CE, UL/cUL, TÜV
Wiring diagram	

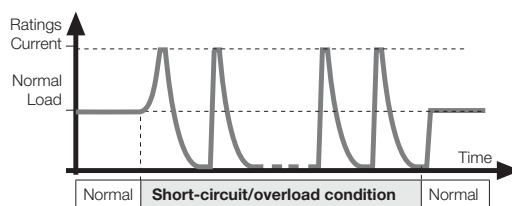


*SELV = Safety Extra Low Voltage

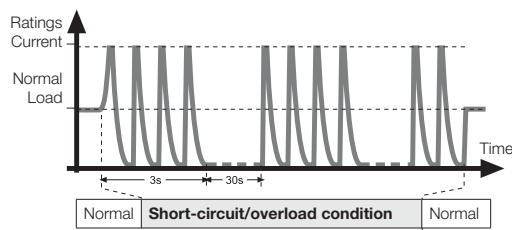


Output short circuit protection

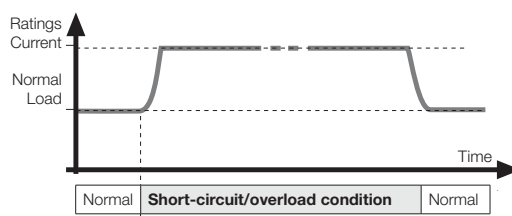
Hiccup mode overload protection*



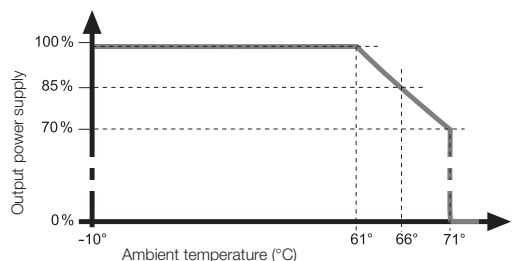
Hiccup mode with turn-off overload protection*



Current limiter and forward characteristic*



Temperature under-load



LED definition

DC ON	DC LO	Possible situation
<input type="radio"/> off	<input type="radio"/> off	AC power supply off, internal fuse burned out, short circuit
<input type="radio"/> on	<input type="radio"/> off	Normal operation
<input type="radio"/> off	<input type="radio"/> on	Output voltage < 19.2 V
<input checked="" type="radio"/> on	<input checked="" type="radio"/> on	Power supply failure

Green Red

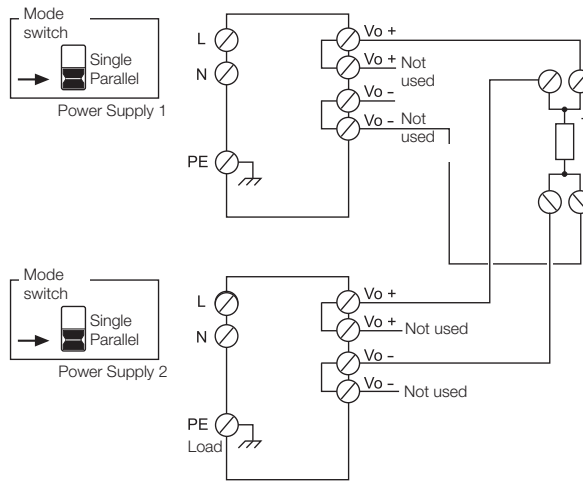
Approvals and standards

- UL/cUL
 UL 508 listed/UL 60950-1, UL 1310 Class 2
- TÜV
 EN 60950-1
- CE
 EN 61000-6-3, EN 55022 Class B, EN 61000-3-2,
 EN 61000-3-3, EN 61000-6-2, EN 55024
 EN 61000-4-2, EN 61000-4-3, EN 61000-4-4
 EN 61000-4-5, EN 61000-4-6, EN 61000-4-8,
 EN 61000-4-11

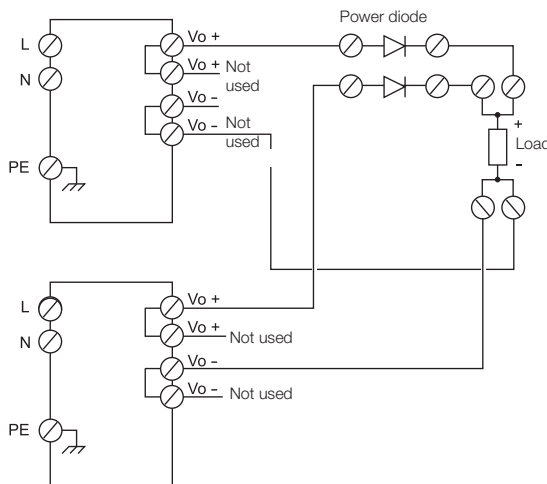
*Note: Diagrams are for illustration only. They do not reflect the actual waveforms.

Parallel mode**

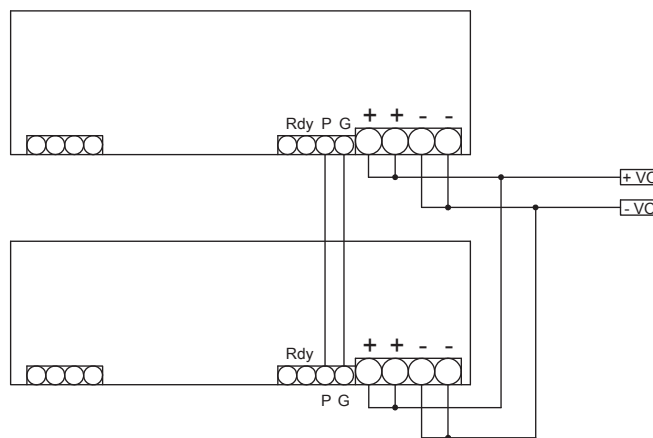
BAE0002, BAE0003 BAE0006,
 BAE0008, BAE0009



For all without parallel switching mode



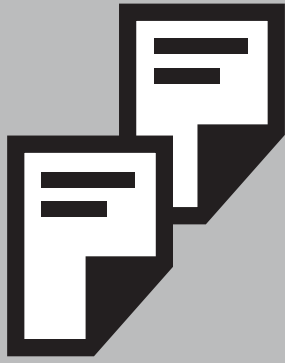
BAE003R



**Note: When wiring power supplies in parallel, the cable lengths should be the same for all DC connections on the load.



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Cable properties

Cable types

PUR cable, PUR insulated

Number of conductors × conductor cross-section	Outside diameter typical
3×0.14 mm ²	2.5...3.5 mm
3×0.25 mm ²	3.5...4.5 mm
3×0.34 mm ²	4...5.5 mm
4×0.14 mm ²	3...4 mm
4×0.34 mm ²	4...5.5 mm
8×0.25 mm ²	6...8 mm
12×0.25 mm ²	6...8 mm
5×0.34 mm ²	5...6.5 mm
3×1.5 mm ²	7.8...8.2 mm
4×1.5 mm ²	7.8...8.2 mm
5×1.5 mm ²	8.5...8.9 mm

Number of conductors × conductor cross-section	Outside diameter typical
2×0.14 mm ²	2.5...3.5 mm
2×0.34 mm ²	4.5...5.5 mm
3×0.14 mm ²	2.7...4.5 mm
3×0.25 mm ²	4...5 mm
3×0.34 mm ²	4.5...5.5 mm
4×0.34 mm ²	4.6...5.5 mm
5×0.34 mm ²	5.0...5.5 mm
8×0.25 mm ²	5.8...6.2 mm

Smallest bending radius

tensioned	untensioned
10×D	5×D

Special cable

The PW-cable is a weld spatter resistant PUR-cable that has good resistance to weld spatter. A special connecting cable is used for sensors that need to be used at higher ambient temperatures.

Tightening torques

The permitted tightening torque is indicated in the data sheets for the modules.

Current load capacity

M5	3 and 4-pin	1 A
M8	3 and 4-pin	4 A
M12	3 and 5-pin	4 A
M12	8-pin	2 A
M12	12-pin	1 A
7/8"	3 and 5-pin	9 A

Color code

Brown, BN	Gray/Pink, GYPK
White, WH	Red/Blue, RDBU
Blue, BU	White/Green, WHGN
Black, BK	Brown/Green, BNGN
Green, GN	Green/Yellow, GNYE
Gray, GY	White/Yellow, WHYE
Orange, OG	White/Gray, WHGY
Pink, PK	Yellow/Brown, YEBN
Purple, YF	Gray/Brown, GYBN

Quality and the environment

Quality management system
per DIN EN ISO 9001:2008

Balluff companies	
Balluff GmbH	Germany
Balluff SIE Sensorik GmbH	Germany
Balluff Controles Eléctricos Ltda.	Brazil
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Ltd.	Great Britain
Balluff Automation S.R.L.	Italy
Balluff Canada Inc.	Canada
Balluff de México S.A. de C.V.	Mexico
Balluff GmbH	Austria
Balluff Sp. z o.o.	Poland
Balluff Hy-Tech AG	Switzerland
Balluff Sensortechnik AG	Switzerland
Balluff S.L.U.	Spain
Balluff CZ, s.r.o	Czech Republic
Balluff Elektronika Kft.	Hungary
Balluff Inc.	USA



Environmental management
system as per
DIN EN ISO 14001:2009

Balluff companies	
Balluff GmbH	Germany
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Elektronika KFT	Hungary

Testing Laboratory

The Balluff testing laboratory operates in accordance with ISO/IEC 17025 and is accredited by DAkkS for testing electromagnetic compatibility (EMC).



Balluff products comply with
EU directives

Products that require labeling are subject to a conformity evaluation process according to the EU directive and the product is labeled with the CE marking.
Balluff products fall under the following EU directive:



2004/108/EC	EMC directive
2006/95/EC	Low Voltage Directive valid for products with supply voltage $\geq 75 \text{ V DC} / \geq 50 \text{ V AC}$
94/9/EC	ATEX-directive valid for products with Ex-label



Product approvals

Product approvals are awarded by domestic and international institutions. Their symbols affirm that our products meet the specifications of these institutions.

"US Safety System" and "Canadian Standards Association" under the auspices of Underwriters Laboratories Inc. (cUL).

CCC-Code by the Chinese CQC.



Standards

Protection class	II □	EN 60947-5-2/IEC 60947-5-2
Enclosure rating	IP 60...67	EN 60529/IEC 60529
	IP 68 per BWN Pr. 20	Balluff factory standard (BWN): Temperature storage 48 h at 60 °C, 8 temperature cycles according to EN 60068-2-14/IEC 60068-2-14 between the benchmark temperatures according to the data sheet, 1 h storage in water, insulation test, 24 h storage in water, insulation test, 8 temperature cycles according to EN 60068-2-14 IEC 60068-2-14 between the benchmark temperatures according to the data sheet, 7 days storage in water, insulation test
	IP 68 according to BWN Pr. 27	Balluff Factory Standard (BWN): Test for products used in the foods industry
	IP 69K	DIN 40050 Part 9: Protection against ingress of water at high-pressure and steam cleaning
EMC (Electromagnetic Compatibility)	Interference (Emissions), radio interference voltage and radio interference emissions from electrical equipment	EN 55011
	Interference immunity against discharging static electricity (ESD)	EN 61000-4-2/IEC 61000-4-2
	Immunity against high-frequency electromagnetic fields (RFI)	EN 61000-4-3/IEC 61000-4-3
	Immunity to fast transients (bursts)	EN 61000-4-4/IEC 61000-4-4
	Immunity against conducted interference induced by high-frequency fields	EN 61000-4-6/IEC 61000-4-6
	Immunity to voltage dips and short interruptions	EN 61000-4-11/IEC 61000-4-11
	Surge-voltage stability	EN 60947-5-2/IEC 60947-5-2
Environmental simulation	Vibration, sinusoidal	EN 60068-2-6/IEC 60068-2-6
	Shock	EN 60068-2-27/IEC 60068-2-27
	Continuous shock	EN 60068-2-29/IEC 60068-2-29
Ex area	Electrical equipment for explosive atmospheres, general requirements	EN 50014
	Succeeded by:	EN 60079-0
	Electrical equipment for gas explosive atmospheres, general requirements	
	Electrical equipment for explosive atmospheres – Intrinsic safety "i"	EN 50020
	For conformity, see product marking.	

Tightening torque

The following torques are to be followed so that the sensors are not mechanically destroyed during installation, as long as no other information is indicated on the data sheet or the sensor packaging.

Size	Material	Tightening torque
M5×0.5	Stainless steel	3 Nm
M8 × 1	Stainless steel	15 Nm
M12×1	Stainless steel	40 Nm
M18×1	PBT	1 Nm
M18×1	Stainless steel	60 Nm
M30×1.5	PBT	3 Nm
M30×1.5	Stainless steel	90 Nm

Enclosure rating

The degrees of protection are specified according to IEC 60529. Code letters IP (International Protection) designate protection for electrical equipment against shock hazard, ingress of solid foreign bodies and water

IP 69K

Protection against ingress of water at high pressure and steam cleaning per DIN 40050 Part 9

First digit:

- 2 Protection against penetration of solid bodies larger than 12 mm, shielding from fingers and objects
- 4 Protection against penetration of solid bodies larger than 1 mm, shielding from tools and wires
- 5 Protection against damaging dust deposits, complete contact protection
- 6 Protection against penetration of dust, complete contact protection

Second digit:

- 0 No special protection
- 4 Protection against water, which is sprayed from all directions against the equipment
- 5 Protection against a stream of water from a nozzle which hits the equipment from all directions
- 7 Protection against water, if the equipment (housing) is temporarily submerged
- 8 Protection against water when submerged for some time



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BAE							
BAE0001	432	BAM0233	419	BCC02NY	270	BCC02U3	280
BAE0002	438	BAM023F	122	BCC02P2	271	BCC02U4	280
BAE0003	439	BAM023F	414	BCC02P3	271	BCC02U5	280
BAE0004	433	BAM023H	122	BCC02P4	271	BCC02U6	280
BAE0005	434	BAM023H	414	BCC02P5	271	BCC02U7	279
BAE0006	437	BAM023J	122	BCC02P6	271	BCC02U8	279
BAE0007	440	BAM023J	414	BCC02P7	271	BCC02U9	279
BAE0008	441	BAM0255	137	BCC02PC	274	BCC02UA	279
BAE0009	441	BAM026K	137	BCC02PE	274	BCC02UC	279
BAE0036	432	BAM026L	137	BCC02PF	274	BCC02UE	279
BAE0039	433	BAW		BCC02PH	274	BCC02UF	279
BAE003E	435	BAW002F	176	BCC02PJ	274	BCC02UH	280
BAE003H	437	BAW003A	177	BCC02PK	274	BCC02UJ	280
BAE003J	436	BAW003W	177	BCC02PL	273	BCC02UK	280
BAE003K	436	BCC		BCC02PM	273	BCC02UL	280
BAE003L	438	BCC00HE	266	BCC02PN	273	BCC02UM	280
BAE003M	439	BCC00HF	268	BCC02PU	273	BCC02UN	280
BAE003R	442	BCC00HH	268	BCC02PW	273	BCC02UP	280
BAE00EK	427	BCC00HJ	268	BCC02PY	273	BCC02UR	276
BAE00EN	428	BCC00HK	267	BCC02PZ	273	BCC02UT	276
BAE00EP	428	BCC00HL	267	BCC02R0	273	BCC02UU	276
BAE00ER	429	BCC00HM	267	BCC02R1	273	BCC02UW	276
BAE00ET	429	BCC00HN	268	BCC02R5	276	BCC02UY	276
BAE00EU	427	BCC00HP	267	BCC02R6	276	BCC02UZ	276
BAE00FL	430	BCC00HR	267	BCC02R7	276	BCC02W0	276
BAE00FW	429	BCC0158	330	BCC02R8	276	BCC02W1	277
BAE00FY	430	BCC02H6	331	BCC02R9	276	BCC02W2	277
BAE00LC	191	BCC02H7	333	BCC02RA	276	BCC02W3	277
BAM							
BAM00ZL	413	BCC02H8	331	BCC02RC	276	BCC02W4	277
BAM00ZM	413	BCC02H9	333	BCC02RE	277	BCC02W5	277
BAM00ZN	413	BCC02HC	286	BCC02RF	277	BCC02W6	277
BAM0114	123	BCC02HE	288	BCC02RH	277	BCC02W7	277
BAM0114	412	BCC02HF	289	BCC02RJ	277	BCC02W8	277
BAM012T	123	BCC02HH	289	BCC02RK	277	BCC02W9	277
BAM012T	412	BCC02M2	272	BCC02RL	277	BCC02WA	277
BAM012U	123	BCC02M3	272	BCC02RM	277	BCC02WC	277
BAM012U	412	BCC02M4	272	BCC02RN	277	BCC02WE	277
BAM01C1	123	BCC02M5	272	BCC02RP	277	BCC02WF	277
BAM01C1	412	BCC02M6	272	BCC02RR	277	BCC02WH	277
BAM01C2	123	BCC02M7	272	BCC02RT	277	BCC02WJ	277
BAM01C2	412	BCC02M8	270	BCC02RU	277	BCC02WK	277
BAM01EA	414	BCC02M9	270	BCC02RW	277	BCC02WL	277
BAM01EC	414	BCC02MA	270	BCC02RY	277	BCC02WM	277
BAM01J0	122	BCC02MH	271	BCC02RZ	277	BCC02WN	277
BAM01J0	414	BCC02MJ	271	BCC02T0	277	BCC02WP	277
BAM01JT	122	BCC02MK	271	BCC02T1	277	BCC02WR	277
BAM01JT	415	BCC02ML	271	BCC02T2	277	BCC02WT	278
BAM01JU	415	BCC02MM	271	BCC02T3	277	BCC02WU	278
BAM01LE	416	BCC02MN	271	BCC02T4	277	BCC02WW	278
BAM01LF	416	BCC02MU	274	BCC02T5	277	BCC02WY	278
BAM01TY	413	BCC02MW	274	BCC02T6	278	BCC02WZ	278
BAM01YN	414	BCC02MY	274	BCC02T7	278	BCC02Y0	278
BAM01Z4	416	BCC02MZ	274	BCC02T8	278	BCC02Y1	278
BAM01Z5	416	BCC02N0	274	BCC02T9	278	BCC02Y2	279
BAM020M	416	BCC02N1	274	BCC02TA	278	BCC02Y3	279
BAM020N	414	BCC02N2	273	BCC02TC	278	BCC02Y4	279
BAM020Z	417	BCC02N3	273	BCC02TE	278	BCC02Y5	279
BAM0210	417	BCC02N4	273	BCC02TF	279	BCC02Y6	279
BAM0212	418	BCC02N8	273	BCC02TH	279	BCC02Y7	279
BAM0213	418	BCC02N9	273	BCC02TJ	279	BCC02Y8	279
BAM0214	419	BCC02NA	273	BCC02TK	279	BCC02Y9	279
BAM0215	419	BCC02NC	273	BCC02TL	279	BCC02YA	279
BAM0216	419	BCC02NE	273	BCC02TM	279	BCC02YC	279
BAM0217	419	BCC02NF	273	BCC02TN	279	BCC02YE	279
BAM021E	418	BCC02NL	272	BCC02TP	279	BCC02YF	279
BAM021F	418	BCC02NM	272	BCC02TR	279	BCC02YH	279
BAM0222	417	BCC02NN	272	BCC02TT	279	BCC02YJ	279
BAM022Z	418	BCC02NP	272	BCC02TU	279	BCC02YK	280
BAM0230	418	BCC02NR	272	BCC02TW	279	BCC02YL	280
BAM0231	419	BCC02NT	272	BCC02TY	279	BCC02YM	280
BAM0232	419	BCC02NU	270	BCC02TZ	279	BCC02YN	280
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				BCC02U2	280	BCC02YT	280



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BCC02Z8	280	BCC0327	300	BCC0353	295	BCC0388	318
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BCC0302	299	BCC032Y	301	BCC035Z	303	BCC038Z	319
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BCC0317	295	BCC0346	295	BCC0374	318	BCC03AC	321
BCC0318	295	BCC0347	297	BCC0375	318	BCC03AE	321
BCC0319	295	BCC0348	297	BCC0376	318	BCC03AF	321
BCC031A	298	BCC0349	297	BCC0377	318	BCC03AH	321
BCC031C	298	BCC034A	295	BCC0378	318	BCC03AJ	322
BCC031E	298	BCC034C	295	BCC0379	318	BCC03AK	322
BCC031F	295	BCC034E	295	BCC037A	318	BCC03AL	322
BCC031H	295	BCC034F	297	BCC037C	318	BCC03AM	322
BCC031J	295	BCC034H	297	BCC037E	319	BCC03AN	322
BCC031K	298	BCC034J	297	BCC037F	319	BCC03AP	322
BCC031L	298	BCC034K	295	BCC037H	319	BCC03AR	322
BCC031M	298	BCC034L	295	BCC037J	319	BCC03AT	321

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BCC03AW	321	BCC03FM	283	BCC03K5	285	BCC03N4	314
BCC03AY	321	BCC03FN	283	BCC03K6	285	BCC03N5	314
BCC03AZ	321	BCC03FP	283	BCC03K6	285	BCC03N6	314
BCC03C0	321	BCC03FR	283	BCC03KH	285	BCC03N7	314
BCC03C1	321	BCC03FT	283	BCC03KJ	285	BCC03N8	314
BCC03C2	322	BCC03FU	283	BCC03KK	285	BCC03N9	314
BCC03C3	322	BCC03FW	283	BCC03KL	285	BCC03NA	313
BCC03C4	322	BCC03FY	283	BCC03KM	285	BCC03NC	313
BCC03C5	322	BCC03FZ	283	BCC03KN	285	BCC03NE	313
BCC03C6	322	BCC03H0	283	BCC03KP	285	BCC03NF	313
BCC03C7	322	BCC03H1	283	BCC03KR	285	BCC03NH	313
BCC03C8	322	BCC03H2	283	BCC03KT	285	BCC03NJ	313
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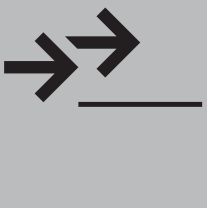


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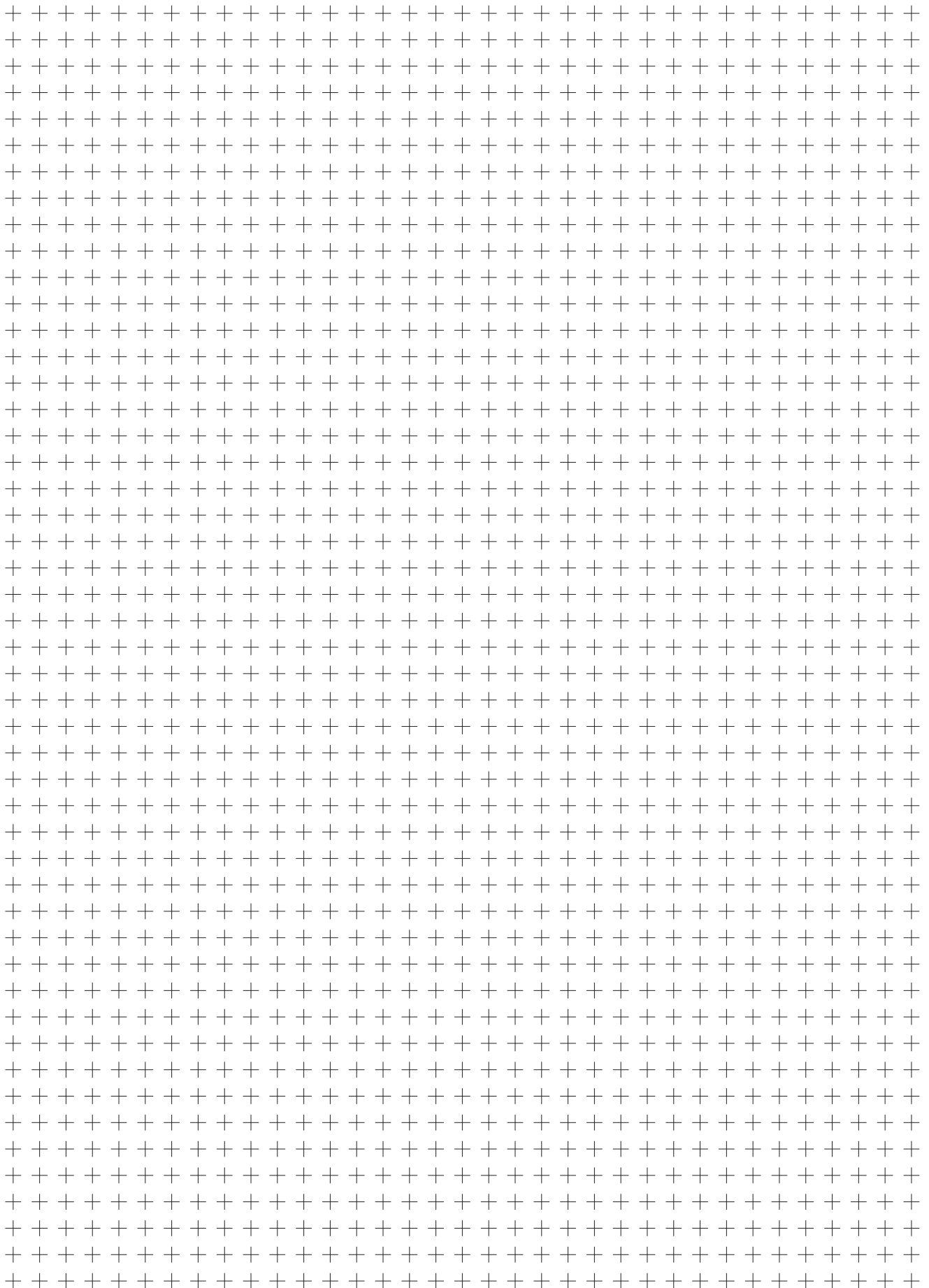
United Arab Emirates

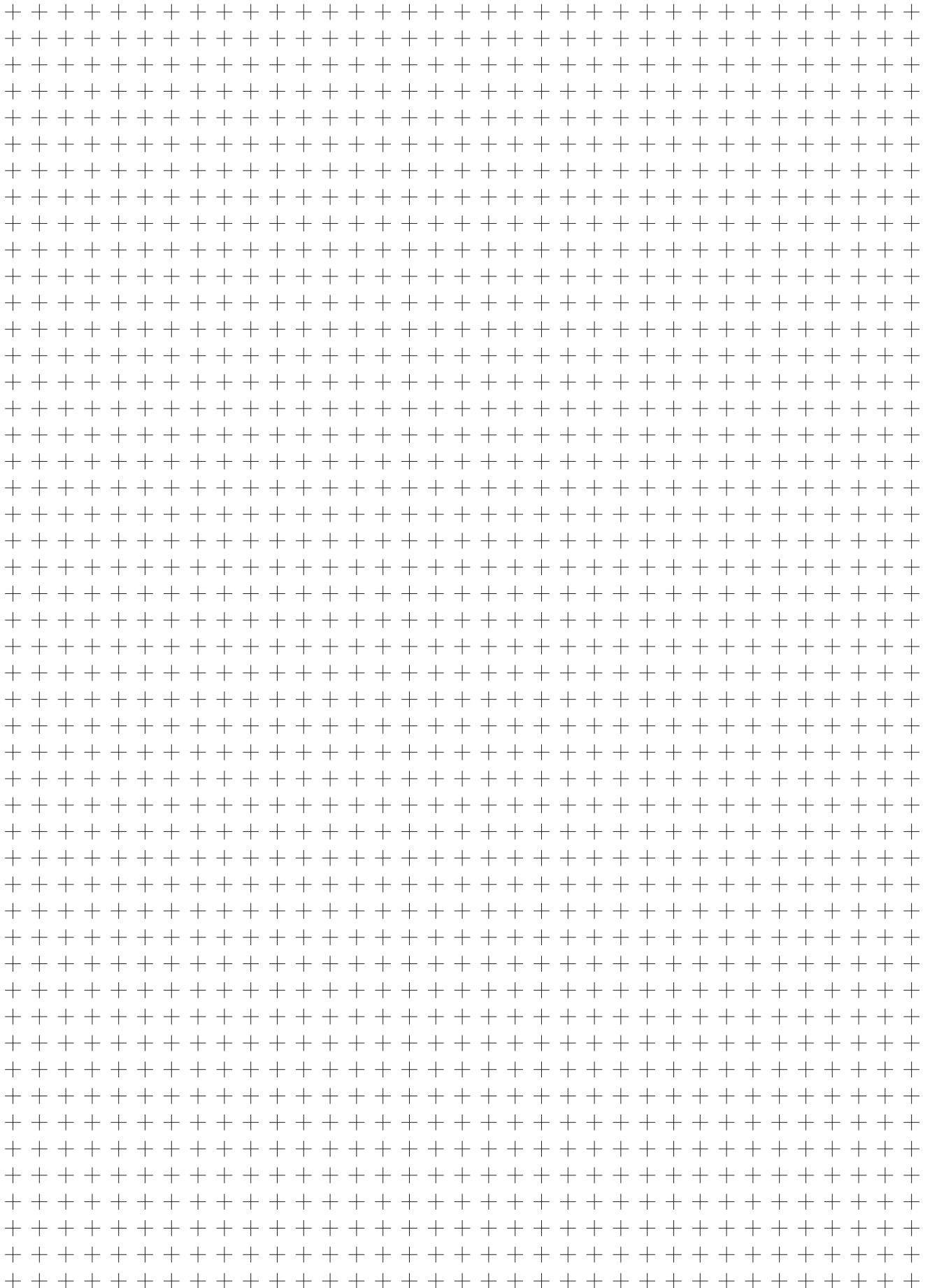
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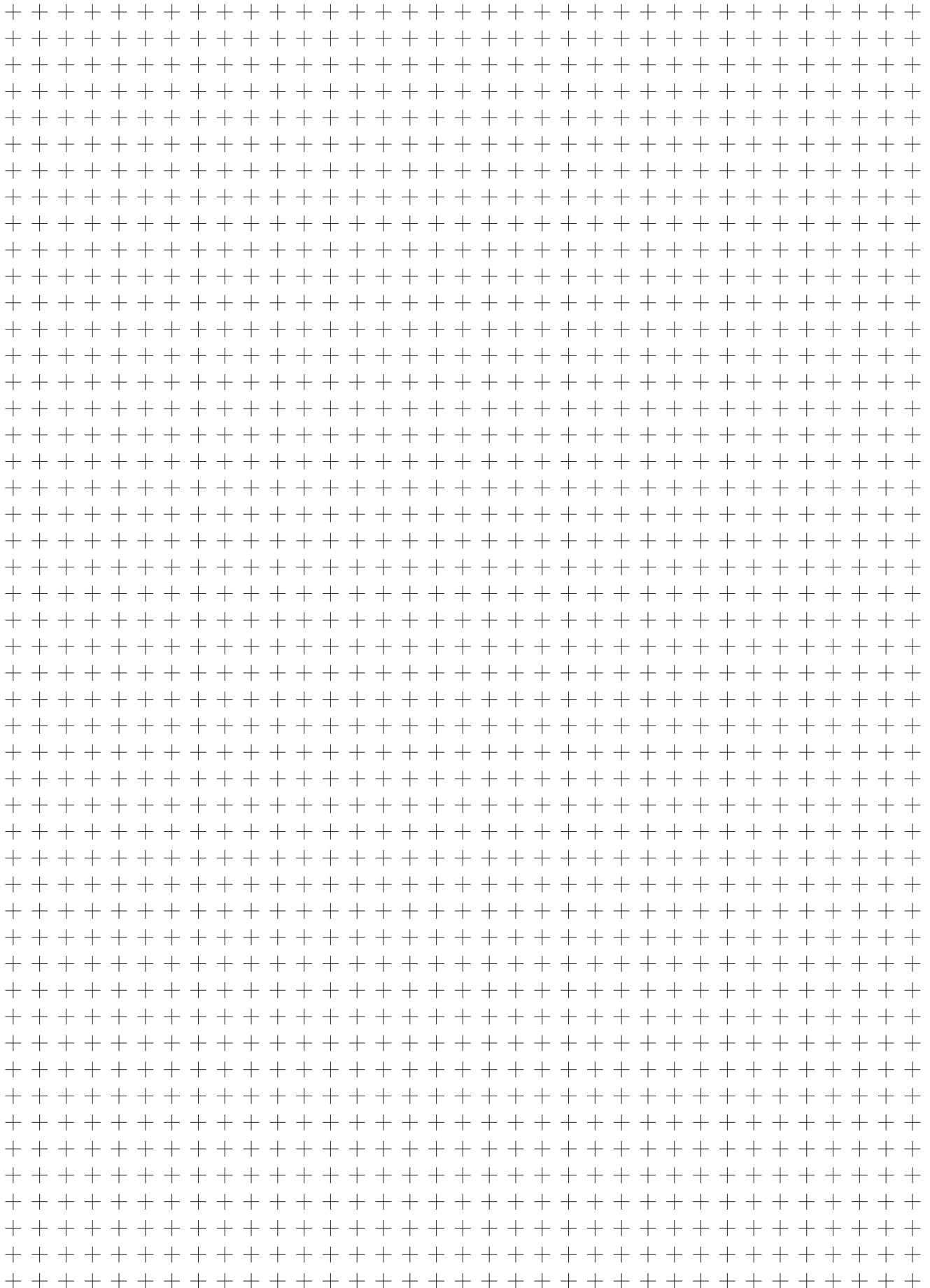
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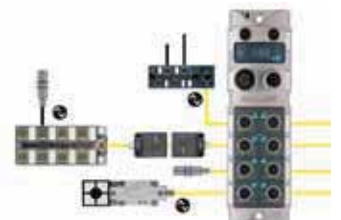




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