BALLUFF

sensors worldwide

Industrial Networking and Connectivity

System Technology

With over 50 years of sensor experience, Balluff is a leading global sensor specialist with its own line of connectivity products for every area of factory automation. Balluff is based in Germany and has a tight international network of 54 representatives and subsidiaries.

Balluff stands for comprehensive systems from a single source, continuous innovation, state-of-the-art technology, highest quality, and greatest reliability. That's not all: Balluff also stands for exceptional customer orientation, customized solutions, fast worldwide service, and outstanding application assistance.

Secure foundation for optimized value creation at the customer
High-quality, innovative products tested in our own accredited laboratory and a quality management system certified according to DIN EN ISO 9001:2008 form a secure foundation for optimized added value for our customers.

Whether electronic and mechanical sensors, rotary and linear transducers, identification systems or optimized connection technology for high-performance automation, Balluff masters not only the entire technological variety with all of the different operating principles, but also provides technology that can be used worldwide. After all, it also fulfills regional standards. Wherever you are in the world, Balluff technology is never far away. You won't have to look far for your nearest Balluff expert.

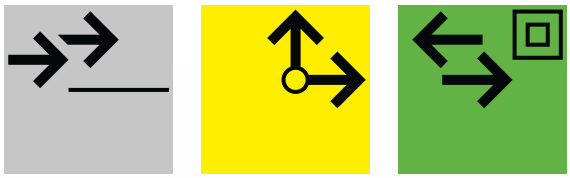
Balluff products increase performance, quality and productivity around the world every day. They provide the basic conditions for meeting the demands of the global market for increased performance and reduced costs. Even in the most demanding areas. No matter how stringent your requirements may be, Balluff delivers state-of-the-art solutions.

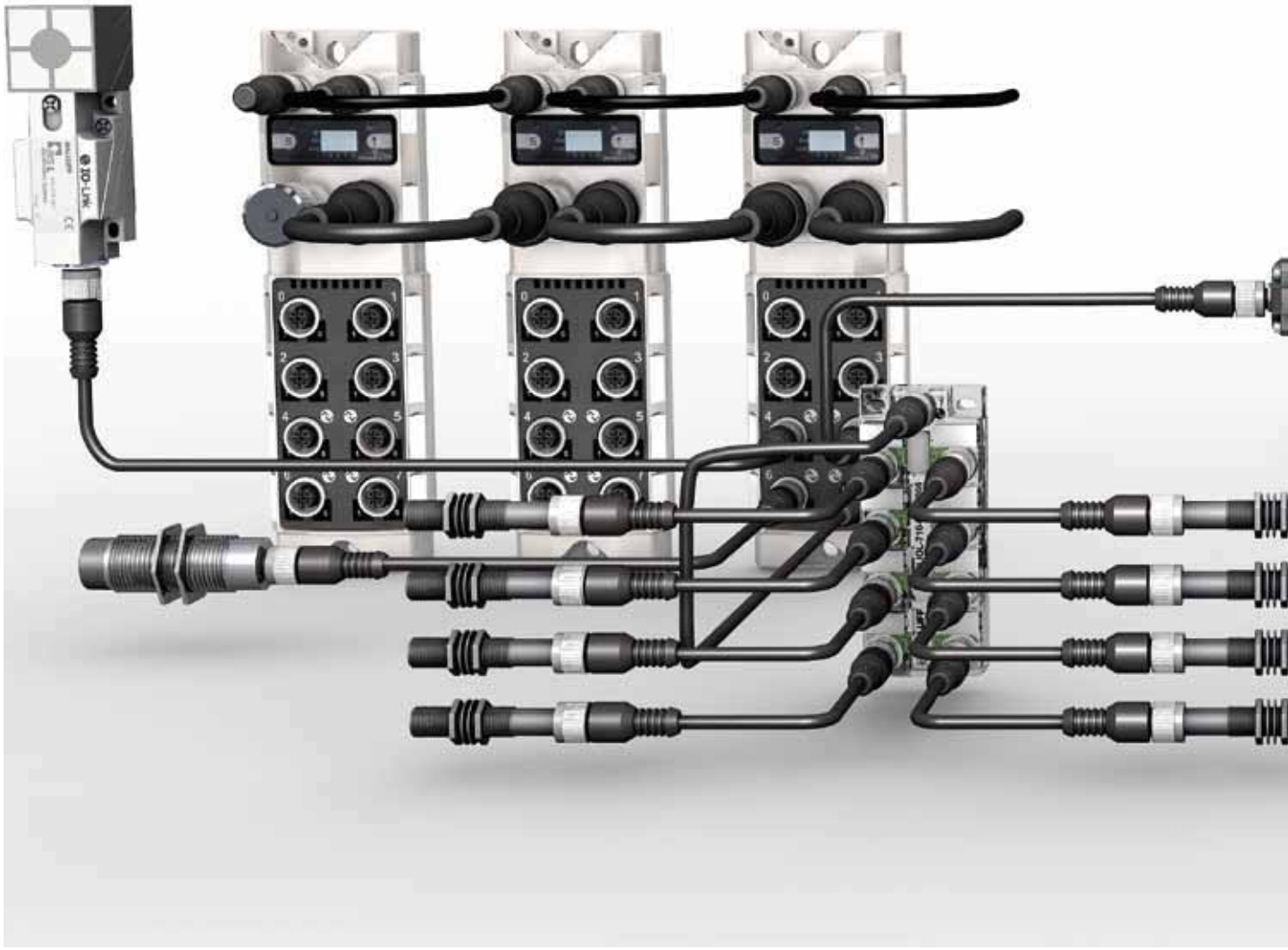
Fully exploit the potential of high quality. With intelligent, comprehensive network solutions.

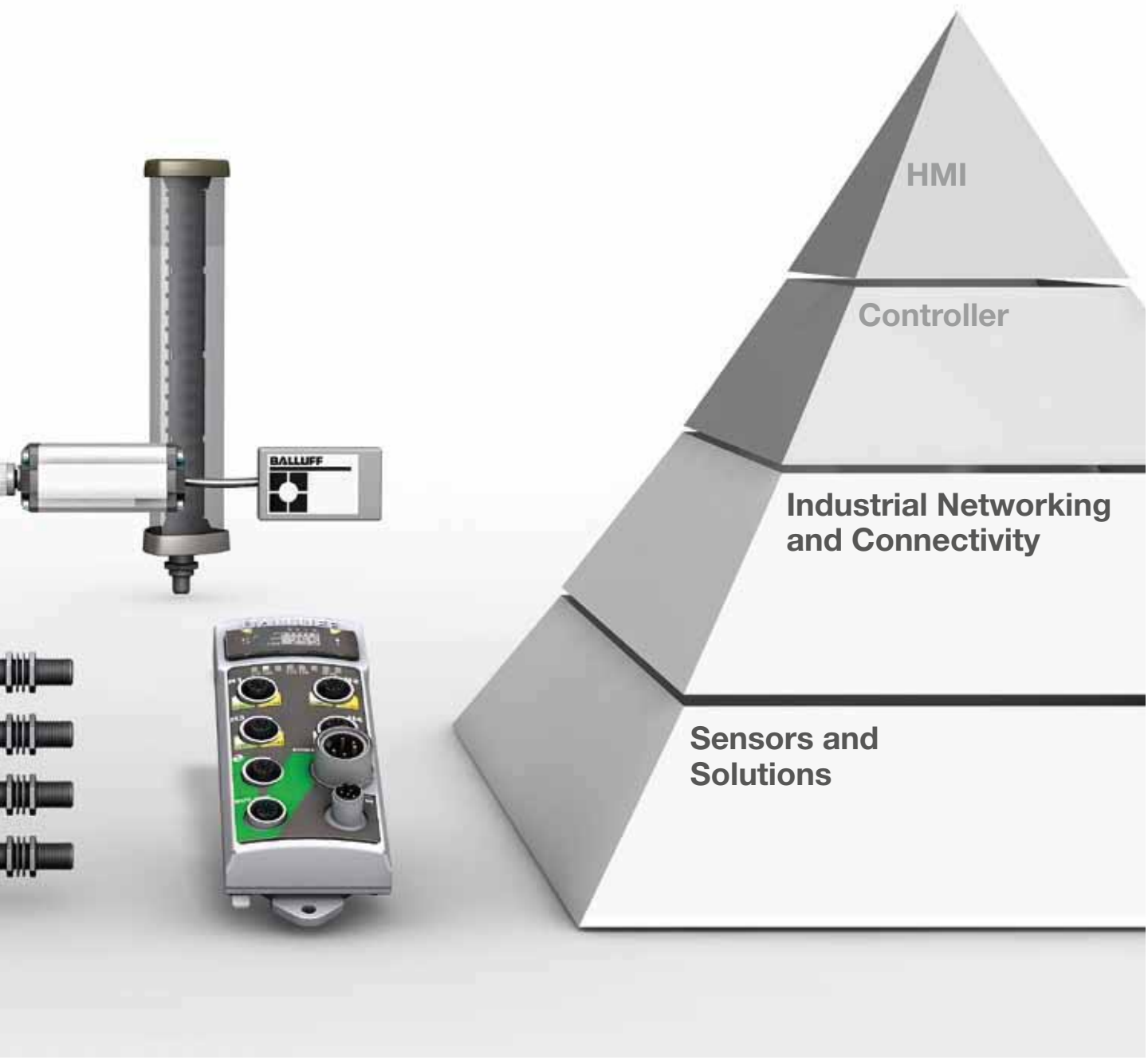
Customized Services

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, plug connectors and connecting cables



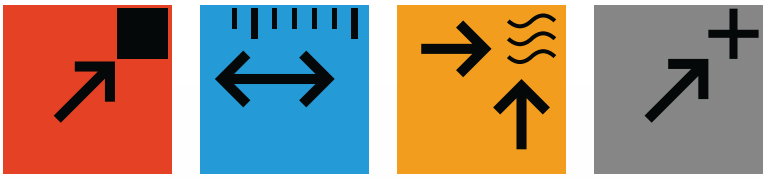


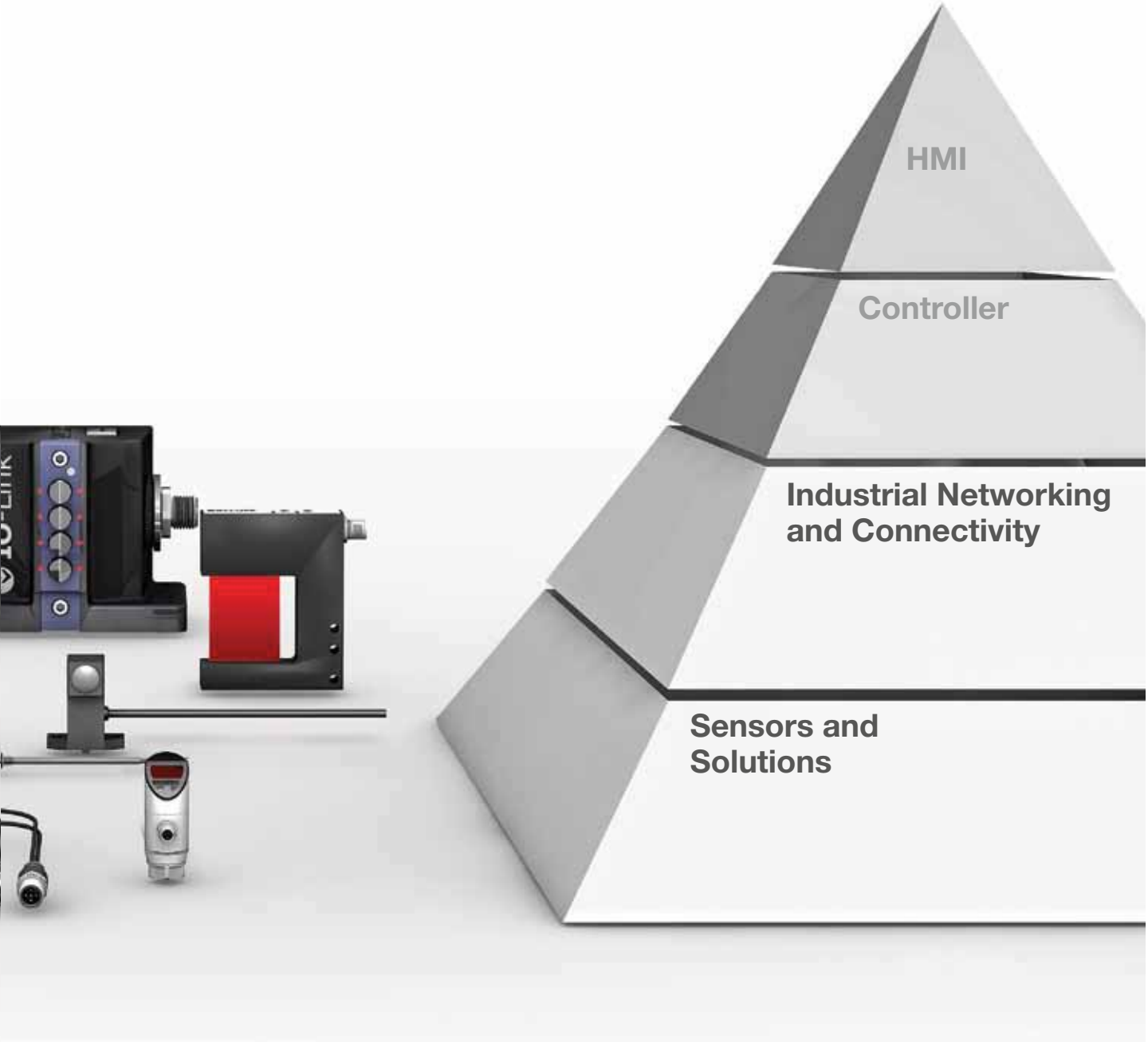

BALLUFF
HMI
Controller
Industrial Networking
and Connectivity
Sensors and
Solutions

Sensor Solutions

Balluff offers suitable products 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, photoelectricdistance sensors, magnetically coded position and angle measurement systems, inductive positioning systems, pressure sensors, mechanical accessories, electrical accessories




HMI
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Products in overview

2D and 3D product data

Current information at a glance

Company

Service and support

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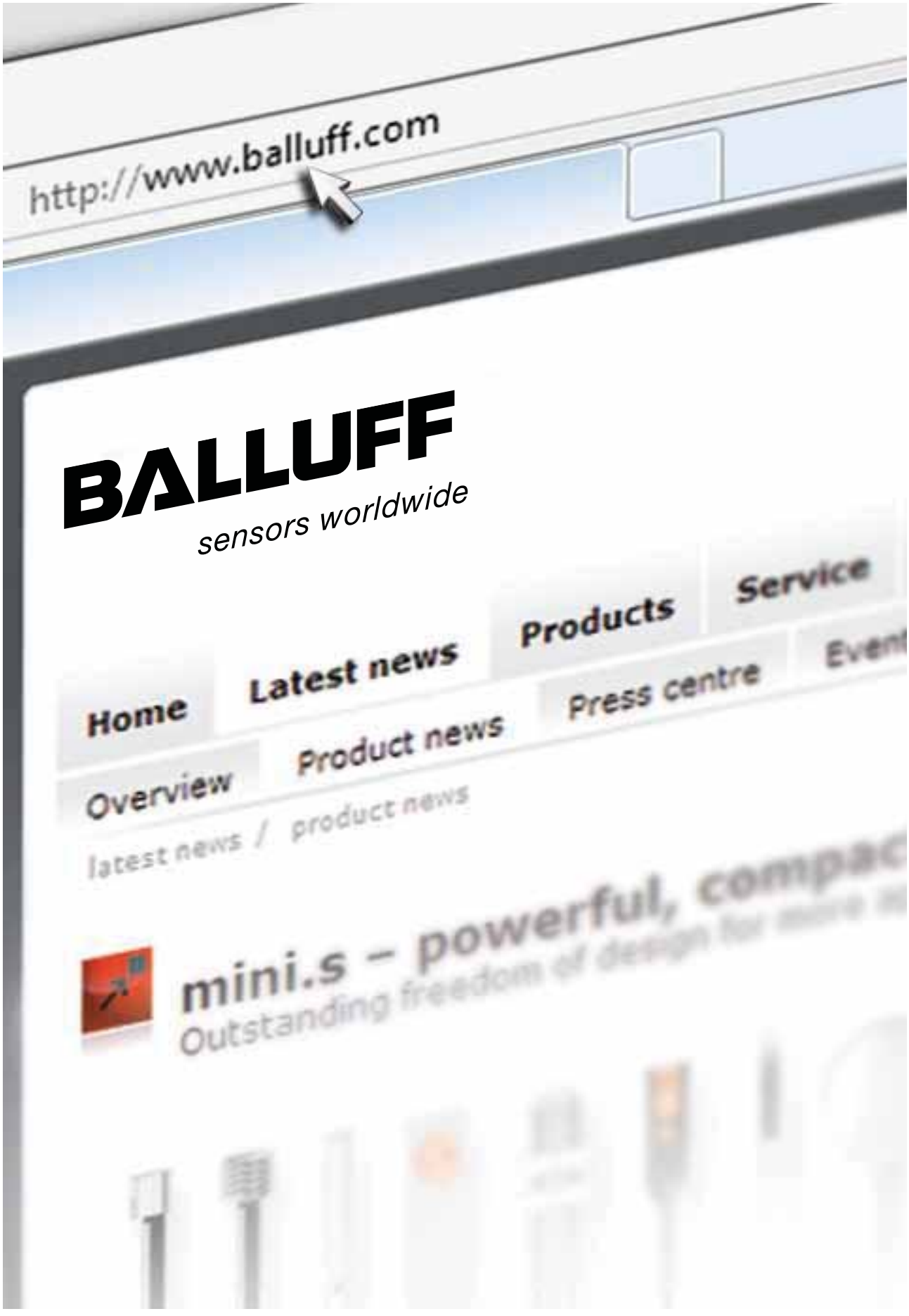
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mini.s – powerful, compac
Outstanding freedom of design for

Matrix

Special features	8 ports 4× IO-Link	8 ports	8 ports	8 ports	8 ports 4× P111 interface	8 ports 4× P111 interface			8 ports 4× RFID interface			4 ports 4× IO-Link			4 ports 4× IO-Link			
Modules	**BNI005R** BNI PBS-502-101-Z001	**BNI0047** BNI PBS-302-101-Z001	**BNI005C** BNI PBS-104-101-Z001	**BNI0057** BNI PBS-202-101-Z001	**BNI0064** BNI PBS-551-001-Z001	**BNI0065** BNI PBS-552-001-Z001			**BIS00T3** BIS V-6102-019-C001			**BNI003P** BNI PBS-507-002-Z001			**BNI0030** BNI PBS-504-002-K008			
No. of ports	8	8	8	8	8	8						4			4			
Max. inputs	16	16	16	8	8							8			4			
Max. outputs	16	16										8			4			
Configurable max. inputs/outputs	16	16																
Analog input U/I						4												
Max. IO-Link ports	4								1			4			4			
IO-Link version	1.1								1.1			1.1			1.1			
Page	22	23	23	23	24	24			163			26			27			

Special features	8 ports 4× IO-Link	8 ports 8× IO-Link	8 ports	8 ports	8 ports	4 ports	8 ports	16 ports	8 ports	8 ports	8 ports	16 ports
Modules	**BNI004A** BNI EIP-502-105-Z015	**BNI006A** BNI EIP-508-105-Z015	**BNI004F** BNI EIP-302-105-Z015	**BNI004M** BNI EIP-104-105-Z015	**BNI005J** BNI EIP-202-105-Z015	**BNI0044** BNI EIP-307-100-Z014	**BNI0014** BNI EIP-104-100-Z016	**BNI0018** BNI EIP-105-100-Z010	**BNI0015** BNI EIP-202-100-Z016	**BNI0016** BNI EIP-206-100-Z016	**BNI0017** BNI EIP-305-100-Z016	**BNI0019** BNI EIP-306-100-Z010
No. of ports	8	8	8	8	8	4	8	16	8	8	8	16
Max. inputs	16	16	16	16		8	16	32			8	16
Max. outputs	16	16	16		8	8			8	16	8	16
Configurable max. inputs/outputs		16	16			8						
Analog input U/I												
Max. IO-Link ports	4	8										
IO-Link version	1.1	1.1										
Page	102	102	103	103	103	103	104	104	105	105	105	104

8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports	8 ports
8× IO-Link	4× IO-Link					4× IO-Link						4× IO-Link				
BNI005H BNI PNT-508-105-Z015	**BNI004U** BNI PNT-502-105-Z015	**BNI0052** BNI PNT-302-105-Z015	**BNI0053** BNI PNT-104-105-Z015	**BNI005F** BNI PNT-202-105-Z015	**BNI005K** BNI PNT-305-105-Z015	**BNI0040** BNI CCL-502-100-Z001	**BNI0049** BNI CCL-106-100-Z001	**BNI002F** BNI CCL-104-100-Z001	**BNI002A** BNI CCL-302-100-Z001	**BNI002C** BNI CCL-305-100-Z001	**BNI002E** BNI CCL-202-100-Z001	**BNI005A** BNI DNT-502-001-Z001	**BNI0001** BNI DNT-104-000-Z004	**BNI0002** BNI DNT-202-000-Z005	**BNI0003** BNI DNT-302-000-Z005	**BNI0004** BNI DNT-305-000-Z005
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
16	16	16	16		8	12	16	16	16	8		16	16		16	8
16	16	16		8	8	12			16	8	8	16		8	16	8
16	16	16				12			16						16	
8	4					4						4				
1.1	1.1					1.1						1.1				
46	47	47	47	47	47	64	64	65	65	65	65	76	77	77	77	78

Unmanaged Switch

Unmanaged				Unmanaged	Unmanaged	
BNI000F BNI EIP-950-000-Z009				**BNI005E** BNI TCP-951-000-E028	**BNI0067** BNI TCP-952-000-E029	
9				5	8	
130				131	131	

Matrix

IO-Link

Special features	M8, 3-pin	M8, 3-pin	M8, 3-pin	M8, 3-pin	M8, 4-pin	M8, 4-pin	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal	M12, metal
Sensor hubs	**BNI000P** BNI IOL-101-000-K018	**BNI001W** BNI IOL-101-S01-K018	**BNI000R** BNI IOL-102-000-K019	**BNI001Y** BNI IOL-102-S01-K019	**BNI0021** BNI IOL-104-000-K021	**BNI0022** BNI IOL-104-S01-K021	**BNI0032** BNI IOL-104-000-Z012	**BNI003U** BNI IOL-302-000-Z012	**BNI0039** BNI IOL-104-S01-Z012	**BNI003T** BNI IOL-104-S01-Z012-C01	**BNI003C** BNI IOL-302-S01-Z012	**BNI005P** BNI IOL-104-S01-Z012-C02	**BNI003A** BNI IOL-302-S01-Z013	**BNI0048** BNI IOL-302-S01-Z013-C01	**BNI0035** BNI IOL-302-000-Z013	**BNI0033** BNI IOL-252-000-Z013	**BNI0034** BNI IOL-256-000-Z013
No. of ports	4	4	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	8	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	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Page	140	142	140	142	141	143	145	145	146	146	147	147	147	147	145	149	149

IO-Link

Type	Fork Sensors	Color sensors	Laser distance sensors	Inductive distance sensors	Industrial RFID systems with read unit	Industrial RFID systems with read/ write unit
IO-Link version	1.0	1.0	1.0	1.0	1.0/1.1	1.0/1.1
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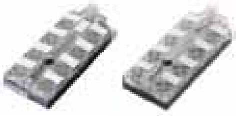
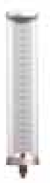
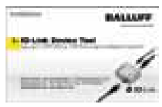
   

	M12, metal	M12, metal	M12, metal	M12, 3-pin	M12, 3-pin	M12, 3-pin	M12, 4-pin, analog, current	M12, 4-pin, analog, voltage	M12 plastic sensor hubs	M12 plastic sensor hubs	M12 plastic sensor hubs	M12 plastic sensor hubs	Adapter	Adapter	Adapter	Adapter	Adapter	Sensor	Sensor				
	BNI0063 BNI IOL-106-000-Z012	**BNI003W** BNI IOL-252-S01-Z013	**BNI003Y** BNI IOL-256-S01-Z013	**BNI0005** BNI IOL-102-000-K006	**BNI0006** BNI IOL-104-000-K006	**BNI0074** BNI IOL-106-000-K006	**BNI0007** BNI IOL-709-000-K006	**BNI0008** BNI IOL-710-000-K006	**BNI005L** NI IOL-302-000-K006	**BNI005T** BNI IOL-302-S01-K006	**BNI005U** BNI IOL-302-000-K006-C01	**BNI005W** BNI IOL-302-S01-K006-C01	**BNI0042** BNI IOL-714-000-K023	**BNI0041** BNI IOL-712-000-K023	**BNI004T** BNI IOL-716-000-K023	**BNI004C** BNI IOL-722-000-K023	**BNI004E** BNI IOL-724-000-K023	**BNI004K** BNI IOL-309-000-K024	**BNI004L** BNI IOL-310-000-K025				
	8	8	8	8	8	8	8	8	8	8	8	8						8	16				
	16	8	16	8	16	16	8	8	16	16	16	16						8	16				
									16	16	16	16						8	16				
									16	16	16	16											
							4							1	1								
								4					1										
																	1						
																1							
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
	145	149	149	150	150	150	151	151	153	153	153	153	182	183	183	183	183	155	155				

	Mechanical multiple position switches	Micropulse transducers	Ultrasonic sensors	SmartLight	IO-Link Valve cluster interface	Universal IO-Link switch	Valve terminal connectors	USB IO-Link master	Accessories	Device tool software
	1.0	1.1	1.0	1.1	1.1	1.1	1.0	1.0/1.1		1.1
	171	175	185	187	178	179	181	188	190	189

Fieldbus Systems

Fieldbus systems in industrial automation

PROFIBUS

PROFINET

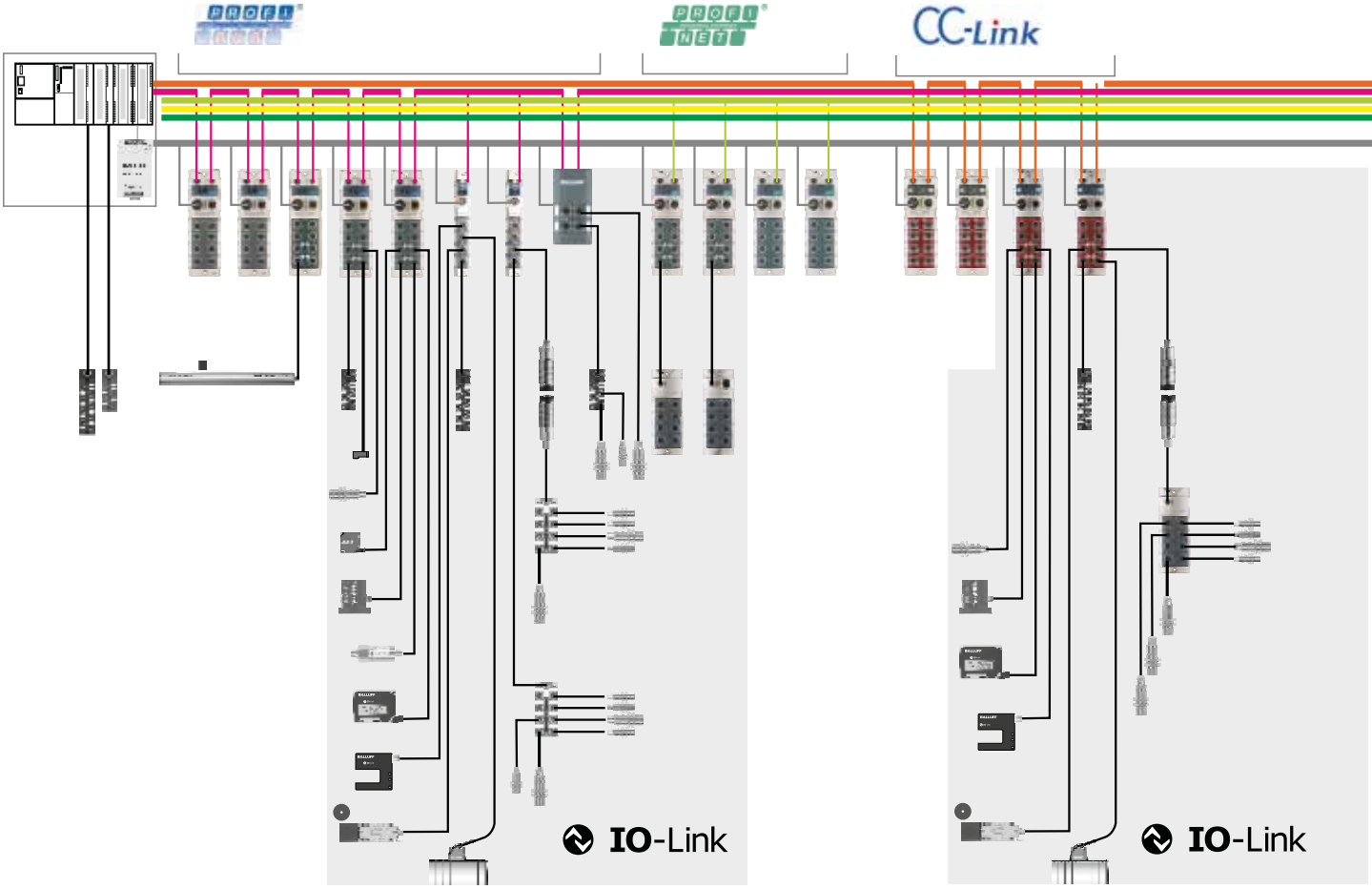
CC-Link

DeviceNet™

EtherNet/IP™

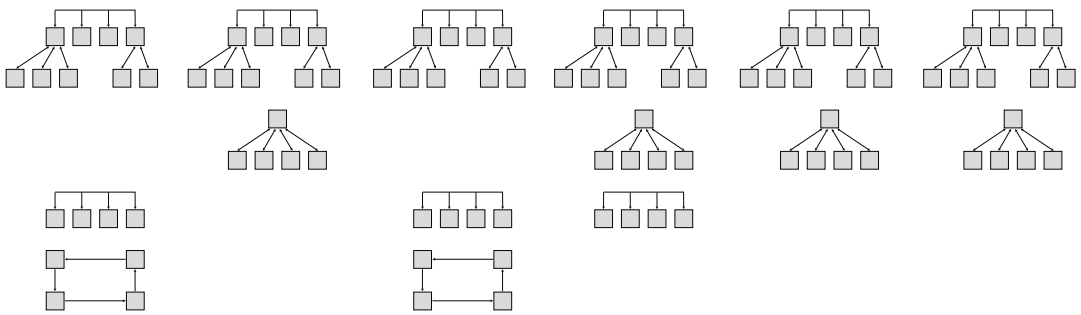
Contents

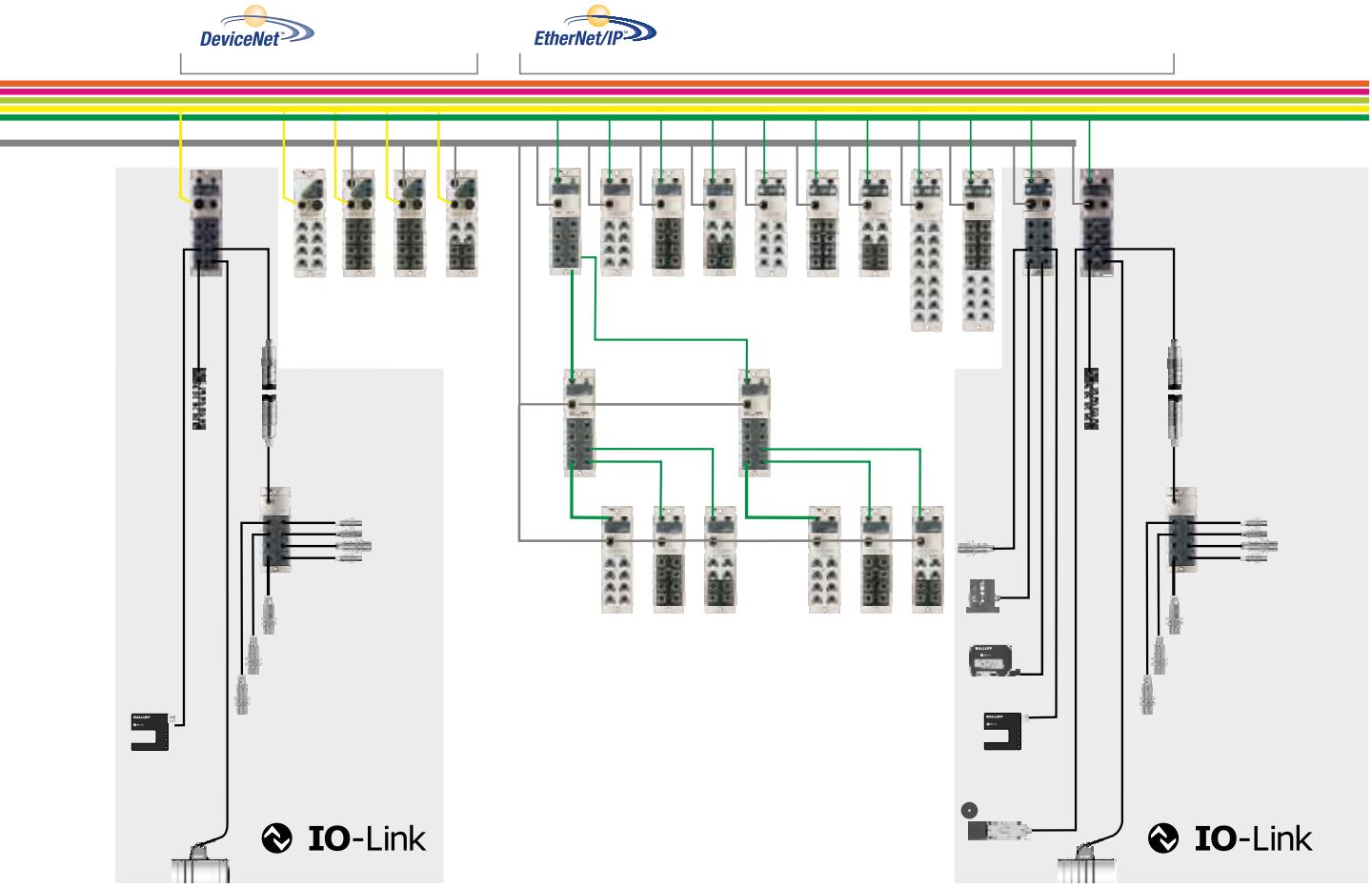
Overview of fieldbus systems

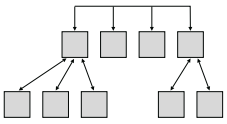
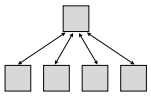
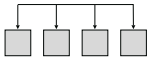
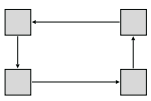


Bus systems in industrial automation

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
Transfer 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 at each end	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





Bus topologies		Benefits +	Disadvantages −
Tree		■ **Minimum wiring effort**	■ Active/passive couplers may be necessary
Star		■ **Each node has its own connection** ■ **Good visual implementation**	■ Total length may be excessive in some cases ■ Complex star couplers ■ Communication only via star coupler
Bus		■ **Simple cabling**	■ Electrical compromise when bus termination used ■ Limited number of bus nodes and bus length
Ring		■ **Extended networks possible**	■ Failure of one node means complete failure of the network

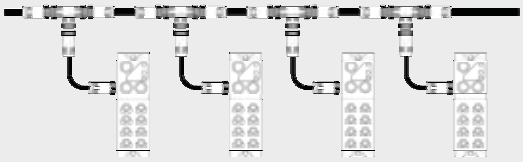
Fieldbus Systems

Fieldbus System: Profibus

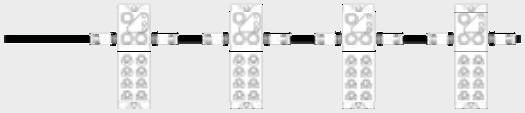
In use for years, Profibus stands for well-engineered fieldbus technology and reliably supports modern manufacturing. As a full-service provider, Balluff offers a wide range of components for optimum Profibus use. Regardless of controller manufacturer, Balluff has the perfect solution in store for you: 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.

Product topology

Trunk and drop lines
- 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 cabling 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, which 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.

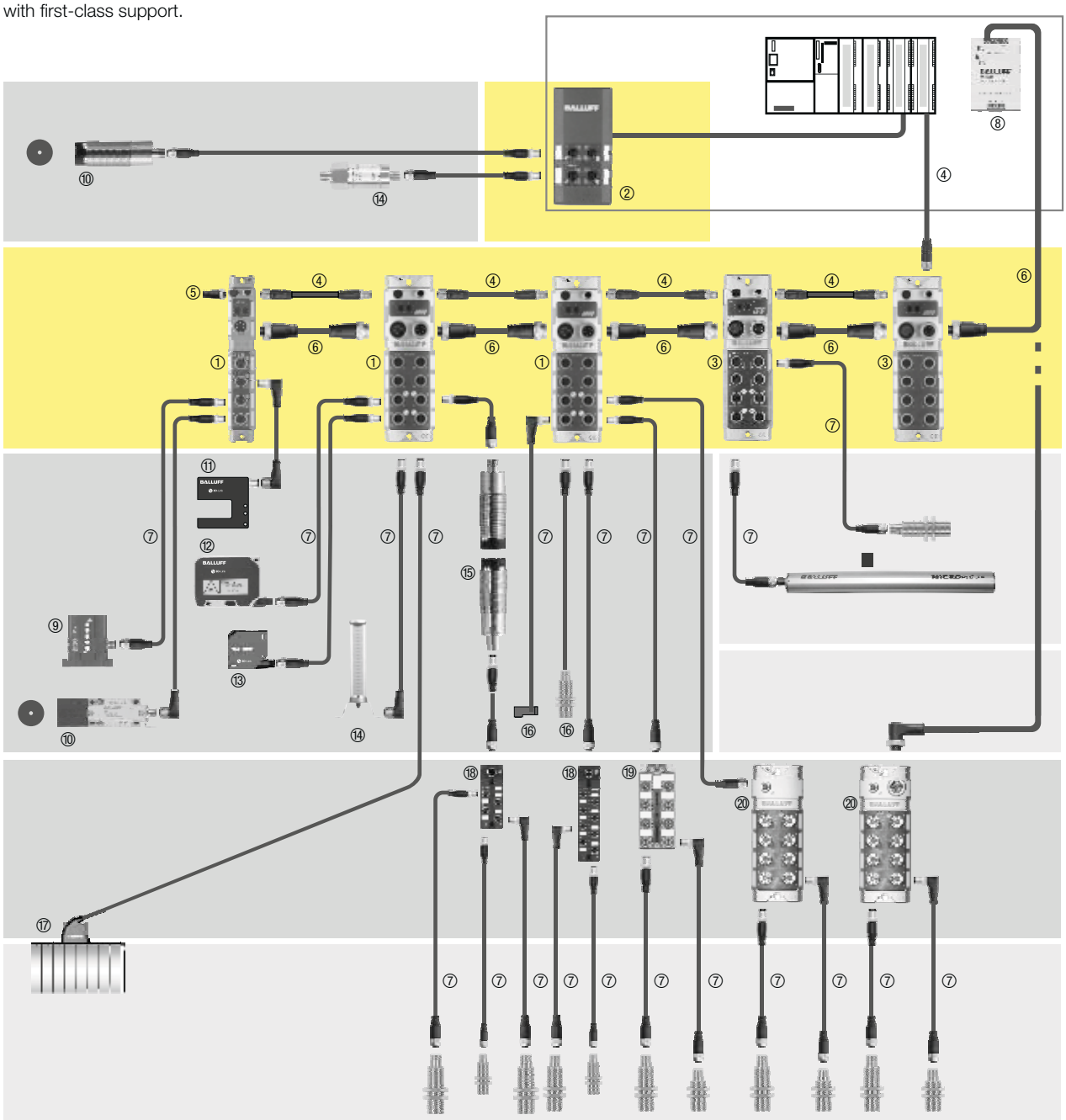
Robust, full-metal housing
The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it and costs no more than a plastic housing.

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 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 Profibus system. Balluff offers all the components you need for optimally setting up a Profibus network and providing it with first-class support.



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IO-Link

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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**.

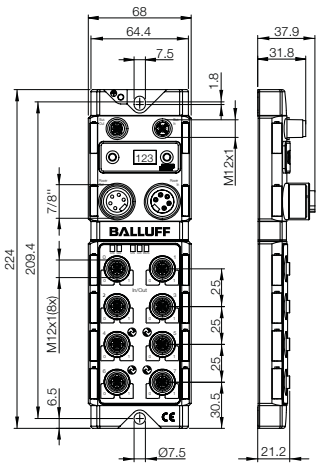
In addition to time savings and considerable cost savings, it provides even greater ease of operation. Balluff provides Profibus modules with a display that you can use to set station numbers or call up module information such as the hardware and software status. This increases security and simplifies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

Fieldbus	Profibus
Version	4× IO-Link, 16× DI/DO
Ordering code	**BNI005R**
Part number	BNI PBS-502-101-Z001
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
Connection: Fieldbus	M12, B coded, socket/plug
Connection: AUX power	7/8", plug, 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 current $U_{Actuator}$	≤ 9 A
Total current U_{Sensor}	≤ 9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)
Operating temperature T_a	–5...+70 °C
Storage temperature	–25...+70 °C
Fastener	2 mounting holes
Dimensions (L×W×H)	225×68×36.9 mm
Housing material	Nickel-plated GdZn

IO-Link Version 1.1

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

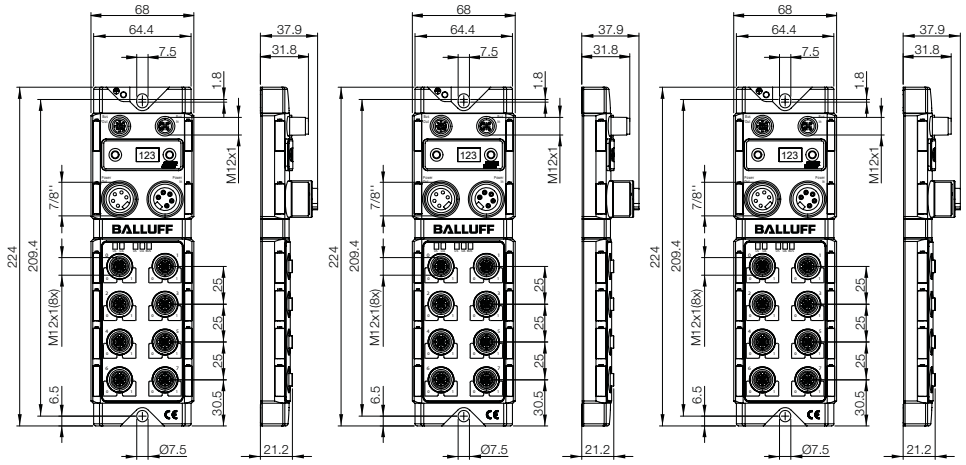
IO-Link
Version 1.1



All modules include four screw plugs and a label set.



Profibus	Profibus	Profibus	
16× DI/DO, configurable	16 DI	8 DO	
BNI0047	**BNI005C**	**BNI0057**	
BNI PBS-302-101-Z001	BNI PBS-104-101-Z001	BNI PBS-202-101-Z001	
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", plug, 5-pin	7/8", plug, 5-pin	7/8", plug, 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			
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 screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	
–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	
225×68×36.9 mm	225×68×36.9 mm	175×68×36.9 mm	
Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	



P111 module for the cost-effective integration of micropulse transducers BTL

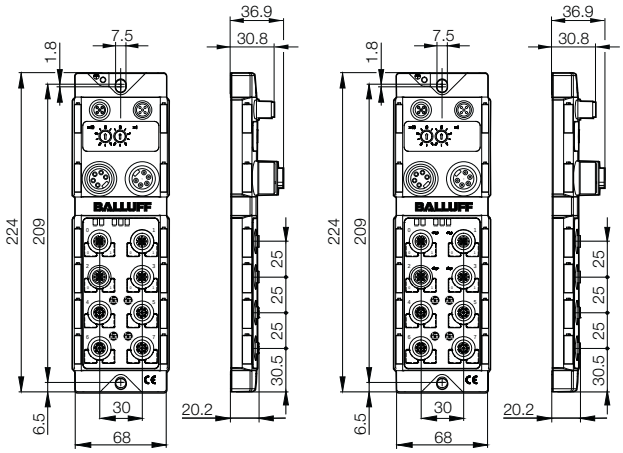
Profibus modules P111 are designed for connecting micropulse transducers, the robust position measuring systems for extreme ambient conditions that can be used universally. Thanks to their durable metal housing, Profibus modules P111 meet the highest mechanical requirements and are ideally suited for use in the harsh industrial environment. The modules are fitted with four interdependent ports for micropulse transducers BTL.
A maximum of 16 encoders can be used per BTL port. With a maximum rated length of 7500 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.

Digital inputs

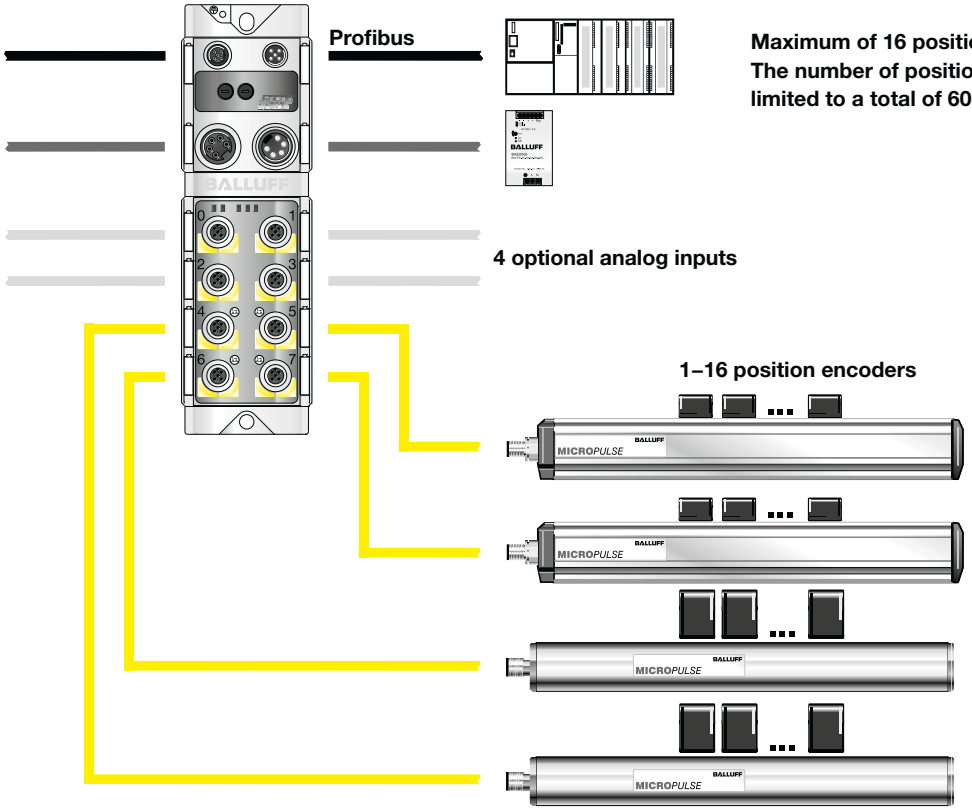
Analog inputs

Fieldbus	Profibus	Profibus
Version	4× P111, 8× DI	4× P111, 4× AI (0...10 V/4...20 mA)
Ordering code	**BNI0064**	**BNI0065**
Part number	BNI-PBS-551-001-Z001	BNI-PBS-552-001-Z001
Supply voltage U_B	18...30 V DC	18...30 V DC
Function indicator	BUS RUN	BUS RUN
Fault function indicator	Red LED	
Power-on indicator	V_A, V_S, undervoltage	V_A, V_S, undervoltage
Connection: Fieldbus	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)
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 current U_{Sensor}	9 A	9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Operating temperature T_a	0...+70 °C	0...+70 °C
Weight	Approx. 735 g	Approx. 735 g
Fastener	2 mounting holes	2 mounting holes
Dimensions (L×W×H)	224×68×36.9	224×68×36.9
Housing material	Nickel-plated GD-Zn, matt finish	Nickel-plated GD-Zn, matt finish



All modules include four screw plugs and a label set.

P111 module for the cost-effective integration of micropulse transducers BTL



Maximum of 16 position encoders per BTL. The number of position encoders per module is limited to a total of 60.

IO-Link modules
For tight spaces – robust and compact

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	
Version	4× IO-Link ports, max. 8 DI/DO	
Ordering code	**BNI003P**	
Part number	BNI-PBS-507-002-Z011	
Supply voltage U_B	18...30 V DC	
Function indicator	BUS RUN	
Power-on indicator	V_A, V_S, undervoltage	
Connection: Fieldbus	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 current $U_{Actuator}$	≤ 9 A	
Total current U_{Sensor}	≤ 9 A	
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	
Operating temperature T_a	–5...+55 °C	
Storage temperature	–25...+70 °C	
Weight	Approx. 355 g	
Fastener	2 mounting holes	
Dimensions (L×W×H)	224×37×32 mm	
Housing material	Nickel-plated GdZn	

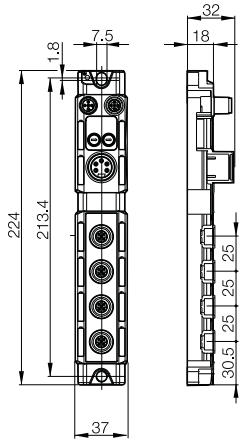
IO-Link Version 1.1

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 for IO-Link device	≤ 1.6 A	

IO-Link Version 1.1

All modules include four screw plugs and a label set.

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



Panel module
IO-Link panel module for simple installation

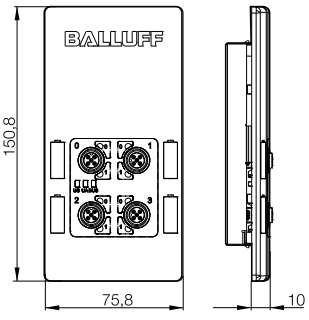
New IO-Link panel module for simple commissioning
Not only are installation and commissioning simplified with the Profibus IO-Link panel module, but cabling is also cost-effective. Developed for small to mid-sized machines and systems, it is ideal for centralized wiring concepts and, with IO-Link sensor 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	Profibus DP	
Version	4× IO-Link, max. 4 DI	
Ordering code	**BNI0030**	
Part number	BNI PBS-504-002-K008	
Supply voltage U_B	18...30.2 V DC	
Net function indicator	Green LED	
Fault function indicator	Red LED	
Power-on indicator	Sensor module	
Connection: Fieldbus	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 current U_{Sensor}	≤ 9 A	
Degree of protection as per IEC 60529	IP 67 (fitted in panel)	
Operating temperature T_a	–5...+55 °C	
Storage temperature	–25...+70 °C	
Weight	Approx. 130 g	
Fastener	4 mounting holes	
Dimensions (W×H)	150.8×75.8 mm	
Lead-in dimensions	112×46 mm	

IO-Link Version 1.1

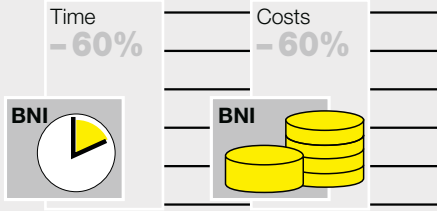
No. of IO-Link ports	4× master	
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3	
Communication indicator	Green LED	
Error indicator	Red LED	
Max. load current for IO-Link device	≤ 1.6 A	

IO-Link Version 1.1

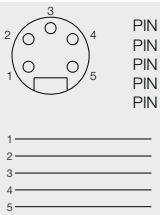
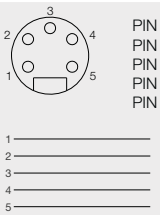


All modules include four screw plugs and a label set.

Reduce your wiring costs by 60%!

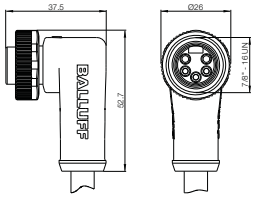


Power cables 7/8", 5-pin

Connector diagram and wiring	 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
Type	Female	Female
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	5×1.5 mm²	5×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

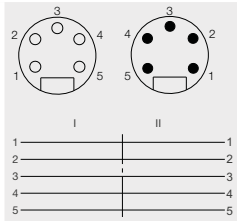
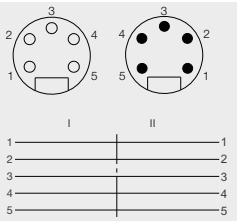
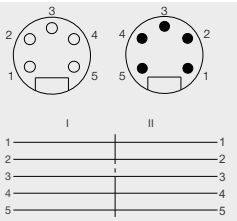
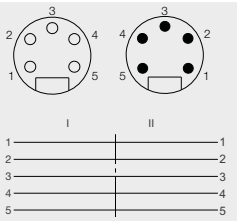
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.6 m		
PUR	Black	2 m	**BCC06HC** BCC A315-0000-10-063-PX05A5-020	**BCC06HH** BCC A325-0000-10-063-PX05A5-020
PUR	Black	5 m	**BCC06HE** BCC A315-0000-10-063-PX05A5-050	**BCC06HJ** BCC A325-0000-10-063-PX05A5-050
PUR	Black	10 m	**BCC06HF** BCC A315-0000-10-063-PX05A5-100	**BCC06HK** BCC A325-0000-10-063-PX05A5-100
PUR	Black	15 m		

Other cable materials, colors, and lengths on request.

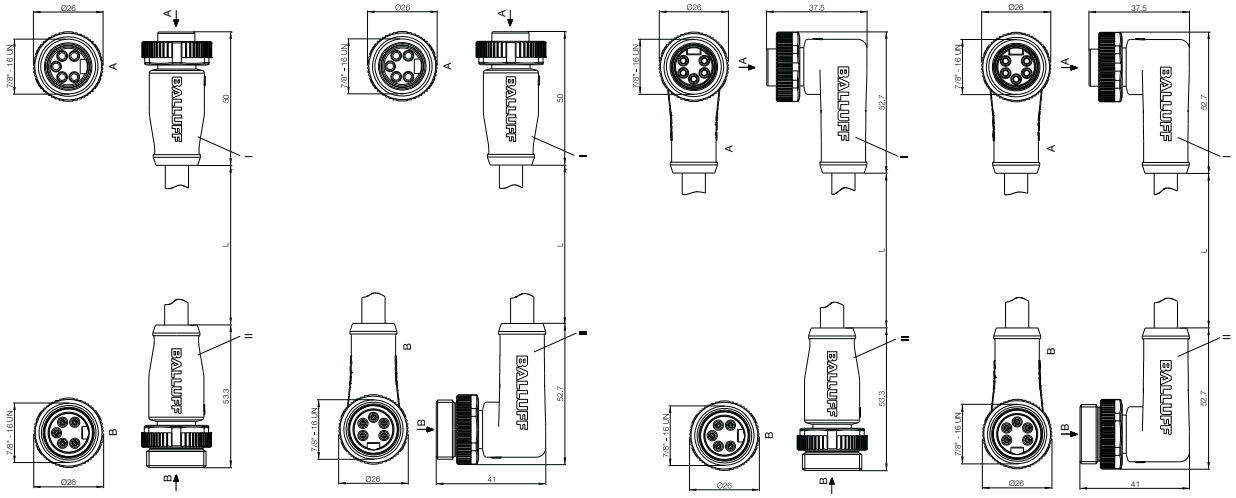


Power connection cables 7/8", 5-pin

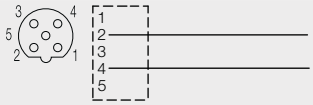
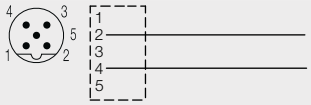
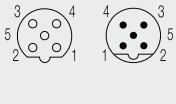


	Female/male	Female/male	Female/male	Female/male
	300 V DC	300 V DC	300 V DC	300 V DC
	5×1.5 mm²	5×1.5 mm²	5×1.5 mm²	5×1.5 mm²
	IP 68	IP 68	IP 68	IP 68
	–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
Ordering code				
Part number				
BCC06FM	**BCC06FU**	**BCC06H1**	**BCC06H6**
BCC A315-A315-30-335-PX05A5-006	BCC A315-A325-30-335-PX05A5-006	BCC A325-A315-30-335-PX05A5-006	BCC A325-A325-30-335-PX05A5-006
BCC06FN	**BCC06FW**	**BCC06H2**	**BCC06H7**
BCC A315-A315-30-335-PX05A5-020	BCC A315-A325-30-335-PX05A5-020	BCC A325-A315-30-335-PX05A5-020	BCC A325-A325-30-335-PX05A5-020
BCC06FP	**BCC06FY**	**BCC06H3**	**BCC06H8**
BCC A315-A315-30-335-PX05A5-050	BCC A315-A325-30-335-PX05A5-050	BCC A325-A315-30-335-PX05A5-050	BCC A325-A325-30-335-PX05A5-050
BCC06FR	**BCC06FZ**	**BCC06H4**	**BCC06H9**
BCC A315-A315-30-335-PX05A5-100	BCC A315-A325-30-335-PX05A5-100	BCC A325-A315-30-335-PX05A5-100	BCC A325-A325-30-335-PX05A5-100
BCC06FT	**BCC06H0**	**BCC06H5**	**BCC06HA**
BCC A315-A315-30-335-PX05A5-150	BCC A315-A325-30-335-PX05A5-150	BCC A325-A315-30-335-PX05A5-150	BCC A325-A325-30-335-PX05A5-150

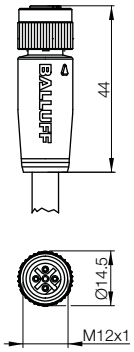


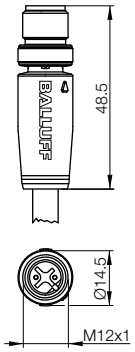
Bus cable, M12, 5-pin, B-coded

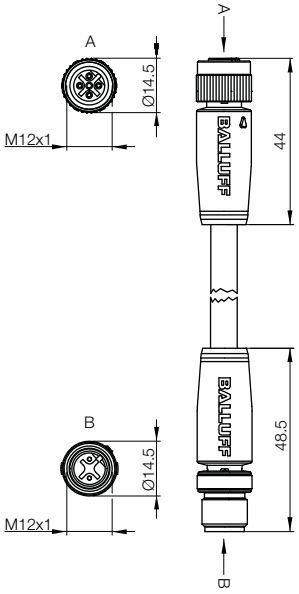
Connector diagram and wiring	 Shield on cap nut	 Shield on cap nut	 1 NC 2 Line A green 3 NC 4 Line B red 5 NC
Type	Female	Male	Female/male
Supply voltage U_B	300 V	300 V	300 V
Number of conductors × conductor cross-section	2×0.64 mm²	2×0.64 mm²	2×0.64 mm²
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	–20...+70 °C	–20...+70 °C	–20...+70 °C

Cable material	Color	Length	Ordering code Part number		
PUR	Violet	0.6 m			**BCC0A12** BCC M415-M412-3B-329-PS72N1-006
PUR	Violet	1 m			**BCC0A13** BCC M415-M412-3B-329-PS72N1-010
PUR	Violet	2 m	**BCC070Y** BCC M415-0000-1B-031-PS72N1-020	**BCC0A0Y** BCC M412-0000-2B-031-PS72N1-020	**BCC0A14** BCC M415-M412-3B-329-PS72N1-020
PUR	Violet	5 m	**BCC070Z** BCC M415-0000-1B-031-PS72N1-050	**BCC0A0Z** BCC M412-0000-2B-031-PS72N1-050	**BCC0A15** BCC M415-M412-3B-329-PS72N1-050
PUR	Violet	10 m	**BCC0710** BCC M415-0000-1B-031-PS72N1-100	**BCC0A10** BCC M412-0000-2B-031-PS72N1-100	**BCC0A16** BCC M415-M412-3B-329-PS72N1-100
PUR	Violet	15 m			**BCC0A17** BCC M415-M412-3B-329-PS72N1-150
PUR	Violet	20 m			**BCC0A18** BCC M415-M412-3B-329-PS72N1-200

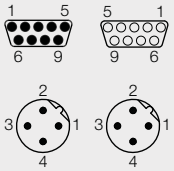
Other cable lengths on request.



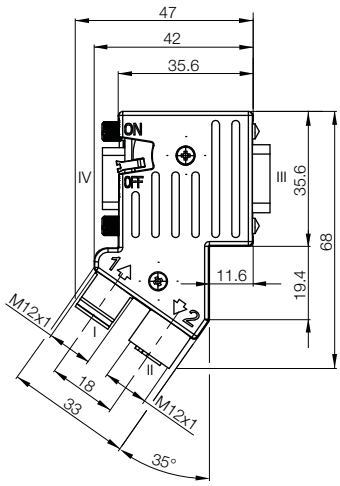


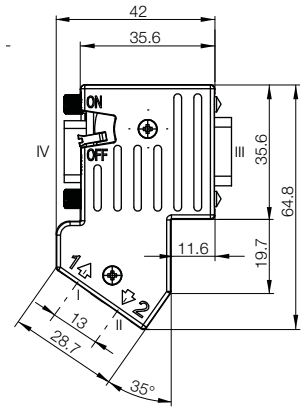


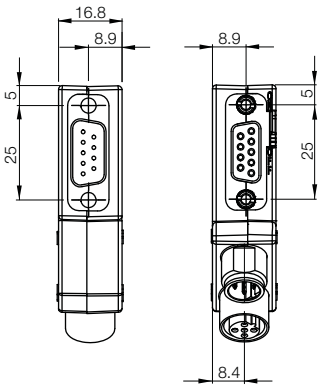
Bus plug with switchable terminating resistor

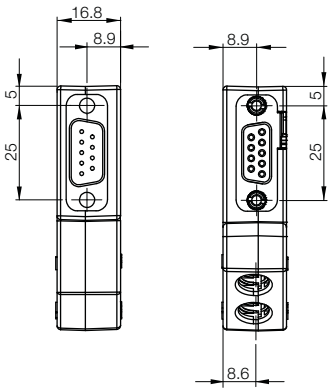
Connector diagram and wiring		
Type	Female/male	Female/male
Connector type	Sub D/M12	Male Sub D / female Sub D
Supply voltage U_B	30 V	30 V
Degree of protection as per IEC 60529	IP 67	IP 30
Ambient temperature T_a	–20...+70 °C	–20...+70 °C

	Ordering code	
	Part number	
Cable outlets, right-angle	**BCC0C0Y**	**BCC0C10**
	BCC D259-M414-M415-U0029-000-C011	BCC D279-0000-E0-000-65X4N1-000-C011
Cable outlets, straight	**BCC0C0Z**	**BCC0C11**
	BCC D269-M414-M415-U0029-000-C011	BCC D289-0000-E0-000-65X4N1-000-C011

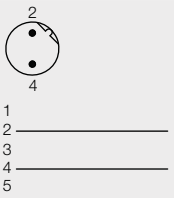
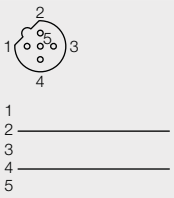






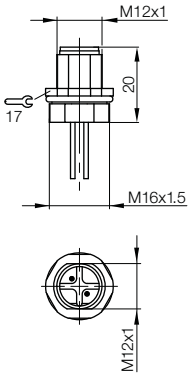


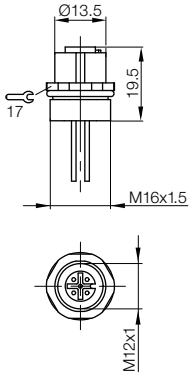
Flange plug and socket

Connector diagram and wiring		
Supply voltage U_B	125 V	125 V
Number of conductors × conductor cross-section	2×0.25 mm²	2×0.25 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

Cable length	**Ordering code**	
	Part number	
0.2 m	**BCC0E40**	**BCC0E3Z**
	BCC M452-0000-2B-RM080-002	BCC M455-0000-1B-RM080-002

Other cable lengths on request.



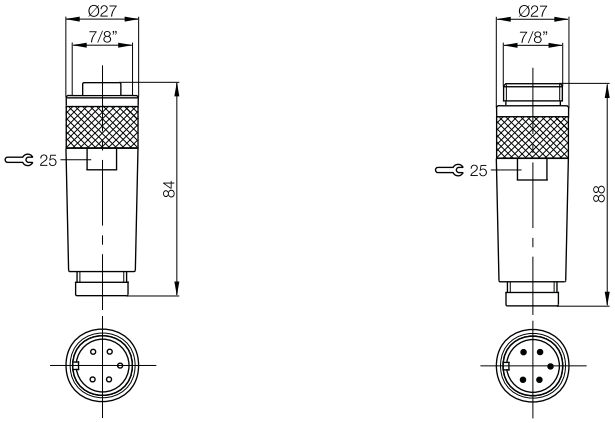


Power plug connector, 7/8", 5-pin

Connector diagram and wiring		
Type	Female	Male
Supply voltage U_B	300 V	300 V
Number of conductors × conductor cross-section	5× max. 1.5 mm²	5× max. 1.5 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

Cable material Cable dia.	Color	Ordering code Part number	
PUR 6...8 mm	Black	**BCC070E** BCC A335-0000-10-000-51X5A5-000	**BCC070J** BCC A335-0000-20-000-51X5A5-000
PUR 8...10 mm	Black	**BCC070F** BCC A335-0000-10-000-61X5A5-000	**BCC070K** BCC A335-0000-20-000-61X5A5-000
PUR 10...12 mm	Black	**BCC070H** BCC A335-0000-10-000-71X5A5-000	**BCC070L** BCC A335-0000-20-000-71X5A5-000

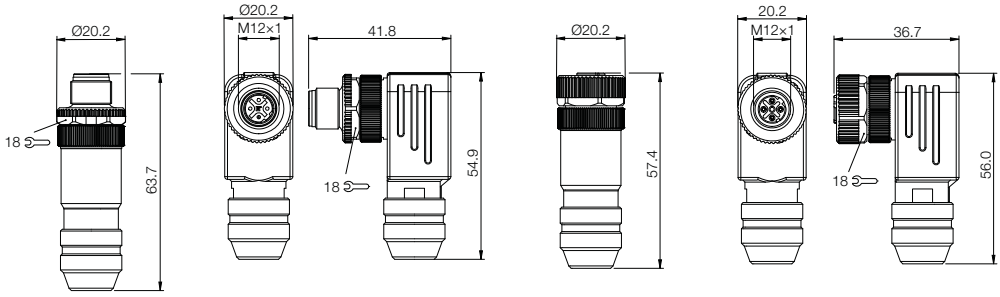
Other cable diameters on request.



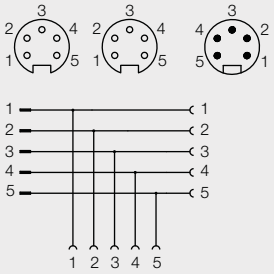
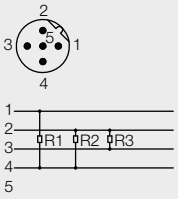
Bus plug connector, M12, 5-pin, B-coded, Customized assembly, shieldable

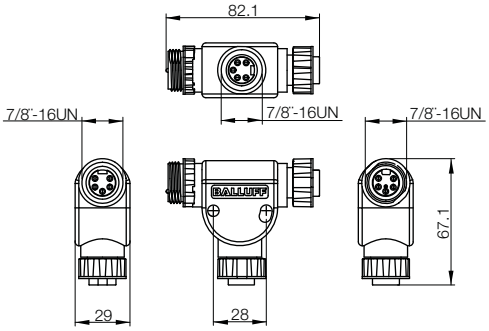


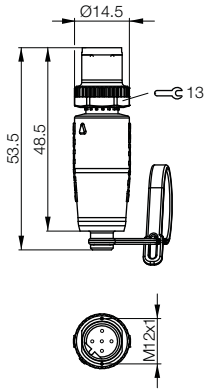

Connector diagram and wiring				
Plug connector	M12	M12	M12	M12
Version	B-coded 5-pin	B-coded 5-pin	B-coded 5-pin	B-coded 5-pin
Type	Male	Male	Female	Female
Ordering code	**BCC0714**	**BCC0716**	**BCC0715**	**BCC0717**
Part number	BCC M475-0000-2B-000-01X575-000	BCC M485-0000-2B-000-01X575-000	BCC M475-0000-1B-000-01X575-000	BCC M485-0000-1B-000-01X575-000
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
Number of conductors × conductor cross-section	5× max. 0.75 mm²	5× max. 0.75 mm²	5× max. 0.75 mm²	5× max. 0.75 mm²
Min. cable diameter	Max. 8.0 mm	Max. 8.0 mm	Max. 8.0 mm	Max. 8.0 mm
Connection	Screw terminal	Screw terminal	Screw terminal	Screw terminal
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C
Housing material	CuZn	CuZn	CuZn	CuZn
Shielded design	Yes	Yes	Yes	Yes



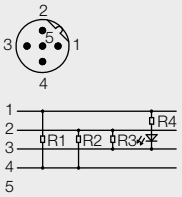
Power tee and bus terminating resistor

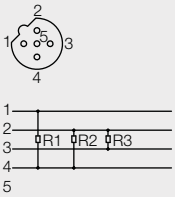
Connector diagram and wiring		
Configuration	7/8" power distributor	M12 terminating resistor
Version	Standard, 5-pin	5-pin, B-coded
Type	Female/male	Male
Ordering code	**BCC0AA7**	**BCC0718**
Part number	BCC A315-A315-A315-T0023-000	BCC M415-0000-2B-R01
Supply voltage U_B	300 V AC	10...30 V DC
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–40...+90 °C	–40...+85 °C
Housing material	Plastic	Plastic



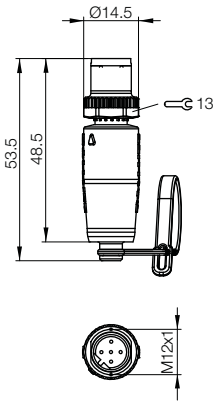


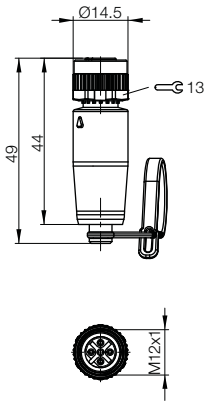
Bus terminating resistor

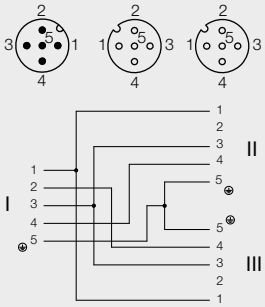


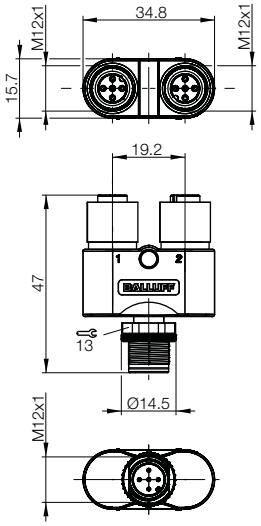


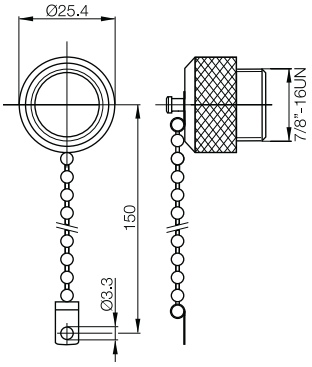
M12 terminating resistor	M12 terminating resistor
5-pin, B-coded	5-pin, B-coded
Male	Female
BCC0719	**BCC0C6E**
BCC M415-0000-2B-R02	BCC M415-0000-1B-R01
10...30 V DC	10...30 V DC
IP 67	IP 67
–40...+85 °C	–40...+85 °C
Plastic	Plastic

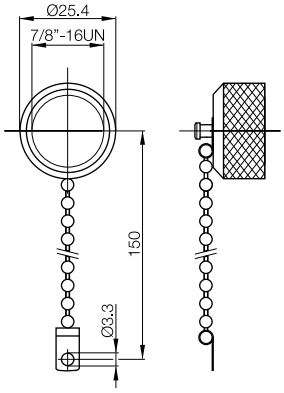




Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

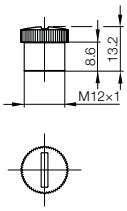


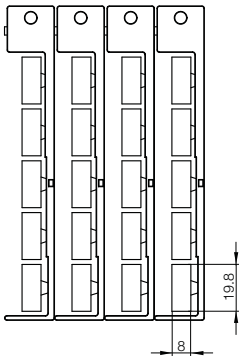




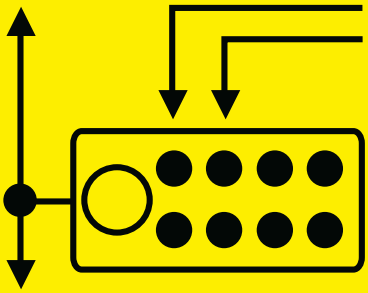


Description	Screw plug M12	Tamperproof cover	Marking sleeve	Label set
Use	IP 65 screw plug for unused ports	with 4 openings	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...
Ordering code	**BAM01C2**	**BAM01J0**		**BAM01AT**
Part number	BAM CS-XA-002-M12-A	BAM FK-NI-PBS-01-C	BAM IA-CC-002-01	BNI ACC-L01-000
Ambient temperature T_a	–20...+80 °C			
Housing material	Plastic			Plastic





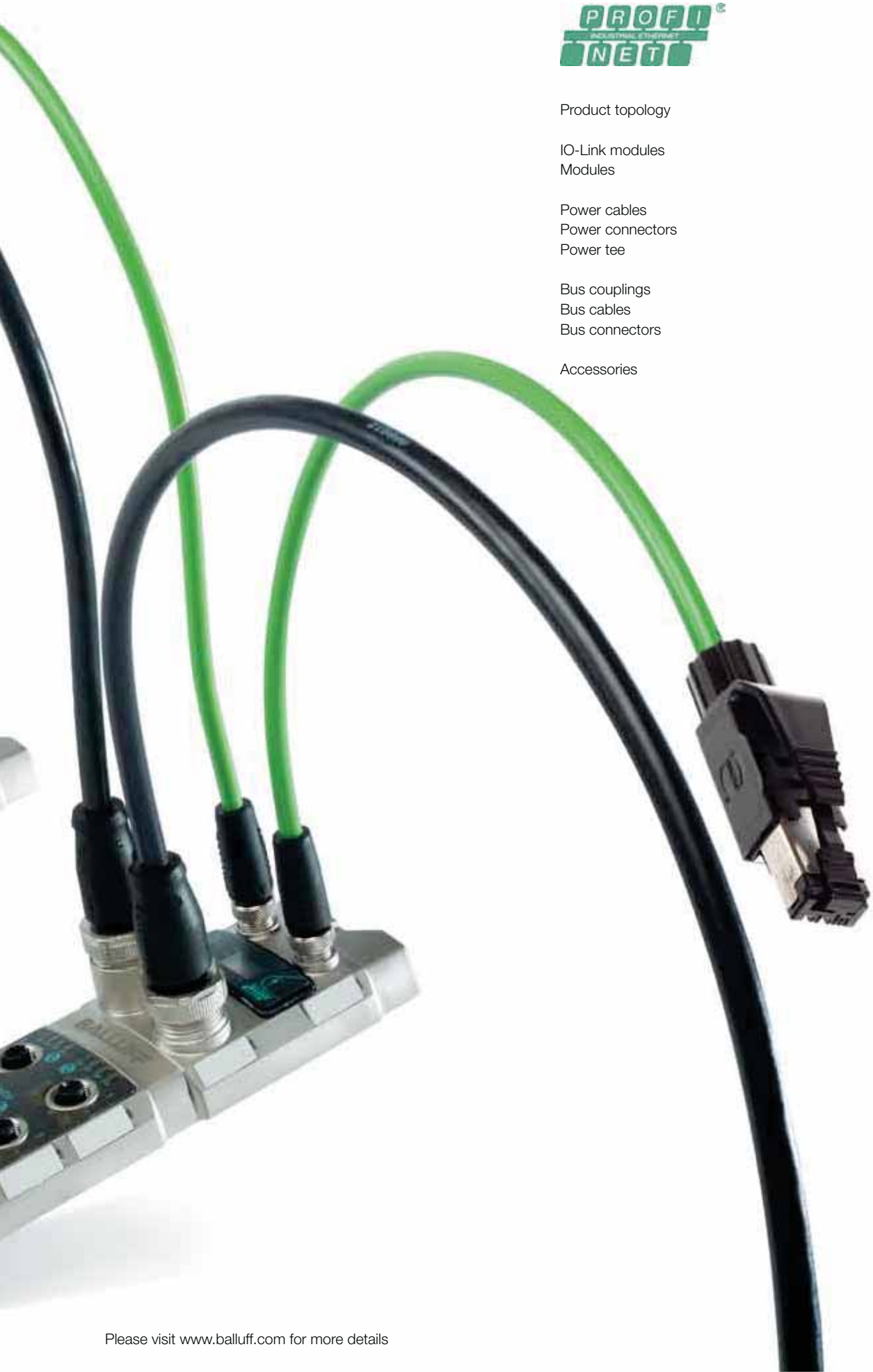
3-wire connector BCC; see the chapter "Connectors and Cables" beginning on **page 270.**



Fieldbus Systems

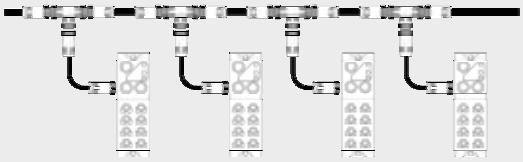
Fieldbus System: Profinet

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.

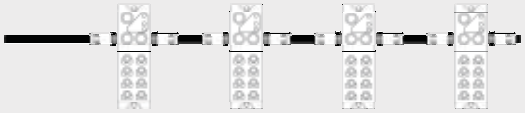


Product topology

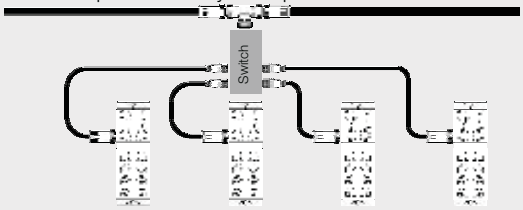
Trunk and drop
- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs



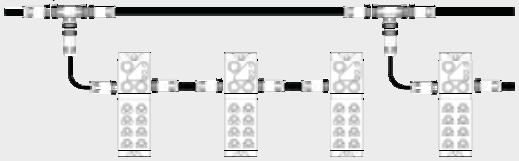
Connected in series
- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer cabling components



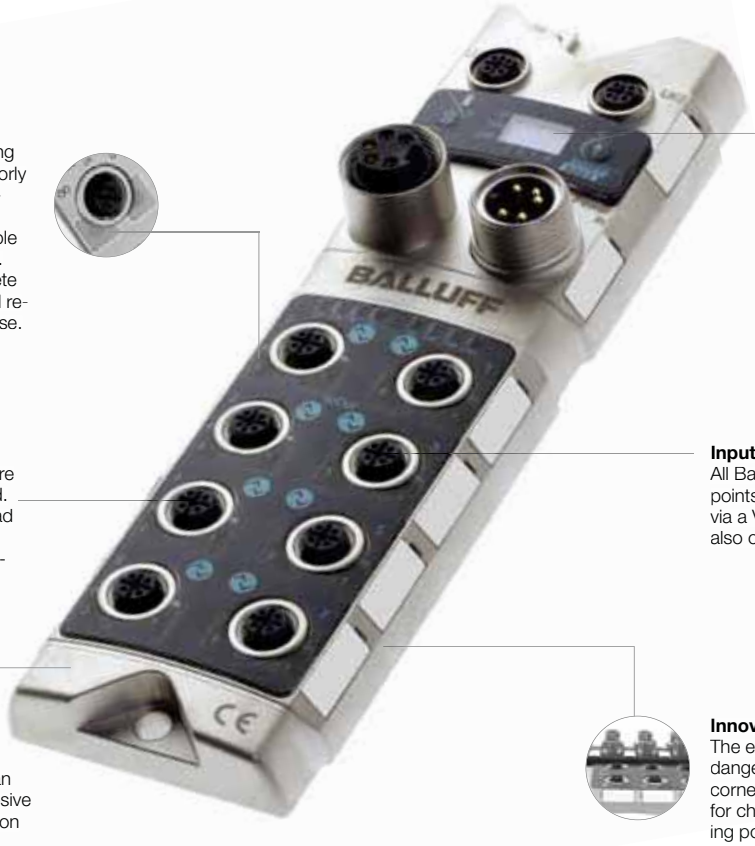
Star
- Simple troubleshooting
- Ideal for large I/O clusters
- Less expensive – only one splitter box needed



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, which 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.



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.

Powerful and safe outputs
With an output current of up to **2 amps**, 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.

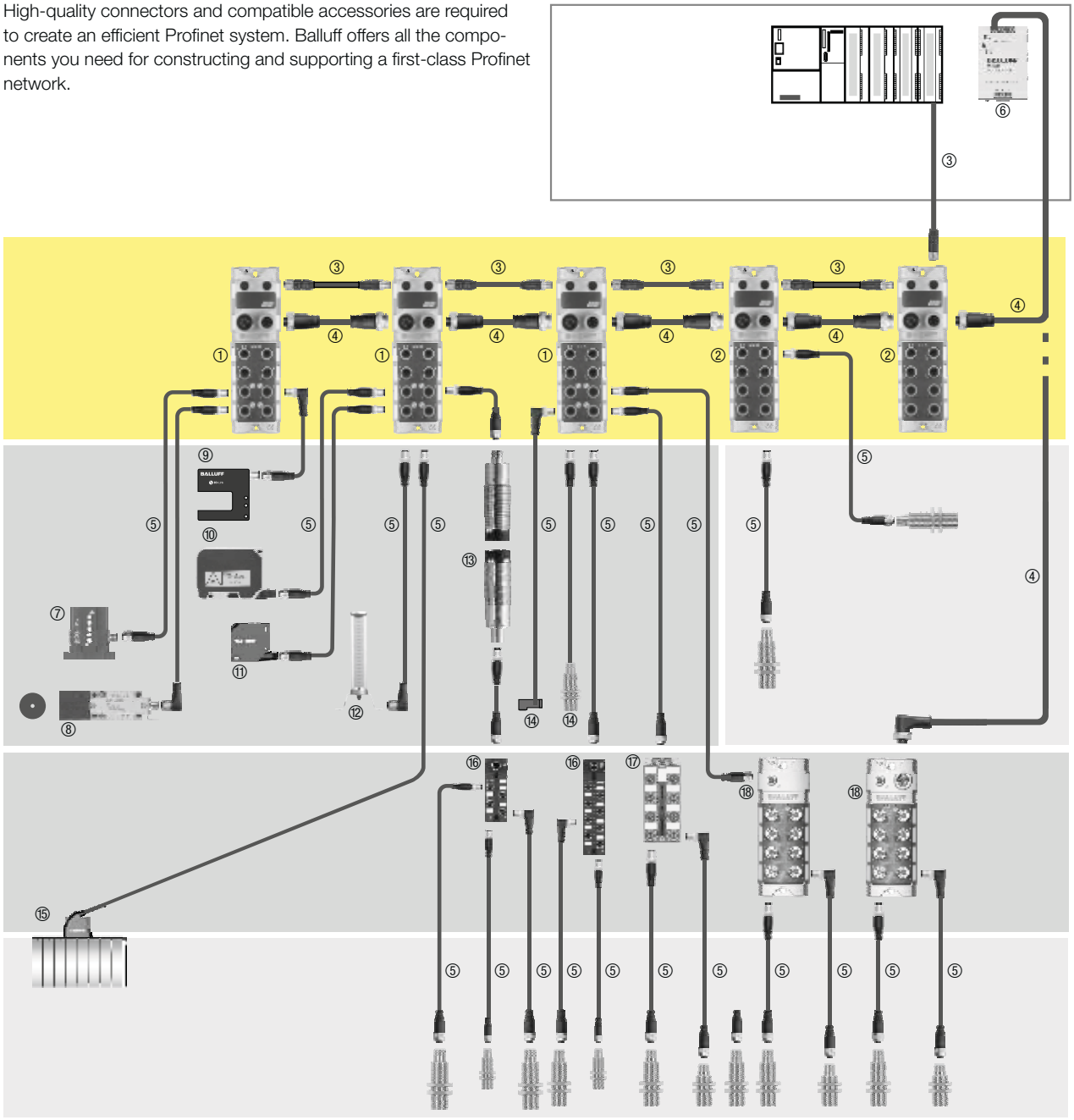
Inputs with high density
All Balluff input blocks offer two input points for each connector, accessed via a V splitter. A DESINA output is also optionally available via pin 2.

Robust, full-metal housing
The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it and costs the same as a plastic housing.

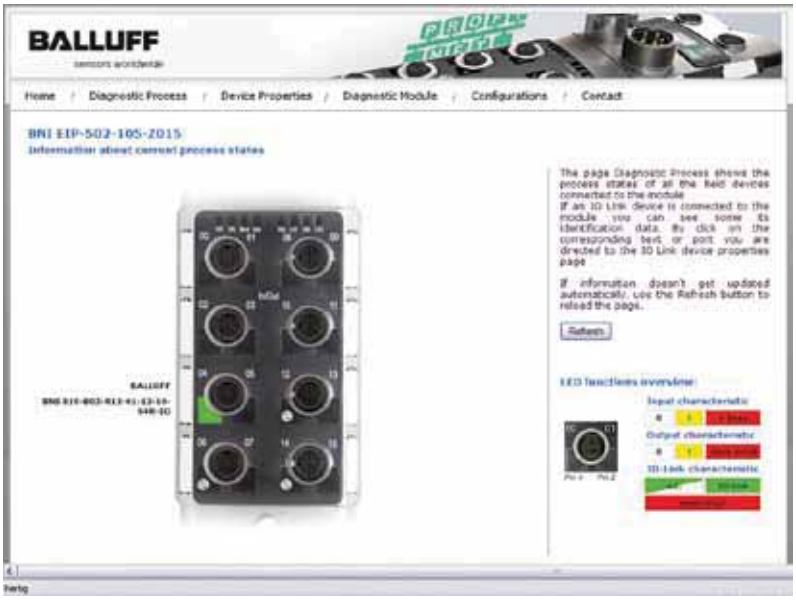
Innovative housing design
The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers and two mounting points are sufficient to secure the robust metal housing.

Product topology

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.

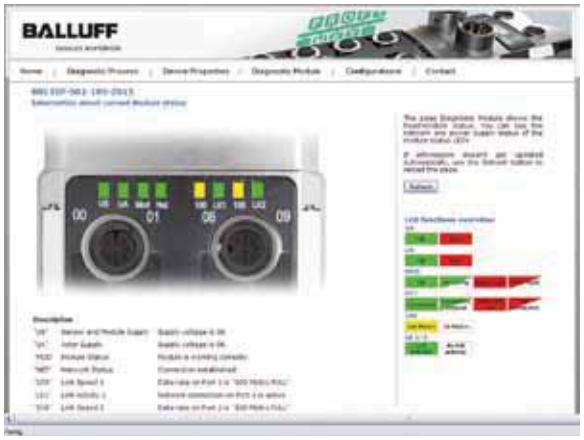


IO-Link



Webserver
For anyone that prefers a web interface, the Profinet modules from Balluff have an easily 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 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.

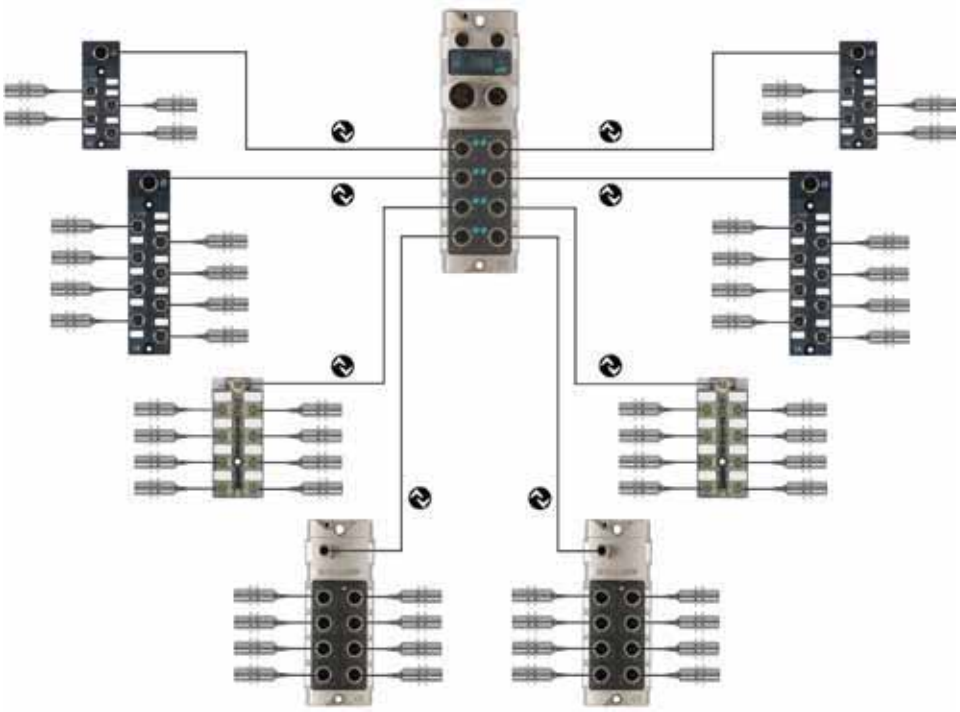
The module configuration, such as assigning or displaying the IP address, is concealed behind the "Configurations" function.

Profinet fieldbus module with eight IO-Link ports

136 IOs on a module
Balluff IO-Link solutions save cash money

Previously, at least nine fieldbus modules had to be used for the capability to activate 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 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.

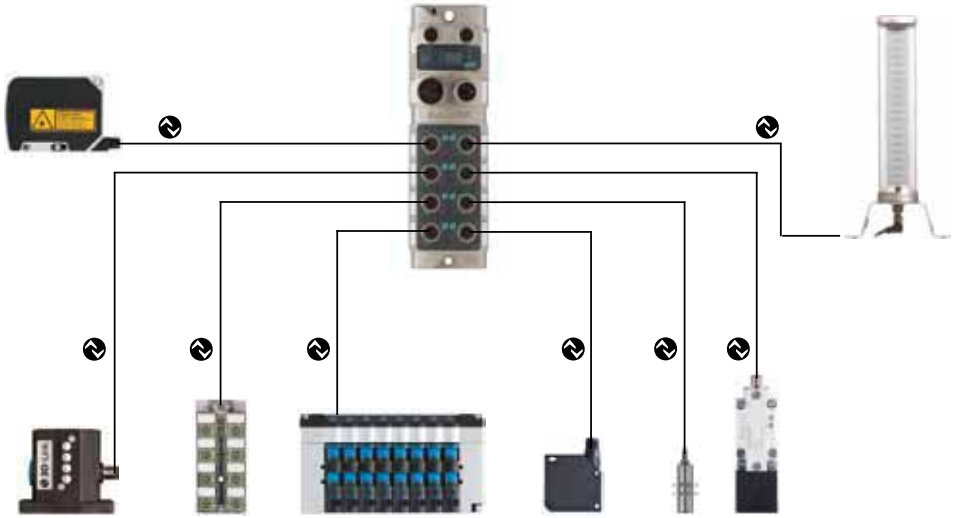


1000 tasks, one module:
The Profinet module with eight IO-Link ports

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.

During field installation of intelligent devices, there are frequently high costs, as shielded cable and intelligent interface cards such as analog input cards are used in the controller. IO-Link not only makes error-prone analog inputs superfluous, it 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.



Second generation with display, integrated switch and web server

For high-performance applications, consider the Profinet IO-Link master interface, which also supports isochronal realtime (IRT) using ERTEC 200.

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 have 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.

Profinet is increasingly becoming the communications medium of the future for mechanical and plant engineering. In some areas, it has already incrementally replaced the Profibus. Based on Ethernet, communication over Profinet is significantly faster, and the volume of data is significantly higher than with classic fieldbus systems and allows the connection of time-critical drive technology. Furthermore, Profinet is quick to install and integrates easily into existing networks. In addition to time savings and considerable cost savings comes the added benefit of ease of operation. This is because only Balluff provides Profinet modules with a display that allows IP addresses to be blocked, protecting the modules from accidental changes. This increases security and simplifies maintenance.

Naturally, even in the second generation of Profinet modules, IO-Link is a firmly entrenched part. The Profinet module with IO-Link functionality has four or eight IO-Link master ports, which the user can configure and use completely independently of one another. You get four additional, freely configurable standard-I/O ports, which make an additional eight inputs/outputs available for standard sensors and actuators.

As a new feature, the second generation of Profinet provides an integrated 2-port Ethernet switch that makes it possible to install a linear topology in the system without an additional external switch.

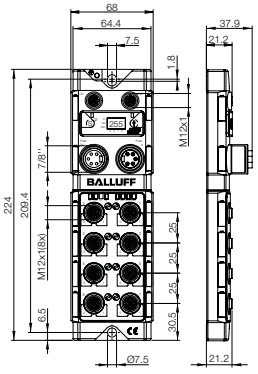
Also new in this generation is the integrated webserver.

Fieldbus		Profinet
Version		8× IO-Link, 16× DI/DO
Ordering code		**BNI005H**
Part number		BNI PNT-508-105-Z015
Supply voltage U_B		18...30 V DC
Function indicator		BUS/RUN
Indicators/input		Display/pushbutton
Module status indicator: Mod LED		Yes
Network status indicator: Net LED		Yes
Port status indicator		Black, red, yellow
Connection: Fieldbus		M12, D-coded, female
Connection: AUX power		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		1.2 A/2 A
Port status indicator (signal status)		Yellow LED
Port diagnostic indicator (overload)		Red LED
Total current $U_{Actuator}$		≤ 9 A
Total current U_{Sensor}		≤ 9 A
Degree of protection as per IEC 60529		IP 67 (when screwed into place)
Operating temperature T_a		–5...+70 °C
Storage temperature		–25...+70 °C
Fastener		2 mounting holes
Dimensions (L×W×H)		225×68×36.9 mm
Housing material		Nickel-plated GdZn

IO-Link Version 1.1

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

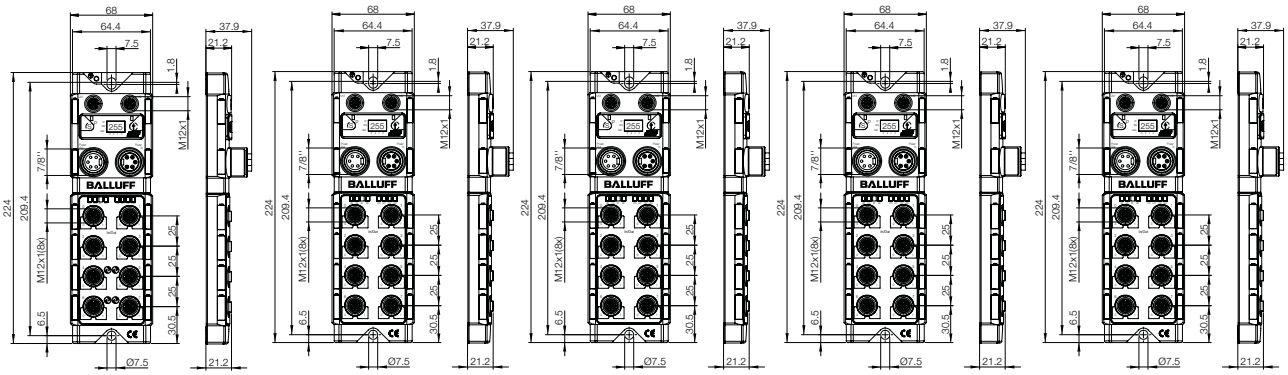
IO-Link
Version 1.1



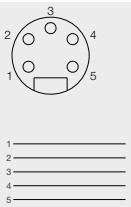
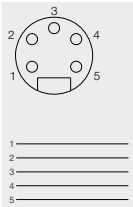
All modules include four screw plugs and a label set.

	Profinet	Profinet	Profinet	Profinet	Profinet
	4× IO-Link, 16× DI/DO	16× DI/DO, configurable	16 DI	8 DO	8 DI/8 DO
	BNI004U	**BNI0052**	**BNI0053**	**BNI005F**	**BNI005K**
	BNI PNT-502-105-Z015	BNI PNT-302-105-Z015	BNI PNT-104-105-Z015	BNI PNT-202-105-Z015	BNI PNT-305-105-Z015
	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-coded, female	M12, D-coded, female	M12, D-coded, female	M12, D-coded, female	M12, D-coded, 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
	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 screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	225×68×36.9 mm	225×68×36.9 mm	225×68×36.9 mm	175×68×36.9 mm	300×68×36.9 mm
	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn

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

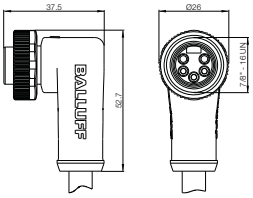


Power cables 7/8", 5-pin

Connector diagram and wiring	 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
Type	Female	Female
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	5×1.5 mm²	5×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

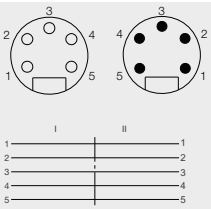
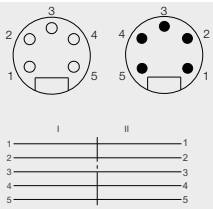
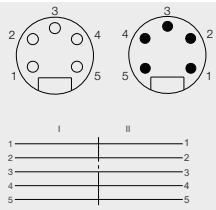
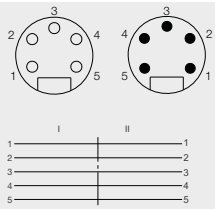
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.6 m		
PUR	Black	2 m	**BCC06HC** BCC A315-0000-10-063-PX05A5-020	**BCC06HH** BCC A325-0000-10-063-PX05A5-020
PUR	Black	5 m	**BCC06HE** BCC A315-0000-10-063-PX05A5-050	**BCC06HJ** BCC A325-0000-10-063-PX05A5-050
PUR	Black	10 m	**BCC06HF** BCC A315-0000-10-063-PX05A5-100	**BCC06HK** BCC A325-0000-10-063-PX05A5-100
PUR	Black	15 m		

Other cable materials, colors, and lengths on request.



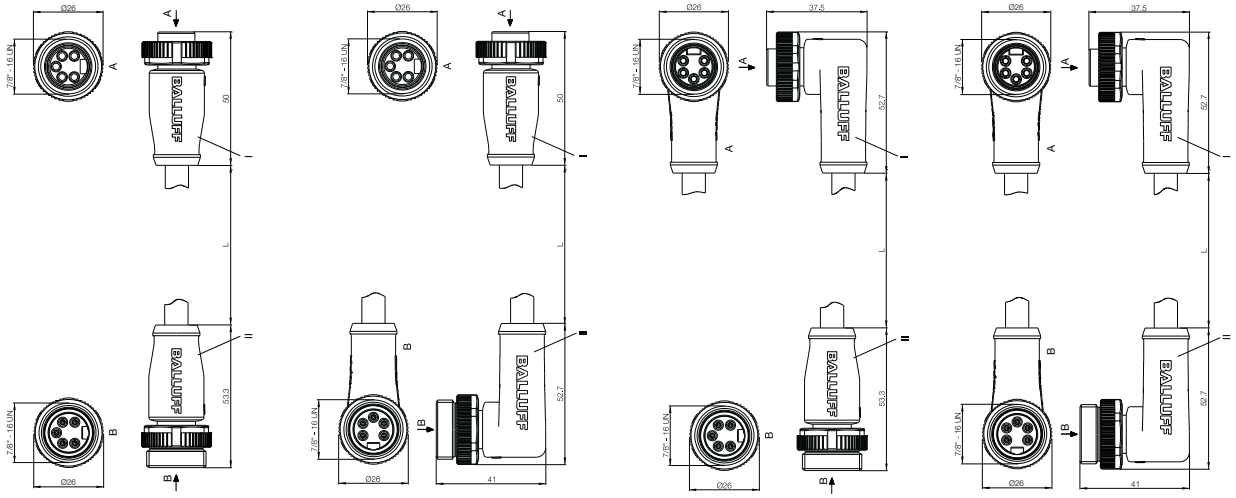
Power connection cables 7/8", 5-pin

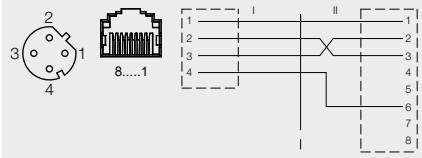


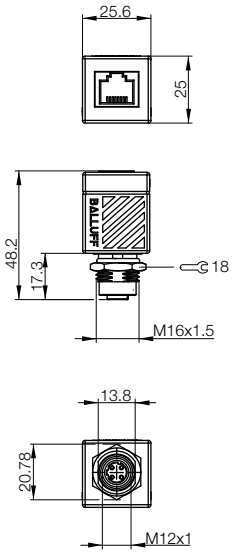
Female/male	Female/male	Female/male	Female/male
300 V DC	300 V DC	300 V DC	300 V DC
5×1.5 mm²	5×1.5 mm²	5×1.5 mm²	5×1.5 mm²
IP 68	IP 68	IP 68	IP 68
–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C

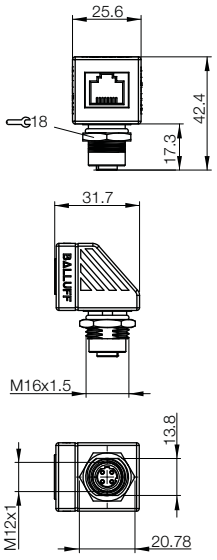
Ordering code			
Part number			
BCC06FM	**BCC06FU**	**BCC06H1**	**BCC06H6**
BCC A315-A315-30-335-PX05A5-006	BCC A315-A325-30-335-PX05A5-006	BCC A325-A315-30-335-PX05A5-006	BCC A325-A325-30-335-PX05A5-006
BCC06FN	**BCC06FW**	**BCC06H2**	**BCC06H7**
BCC A315-A315-30-335-PX05A5-020	BCC A315-A325-30-335-PX05A5-020	BCC A325-A315-30-335-PX05A5-020	BCC A325-A325-30-335-PX05A5-020
BCC06FP	**BCC06FY**	**BCC06H3**	**BCC06H8**
BCC A315-A315-30-335-PX05A5-050	BCC A315-A325-30-335-PX05A5-050	BCC A325-A315-30-335-PX05A5-050	BCC A325-A325-30-335-PX05A5-050
BCC06FR	**BCC06FZ**	**BCC06H4**	**BCC06H9**
BCC A315-A315-30-335-PX05A5-100	BCC A315-A325-30-335-PX05A5-100	BCC A325-A315-30-335-PX05A5-100	BCC A325-A325-30-335-PX05A5-100
BCC06FT	**BCC06H0**	**BCC06H5**	**BCC06HA**
BCC A315-A315-30-335-PX05A5-150	BCC A315-A325-30-335-PX05A5-150	BCC A325-A315-30-335-PX05A5-150	BCC A325-A325-30-335-PX05A5-150

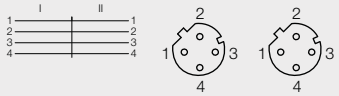


Connector diagram and wiring		
Type	M12 female straight/RJ45 straight, pass-thru	M12 female straight/RJ45 right angle, pass-thru
Coding	D-coded/no coding	D-coded/no coding
Supply voltage U_B	60 V AC/DC	60 V AC/DC
Degree of protection	IP 20	IP 20
Ambient temperature T_a	–25...+85 °C	–25...+85 °C
Mounting thread	M16	M16

	Ordering code	
	Part number	
	BCC085F	**BCC085H**
	BCC M414-E814-BG-RM013-000	BCC M424-E814-BG-RM013-000

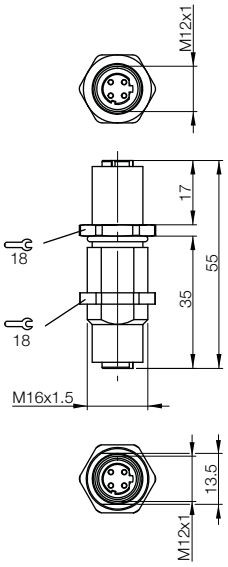






	M12 female straight/M12 female straight, pass-thru		
	D-coded		
	60 V AC/DC		
	IP 67		
	–25...+80 °C		
	M16		

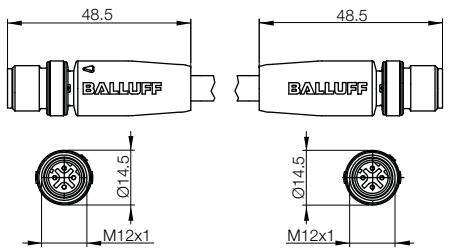
	Ordering code		
	Part number		
	BCC06YP		
	BCC M454-M454-5D-RM002-000		



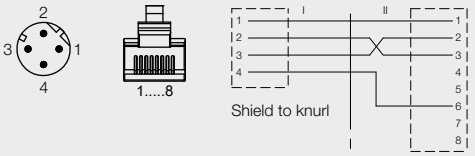
Bus connection cables M12, 4-pin, D-coded

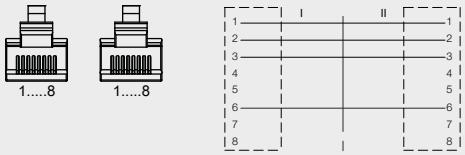
Connector diagram and wiring		
Type	M12 male straight/M12 male straight	
Supply voltage U_B	60 V AC/DC	
Number of conductors × conductor cross-section	4×22 AWG	
Degree of protection as per IEC 60529	IP 68	
Ambient temperature T_a	–20...+60 °C	

Cable material	Color	Length	Ordering code Part number	
PUR shielded	Green	0.6 m	**BCC04K0** BCC M414-M414-6D-331-PS54T2-006	
PUR shielded	Green	2 m	**BCC04K1** BCC M414-M414-6D-331-PS54T2-020	
PUR shielded	Green	5 m	**BCC04K2** BCC M414-M414-6D-331-PS54T2-050	
PUR shielded	Green	10 m	**BCC04K3** BCC M414-M414-6D-331-PS54T2-100	
PUR shielded	Green	15 m	**BCC04ZH** BCC M414-M414-6D-331-PS54T2-150	
PUR shielded	Green	20 m	**BCC04K4** BCC M414-M414-6D-331-PS54T2-200	
PUR shielded	Green	30 m	**BCC04K5** BCC M414-M414-6D-331-PS54T2-300	



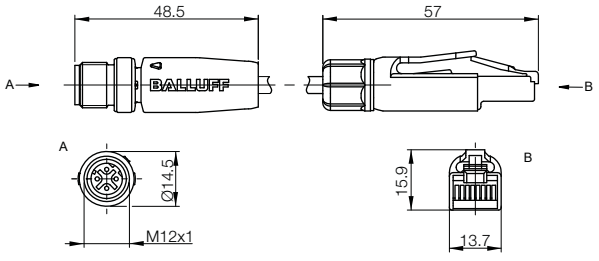
Bus connection cables M12, 4-pin, D-coded and RJ45

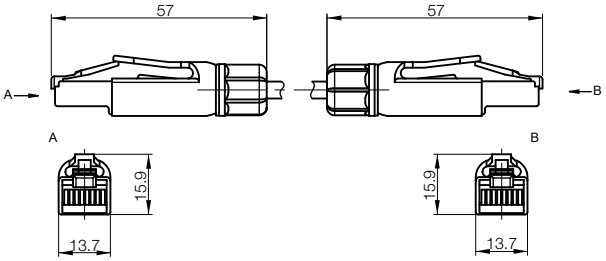




M12 male straight/RJ45 male straight	RJ45 male straight/RJ45 male straight
60 V AC/DC	60 V AC/DC
4×22 AWG	4×22 AWG
IP 68/IP 20	IP 20
–20...+60 °C	–20...+60 °C

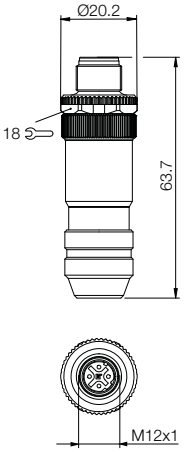
Ordering code	
Part number	
BCC04K6	**BCC04KE**
BCC M414-E834-8G-668-PS54T2-006	BCC E834-E834-90-334-PS54T2-006
BCC04K7	**BCC04KF**
BCC M414-E834-8G-668-PS54T2-020	BCC E834-E834-90-334-PS54T2-020
BCC04K8	**BCC04KH**
BCC M414-E834-8G-668-PS54T2-050	BCC E834-E834-90-334-PS54T2-050
BCC04K9	**BCC04KJ**
BCC M414-E834-8G-668-PS54T2-100	BCC E834-E834-90-334-PS54T2-100
BCC04ZJ	**BCC04ZK**
BCC M414-E834-8G-668-PS54T2-150	BCC E834-E834-90-334-PS54T2-150
BCC04KA	**BCC04KK**
BCC M414-E834-8G-668-PS54T2-200	BCC E834-E834-90-334-PS54T2-200
BCC04KC	**BCC04KL**
BCC M414-E834-8G-668-PS54T2-300	BCC E834-E834-90-334-PS54T2-300

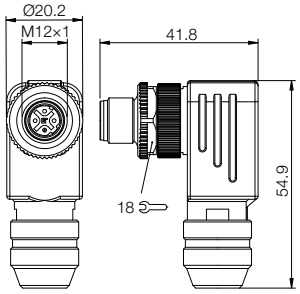




Bus connector M12, 4-pin, D-coded, User-fabricated, shieldable

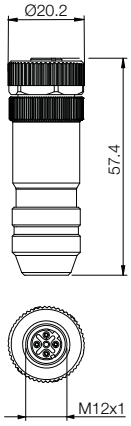
Connector diagram and wiring			
Connector	M12 male, straight	M12 male, right-angle	
Version	4-pin, D-coded	4-pin, D-coded	
Ordering code	**BCC03WZ**	**BCC03Y0**	
Part number	BCC M474-0000-2D-000-51X475-000	BCC M484-0000-2D-000-51X475-000	
Nominal voltage	60 V AC/DC	60 V AC/DC	
Number of connections	4	4	
Number of conductors × Cross-section	4×0.75 mm²	4×0.75 mm²	
Cable diameter	Max. 8 mm	Max. 8 mm	
Connection	Cage clamp	Screw plug	
Degree of protection as 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	

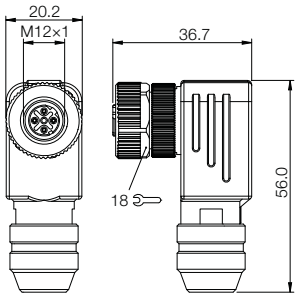


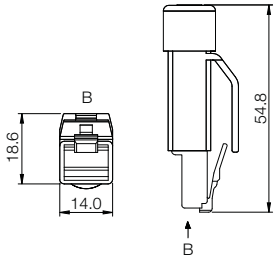


Bus connector M12, 4-pin, D-coded, User-fabricated, shieldable

M12 female, straight	M12 female, right-angle	RJ45 male, straight
4-pin, D-coded	4-pin, D-coded	No coding
BCC03Y1	**BCC03Y2**	**BCC06FH**
BCC M474-0000-1D-000-51X475-000	BCC M484-0000-1D-000-51X475-000	BCC E834-0000-20-000-53X4T2-000
60 V AC/DC	60 V AC/DC	60 V AC/DC
4	4	8
4×0.75 mm²	4×0.75 mm²	244× 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



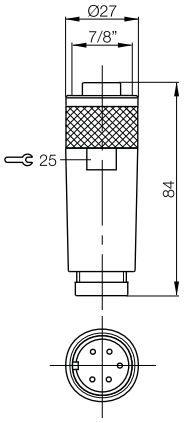


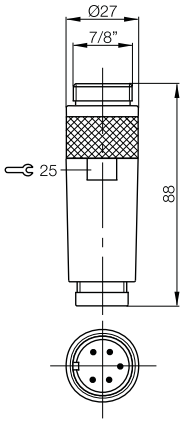


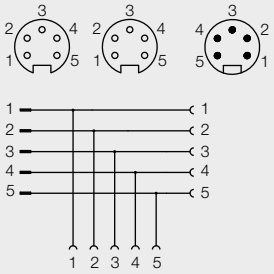
Power plug connector, 7/8", 5-pin

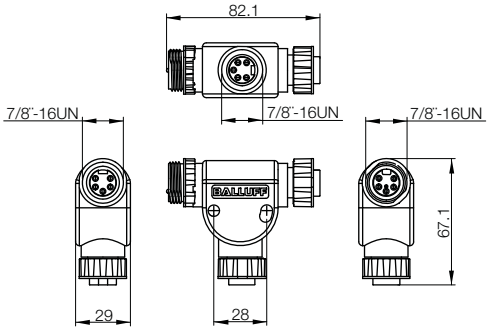
Connector diagram and wiring		
Type	Female	Male
Supply voltage U_B	300 V	300 V
Number of conductors × conductor cross-section	5× max. 1.5 mm²	5× max. 1.5 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

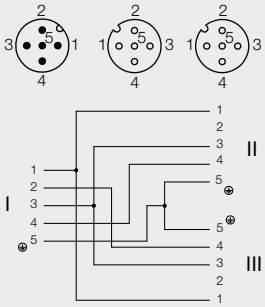
Cable material Cable dia.	Color	Ordering code Part number	
PUR 6...8 mm	Black	**BCC070E** BCC A335-0000-10-000-51X5A5-000	**BCC070J** BCC A335-0000-20-000-51X5A5-000
PUR 8...10 mm	Black	**BCC070F** BCC A335-0000-10-000-61X5A5-000	**BCC070K** BCC A335-0000-20-000-61X5A5-000
PUR 10...12 mm	Black	**BCC070H** BCC A335-0000-10-000-71X5A5-000	**BCC070L** BCC A335-0000-20-000-71X5A5-000

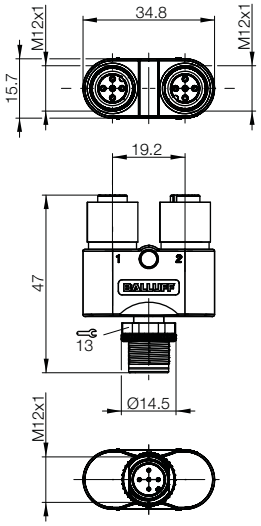


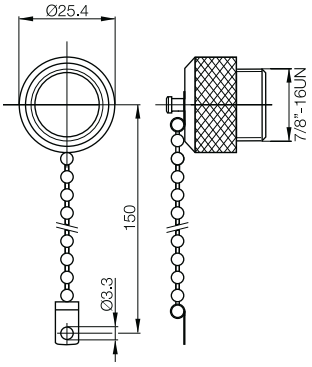


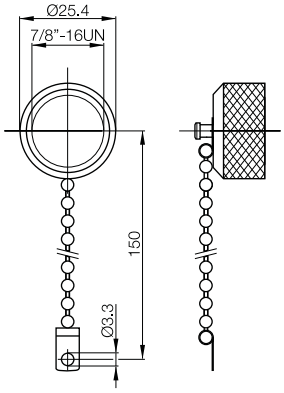
Connector diagram and wiring		
Configuration	7/8" power distributor	
Version	Standard, 5-pin	
Type	Female/male	
Ordering code	**BCC0AA7**	
Part number	BCC A315-A315-A315-T0023-000	
Supply voltage U_B	300 V AC	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	–40...+90 °C	
Housing material	Plastic	



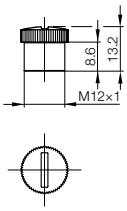
Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

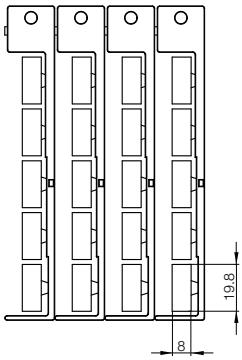







Description	M12 locking screw	Marking sleeve	Label set	
Use	IP 65 screw plug for unused ports	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...	
Ordering code	**BAM01C2**		**BAM01AT**	
Part number	BAM CS-XA-002-M12-A	BAM IA-CC-002-01	BNI ACC-L01-000	
Ambient temperature T_a	–20...+80 °C			
Housing material	Plastic		Plastic	



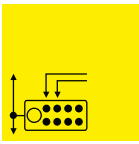


3-wire connector BCC; see the chapter "Connectors and Cables" beginning on **page 270.**

Fieldbus Systems

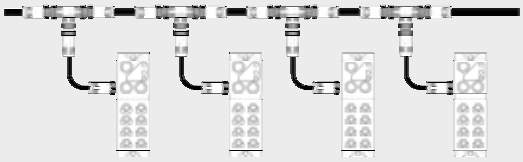
Fieldbus System: CC-Link

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.

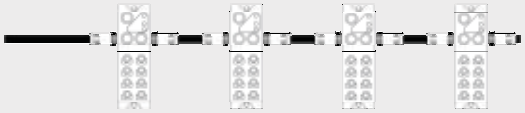


Product topology

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 cabling 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, which 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.

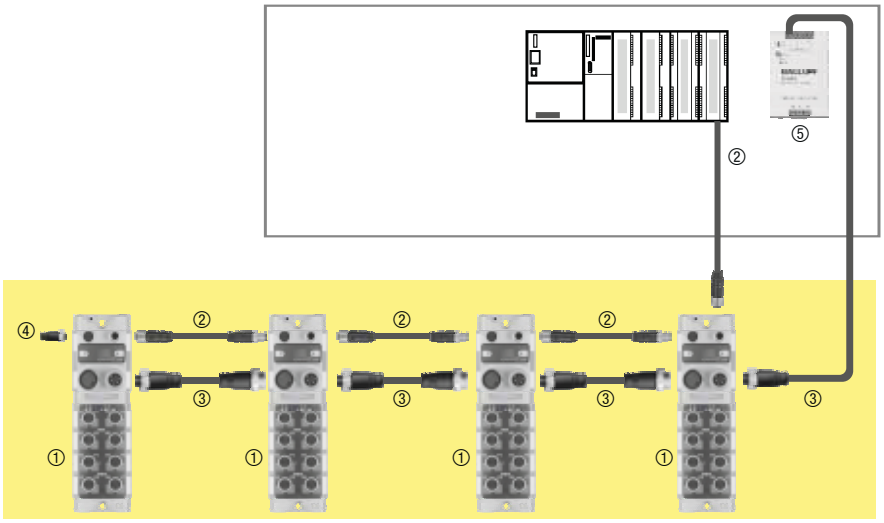
Powerful and safe outputs
With an output current of up to **2 amps**, Balluff output modules are capable of driving almost any load. Each output also offers an overload protection with LED indicator and a memory feature for easy troubleshooting.

Robust, full-metal housing
The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it and costs the same as 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 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.



① **CC-Link module BNI**	Page 64
② **Bus cable BCC**	Page 68
③ **Power cable BCC**	Page 66
④ **Terminating resistor**	Page 70
⑤ **Power supplies BAE**	Page 365

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

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

CC-Link with IO-Link functionality

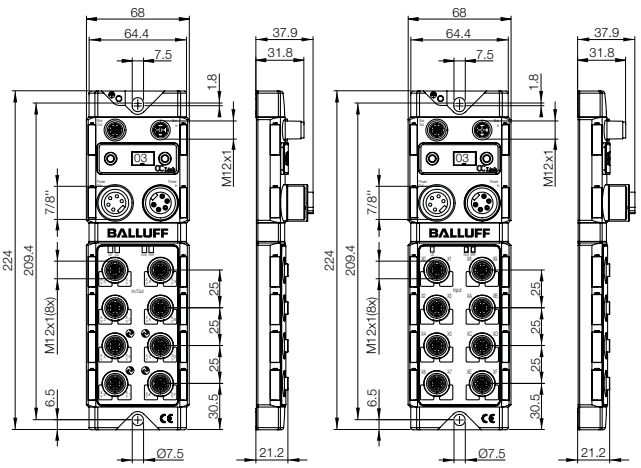
A module with four IO-Link ports is now available in addition to the CC-Link fieldbus modules.

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.

Fieldbus	CC-Link	CC-Link
Version	4× IO-Link, 12 DI/DO PNP	16 DI NPN
Ordering code	**BNI0040**	**BNI0049**
Part number	BNI CCL-502-100-Z001	BNI CCL-106-100-Z001
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
Connection: Fieldbus	M12, 5-pin, female and male	M12, 5-pin, female and male
Supply voltage connection	7/8", 5-pin, female and male	7/8", 5-pin, female and male
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8
Number of inputs	max. 12 PNP	16 NPN
Number of outputs	max. 12 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	≤ 9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Operating temperature T_a	–5...+70 °C	–5...+55 °C
Storage temperature	–25...+70 °C	–25...+75 °C
Weight	Approx. 577 g	Approx. 577 g
Fastener	2 mounting holes	2 mounting holes
Dimensions (L×W×H)	224×68×36.9 mm	224×68×36.9 mm
Housing material	Nickel-plated GdZn	Nickel-plated GdZn

IO-Link Version 1.1

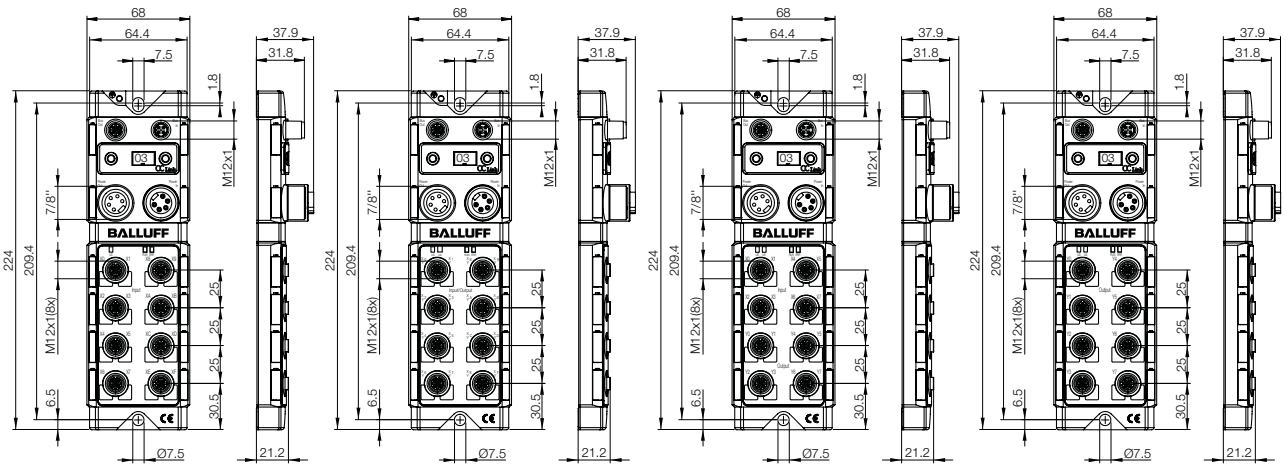
No. of IO-Link master ports		4× master
Operating modes (3-wire)		SIO, COM 1, COM 2, COM 3
Indicators	Communication	Green LED
	Error	Red LED
Max. load current for IO-Link device		1.6 A



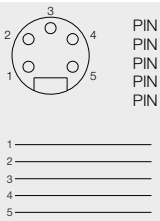
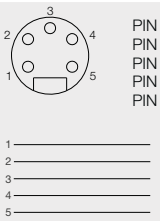
All modules include four screw plugs and a label set.




	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**
	BNI CCL-104-100-Z001	BNI CCL-302-100-Z001	BNI CCL-305-100-Z001	BNI CCL-202-100-Z001
	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, female and male	M12, 5-pin, female and male	M12, 5-pin, female and male	M12, 5-pin, female and male
	7/8", 5-pin, female and male	7/8", 5-pin, female and male	7/8", 5-pin, female and male	7/8", 5-pin, female and male
	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	
		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
	≤ 9 A	≤ 9 A	≤ 9 A	≤ 9 A
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–5...+55 °C	–5...+55 °C	–5...+55 °C	–5...+55 °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
	224×68×36.9 mm	224×68×36.9 mm	224×68×36.9 mm	224×68×36.9 mm
	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn

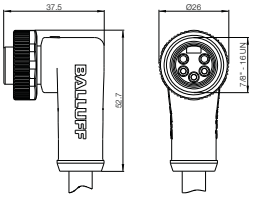


Power cables 7/8", 5-pin

Connector diagram and wiring	 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
Type	Female	Female
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	5×1.5 mm²	5×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

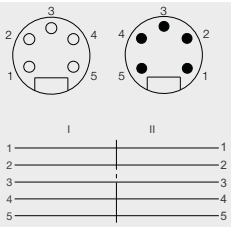
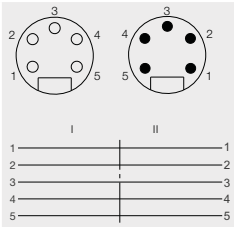
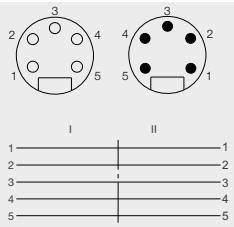
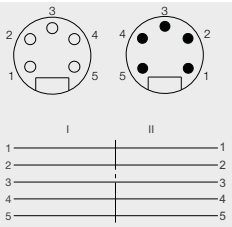
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.6 m		
PUR	Black	2 m	**BCC06HC** BCC A315-0000-10-063-PX05A5-020	**BCC06HH** BCC A325-0000-10-063-PX05A5-020
PUR	Black	5 m	**BCC06HE** BCC A315-0000-10-063-PX05A5-050	**BCC06HJ** BCC A325-0000-10-063-PX05A5-050
PUR	Black	10 m	**BCC06HF** BCC A315-0000-10-063-PX05A5-100	**BCC06HK** BCC A325-0000-10-063-PX05A5-100
PUR	Black	15 m		

Other cable materials, colors, and lengths on request.



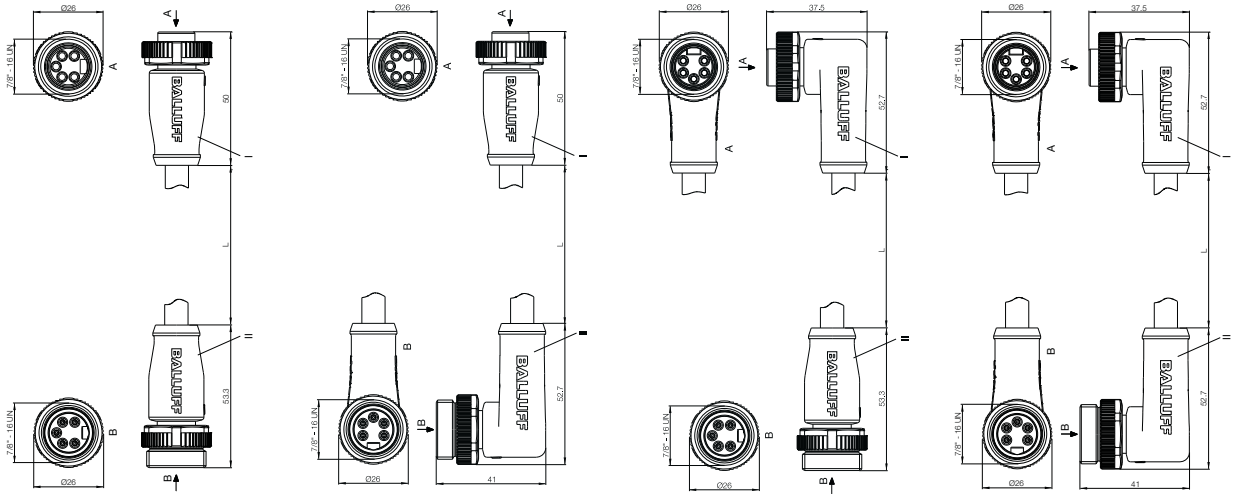
Power connection cables 7/8", 5-pin



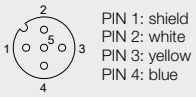
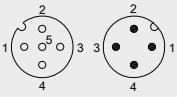






Female/male	Female/male	Female/male	Female/male
300 V DC	300 V DC	300 V DC	300 V DC
5×1.5 mm²	5×1.5 mm²	5×1.5 mm²	5×1.5 mm²
IP 68	IP 68	IP 68	IP 68
–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C

Ordering code			
Part number			
BCC06FM	**BCC06FU**	**BCC06H1**	**BCC06H6**
BCC A315-A315-30-335-PX05A5-006	BCC A315-A325-30-335-PX05A5-006	BCC A325-A315-30-335-PX05A5-006	BCC A325-A325-30-335-PX05A5-006
BCC06FN	**BCC06FW**	**BCC06H2**	**BCC06H7**
BCC A315-A315-30-335-PX05A5-020	BCC A315-A325-30-335-PX05A5-020	BCC A325-A315-30-335-PX05A5-020	BCC A325-A325-30-335-PX05A5-020
BCC06FP	**BCC06FY**	**BCC06H3**	**BCC06H8**
BCC A315-A315-30-335-PX05A5-050	BCC A315-A325-30-335-PX05A5-050	BCC A325-A315-30-335-PX05A5-050	BCC A325-A325-30-335-PX05A5-050
BCC06FR	**BCC06FZ**	**BCC06H4**	**BCC06H9**
BCC A315-A315-30-335-PX05A5-100	BCC A315-A325-30-335-PX05A5-100	BCC A325-A315-30-335-PX05A5-100	BCC A325-A325-30-335-PX05A5-100
BCC06FT	**BCC06H0**	**BCC06H5**	**BCC06HA**
BCC A315-A315-30-335-PX05A5-150	BCC A315-A325-30-335-PX05A5-150	BCC A325-A315-30-335-PX05A5-150	BCC A325-A325-30-335-PX05A5-150

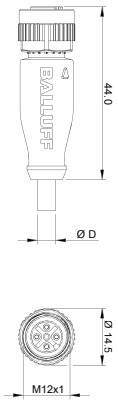


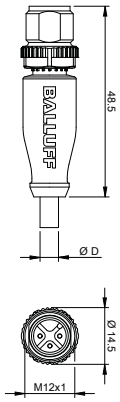
Bus cable M12, 4-pin, A-coded

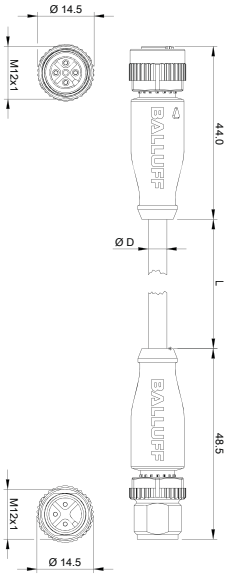
Connector diagram and wiring	 PIN 1: shield PIN 2: white PIN 3: yellow PIN 4: blue	 PIN 1: shield PIN 2: white PIN 3: yellow PIN 4: blue	 PIN 1: shield PIN 2: white PIN 3: yellow PIN 4: blue
Type	Female	Male	Female/male
Supply voltage U_B	250 V	250 V	250 V
Number of conductors × conductor cross-section	3×1×AWG20	3×1×AWG20	3×1×AWG20
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	–25...+70 °C	–25...+70 °C	–25...+70 °C

Cable material	Color	Length	Ordering code Part number		
PVC	Red	0.6 m			**BCC06WU** BCC M415-M414-3A-337-VS24N7-006
PVC	Red	2 m	**BCC06Y1** BCC M415-0000-1A-068-VS24N7-020	**BCC084R** BCC M414-0000-2A-068-VS24N7-020	**BCC06WW** BCC M415-M414-3A-337-VS24N7-020
PVC	Red	5 m	**BCC06Y2** BCC M415-0000-1A-068-VS24N7-050	**BCC084T** BCC M414-0000-2A-068-VS24N7-050	**BCC06WY** BCC M415-M414-3A-337-VS24N7-050
PVC	Red	10 m	**BCC06Y3** BCC M415-0000-1A-068-VS24N7-100	**BCC084U** BCC M414-0000-2A-068-VS24N7-100	**BCC06WZ** BCC M415-M414-3A-337-VS24N7-100
PVC	Red	15 m			**BCC06Y0** BCC M415-M414-3A-337-VS24N7-150

Other cable materials, colors and lengths on request.





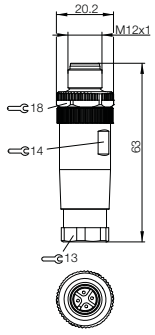


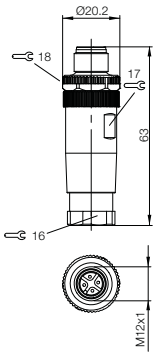
Bus connector M12, 4-pin, A-coded, User-fabricated, shieldable

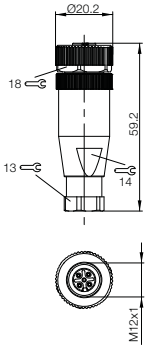


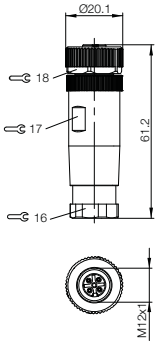

Connector diagram				
Version	M12 male, straight	M12 male, straight	M12 female straight	M12 female straight
Max. supply voltage AC U_B	250 V AC	250 V AC	250 V AC	250 V AC
Max. supply voltage DC U_B	250 V DC	250 V DC	250 V DC	250 V DC
Cable	User-fabricated	User-fabricated	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	4×0.14...0.75 mm²	4×0.14...0.50 mm²	4×0.14...0.75 mm²	4×0.14...0.50 mm²
Connection	Screw terminal	Spring clamp terminal	Screw terminal	Spring clamp terminal
Degree of protection as 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

Cable dia.	Ordering code			
	Part number			
6...8 mm	**BCC06F7**	**BCC06Y5**	**BCC06F6**	**BCC06Y6**
	BCC M434-0000-2A-000-51X475-000	BCC M434-0000-2A-000-55X450-000	BCC M435-0000-1A-000-51X475-000	BCC M435-0000-1A-000-55X450-000

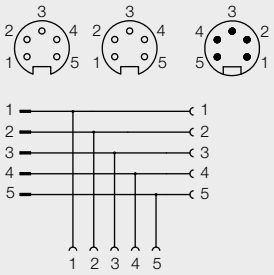
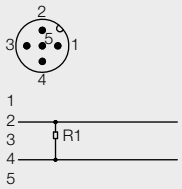


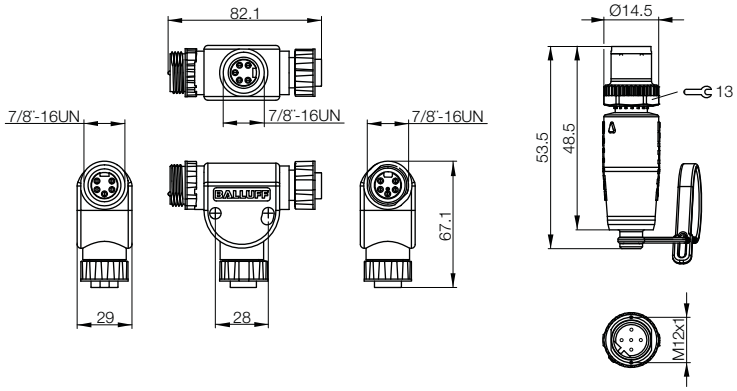


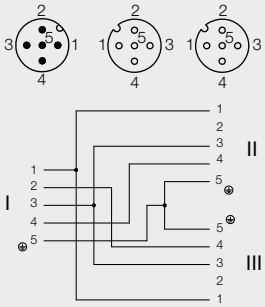


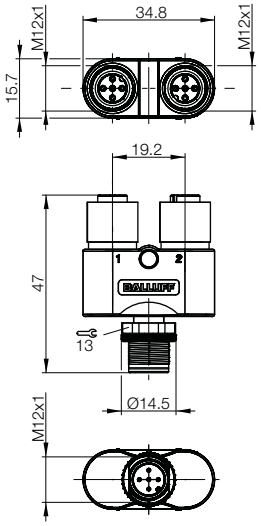


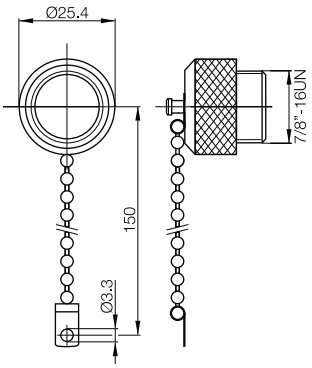
Power tee, terminating resistor

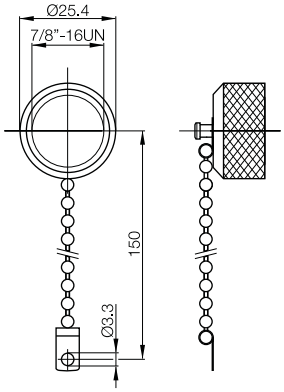
Connector diagram and wiring			
Configuration	7/8" power distributor	M12 terminating resistor	
Version	Standard, 5-pin	A-coded, 5-pin	
Type	Female/male		
Ordering code	**BCC0AA7**	**BCC06Y4**	
Part number	BCC A315-A315-A315-T0023-000	BCC M415-0000-2A-R03	
Supply voltage U_B	300 V AC	10...30 V DC	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	–40...+90 °C	–40...+85 °C	
Housing material	Plastic	Plastic	



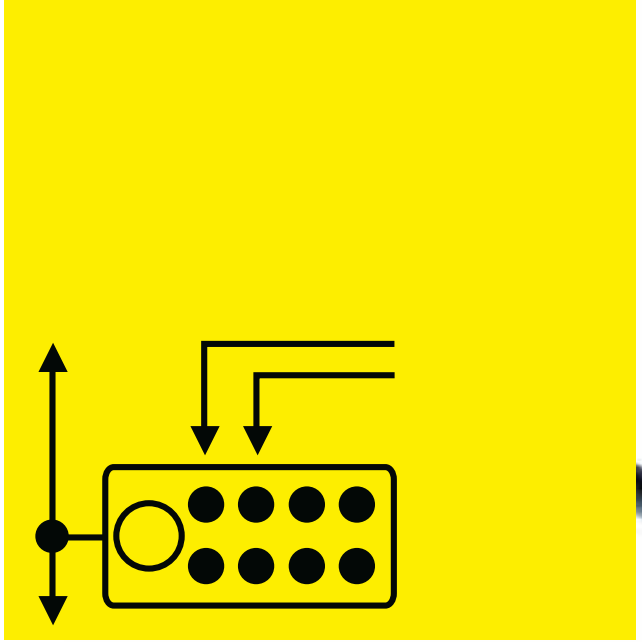
Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn







Description	M12 locking screw	Marking sleeve	Label set
Use	IP 65 screw plug for unused ports	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...
Ordering code	**BAM01C2**		**BAM01AT**
Part number	BAM CS-XA-002-M12-A	BAM IA-CC-002-01	BNI ACC-L01-000
Housing material	Plastic		Plastic



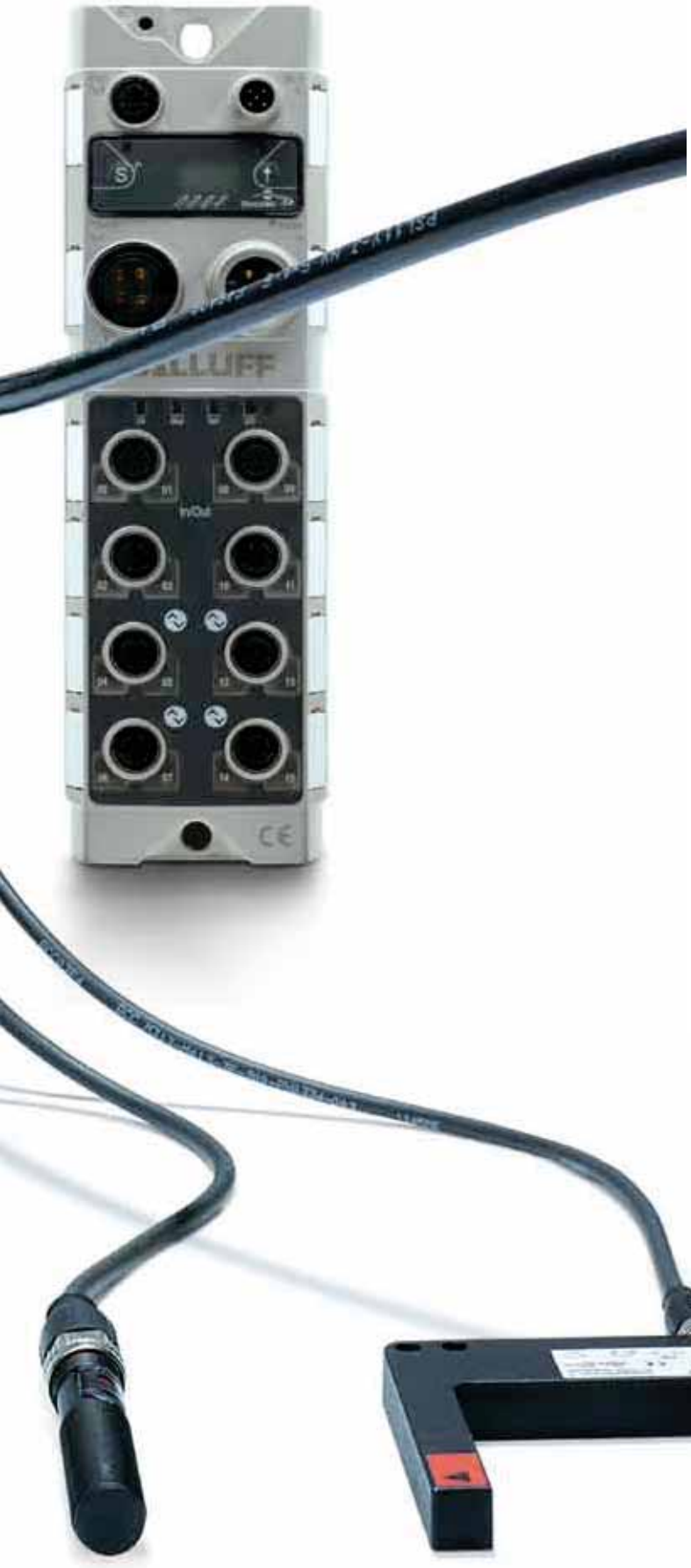
Fieldbus Systems

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 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.

Contents



DeviceNet™

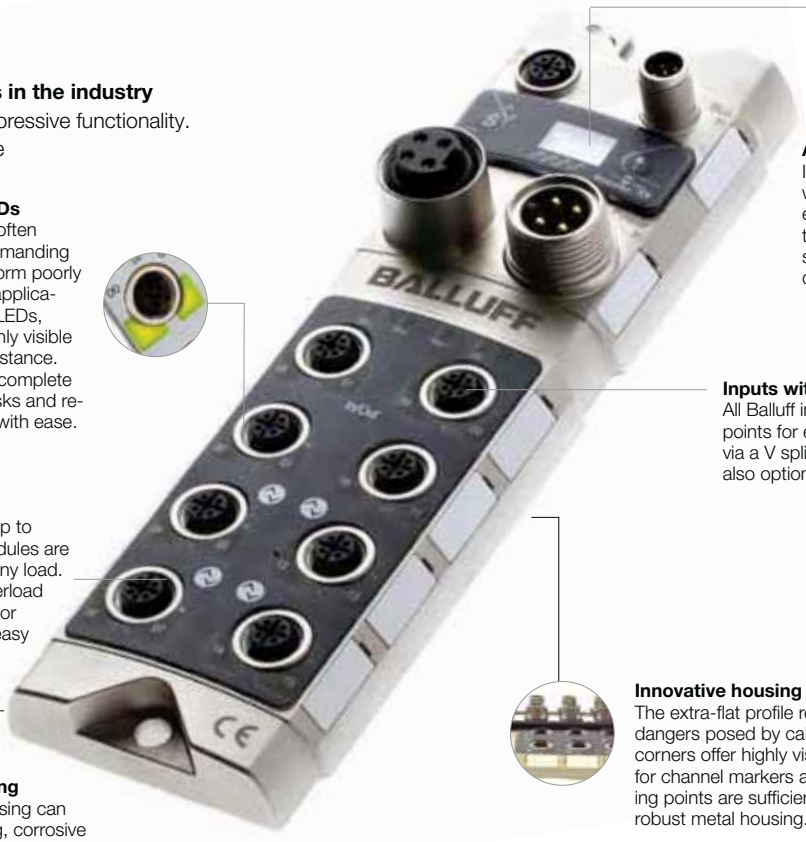
Product topology

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, which 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 safe outputs
With an output current of up to **2 amps**, 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 and costs the same as a plastic housing.



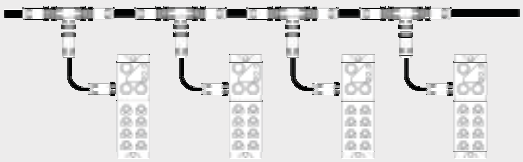
Addressable display
IP address, subnet mask and gateway address appear on the illuminated display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).

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

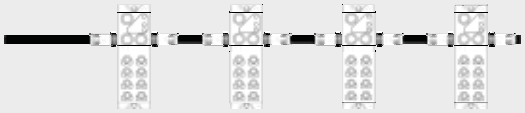
Innovative housing design
The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers and two mounting points are sufficient to secure the robust metal housing.

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.

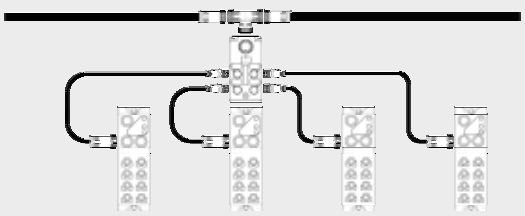
Trunk and drop
- Very simple troubleshooting
- A single device can be disconnected without disrupting the network
- Extra cable requirements result in higher costs



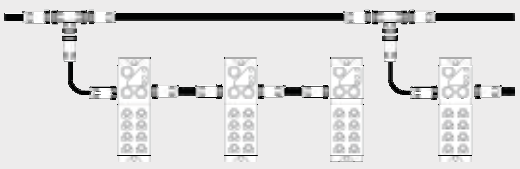
Connected in series
- Difficult troubleshooting
- Disconnecting a device interrupts the network
- Lower costs due to fewer cabling components



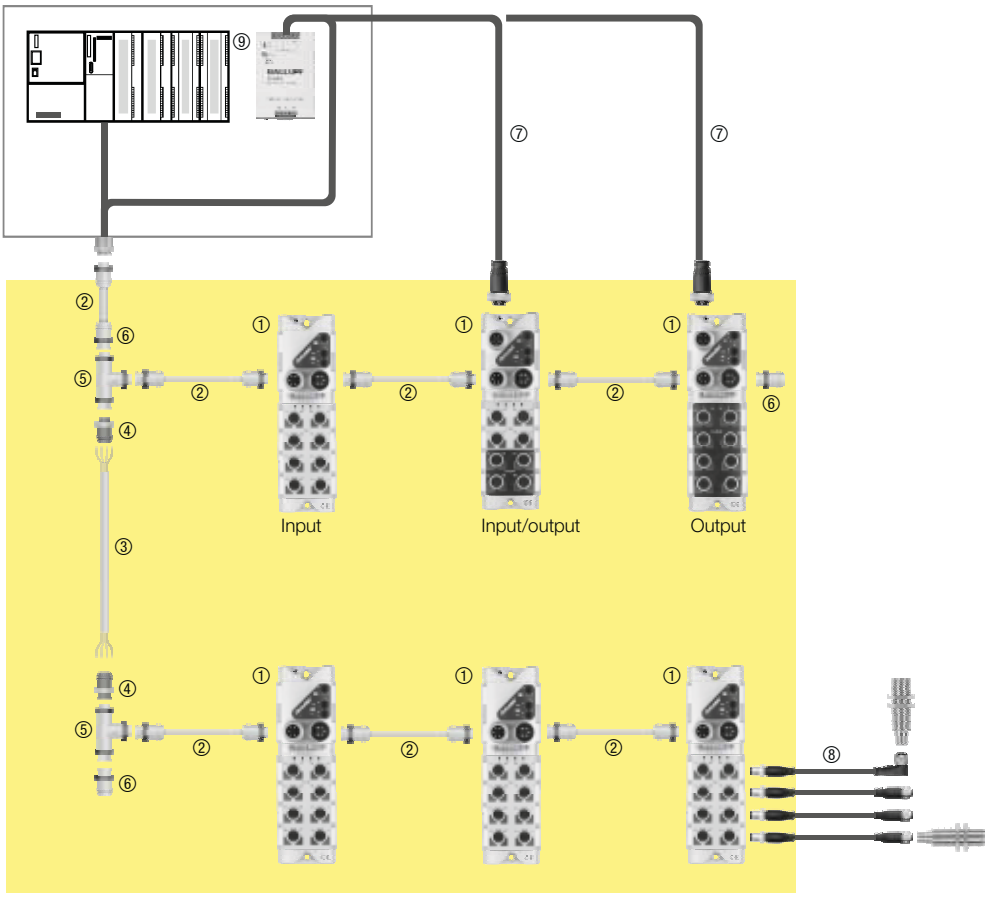
Star
- Simple troubleshooting
- Ideal for large I/O clusters
- Less expensive – only one splitter box needed



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



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 76
②	**Bus cables BCC**	Page 80
③	**Network cables**	
④	**Field attachable bus connectors BCC**	Page 89
⑤	**Bus tees BCC**	Page 87
⑥	**Bus terminating resistors BCC**	Page 86
⑦	**Power cables BCC**	Page 82
⑧	**Connection cables BCC**	Page 336
⑨	**Power supplies BAE**	Page 365

BNI DNT-502-100-Z001
- 4 IO-Link master ports
- SIO, COM 1, COM 2, COM 3
- IO-Link version 1.1
- 4 additional I/O ports
- 16 I/O max.

BNI DNT-104-000-Z004
- 16 PNP inputs on 8 connections powered by the Devicenet™ network
- Short-circuit protected
- Short-circuit diagnostics
- I/O size: 4-byte input, 0-byte output

BNI DNT-202-000-Z005
- 8 sourcing outputs supplied via
- auxiliary power source
- Rated output current 2 A
- Resettable latching overload diagnostics at point level
- I/O size: 3-byte input, 2-byte output

BNI DNT-302-000-Z005
- 16 points configured as PNP inputs or sourcing outputs
- Inputs and outputs powered via auxiliary power source
- Rated output current 1.6 A
- Short circuit at point level and resettable overload diagnostics
- I/O size: 7-byte input, 4-byte output

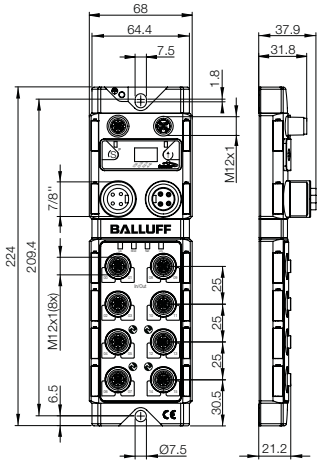
IO-Link Version 1.1

All modules include four screw plugs and a label set.

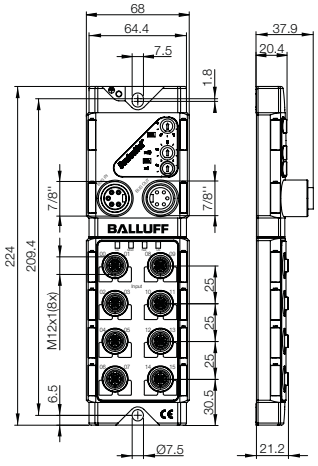
Fieldbus	Devicenet
Version	4× IO-Link, 16× I/O
Ordering code	**BNI005A**
Part number	BNI-DNT-502-100-Z001
Supply voltage U_B	18...30 V DC
Indicators/input	Display/pushbutton
Net function indicator	Green LED
Fault function indicator	Red LED
Module status indicator: Mod LED	Yes
Network status indicator: Net LED	Yes
Port status indicator	Black, red, yellow
Power-on indicator	V_A, V_S, undervoltage
Connection: Fieldbus	M12, B coded, socket/plug
Supply voltage 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	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 current $U_{Actuator}$	< 9 A
Total current U_{Sensor}	< 9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)
Operating temperature T_a	–5…+70 °C
Storage temperature	–25…+70 °C
Weight	Approx. 580 g
Fastener	2 mounting holes
Dimensions (L×W×H)	225×68×36.9 mm
Housing material	Nickel-plated GdZn

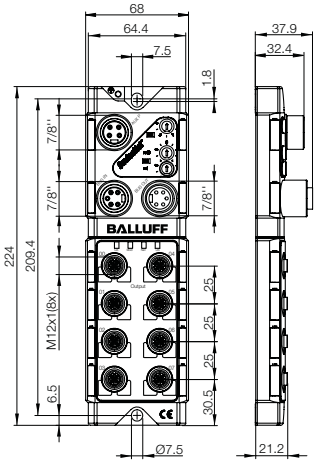
IO-Link Version 1.1

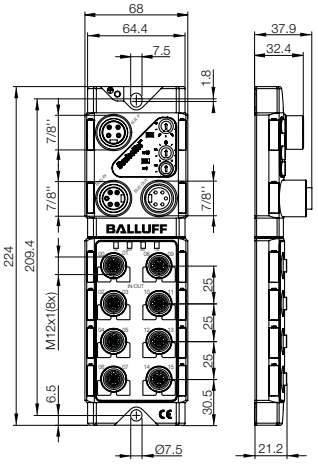
No. of IO-Link master ports		4× master
Operating modes (3-wire)		SIO, COM 1, COM 2, COM 3
Indicators	Communication	Green LED
	Error	Red LED
Max. load current for IO-Link device		1.6 A



	Devicenet	Devicenet	Devicenet
	16 DI	8 DO	16 DI/DO
	BNI0001	**BNI0002**	**BNI0003**
	BNI-DNT-104-000-Z004	BNI-DNT-202-000-Z005	BNI-DNT-302-000-Z005
	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" 5-pin female and male
		7/8" 4-pin male	7/8" 4-pin male
	M12, A-coded, male	M12, A-coded, male	M12, A-coded, male
	8	8	8
	16 PNP		16 PNP
		8 PNP	16 PNP
	No	No	Yes
	200 mA		200 mA
		2 A	2 A
	Green LED	Green LED	Green LED
	Red LED	Red LED	Red LED
		< 9 A	< 9 A
	< 9 A	< 9 A	< 9 A
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–5...+70 °C	–5...+70 °C	–5...+70 °C
	–25...+85 °C	–25...+85 °C	–25...+85 °C
	Approx. 580 g	Approx. 580 g	Approx. 580 g
	2 mounting holes	2 mounting holes	2 mounting holes
	225×68×36.9 mm	225×68×36.9 mm	225×68×36.9 mm
	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn



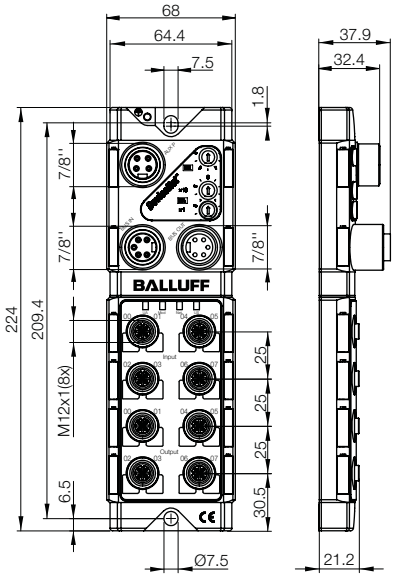




BNI DNT-305-000-Z005

- 8 PNP inputs and 8 sourcing outputs
- Inputs and outputs powered via auxiliary power source
- Rated output current 1.6 A
- Short circuit at point level and resettable overload diagnostics
- I/O size: 5-byte input, 2-byte output

Fieldbus	Devicenet
Version	8 DI + 8 DO
Ordering code	**BNI0004**
Part number	BNI-DNT-305-000-Z005
Supply voltage U_B	18...30 V DC
Net function indicator	Green LED
Fault function indicator	Red LED
Power-on indicator	Module, actuators
Connection: Fieldbus	7/8" 5-pin female and male
Supply voltage connection	7/8" 4-pin male
Connection: I/O ports	M12, A-coded, male
No. of I/O ports	8
Number of inputs	8 PNP
Number of outputs	8 PNP
Configurable	No
Max. load current, sensors/channel	200 mA
Max. load current, output	2 A
Port status indicator (signal status)	Green LED
Port diagnostic indicator (overload)	Red LED
Total current $U_{Actuator}$	< 9 A
Total current U_{Sensor}	< 9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)
Operating temperature T_a	–5...+70 °C
Storage temperature	–25...+85 °C
Weight	Approx. 580 g
Fastener	2 mounting holes
Dimensions (L×W×H)	225×68×36.9 mm
Housing material	Nickel-plated GdZn



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)

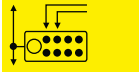
		Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IN	Word 0	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Word 1	S-15	S-14	S-13	S-12	S-11	S-10	S-9	S-8	S-7	S-6	S-5	S-4	S-3	S-2	S-1	S-0
	Word 2	OL-15	OL-14	OL-13	OL-12	OL-11	OL-10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

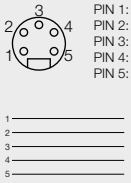
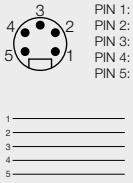
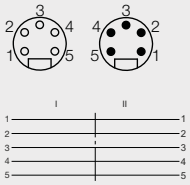
Bitmap legend

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

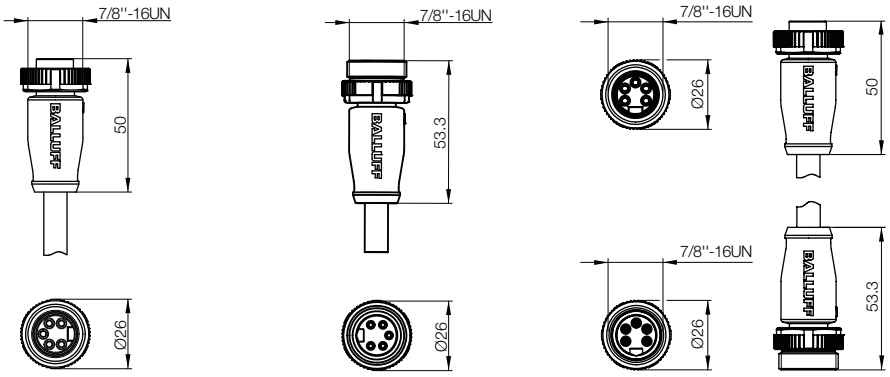


Bus cables 7/8", 5-pin, thin

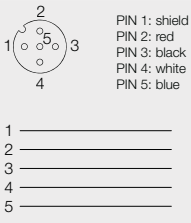
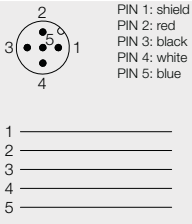
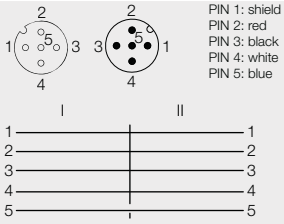
Transfer rate	Cable	
	thick	thin
125 kbs baud rate	500 m	100 m
250 kbs baud rate	250 m	100 m
500 kbs baud rate	100 m	100 m

Connector diagram and wiring			
Type	Female straight	Male straight	Female straight/Male straight
Supply voltage U_B	30 V	30 V	30 V
Number of conductors × conductor cross-section	2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG
Degree of protection as per IEC 60529	IP 68	IP 68	IP 68
Ambient temperature T_a	–20...+80 °C	–20...+80 °C	–20...+80 °C

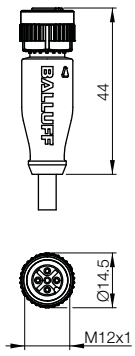
Standard lengths	Ordering code		
	Part number		
0.6 m			**BCC09YA**
			BCC A315-A315-30-330-VS85N6-006
2 m	**BCC09UY**	**BCC09W8**	**BCC09YE**
	BCC A315-0000-10-030-VS85N6-020	BCC A315-0000-20-030-VS85N6-020	BCC A315-A315-30-330-VS85N6-020
5 m	**BCC09W0**	**BCC09WA**	**BCC09YJ**
	BCC A315-0000-10-030-VS85N6-050	BCC A315-0000-20-030-VS85N6-050	BCC A315-A315-30-330-VS85N6-050
10 m	**BCC09W3**	**BCC09WF**	**BCC09YP**
	BCC A315-0000-10-030-VS85N6-100	BCC A315-0000-20-030-VS85N6-100	BCC A315-A315-30-330-VS85N6-100
15 m			**BCC09YT**
			BCC A315-A315-30-330-VS85N6-150

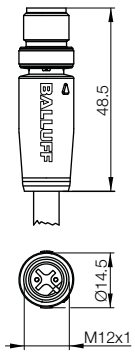


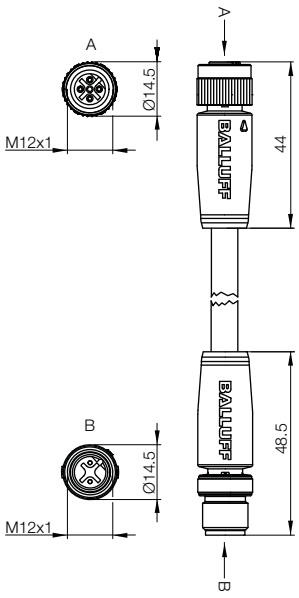
Bus connection cable M12, 5-pin, thin

Connector diagram and wiring			
Type	Female straight	Male straight	Female straight/Male straight
Supply voltage U_B	30 V	30 V	30 V
Number of conductors × conductor cross-section	2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG	2×24 AWG + 2×22 AWG
Degree of protection as per IEC 60529	IP 68	IP 68	IP 68
Ambient temperature T_a	–20...+80 °C	–20...+80 °C	–20...+80 °C

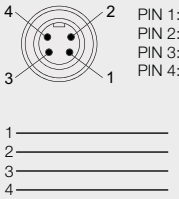
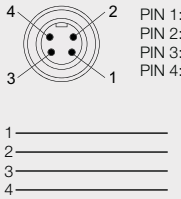
Standard lengths	Ordering code Part number		
0.6 m			**BCC0E03** BCC M415-M415-3A-330-VS85N6-006
2 m	**BCC0CZW** BCC M415-0000-1A-030-VS85N6-020	**BCC0E00** BCC M415-0000-2A-030-VS85N6-020	**BCC0E04** BCC M415-M415-3A-330-VS85N6-020
5 m	**BCC0CZY** BCC M415-0000-1A-030-VS85N6-050	**BCC0E01** BCC M415-0000-2A-030-VS85N6-050	**BCC0E05** BCC M415-M415-3A-330-VS85N6-050
10 m	**BCC0CZZ** BCC M415-0000-1A-030-VS85N6-100	**BCC0E02** BCC M415-0000-2A-030-VS85N6-100	**BCC0E06** BCC M415-M415-3A-330-VS85N6-100
15 m			**BCC0E07** BCC M415-M415-3A-330-VS85N6-150





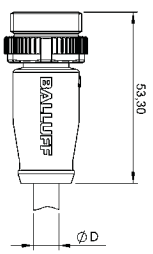


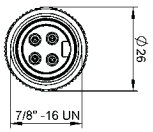
Power cables 7/8", 4-pin

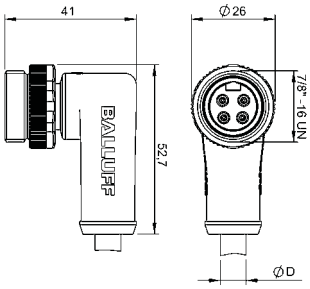
Connector diagram and wiring		
Type	Male	Male
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	4×1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80° C	–25...+80° C

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC06HL**	**BCC06HP**
			BCC A314-000-20-003-PX04A5-020	BCC A324-0000-20-003-PX04A5-020
PUR	Black	5 m	**BCC06HM**	**BCC06HR**
			BCC A314-000-20-003-PX04A5-050	BCC A324-0000-20-003-PX04A5-050
PUR	Black	10 m	**BCC06HN**	**BCC06HT**
			BCC A314-000-20-003-PX04A5-100	BCC A324-0000-20-003-PX04A5-100

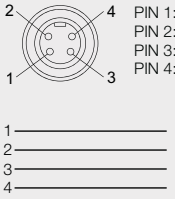
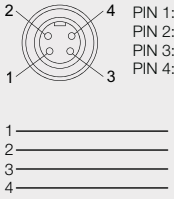
Other cable materials, colors, and lengths on request.



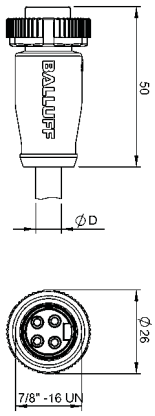


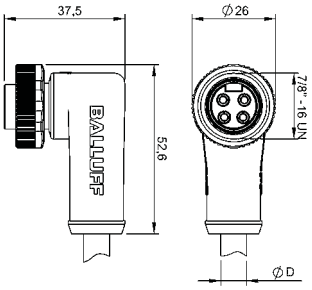


Power cables 7/8", 4-pin

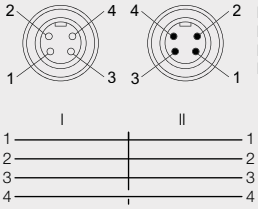
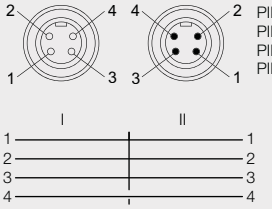
		
Female	Female	
300 V DC	300 V DC	
4×1.5 mm²	4×1.5 mm²	
IP 68	IP 68	
–25...+80° C	–25...+80° C	

Ordering code		
Part number		
BCC06HU	**BCC06HZ**	
BCC A314-0000-10-003-PX04A5-020	BCC A324-0000-10-003-PX04A5-020	
BCC06HW	**BCC06J0**	
BCC A314-0000-10-003-PX04A5-050	BCC A324-0000-10-003-PX04A5-050	
BCC06HY	**BCC06J1**	
BCC A314-0000-10-003-PX04A5-100	BCC A324-0000-10-003-PX04A5-100	



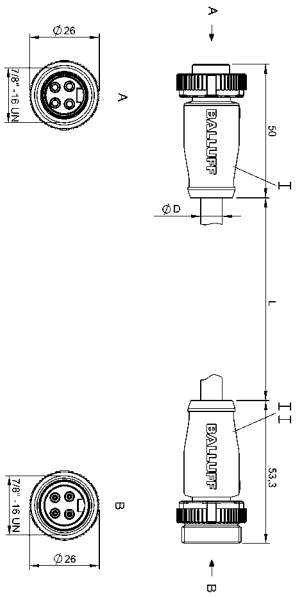


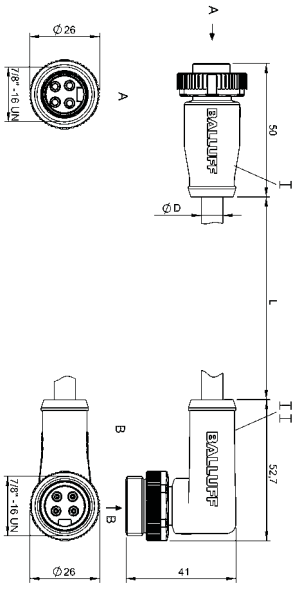
Power connection cables 7/8", 4-pin

Connector diagram and wiring		
Type	Female/male	Female/male
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	4×1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80° C	–25...+80° C

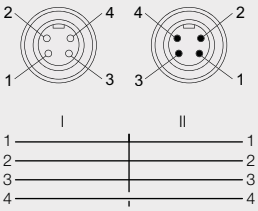
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.6 m	**BCC06J2**	**BCC06J7**
			BCC A314-A314-30-304-PX04A5-006	BCC A314-A324-30-304-PX04A5-006
PUR	Black	2 m	**BCC06J3**	**BCC06J8**
			BCC A314-A314-30-304-PX04A5-020	BCC A314-A324-30-304-PX04A5-020
PUR	Black	5 m	**BCC06J4**	**BCC06J9**
			BCC A314-A314-30-304-PX04A5-050	BCC A314-A324-30-304-PX04A5-050
PUR	Black	10 m	**BCC06J5**	**BCC06JA**
			BCC A314-A314-30-304-PX04A5-100	BCC A314-A324-30-304-PX04A5-100
PUR	Black	15 m	**BCC06J6**	**BCC06JC**
			BCC A314-A314-30-304-PX04A5-150	BCC A314-A324-30-304-PX04A5-150

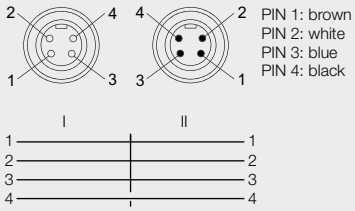
Other cable materials, colors, and lengths on request.





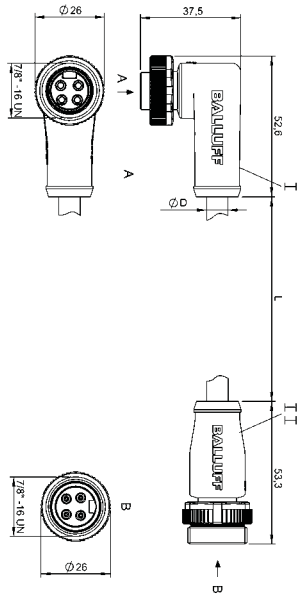
Power connection cables 7/8", 4-pin

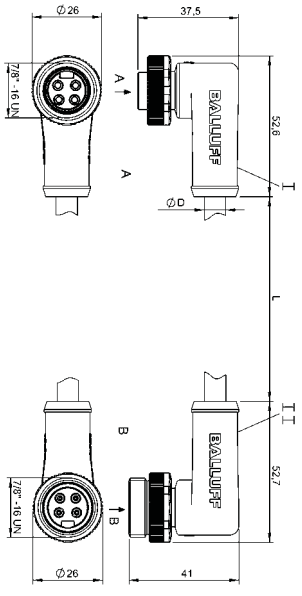


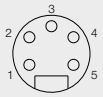


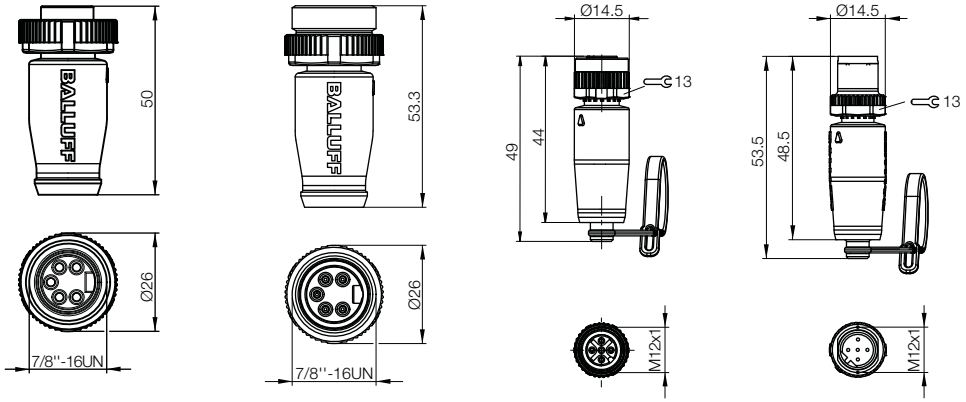
Female/male	Female/male
300 V DC	300 V DC
4×1.5 mm²	4×1.5 mm²
IP 68	IP 68
–25...+80° C	–25...+80° C

Ordering code	
Part number	
BCC06JE	**BCC06JL**
BCC A324-A314-30-304-PX04A5-006	BCC A324-A324-30-304-PX04A5-006
BCC06JF	**BCC06JM**
BCC A324-A314-30-304-PX04A5-020	BCC A324-A324-30-304-PX04A5-020
BCC06JH	**BCC06JN**
BCC A324-A314-30-304-PX04A5-050	BCC A324-A324-30-304-PX04A5-050
BCC06JJ	**BCC06JP**
BCC A324-A314-30-304-PX04A5-100	BCC A324-A324-30-304-PX04A5-100
BCC06JK	**BCC06JR**
BCC A324-A314-30-304-PX04A5-150	BCC A324-A324-30-304-PX04A5-150

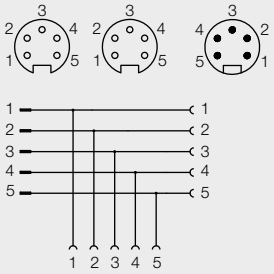


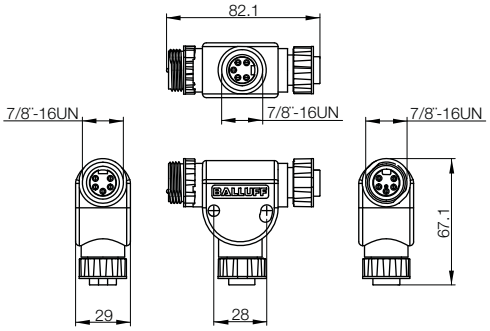


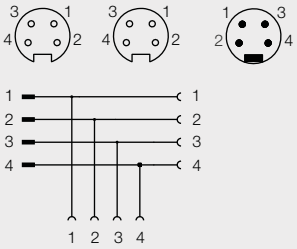
Connector diagram and wiring				
Configuration	Female mini size A 7/8"	Male mini size A 7/8"	Female M12	M12 plug
Version	Female standard 5-pin DN	Male standard 5-pin DN	Female 5-pin A-coded	Male 5-pin A-coded
Type	Mini female	Mini male	Micro female	Micro male
Without **Ordering code**	**BCC0A0A**	**BCC0A09**	**BCC0A08**	**BCC09MR**
LED | Part number	BCC A315-0000-1A-R04	BCC A315-0000-2A-R04	BCC M415-0000-1A-R04	BCC M415-0000-2A-R04
Supply voltage U_B	50 V	50 V	10...30 V DC	50 V
Ambient temperature T_a	–25...+80 °C	–25...+80 °C	–40...+85 °C	–40...+85 °C
Degree of protection as per IEC 60529	IP 68	IP 68	IP 68	IP 68
Housing material	Plastic	Plastic	Plastic	Plastic

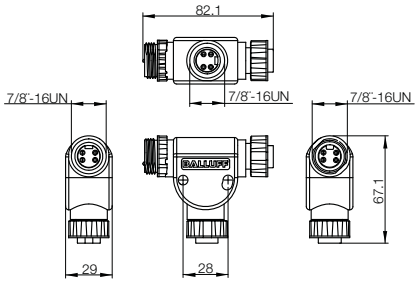


Bus tee

Connector diagram and wiring		
Configuration	7/8" power distributor	
Version	Standard, 5-pin	
Type	Female/male	
Ordering code	**BCC0AA7**	
Part number	BCC A315-A315-A315-T0023-000	
Supply voltage U_B	300 V AC	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	–40...+90 °C	
Housing material	Plastic	



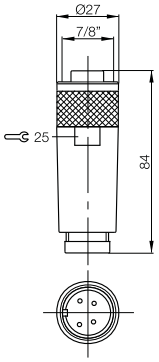
Connector diagram and wiring		
Configuration	7/8" power distributor Mini pass-thru, mini drop	
Version	Female/male, 4-pin mini size A 7/8" Female mini size A 7/8"	
Type	Female/male	
Ordering code	**BCC0AA6**	
Part number	BCC A314-A314-A314-T0022-000	
Supply voltage U_B	50 V	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	–20...+80 °C	
Housing material	TPE	

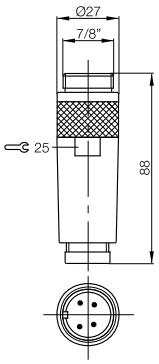


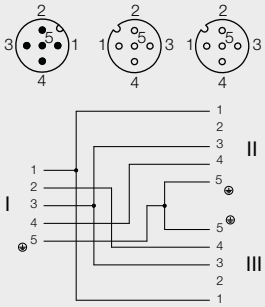
Power plug connector, 7/8", 4-pin

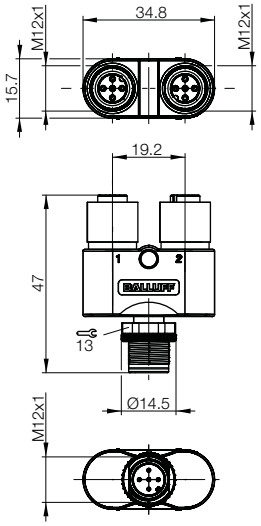
Connector diagram and wiring		
Type	Female	Male
Supply voltage U_B	250 V	250 V
Number of conductors × conductor cross-section	4× max. 1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

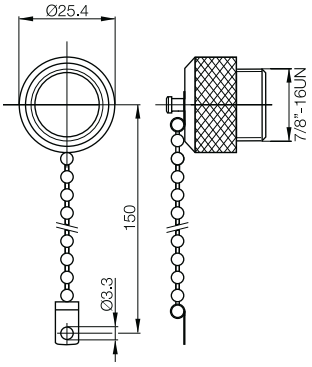
Cable material Cable dia.	Color	Ordering code Part number	
PUR 6...8 mm	Black	**BCC0706** BCC A334-0000-10-000-51X4A5-000	**BCC0709** BCC A334-0000-20-000-51X4A5-000
PUR 8...10 mm	Black	**BCC0707** BCC A334-0000-10-000-61X4A5-000	**BCC070A** BCC A334-0000-20-000-61X4A5-000
PUR 10...12 mm	Black	**BCC0708** BCC A334-0000-10-000-71X4A5-000	**BCC070C** BCC A334-0000-20-000-71X4A5-000

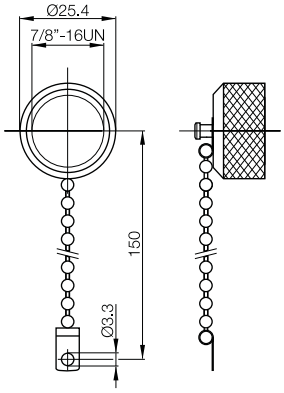




Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

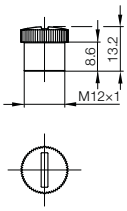


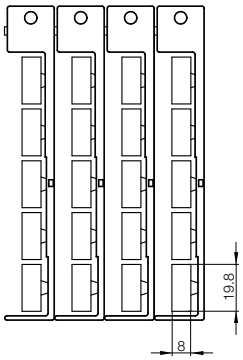




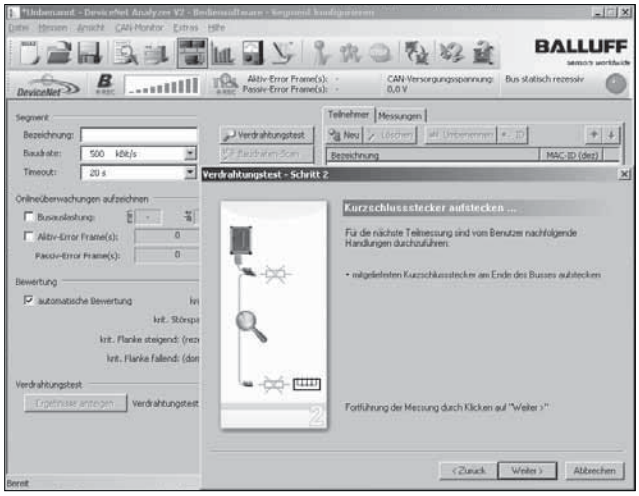


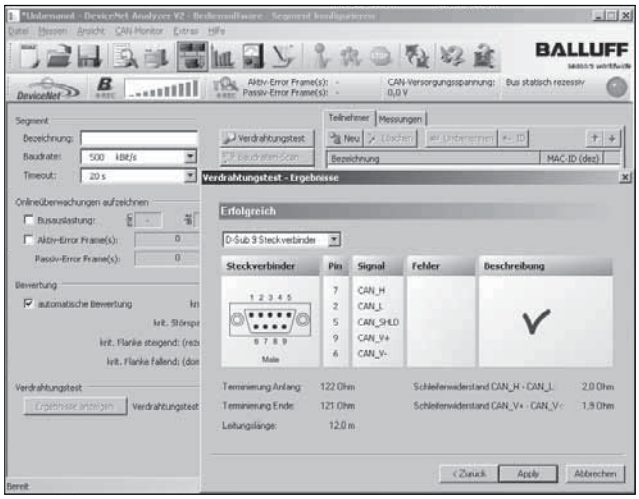
Description	M12 locking screw	Tamperproof cover	Marking sleeve	Label set
Use	IP 65 threaded cover for unused ports	with 4 openings	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...
Ordering code	**BAM01C2**	**BAM01J0**		**BAM01AT**
Part number	BAM CS-XA-002-M12-A	BAM FK-NI-PBS-01-C	BAM IA-CC-002-01	BNI ACC-L01-000
Ambient temperature T_a	–20...+80 °C			
Housing material	Plastic			Plastic

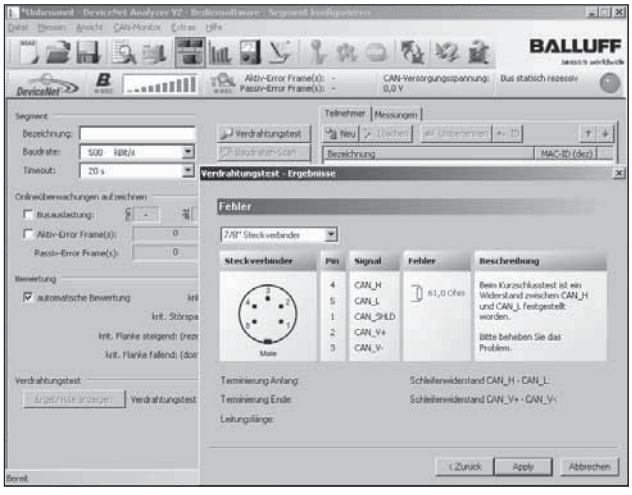




Analyzer– for analyzing, monitoring and maintaining Devicenet installations



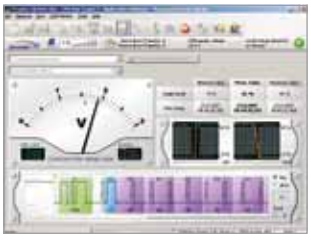




The Devicenet Analyzer is a particularly powerful tool for analyzing, commissioning, monitoring and maintaining Devicenet/ CAN bus systems. The Devicenet tester was designed primarily for preventive maintenance purposes. Whether maintenance technicians, integrators or technical experts, anyone who requires 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.

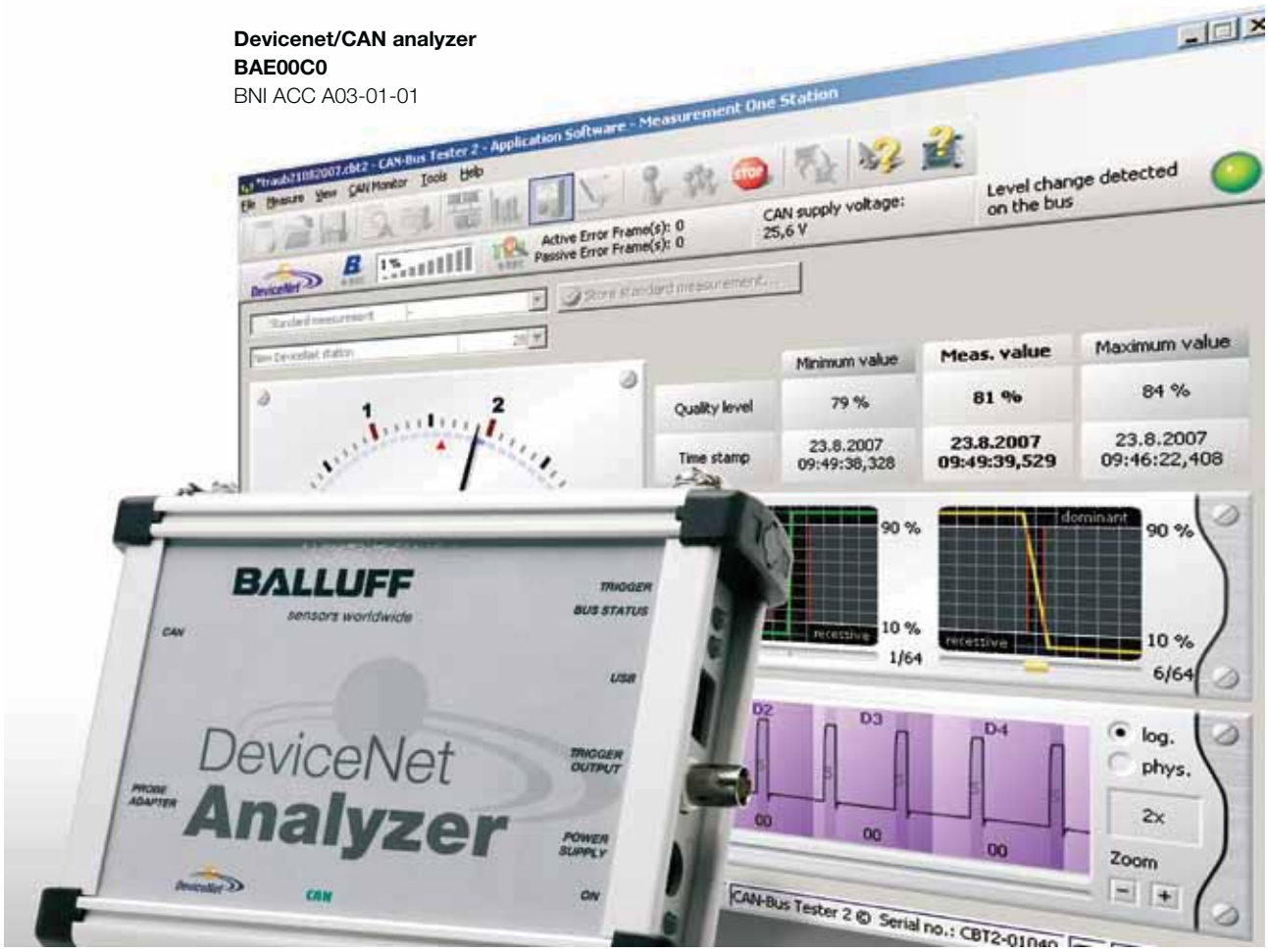


Analyzer– for analyzing, monitoring and maintaining Devicenet installations, bitmaps

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. A gradual degradation of quality caused by cable wear, for example, can then 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 interface for connecting a PC or notebook. The device is very simple to operate thanks to the easy-to-use PC software.

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

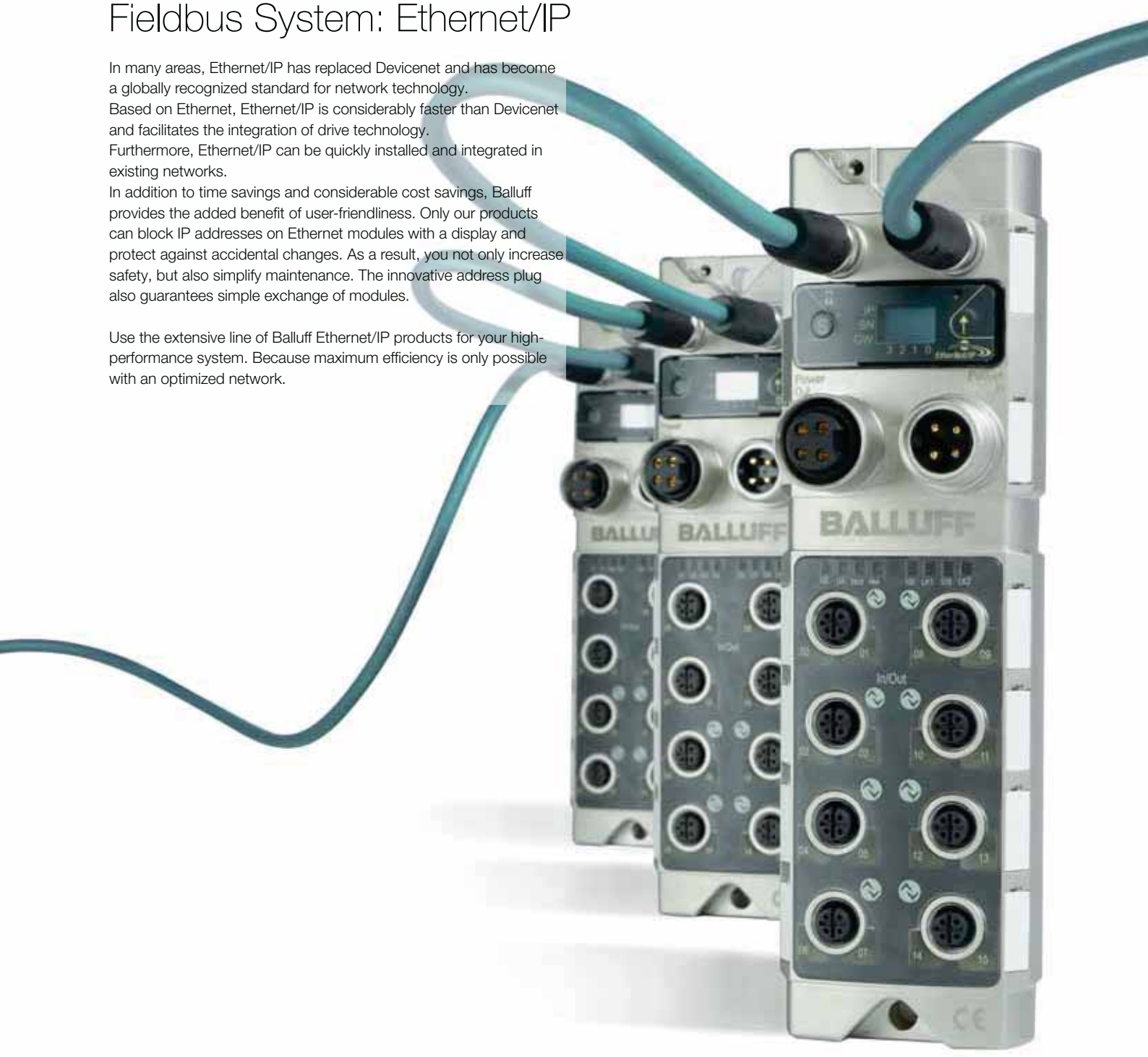


Fieldbus Systems

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.



Contents

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

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

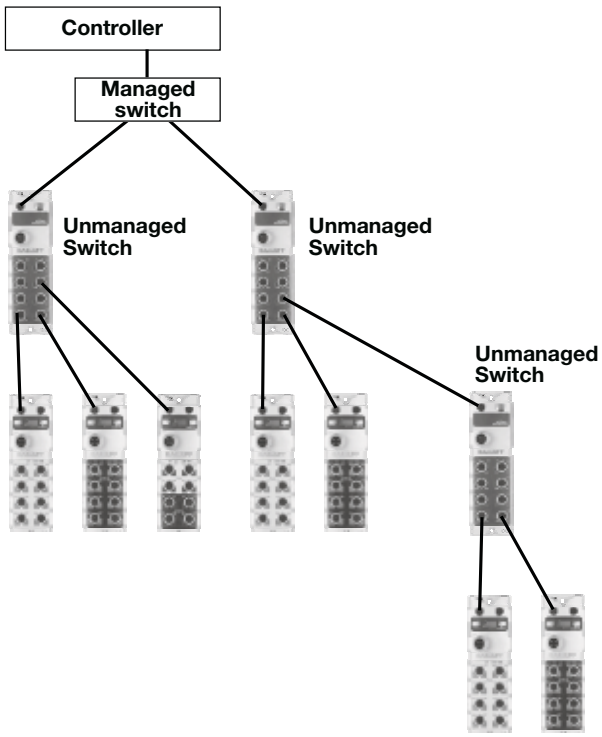
Unmanaged switches
- Unmanaged switch with 9 ports
- Dual power sources
- 10/100 base Tx ports
- Supports half/full duplex
- Overload diagnostics
- M12 sockets, D-coded
- Store-and-forward technology

Advantages of star topology

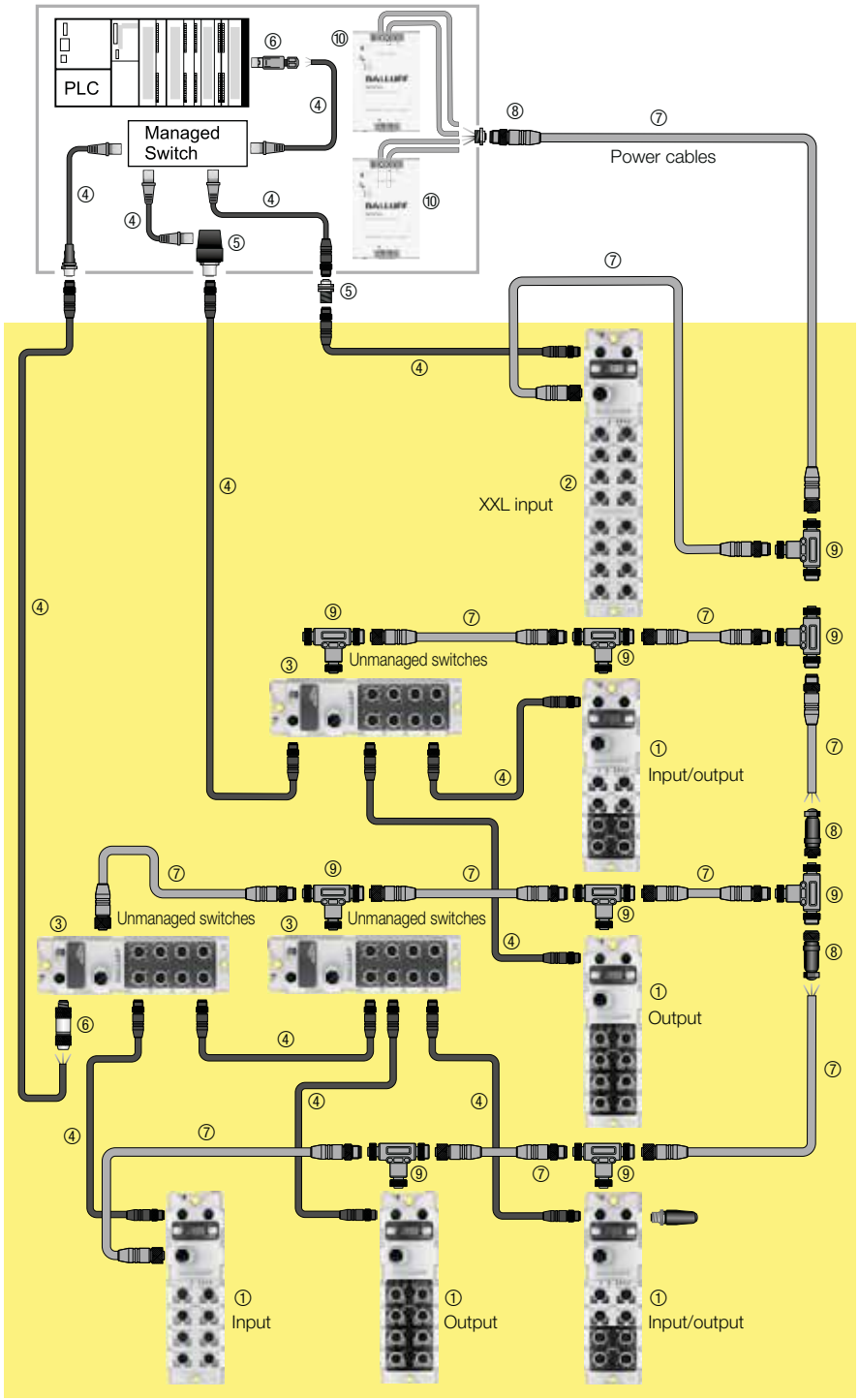
In industrial Ethernet networks, star topologies have prevailed over daisy chain topologies. Balluff offers star topologies exclusively due to their greater reliability.

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.



Consistent communication 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 further in the coming years.
At Balluff, you will find a high-performance range of permanently mountable I/O blocks with compatible cables and accessory parts.



① **Ethernet/IP modules BNI**
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② **Ethernet/IP XXL modules BNI**
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④ **Bus cables BCC**
Page 106
⑤ **Bus couplings and pass-thrus BCC**
Page 110
⑥ **Field-attachable bus connectors BCC**
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⑦ **Power cables BCC**
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⑧ **Accessories BAM**
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⑨ **Bus tees BCC**
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⑩ **Power supplies BAE**
Page 365

Ethernet/IP
Integrated communication saves costs

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, which 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 and costs the same as 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 safe outputs
With an output current of up to **2 amps**, 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 trouble-shooting.

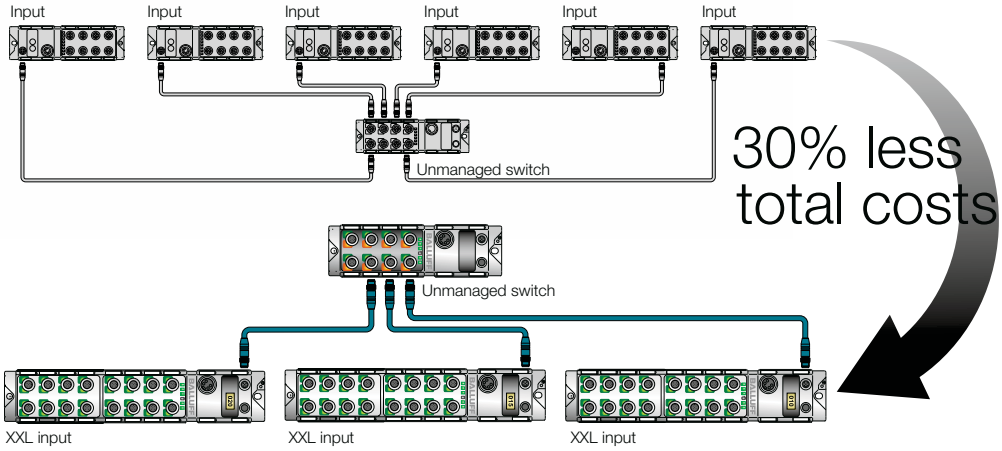
User-defined LEDs (100 series)
Like the IPAP, the display has red and green LEDs for simplifying possible troubleshooting.

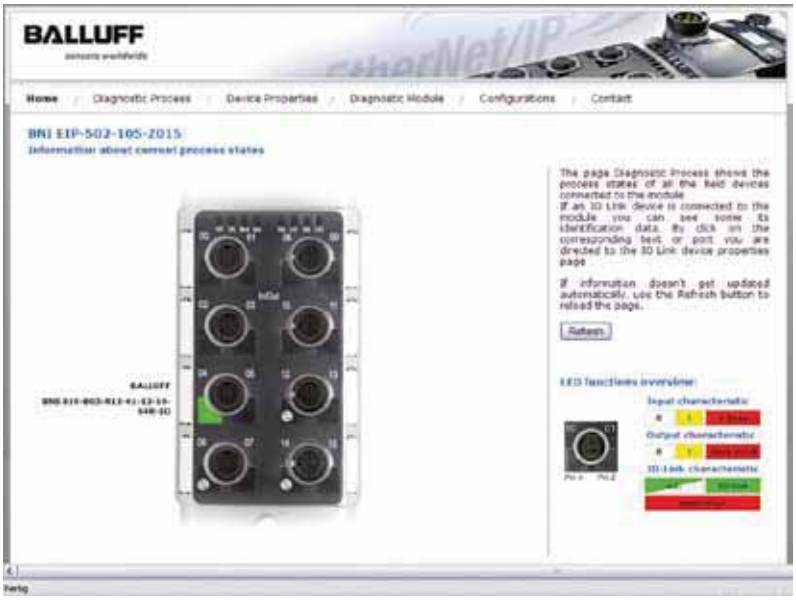
Addressable display (Series 100 only)
IP address, subnet mask and gate-way address appear on the illuminat-ed display. Push buttons can be used to set each octet of the addresses specified above. The display can be disabled via the PLC (controller).

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!

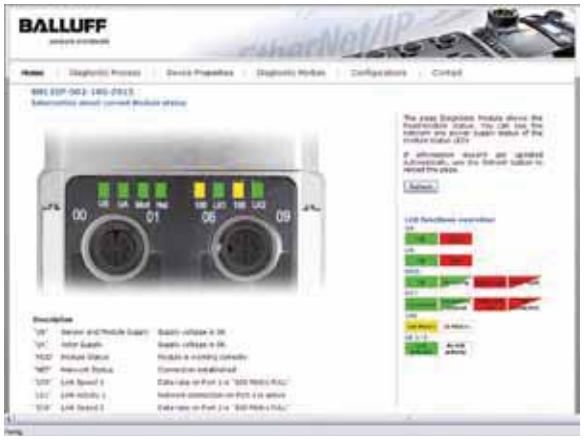
More savings
- Switch utilization reduced by 13% – renders one port superfluous
- No network cable required
- Without auxiliary power cable
- 20% less installation space





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.

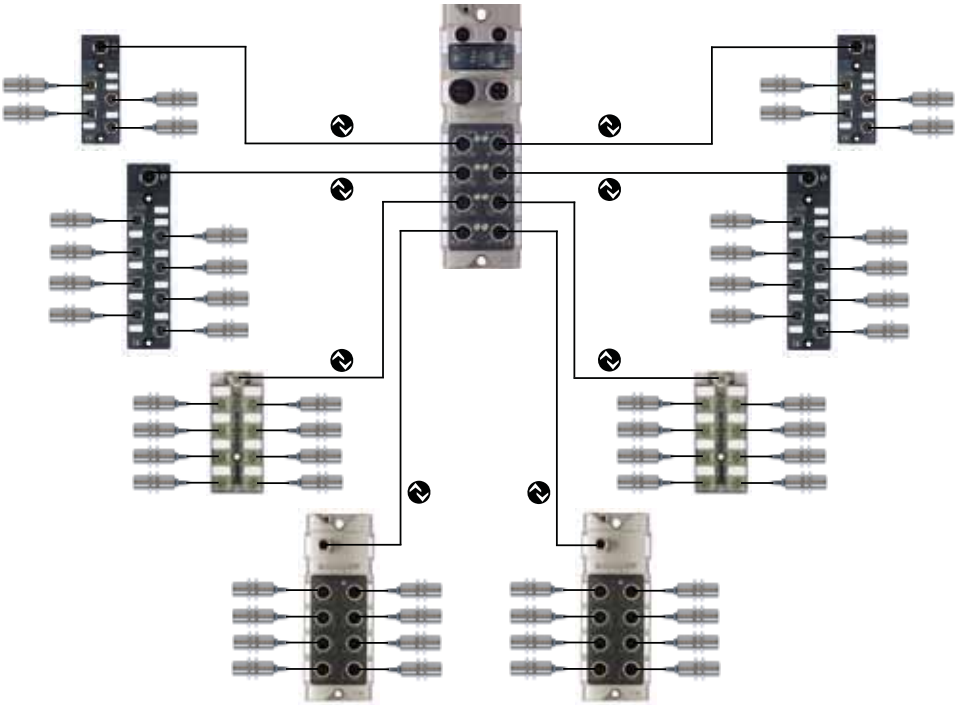
The module configuration, such as assigning or displaying the IP address, is hidden behind the "Configurations" function.

Ethernet fieldbus module with eight IO-Link ports

136 IOs on a module
Balluff IO-Link solutions save cash money

Until now, at least nine fieldbus modules had to be used in order to be able to activate 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 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.

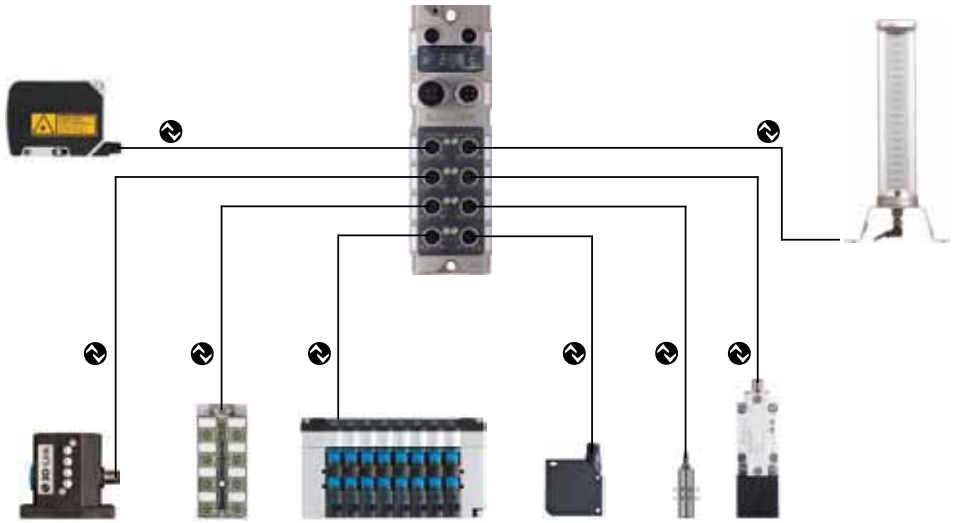


1000 tasks, one module:
The Ethernet module with eight IO-Link ports

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.

During field installation of intelligent devices, there are frequently high costs, as shielded cable and intelligent interface cards such as analog input cards are used in the controller. IO-Link not only makes error-prone analog inputs superfluous, it 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.



Ethernet/IP with IO-Link functionality
IO-Link does not just communicate with Profibus, Profinet and CC-Link now. At Balluff, IO-Link now communicates with Ethernet/IP so that all the benefits of IO-Link are available right down to the second lowest level.

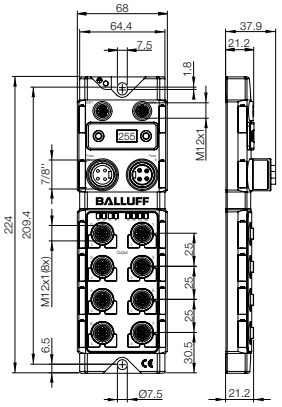
IO-Link not only ensures freedom of installation, but also guarantees simplified wiring, integrated diagnostics and central configuration. System failures can be prevented more reliably and systems restarted quickly if a failure occurs.

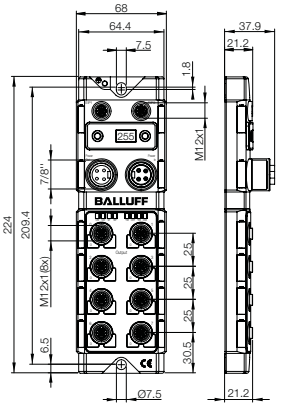
Ethernet/IP with IO-Link guarantees efficient operation.
Users gain time, save costs and incorporate intelligent connection technology to improve process quality.

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.

IO-Link Version 1.1

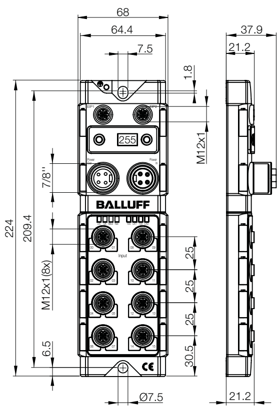
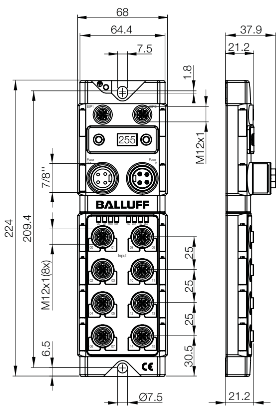
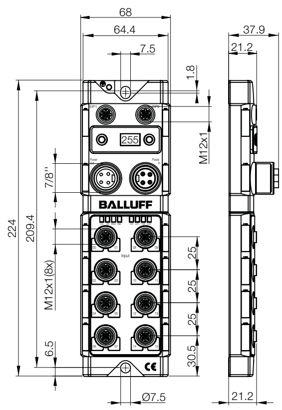
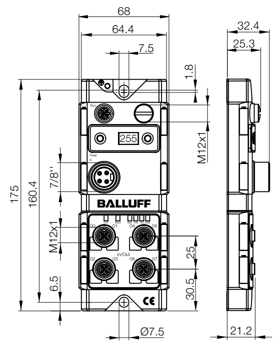
Fieldbus		Ethernet/IP	Ethernet/IP
Version		4× IO-Link, 16 DI/DO PNP	8× IO-Link, 16 DI/DO PNP
Ordering code		**BNI004A**	**BNI006A**
Part number		BNI EIP-502-105-Z015	BNI EIP-508-105-Z015
Supply voltage U_B		18...30 V DC	18...30 V DC
Module current consumption		120...130 mA	120...130 mA
AUX input/output power status UA LED		US /no	US /no
Module status indicator: Mod LED		Yes	Yes
Network status indicator: Net LED		Yes	Yes
Port status indicator		Black, red, yellow	Black, red, yellow
Connection: Fieldbus		M12, D-coded, female	M12, D-coded, female
Connection: AUX power		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 current $U_{Actuator}$		≤ 9 A	≤ 9 A
Total current U_{Sensor}		≤ 9 A	≤ 9 A
Degree of protection as per IEC 60529		IP 67 (when screwed into place)	IP 67 (when screwed into place)
Operating temperature T_a		–5...+70 °C	–5...+70 °C
Storage temperature		–25...+70 °C	–25...+70 °C
Fastener		2 mounting holes	2 mounting holes
Dimensions (L×W×H)		225×68×36.9 mm	225×68×36.9 mm
Housing material		Nickel-plated GdZn	Nickel-plated GdZn
IO-Link Version 1.1			
No. of IO-Link master ports		4× master	8× master
Operating modes (3-wire)		SIO, COM 1, COM 2, COM 3	SIO, COM 1, COM 2, COM 3
Indicators	Communication	Green LED	Green LED
	Error	Red LED	Red LED
Max. load current for IO-Link device		1.6 A	1.6 A



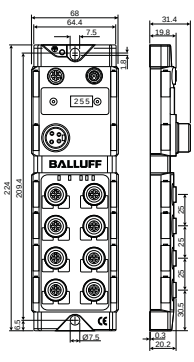


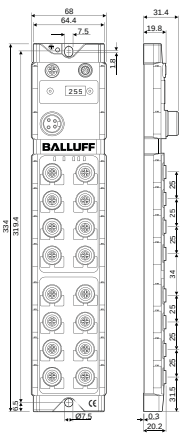


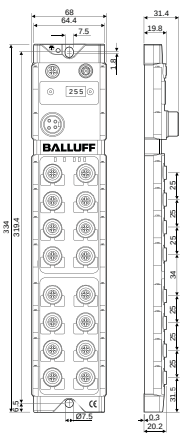

	Ethernet/IP	Ethernet/IP	Ethernet/IP	Ethernet/IP
	16 DI/DO PNP configurable	16 DI PNP	8 DO PNP	8 DI/DO PNP configurable
	BNI004F	**BNI004M**	**BNI005J**	**BNI0044**
	BNI EIP-302-105-Z015	BNI EIP-104-105-Z015	BNI EIP-202-105-Z015	BNI EIP-307-100-Z014
	18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
	120...130 mA	120...130 mA	BUS/RUN	120...130 mA
	US /no	US /no	Display/pushbutton	US /no
	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	max. 16 PNP		max. 8 PNP
	max. 16 PNP		8	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		≤ 9 A
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	225×68×36.9 mm	225×68×36.9 mm	175×68×36.9 mm	175×68×36.9 mm
	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn

Type	16 DI	16 DI + 16 DO	32 DI
Display	Yes		Yes
Ordering code	**BNI0014**	**BNI0019**	**BNI0018**
Part number	BNI EIP-104-100-Z016	BNI EIP-306-100-Z010	BNI EIP-105-100-Z010
Supply voltage U_B	24 V DC	24 V DC	24 V DC
Module current consumption	120...130 mA	120...130 mA	120...130 mA
AUX input/output power status: U_O LED	U_T/no	Yes	U_T/no
Module status indicator: Mod LED	Yes	Yes	Yes
Network status indicator: Net LED	Yes	Yes	Yes
Port status indicator	Black, red, yellow		Black, red, yellow
Connection: Fieldbus	M12, D-coded, female	M12, D-coded, female	M12, D-coded, female
Connection: AUX power	7/8", male, 4-pin	7/8", male, 4-pin	7/8", male, 4-pin
Connection: I/O ports	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	16	16
Number of inputs	16 PNP	16 PNP	32 PNP
Number of outputs		16 PNP	
Max. load current, sensors/channel	200 mA	200 mA	200 mA
Max. load current actuators/channel		2 A	
Sensor total current U_{Sensor}	9 A	9 A	9 A
Actuator total current/$U_{Actuator}$		9 A	
Degree of protection	IP 67	IP 67	IP 67
Operating temperature	–5...+55 °C	–5...+55 °C	–5...+55 °C
Storage temperature	–25...+70 °C	–25...+70 °C	–25...+70 °C
Housing material	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
Transfer rates			
IP address space	IPv4	IPv4	IPv4
Addressing methods	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block, display
Max. switching frequency	100 Hz ohm active load, 1...10 Hz inductive load		
Outputs can be reset using software		Yes	
Overload protection		Yes	
Short-circuit protected	Yes	Yes	Yes
Input/output type	PNP inputs	PNP	PNP inputs
Approvals	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE

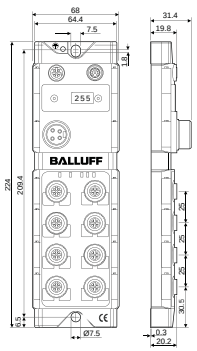


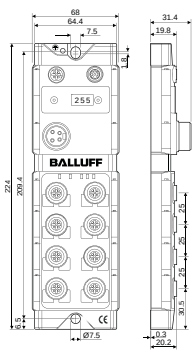


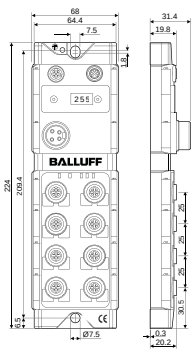


All modules include four screw plugs and a label set.

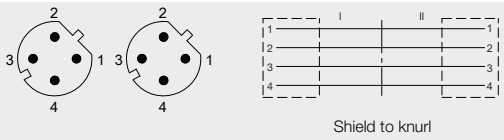
	8 DO	16 DO	8 DI + 8 DO
	Yes	Yes	Yes
	BNI0015	**BNI0016**	**BNI0017**
	BNI EIP-202-100-Z016	BNI EIP-206-100-Z016	BNI EIP-305-100-Z016
	24 V DC	24 V DC	24 V DC
	120...130 mA	120...130 mA	120...130 mA
	Yes	Yes	Yes
	Yes	Yes	Yes
	Yes	Yes	Yes
	Black, red, yellow	Black, red, yellow	Black, red, yellow
	M12, 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
	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
	8	8	8
			8 PNP
	8 PNP	16 PNP	8 PNP
			200 mA
	2 A	2 A	2 A
	9 A	9 A	9 A
	9 A	9 A	9 A
	IP 67	IP 67	IP 67
	–5...+55 °C	–5...+55 °C	–5...+55 °C
	–25...+70 °C	–25...+70 °C	–25...+70 °C
	Nickel-plated GdZn	Nickel-plated GdZn	Nickel-plated GdZn
	10/100 Mbps, automatic detection, full-duplex	10/100 Mbps, automatic detection, full-duplex	
	IPv4	IPv4	IPv4
	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block, display	BOOTP, DHCP, IP address plug, USB tool, function block, display
	100 Hz ohm active load, 1...10 Hz inductive load		
	Yes	Yes	Yes
	Yes	Yes	Yes
			Yes
	Outputs	Outputs	PNP inputs/outputs
	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE	ODVA, UL-CUL, CSA, CE





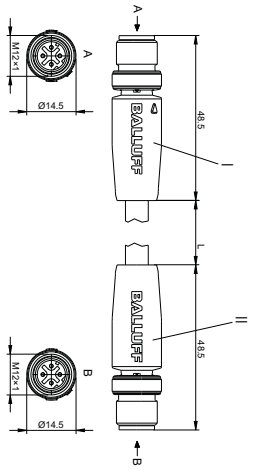


M12 bus connection cable, shielded

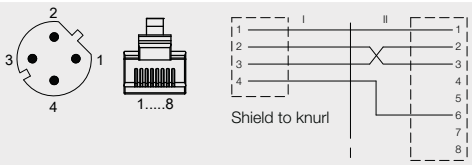
Connector diagram and wiring	
Type	M12 male straight/M12 male straight
Supply voltage U_B	250 V AC/DC
Number of conductors × conductor cross-section	2×2×24 AWG
Degree of protection as per IEC 60529	IP 67
Ambient temperature T_a	–25...+75 °C

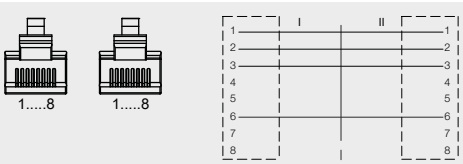
Cable material	Color	Length	Ordering code Part number
TPE shielded	blue-green	0.6 m	**BCC09NL** BCC M414-M414-6D-338-ES64N9-006
TPE shielded	blue-green	2 m	**BCC09NN** BCC M414-M414-6D-338-ES64N9-020
TPE shielded	blue-green	5 m	**BCC09NP** BCC M414-M414-6D-338-ES64N9-050
TPE shielded	blue-green	10 m	**BCC09NR** BCC M414-M414-6D-338-ES64N9-100
TPE shielded	blue-green	15 m	**BCC09NT** BCC M414-M414-6D-338-ES64N9-150

Other cable materials, colors and lengths on request.



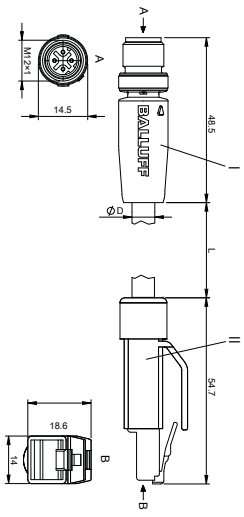
M12 and RJ45 bus connection cables, shielded

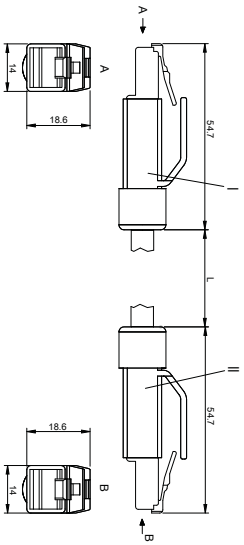




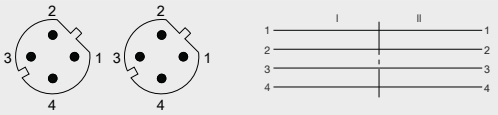
M12 male straight/RJ45 male straight	RJ45 male straight/RJ45 male straight
60 V AC/DC	60 V AC/DC
2×2×24 AWG	2×2×24 AWG
IP 67/IP 20	IP 20/IP 20
–25...+70 °C	–25...+70 °C

Ordering code	
Part number	
BCC0CZA	**BCC0CZJ**
BCC M414-E834-8G-672-ES64N9-006	BCC E834-E834-90-339-ES64N9-006
BCC0CZC	**BCC0CZK**
BCC M414-E834-8G-672-ES64N9-020	BCC E834-E834-90-339-ES64N9-020
BCC0CZE	**BCC0CZL**
BCC M414-E834-8G-672-ES64N9-050	BCC E834-E834-90-339-ES64N9-050
BCC0CZF	**BCC0CZM**
BCC M414-E834-8G-672-ES64N9-100	BCC E834-E834-90-339-ES64N9-100
BCC0CZH	**BCC0CZN**
BCC M414-E834-8G-672-ES64N9-150	BCC E834-E834-90-339-ES64N9-150



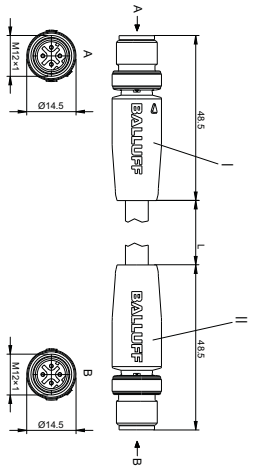


M12 bus connection cable, unshielded

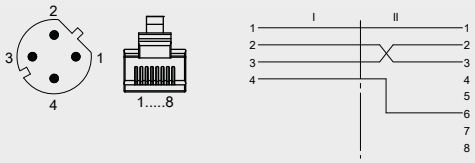
Connector diagram and wiring		
Type	M12 male straight/M12 male straight	
Supply voltage U_B	60 V AC/DC	
Number of conductors × conductor cross-section	2×2×24 AWG	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	–40...+75 °C	

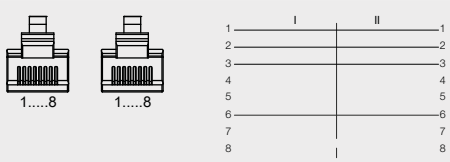
Cable material	Color	Length	Ordering code Part number	
TPE unshielded	blue-green	0.6 m	**BCC0E08** BCC M414-M414-6D-366-EX64N9-006	
TPE unshielded	blue-green	2 m	**BCC0CLZ** BCC M414-M414-6D-366-EX64N9-020	
TPE unshielded	blue-green	5 m	**BCC0CM1** BCC M414-M414-6D-366-EX64N9-050	
TPE unshielded	blue-green	10 m	**BCC0CM3** BCC M414-M414-6D-366-EX64N9-100	
TPE unshielded	blue-green	15 m	**BCC0E09** BCC M414-M414-6D-366-EX64N9-150	

Other cable materials, colors and lengths on request.



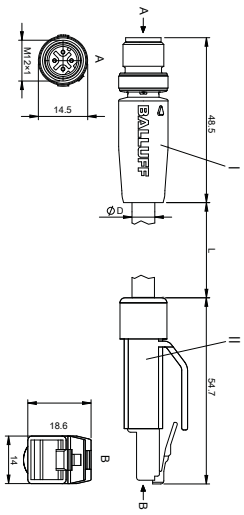
M12 and RJ45 bus connection cables, unshielded

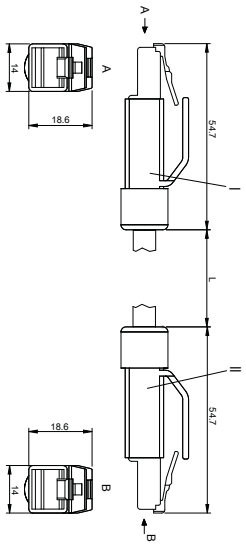


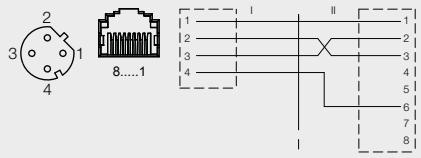


M12 male straight/RJ45 male straight	RJ45 male straight/RJ45 male straight
60 V AC/DC	60 V AC/DC
2×2×24 AWG	2×2×24 AWG
IP 67/IP 20	IP 20/IP 20
–40...+70 °C	–40...+70 °C

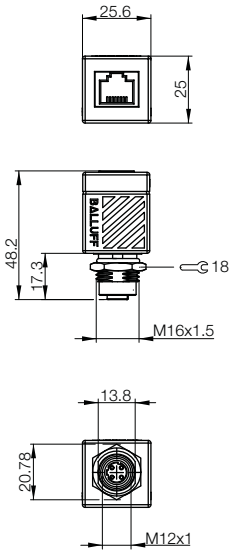
Ordering code	
Part number	
BCC0E0A	**BCC0CZP**
BCC M414-E834-8G-695-EX64N9-006	BCC E834-E834-90-367-EX64N9-006
BCC0E0C	**BCC0CZR**
BCC M414-E834-8G-695-EX64N9-020	BCC E834-E834-90-367-EX64N9-020
BCC0CNP	**BCC0CZT**
BCC M414-E834-8G-695-EX64N9-050	BCC E834-E834-90-367-EX64N9-050
BCC0CNR	**BCC0CZU**
BCC M414-E834-8G-695-EX64N9-100	BCC E834-E834-90-367-EX64N9-100
BCC0CNT	**BCC0CNU**
BCC M414-E834-8G-695-EX64N9-150	BCC E834-E834-90-367-EX64N9-150

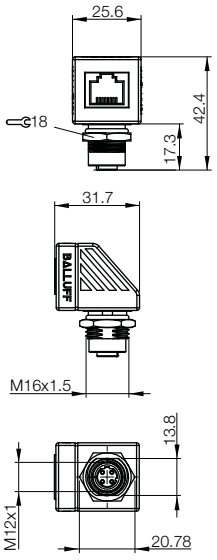


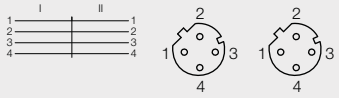


Connector diagram and wiring		
Type	M12 female straight/RJ45 straight, pass-thru	M12 female straight/RJ45 right angle, pass-thru
Coding	D-coded/no coding	D-coded/no coding
Supply voltage U_B	60 V AC/DC	60 V AC/DC
Degree of protection	IP 20	IP 20
Ambient temperature T_a	–25...+85 °C	–25...+85 °C
Mounting thread	M16	M16

	Ordering code	
	Part number	
	BCC085F	**BCC085H**
	BCC M414-E814-BG-RM013-000	BCC M424-E814-BG-RM013-000

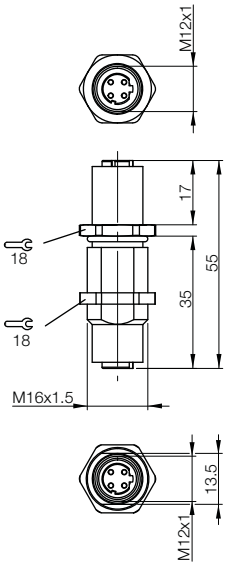






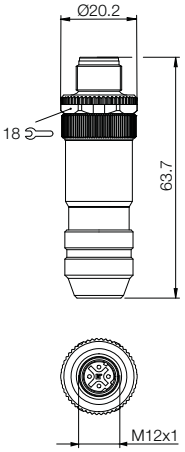
	M12 female straight/M12 female straight, pass-thru		
	D-coded		
	60 V AC/DC		
	IP 67		
	–25...+80 °C		
	M16		

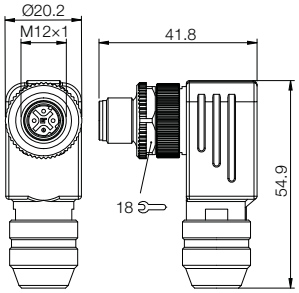
	Ordering code		
	Part number		
	BCC06YP		
	BCC M454-M454-5D-RM002-000		



Bus connector M12, 4-pin, D-coded, User-fabricated, shieldable

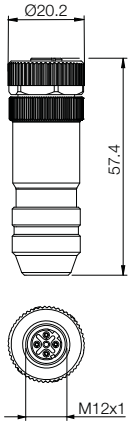
Connector diagram and wiring		
Connector	M12 male, straight	M12 male, right-angle
Version	4-pin, D-coded	4-pin, D-coded
Ordering code	**BCC03WZ**	**BCC03Y0**
Part number	BCC M474-0000-2D-000-51X475-000	BCC M484-0000-2D-000-51X475-000
Nominal voltage	60 V AC/DC	60 V AC/DC
Number of connections	4	4
Number of conductors × Cross-section	4×0.75 mm²	4×0.75 mm²
Cable diameter	Max. 8 mm	Max. 8 mm
Connection	Cage clamp	Screw plug
Degree of protection as 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

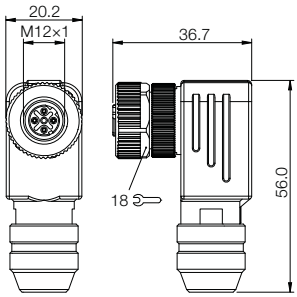


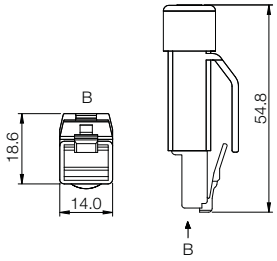


Bus connector M12, 4-pin, D-coded, User-fabricated, shieldable

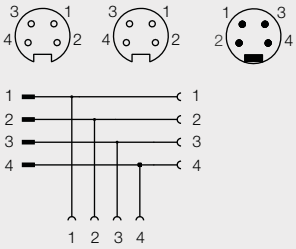
M12 female, straight	M12 female, right-angle	RJ45 male, straight
4-pin, D-coded	4-pin, D-coded	No coding
BCC03Y1	**BCC03Y2**	**BCC06FH**
BCC M474-0000-1D-000-51X475-000	BCC M484-0000-1D-000-51X475-000	BCC E834-0000-20-000-53X4T2-000
60 V AC/DC	60 V AC/DC	60 V AC/DC
4	4	4
4×0.75 mm²	4×0.75 mm²	244× max. 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

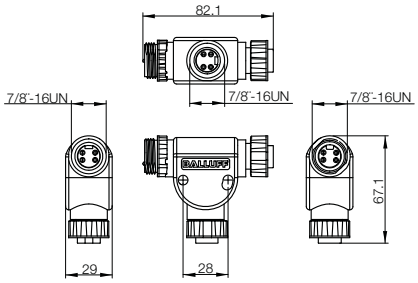




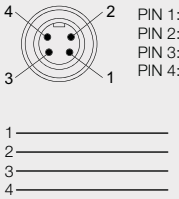
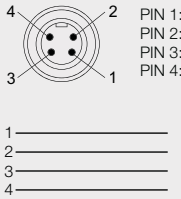


Power tee, 7/8", 4-pin

Connector diagram and wiring		
Configuration	7/8" power distributor Mini pass-thru, mini drop	
Version	Female/male, 4-pin mini size A 7/8" Female mini size A 7/8"	
Type	Female/male	
Ordering code	**BCC0AA6**	
Part number	BCC A314-A314-A314-T0022-000	
Supply voltage U_B	50 V	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	–20...+80 °C	
Housing material	TPE	

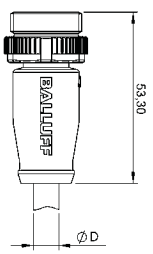


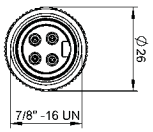
Power cables 7/8", 4-pin

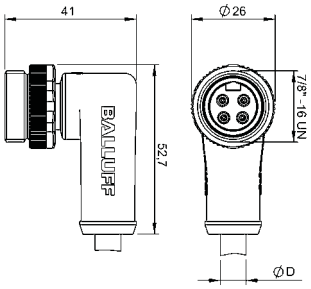
Connector diagram and wiring		
Type	Male	Male
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	4×1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80° C	–25...+80° C

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC06HL**	**BCC06HP**
			BCC A314-000-20-003-PX04A5-020	BCC A324-0000-20-003-PX04A5-020
PUR	Black	5 m	**BCC06HM**	**BCC06HR**
			BCC A314-000-20-003-PX04A5-050	BCC A324-0000-20-003-PX04A5-050
PUR	Black	10 m	**BCC06HN**	**BCC06HT**
			BCC A314-000-20-003-PX04A5-100	BCC A324-0000-20-003-PX04A5-100

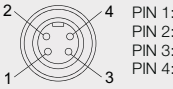
Other cable materials, colors, and lengths on request.

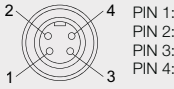






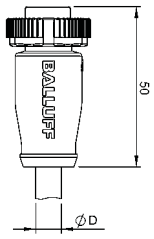
Power cables 7/8", 4-pin

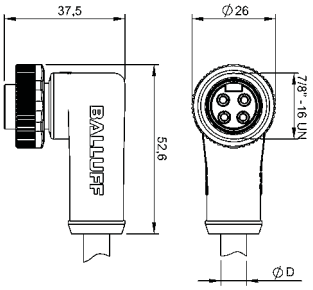




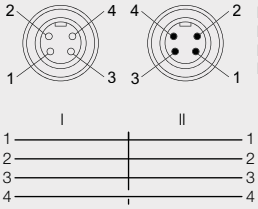
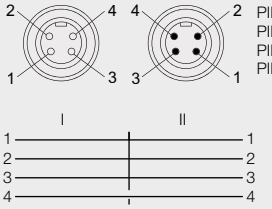
Female	Female		
300 V DC	300 V DC		
4×1.5 mm²	4×1.5 mm²		
IP 68	IP 68		
–25...+80° C	–25...+80° C		

Ordering code		
Part number		
BCC06HU	**BCC06HZ**	
BCC A314-0000-10-003-PX04A5-020	BCC A324-0000-10-003-PX04A5-020	
BCC06HW	**BCC06J0**	
BCC A314-0000-10-003-PX04A5-050	BCC A324-0000-10-003-PX04A5-050	
BCC06HY	**BCC06J1**	
BCC A314-0000-10-003-PX04A5-100	BCC A324-0000-10-003-PX04A5-100	



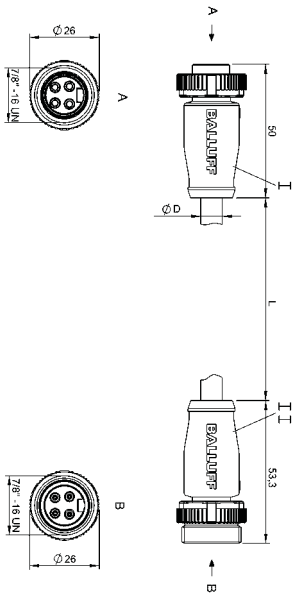


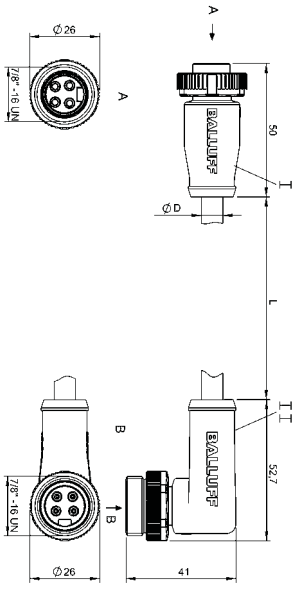
Power connection cables 7/8", 4-pin

Connector diagram and wiring		
Type	Female/male	Female/male
Supply voltage U_B	300 V DC	300 V DC
Number of conductors × conductor cross-section	4×1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+80° C	–25...+80° C

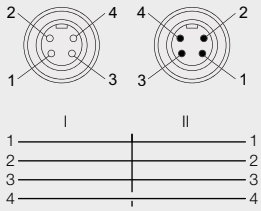
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.6 m	**BCC06J2**	**BCC06J7**
			BCC A314-A314-30-304-PX04A5-006	BCC A314-A324-30-304-PX04A5-006
PUR	Black	2 m	**BCC06J3**	**BCC06J8**
			BCC A314-A314-30-304-PX04A5-020	BCC A314-A324-30-304-PX04A5-020
PUR	Black	5 m	**BCC06J4**	**BCC06J9**
			BCC A314-A314-30-304-PX04A5-050	BCC A314-A324-30-304-PX04A5-050
PUR	Black	10 m	**BCC06J5**	**BCC06JA**
			BCC A314-A314-30-304-PX04A5-100	BCC A314-A324-30-304-PX04A5-100
PUR	Black	15 m	**BCC06J6**	**BCC06JC**
			BCC A314-A314-30-304-PX04A5-150	BCC A314-A324-30-304-PX04A5-150

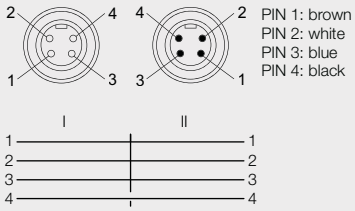
Other cable materials, colors, and lengths on request.





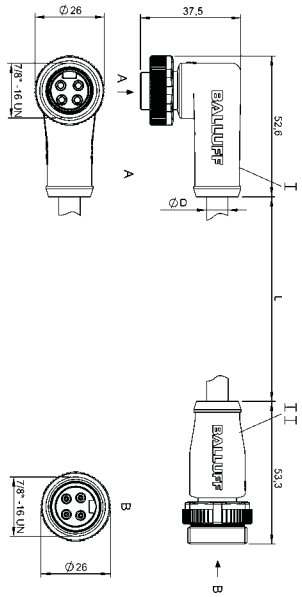
Power connection cables 7/8", 4-pin

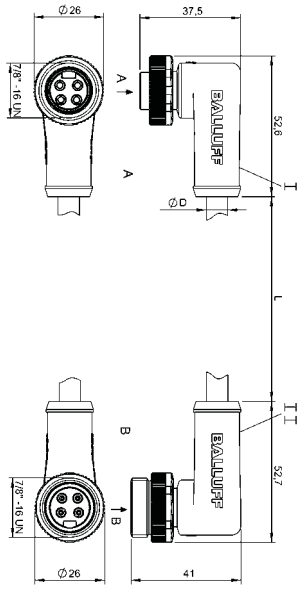




Female/male	Female/male
300 V DC	300 V DC
4×1.5 mm²	4×1.5 mm²
IP 68	IP 68
–25...+80° C	–25...+80° C

Ordering code	
Part number	
BCC06JE	**BCC06JL**
BCC A324-A314-30-304-PX04A5-006	BCC A324-A324-30-304-PX04A5-006
BCC06JF	**BCC06JM**
BCC A324-A314-30-304-PX04A5-020	BCC A324-A324-30-304-PX04A5-020
BCC06JH	**BCC06JN**
BCC A324-A314-30-304-PX04A5-050	BCC A324-A324-30-304-PX04A5-050
BCC06JJ	**BCC06JP**
BCC A324-A314-30-304-PX04A5-100	BCC A324-A324-30-304-PX04A5-100
BCC06JK	**BCC06JR**
BCC A324-A314-30-304-PX04A5-150	BCC A324-A324-30-304-PX04A5-150

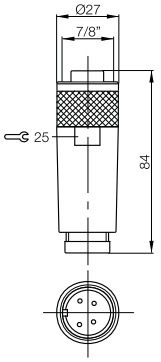


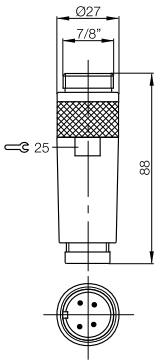


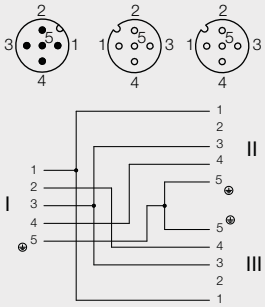
Power plug connector, 7/8", 4-pin

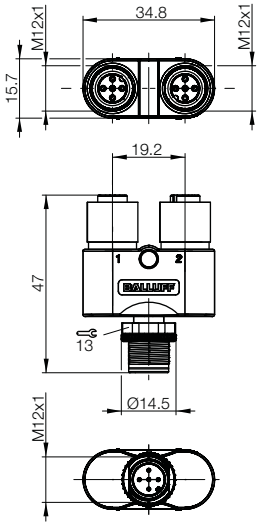
Connector diagram and wiring		
Type	Female	Male
Supply voltage U_B	250 V	250 V
Number of conductors × conductor cross-section	4× max. 1.5 mm²	4×1.5 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+80 °C	–25...+80 °C

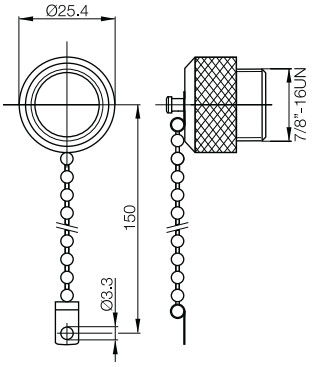
Cable material Cable dia.	Color	Ordering code Part number	
PUR 6...8 mm	Black	**BCC0706** BCC A334-0000-10-000-51X4A5-000	**BCC0709** BCC A334-0000-20-000-51X4A5-000
PUR 8...10 mm	Black	**BCC0707** BCC A334-0000-10-000-61X4A5-000	**BCC070A** BCC A334-0000-20-000-61X4A5-000
PUR 10...12 mm	Black	**BCC0708** BCC A334-0000-10-000-71X4A5-000	**BCC070C** BCC A334-0000-20-000-71X4A5-000

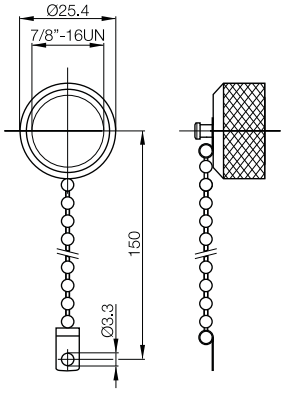




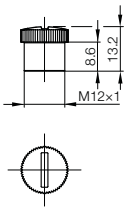
Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

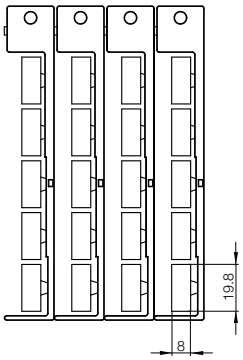






Description	M12 locking screw	Marking sleeve	Label set	
Use	IP 65 threaded cover for unused ports	For labeling connectors	Labeling the ports for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...	
Ordering code	**BAM01C2**		**BAM01AT**	
Part number	BAM CS-XA-002-M12-A	BAM IA-CC-002-01	BNI ACC-L01-000	
Ambient temperature T_a	–20...+80 °C			
Housing material	Plastic		Plastic	





Bitmaps

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							

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

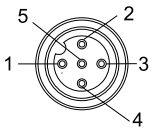
Output control byte display (Series 100 only)	
Bit 0	Red LED illuminates
Bit 1	Green LED illuminates
Bit 2	Display disable
Bit 3	
Bit 4	
Bit 5	
Bit 6	
Bit 7	

Pin assignments

Ethernet

Pin No.	Function
1	TD+
2	RD+
3	TD–
4	RD–

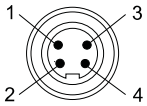
I/O port



Input port Pin No.	Function
1	V+
2	Input
3	0 V
4	Input
5	Ground GND

Output port Pin No.	Function
1	
2	Output
3	0 V
4	Output
5	Ground GND

Auxiliary power



Pin No.	Function
1	Actuator (+24 V)
2	Sensor (+24 V)
3	GND sensor
4	GND actuator

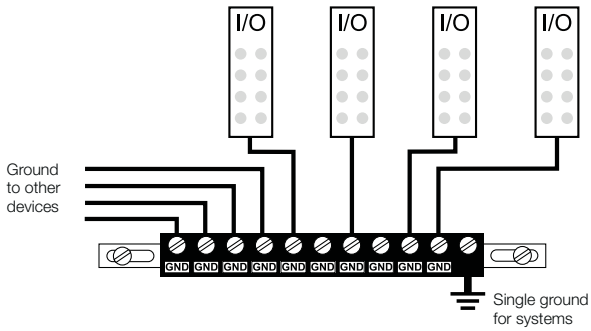
Information on grounding

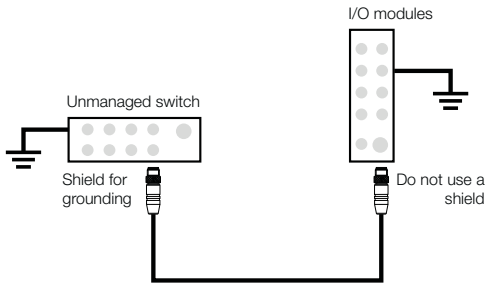
With a standard European grounding connection, use a joint grounding point for all blocks (see first illustration). All blocks remain within the same grounding potential. Grounding straps are included for mounting on a painted surface.

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."

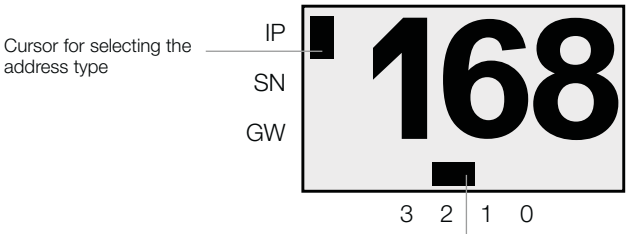
ODVA recommends that the shield be connected to ground at the switch and not at the network device. Ethernet specification IEEE802.3 also permits the use of unshielded cables.





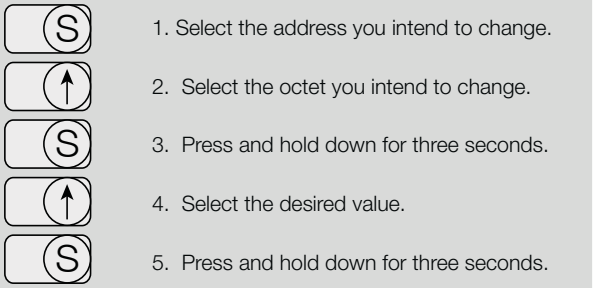
Ethernet/IP modules
Display with operating buttons

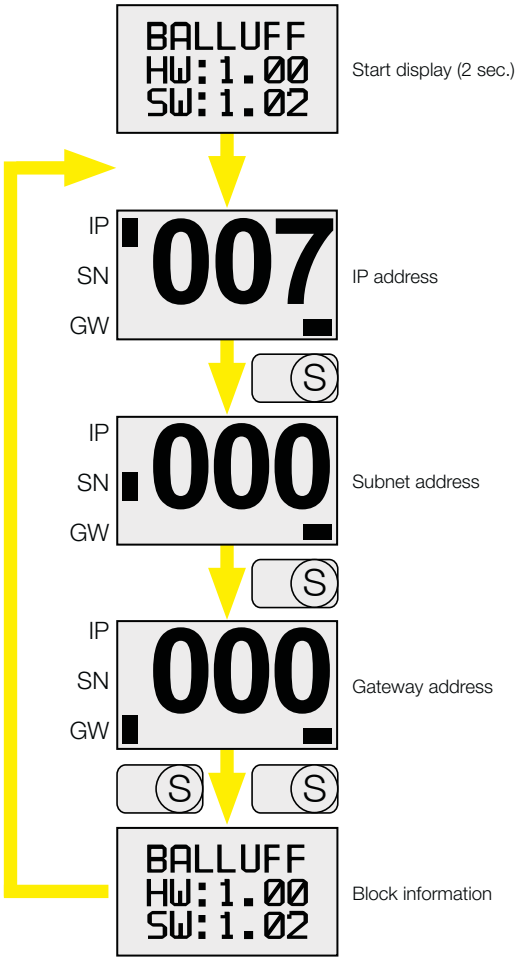
The Balluff Series 100 modules feature a digital display with two operating buttons that can be used to program the IP address, subnet and gateway address. You can also view the hardware and software versions from the module. When unused, octet 0 of the IP address is displayed by default.

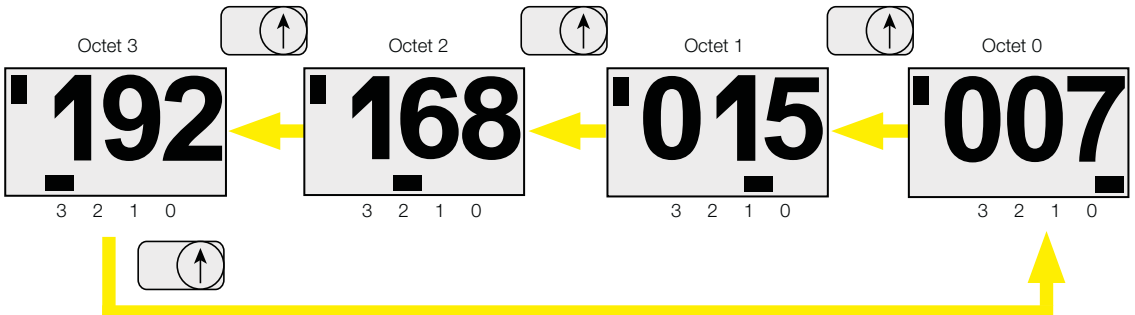


Address types
IP: IP address
SN: Subnet address
GW: Gateway address

Octet
3: Fourth octet
2: Third octet
1: Second octet
0: First octet







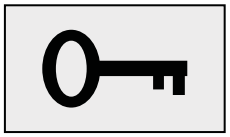
User-defined functions

User-defined LEDs

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

Disable buttons

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



Fieldbus Systems

Fieldbus System: Unmanaged Switches

Unmanaged Switches
Contents

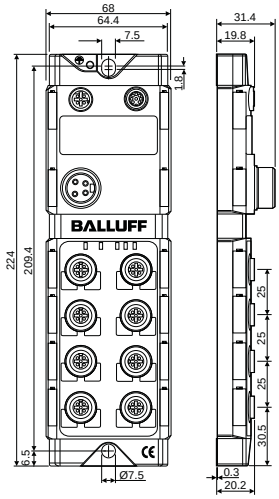
Ethernet 5-port switch IP 20
Ethernet 8-port switch IP 20
Ethernet 9-port switch IP 67

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.

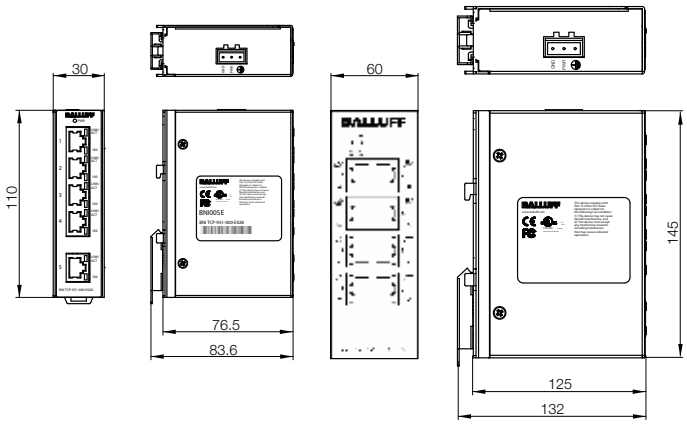
With Balluff, you receive a complete system so that you can use Ethernet to link Ethernet system components easily. The Ethernet product line was expanded with the addition of 5-port and 8-port Ethernet switches for this reason.

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
Version	No display
Ordering code	**BNI000F**
Part number	BNI EIP-950-000-Z009
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
Degree of protection as per IEC 60529	IP 67
Operating temperature	0...+55 °C
Storage temperature	–25...+70 °C
Housing material	Nickel-plated GdZn
Transfer rates	10/100 Mbps, automatic detection, full-duplex
Degree of protection	IP 67
Max. switching frequency	32 gigabyte
Overload protection	IEEE 802.3
IP address space	IPv4
Approvals	ODVA, UL-CUL, CSA, CE



Communication	Ethernet	Ethernet
Version	Ethernet switch	Ethernet switch
Ordering code	**BNI005E**	**BNI0067**
Part number	BNI TCP-951-000-E028	BNI TCP-952-000-E029
Ports	5×RJ45 Spring force clamp	8×RJ45 Spring force clamp
System power supply	0.2...2.5 mm²	0.2...2.5 mm²
Supply voltage U_B	12...48 V DC	2×12...30 V DC, redundant
Transfer 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
Degree of protection	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)
Fastener	Snaps onto support rail TH35 (EN60715)	Snaps onto support rail TH35 (EN60715)
Weight	152 g	363 g



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. And it does it by simple means.

IO-Link advantages at a glance

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

IO-Link

Profibus IO-Link modules starting on **page 22**
Profinet IO-Link modules starting on **page 46**
Connection cables BCC starting on **page 274**

IO-Link

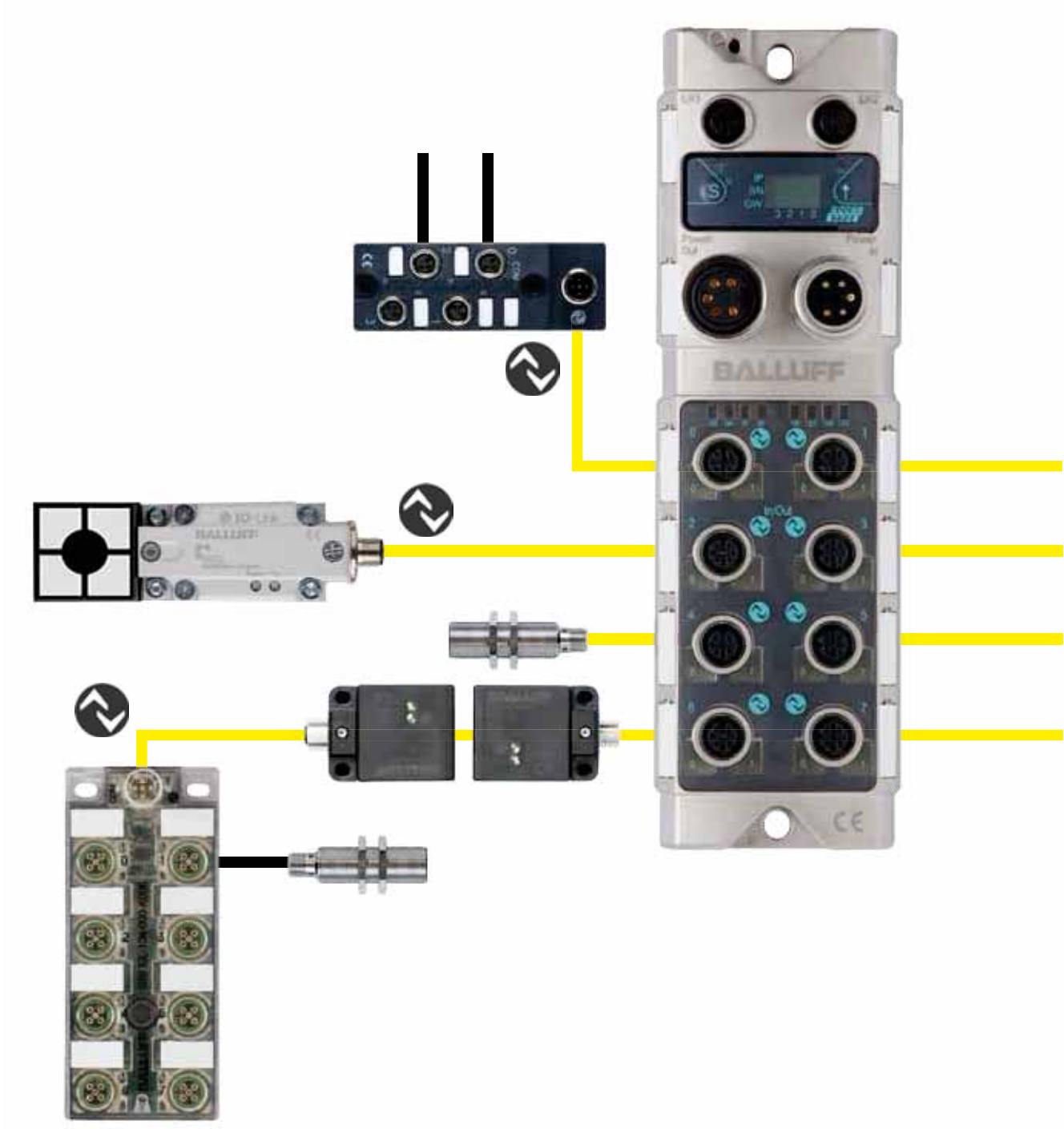
Network technology for reliable data transfer and more efficiency

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.



IO-Link
Network technology for reliable data transfer and more efficiency

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 security against interference by means of digital communication
- A selection of sensors that is highly suited to the particular application because of the simultaneous use of binary, analog, and IO-Link sensors

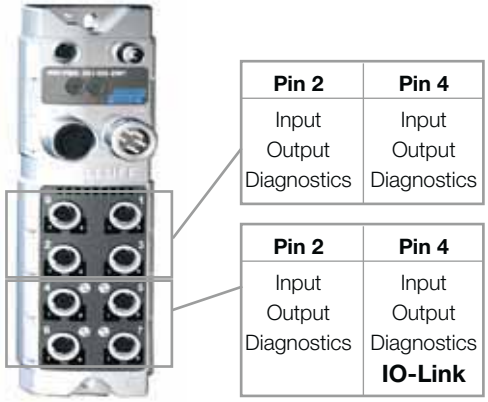
Highest machine availability
- Faster, error-free sensor replacement and prompt commissioning
- Automatic configuration of an IO-Link sensor
- Prompt format changes and recipe changes centrally via the controller
- Additional security from clearly identifiable IO-Link devices

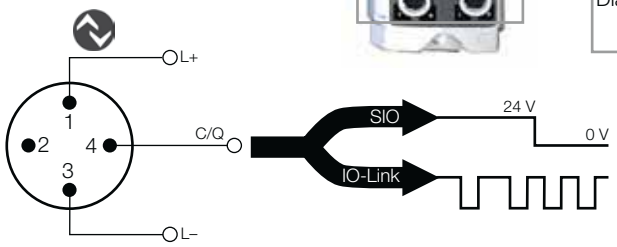
Network technology for flexible installation and reliable data transfer

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

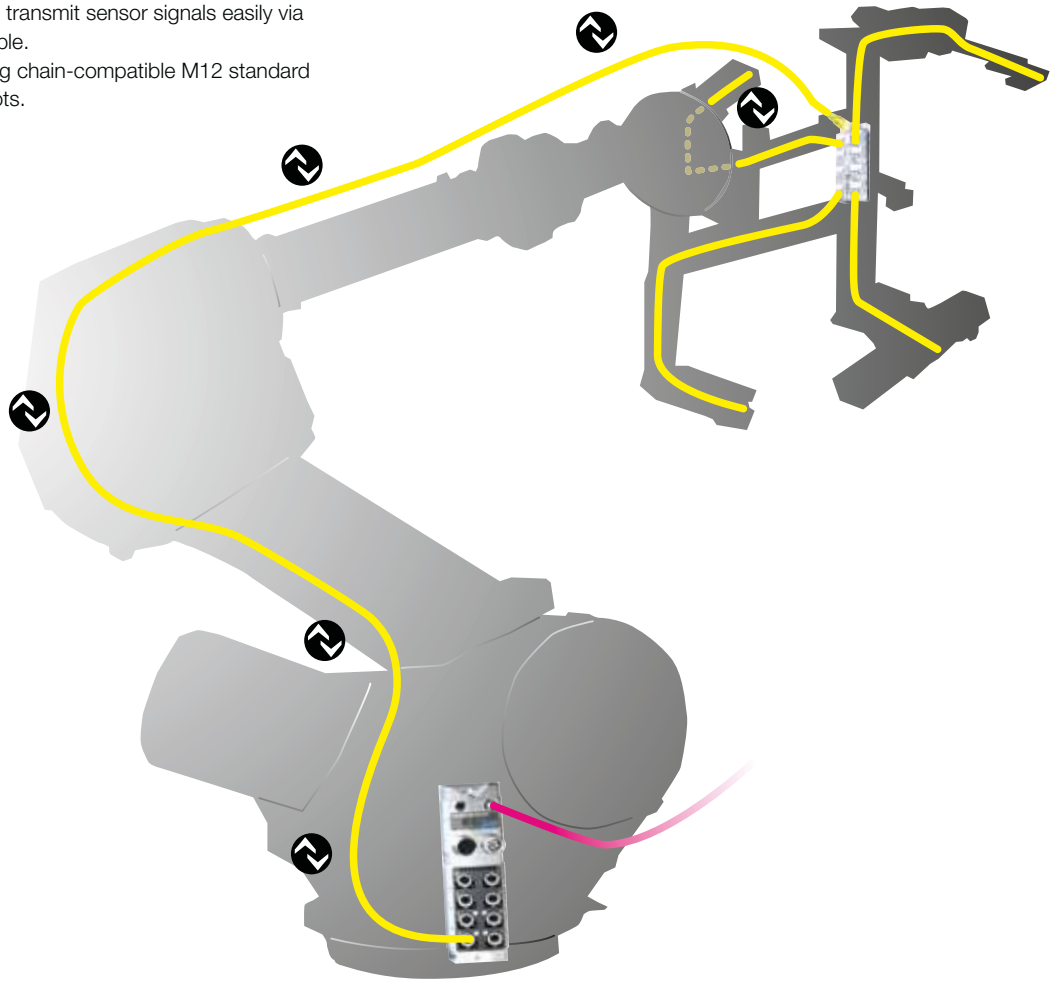
Depending on model type, the ports of the Balluff IO-Link distributor modules can be configured as a (diagnostic) input, output or IO-Link port. For each port, pin 2 or pin 4 can be used as input and output or for diagnostics.
IO-Link ports are labeled with the IO-Link symbol.





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.



Network technology for reduced costs and greater efficiency

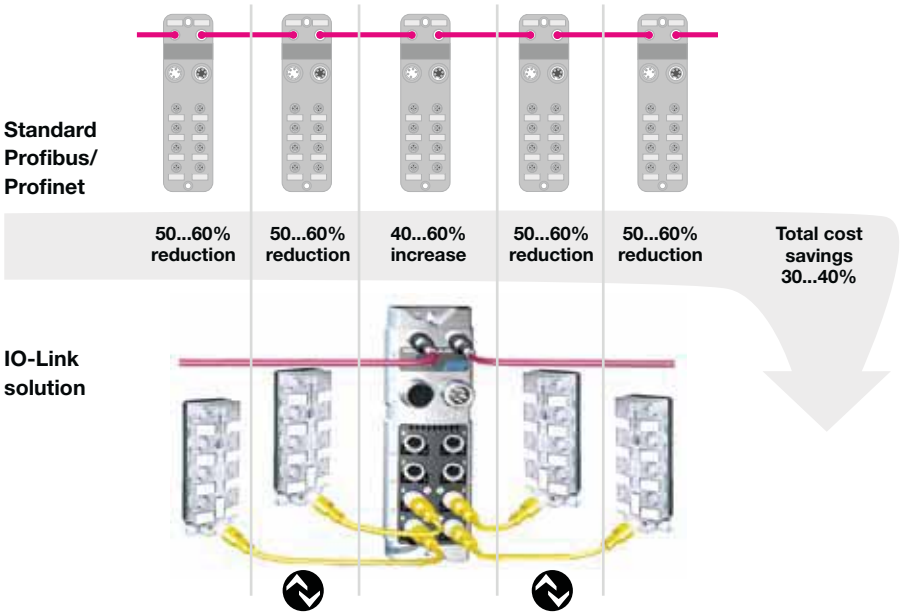
Balluff IO-Link sensor hubs save money

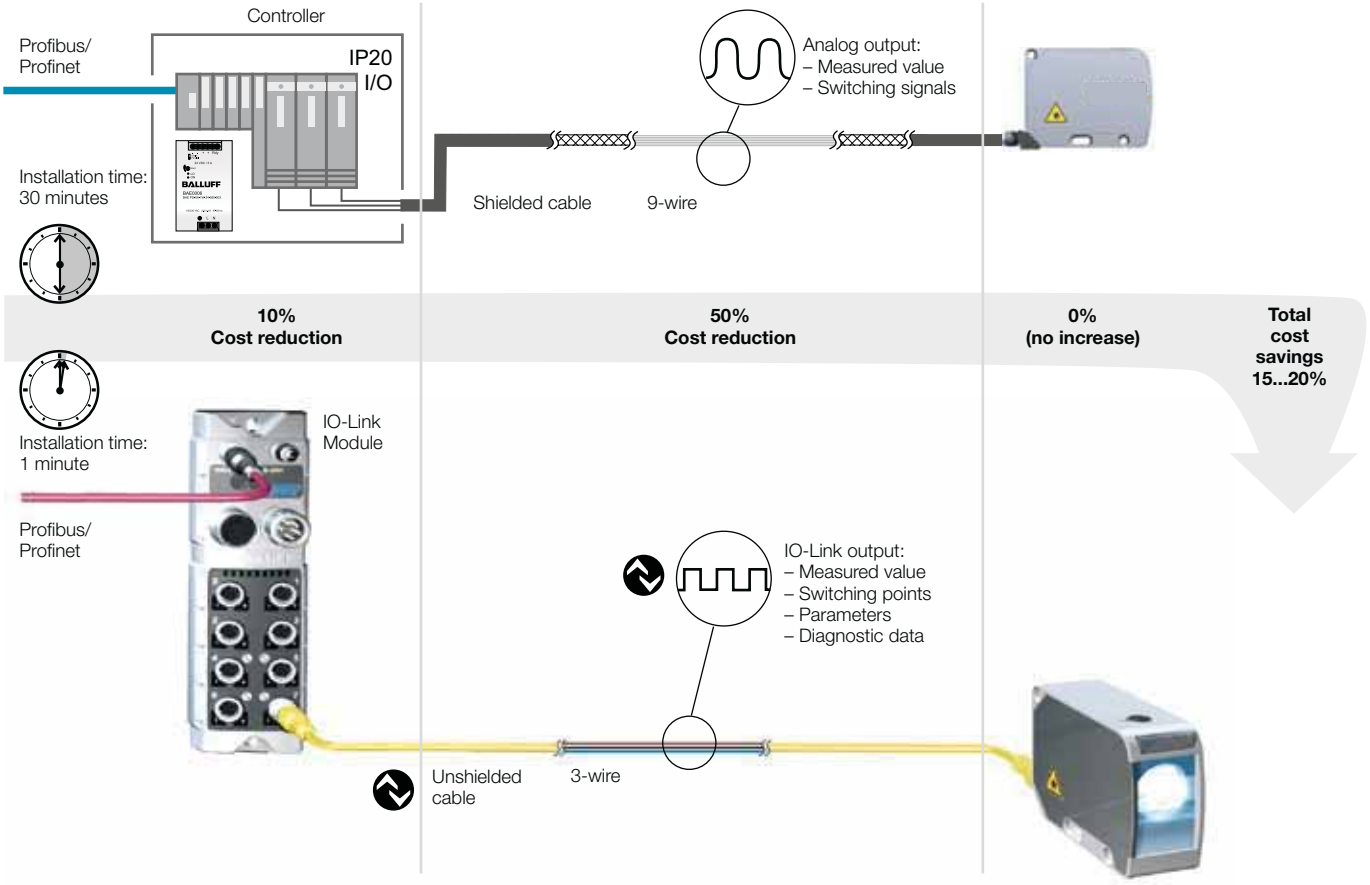
You save a great deal of money during the installation of IO-Link sensor hubs: 15 to 20% per input compared to Profibus and Profinet.

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.

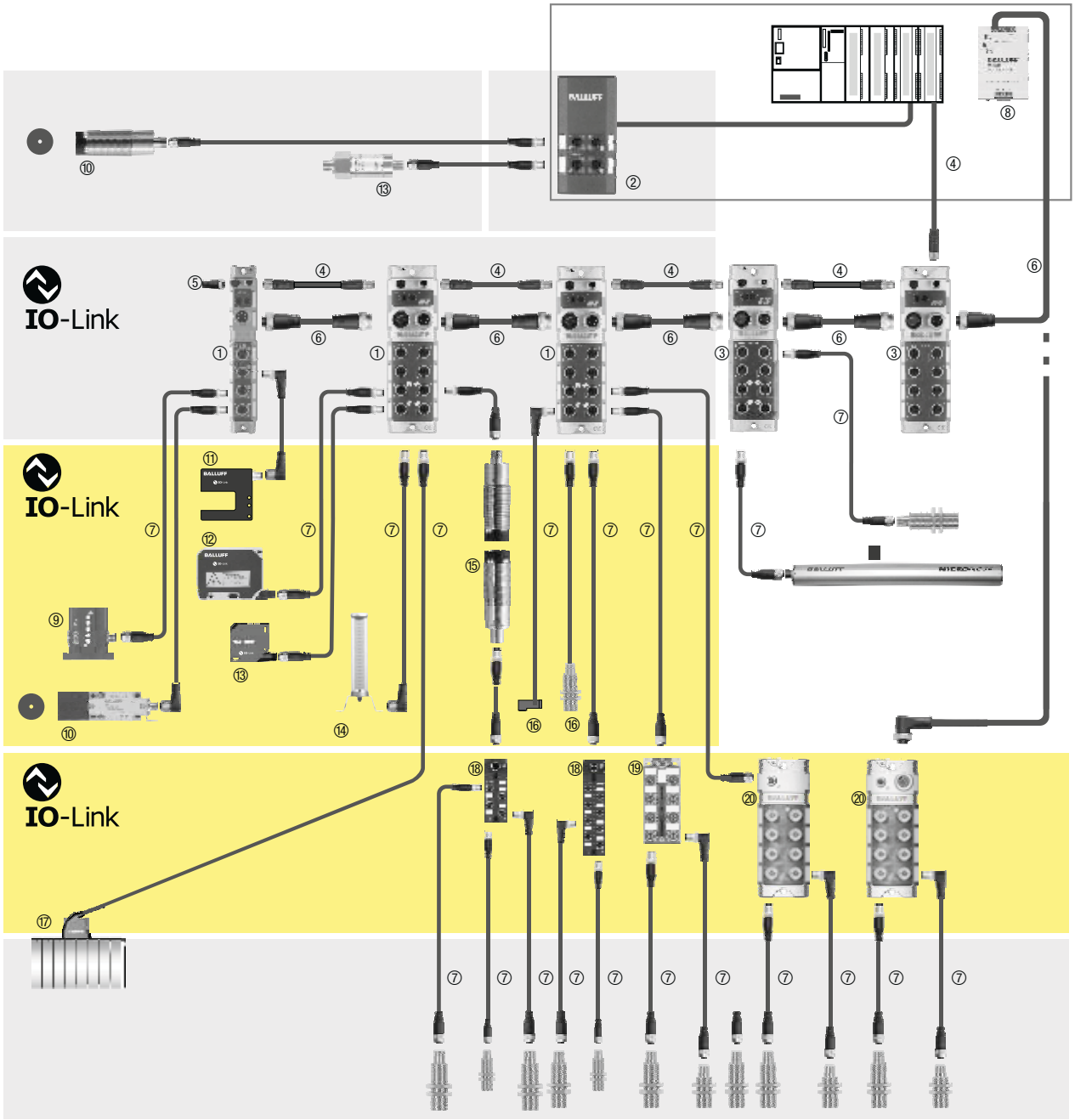
Cost-effective installation with high functionality

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, economical M12 cables, you can conveniently set up the system in just one minute without so much as screwdriver. For a standard connection, you would need around 30 minutes. Clear IO-Link advantages that speak for themselves.





Profibus and Profinet product topology



IO-Link

① **Profibus/Profinet IO-Link module BNI**	Page 22, 46	⑨ **IO-Link multiple position switches BNS**	Page 171
② **Profibus IO-Link panel module BNI**	Page 27	⑩ **IO-Link RFID system BIS**	Page 164
③ **Profibus/Profinet module BNI**	Page 23, 47	⑪ **IO-Link fork sensor BGL**	Page 157
④ **Bus cable BCC**	Page 30	⑫ **IO-Link laser distance sensor BOD**	Page 159
⑤ **Terminating resistor**	Page 36	⑬ **IO-Link color sensor BFS**	Page 158
⑥ **Power cable BCC**	Page 28	⑭ **IO-Link SmartLight**	Page 187
⑦ **Connection cable BCC**	Page 336	⑮ **IO-Link inductive couplers BIC**	Page 210
⑧ **Power supplies BAE**	Page 365	⑯ **IO-Link inductive distance sensors BAW**	Page 160
		⑰ **IO-Link valve terminal connector BNI**	Page 180
		⑱ **IO-Link sensor hub BNI M8**	Page 140
		⑲ **IO-Link sensor hub BNI M12**	Page 145
		⑳ **Metal IO-Link sensor hub**	Page 146

Modular expansion of fieldbus systems

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 according to your needs. 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

Sensor hubs

Simple integration
- Sensor hubs can be configured easily via fieldbus

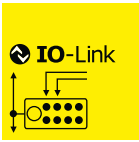
Low space requirements
- Smaller in size than a bus splitter

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

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**



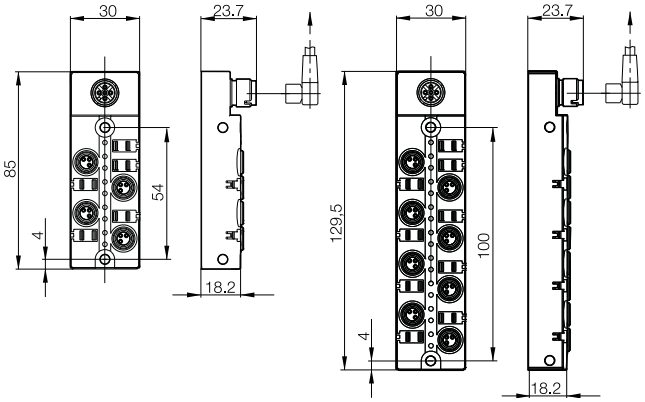
Profibus IO-Link modules starting on **page 22!**
Profinet IO-Link modules starting on **page 46!**

Simple handling, fast data, four variants

The space-saving M8 sensor hubs with IO-Link interface 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		Device	Device
Version		4× DI	8× DI
Ordering code		**BNI000P**	**BNI000R**
Part number		BNI IOL-101-000-K018	BNI IOL-102-000-K019
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 current U_T		max. 800 mA	max. 800 mA
Degree of protection as per IEC 60529		IP 67 (when screwed into place)	IP 67 (when screwed into place)
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
Fastener		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			
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
Indicators	Communication	Green LED, pulsing	Green LED, pulsing
	Error	Red LED	Red LED
Parameter		NC/NO per input	NC/NO per input

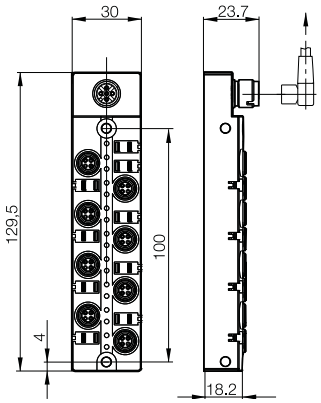


All hubs include four screw plugs and a label set.

IO-Link	Device			
Version	16× DI			
Ordering code	**BNI0021**			
Part number	BNI IOL-104-000-K021			
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_T	max. 800 mA			
Degree of protection as per IEC 60529	IP 67 (when screwed into place)			
Operating temperature T_a	–5...+55 °C			
Storage temperature	–25...+70 °C			
Weight	Approx. 103 g			
Fastener	2 mounting holes			
Dimensions (L×W×H)	129.5×30×23.7 mm			
Housing material	Plastic			

IO-Link

No. of IO-Link ports		1× device		
Operating mode		COM 2		
IO-Link process data length		2 input bytes		
Indicators	Communication	Green LED, pulsing		
	Error	Red LED		
Parameter		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.

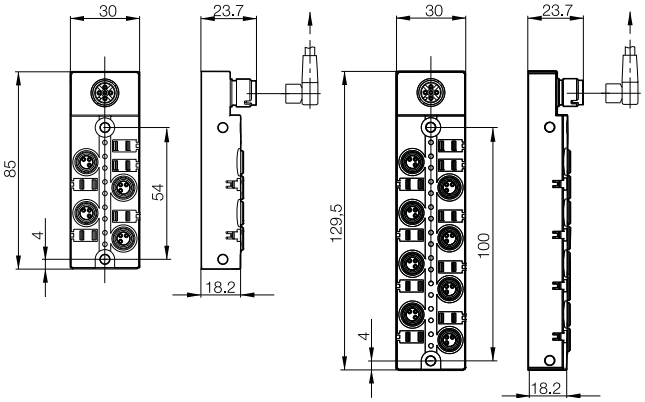
The single-channel monitoring function provides detailed diagnostic results extremely fast.

The single-channel monitoring function enables port-specific diagnostics of short circuits, overloading and cable breaks separately for each single channel. 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
Version		4× DI	8× DI
Ordering code		**BNI001W**	**BNI001Y**
Part number		BNI IOL-101-S01-K018	BNI IOL-102-S01-K019
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 current U_T		max. 800 mA	max. 800 mA
Degree of protection as per IEC 60529		IP 67 (when screwed into place)	IP 67 (when screwed into place)
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
Fastener		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			
No. of IO-Link ports		1× device	1× device
Operating mode		COM 2	COM 2
IO-Link process data length		2 input bytes	2 input bytes
Indicators	Communication	Green LED, pulsing	Green LED, pulsing
	Error	Red LED	Red LED
Parameter		NC/NO per input	NC/NO per input



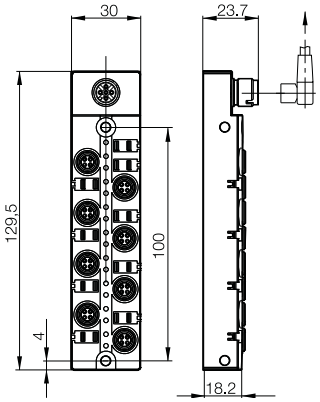
All hubs include four screw plugs and a label set.

M8 sensor hubs, IP 67, 4-pin, single-channel monitoring

IO-Link	Device		
Version	16× DI		
Ordering code	**BNI0022**		
Part number	BNI IOL-104-S01-K021		
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_T	max. 800 mA		
Degree of protection as per IEC 60529	IP 67 (when screwed into place)		
Operating temperature T_a	–5...+55 °C		
Storage temperature	–25...+70 °C		
Weight	Approx. 103 g		
Fastener	2 mounting holes		
Dimensions (L×W×H)	129.5×30×23.7 mm		
Housing material	Plastic		

IO-Link

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



M12 sensor hubs, IP 67, 16 digital inputs/outputs

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

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.

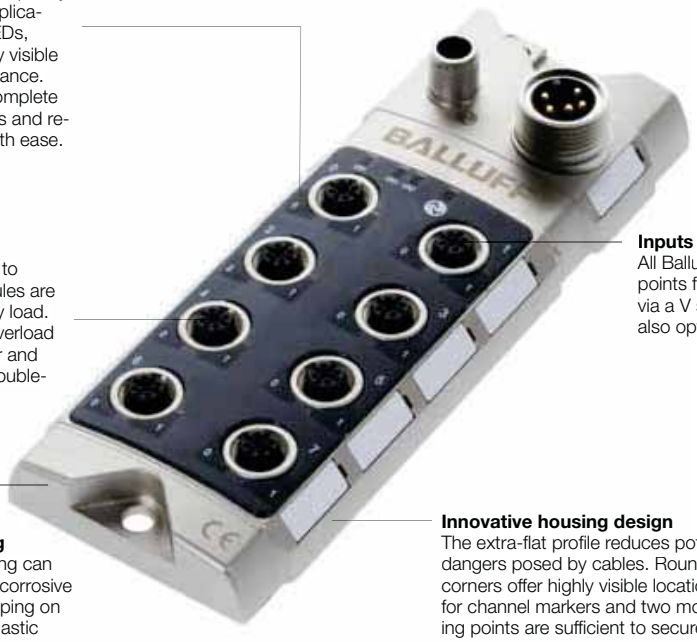
IO-Link	
Version	
Ordering code	
Part number	
Supply voltage U_B	
Function indicator IO-Link RUN	
Power-on indicator	
Connection: IO-Link	
Connection: I/O ports	
Connection U_O	
Connection U_A	
No. of I/O ports	
Number of inputs	
Number of outputs	
Configurable	
Single-channel monitoring	
Max. load current, sensors/channel	
Max. load current actuators/channel	
Port status indicator	
Total current U_T	
Total current U_O	
Degree of protection as per IEC 60529	
Operating temperature T_a	
Storage temperature	
Fastener	
Dimensions (L×W×H)	
Housing material	

IO-Link

No. of IO-Link ports		
Max. cycle time		
IO-Link process data length		
Indicators	Communication	
	Error	

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, which 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 safe outputs
With an output current of up to **2 amps**, 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.



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

Robust, full-metal housing
The fully encapsulated housing can withstand impacts, shaking, corrosive fluids, as well as people stepping on it and costs the same as a plastic housing.

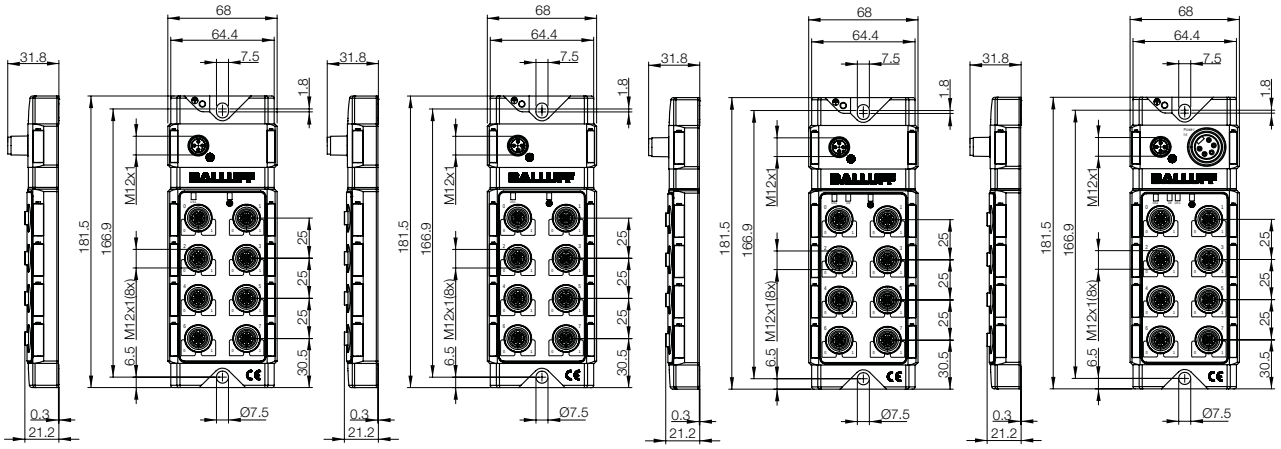
Innovative housing design
The extra-flat profile reduces potential dangers posed by cables. Rounded corners offer highly visible locations for channel markers and two mounting points are sufficient to secure the robust metal housing.

M12 sensor hubs, IP 67, 16 digital inputs/outputs

NPN

	Device	Device	Device	Device
	16× DI	16× DI	16× DI/DO	16× DI/DO
	BNI0032	**BNI0063**	**BNI003U**	**BNI0035**
	BNI IOL-104-000-Z012	BNI IOL-106-000-Z012	BNI IOL-302-000-Z012	BNI IOL-302-000-Z013
	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
			via IO-Link interface	via 7/8" connector
	8	8	8	8
	16	16	max. 16	max. 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 screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	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

All hubs include four screw plugs and a label set.



Selectable IO-Link sensor hubs

Simple handling – lower costs – universal use
Selectable IO-Link sensor hubs from Balluff are a market innovation. The user can write and read his 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 (overload, short-circuit or cable break)
- Reduced downtimes

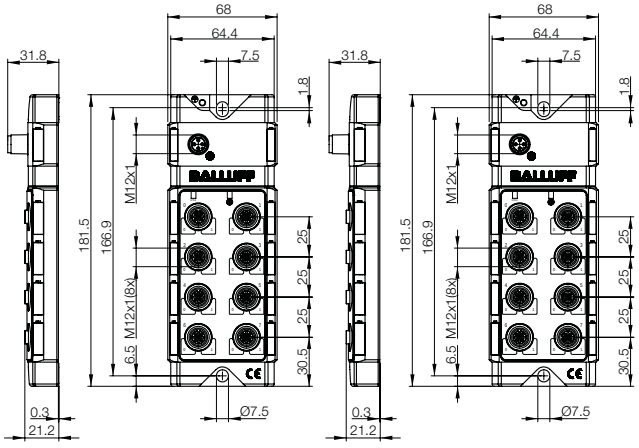
Selectable sensor hubs from Balluff represent lower costs, less work and reduced idle periods and ensure the highest efficiency.

CE
IO-Link

selectable

IO-Link		Device	Device
Version		16× DI	16× DI
Ordering code		**BNI0039**	**BNI003T**
Part number		BNI IOL-104-S01-Z012	BNI IOL-104-S01-Z012-C01
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
Connection U_O		via IO-Link interface	via IO-Link interface
Connection U_A			
No. of I/O ports		8	8
Number of inputs		16	16
Number of outputs		0	0
Configurable			
Single-channel monitoring		Yes	Yes
Max. load current, sensors/channel		100 mA	100 mA
Max. load current actuators/channel			
Port status indicator		Yellow/red LED	Yellow/red LED
Total current U_T		< 1.4 A	< 1.4 A
Total current U_O			
Degree of protection as per IEC 60529		IP 67 (when screwed into place)	IP 67 (when screwed into place)
Operating temperature T_a		–5...+70 °C	–5...+70 °C
Storage temperature		–25...+70 °C	–25...+70 °C
Fastener		2 mounting holes	2 mounting holes
Dimensions (L×W×H)		181×68×36.9 mm	181×68×36.9 mm
Housing material		Nickel-plated GdZn	Nickel-plated GdZn
IO-Link			
Max. cycle time		10 ms	15 ms
IO-Link process data length		4 input bytes	6 input bytes
Indicators	Communication	Green LED, pulsing	Green LED, pulsing
	Error	Red LED	Red LED

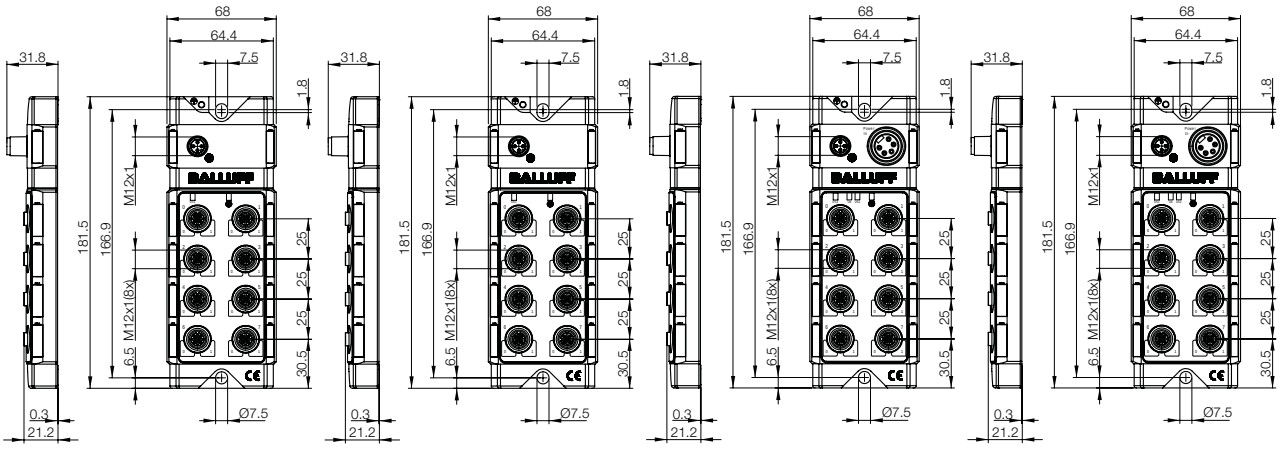
All hubs include four screw plugs and a label set.



Metal M12 sensor/actuator hubs, single-channel monitoring

selectable

	Device	Device	Device	Device
	16× DI/DO	16× DI/DO	16× DI/DO	16× DI/DO
	BNI003C	**BNI005P**	**BNI003A**	**BNI0048**
	BNI IOL-302-S01-Z012	BNI IOL-104-S01-Z012-C02	BNI IOL-302-S01-Z013	BNI IOL-302-S01-Z013-C01
	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
	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
	< 1.4 A	< 1.4 A	9 A	9 A
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	25 ms	25 ms	25 ms	30 ms
	8 input bytes/2 output bytes	8 input bytes/2 output bytes	8 input bytes/2 output 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

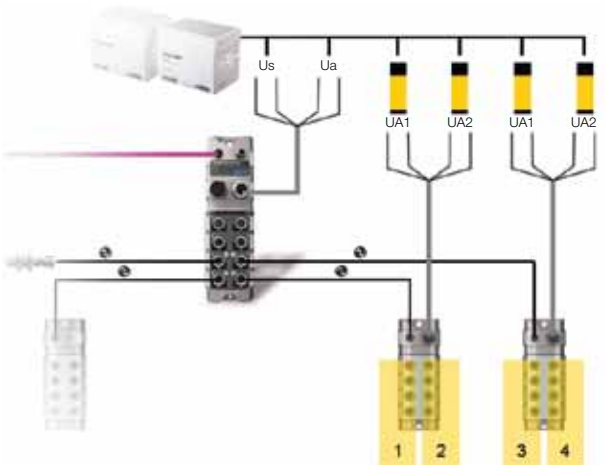


- Robust housing
- Powerful inputs
- Powerful outputs
- Extended temperature range
- Modules with reliable deactivation mechanism

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

Type BNI IOL-252/256 IO-Link actuator hubs fulfill requirements relating to the "passive safety" of outputs following safe deactivation in accordance with Machinery Directive 2006/42/EC, EN 954-1 category 3, EN 13849-1, EN 62061 SIL2.

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.



CE
IO-Link

IO-Link	
Version	
Ordering code	
Part number	
Supply voltage U_B	
Function indicator IO-Link RUN	
Power-on indicator	
Connection: IO-Link	
Connection: I/O ports	
Connection U_O	
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, sensors/channel	
Max. load current actuators/channel	
Port status indicator	
Total current U_T	
Total current U_O	
Degree of protection as per IEC 60529	
Operating temperature T_a	
Storage temperature	
Fastener	
Dimensions (L×W×H)	
Housing material	

IO-Link

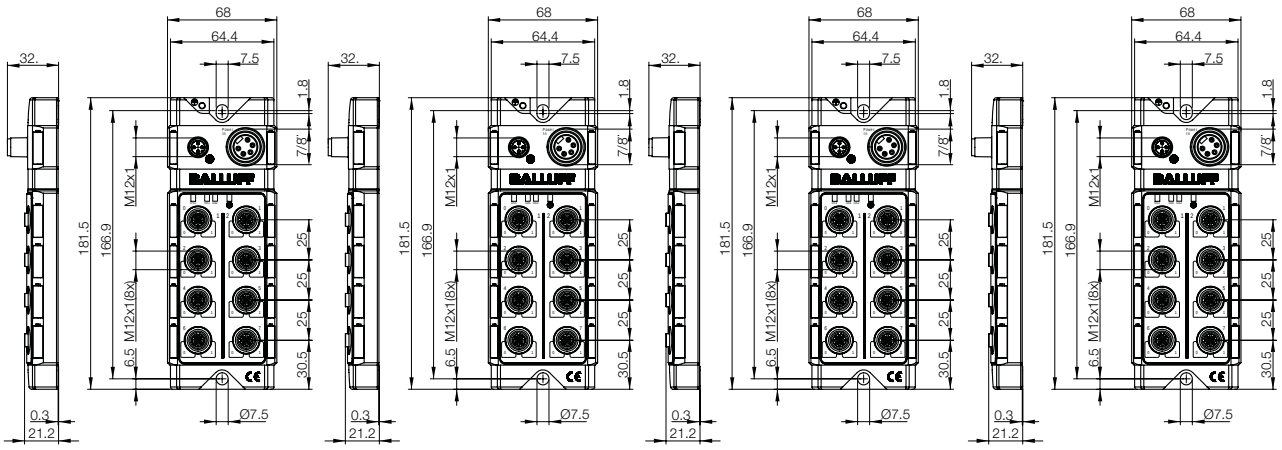
Max. cycle time		
IO-Link process data length		
Indicators	Communication	
	Error	

All hubs include four screw plugs and a label set.

Metal M12 actuator hubs, single-channel monitoring



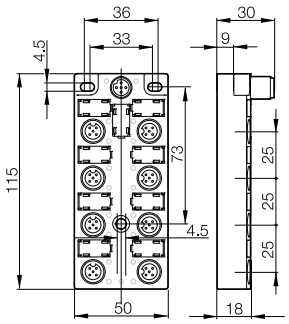

	Device	Device	Device	Device
	2× 4×DO	2× 4×DO	2× 8×DO	2× 8×DO
	BNI0033	**BNI0034**	**BNI003W**	**BNI003Y**
	BNI IOL-252-000-Z013	BNI IOL-256-000-Z013	BNI IOL-252-S01-Z013	BNI IOL-256-S01-Z013
	18...30 V DC	18...30 V DC	18...30 V DC	18...30 V DC
	Green LED	Green LED	Green LED	Green LED
	Green LED	Green 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 screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	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

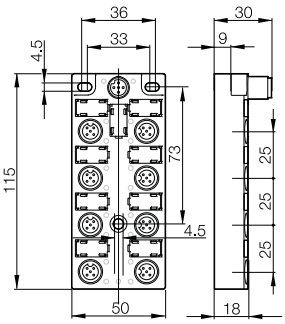


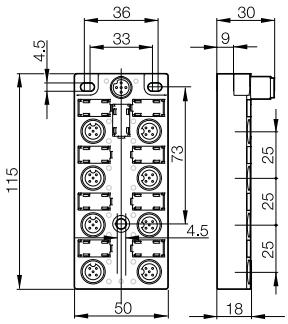
NPN

IO-Link	Device	Device	Device
Version	8× DI	16× DI	16× DI
Ordering code	**BNI0005**	**BNI0006**	**BNI0074**
Part number	BNI IOL-102-000-K006	BNI IOL-104-000-K006	BNI IOL-106-000-K006
Supply voltage U_B	18...30 V DC	18...30 V DC	18...30 V
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: I/O ports	M12, A-coded, female	M12, A-coded, female	M12, A-coded, female
No. of I/O ports	8	8	8
Number of inputs	8 PNP	16 PNP	16 NPN
Configurable/parameterizable	No	No	NC/NO
Max. load current, sensors/channel	100 mA	100 mA	200 mA
Port status indicator	Yellow LED	Yellow LED	Yellow LED
Total current U_T	< 1.2 A	< 1.2 A	< 1.2 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Operating temperature T_a	–5...+55 °C	–5...+55 °C	–5...+55 °C
Storage temperature	–25...+85 °C	–25...+85 °C	–25...+85 °C
Weight	Approx. 86 g	Approx. 86 g	
Fastener	3 mounting holes	3 mounting holes	3 mounting holes
Dimensions (L×W×H)	115×50×31 mm	115×50×31 mm	115×50×31 mm
Housing material	Trogamid	Trogamid	PC
IO-Link			
No. of IO-Link ports	1× device	1× device	1× device
Max. cycle time	3 ms	3 ms	3 ms
IO-Link process data length	2 input bytes	2 input bytes	2 input bytes
Indicators Communication	Green LED	Green LED	Green LED
Error	Red LED	Red LED	Red LED

All hubs include four screw plugs and a label set.







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. to increase the flexibility of 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.

M12 sensor hubs, IP 67, 4-pin Analog

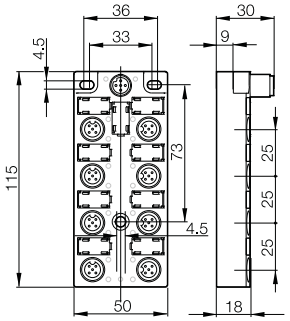
With the analog sensor hub, you can select from two additional variants with current and voltage interface, allowing you to connect non-IO-Link capable sensors with maximum reliability. Four existing analog channels can be supplemented with four additional dual-use standard input ports per IEC 61131.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

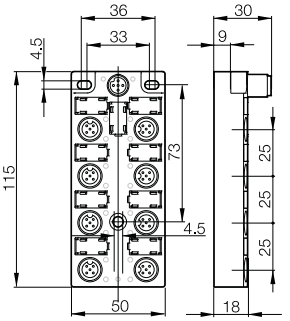
IO-Link	Device	Device
Version	4 AI, 4-20 mA, 8× DI	4 AI, 0-10 V DC, 8× DI
Ordering code	**BNI0007**	**BNI0008**
Part number	BNI IOL-709-000-K006	BNI IOL-710-000-K006
Supply voltage U_B	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	Green LED	Green LED
Power-on indicator	Green LED	Green LED
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 digital inputs	8 PNP	8 PNP
Configurable	NC/NO	NC/NO
Max. load current, sensors/channel	200 mA	200 mA
Port status indicator	Yellow LED	Yellow LED
Total current U_T	< 1.2 A	< 1.2 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
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
Fastener	3 mounting holes	3 mounting holes
Dimensions (L×W×H)	115×50×31 mm	115×50×31 mm
Housing material	Trogamid	Trogamid

Analog ports			
Number of analog ports		4	4
Interface		4...20 mA	0...10 V DC
Resolution		10 bit	10 bit
Analog signal indicator		Green LED	Green LED

IO-Link			
No. of IO-Link ports		1× device	1× device
Operating mode		COM 2 (3-wire)	COM 2 (3-wire)
IO-Link process data length		10 input bytes	10 input bytes
Indicators	Communication	Green LED	Green LED
	Error	Red LED	Red LED
Max. load current		< 1.2 A	< 1.2 A
Parameter		NC/NO per input, 1 switching point per analog channel	NC/NO per input, 1 switching point per analog channel

All hubs include four screw plugs and a label set.





- 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

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 3-pin standard cable is sufficient for the connection. M12 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. 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 (DESINA).

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

M12 plastic sensor hubs now also have output functionality

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

IO-Link Version 1.1

IO-Link	
Description	
Version	
Ordering code	
Part number	
Supply voltage U_B	
Function indicator IO-Link RUN	
Power-on indicator	
Connection: IO-Link	
Connection: I/O ports	
Connection U_O	
Connection U_A	
No. of I/O ports	
Number of inputs	
Number of outputs	
Configurable	
Single-channel monitoring	
Codeable via IO-Link	
Max. load current, sensors/channel	
Max. load current actuators/channel	
Port status indicator	
Total current U_T	
Total current U_O	
Degree of protection as per IEC 60529	
Operating temperature T_a	
Storage temperature	
Fastener	
Dimensions (L×W×H)	
Housing material	

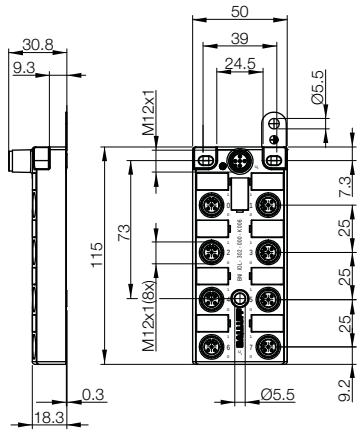
IO-Link Version 1.1

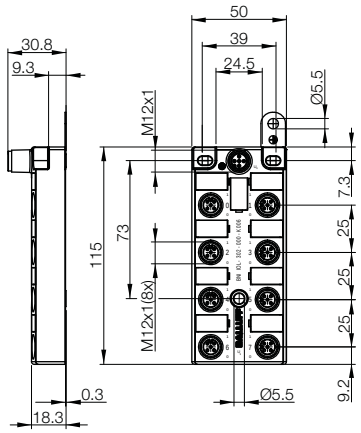
Max. cycle time		
IO-Link process data length		
Indicators	Communication	
	Error	

All hubs include four screw plugs and a label set.




	Device	Device	Device	Device
	Standard module	Single-channel diagnostics	selectable	Single-channel diagnostics and codeable
	16× DI/DO	16× DI/DO	16× DI/DO	16× DI/DO
	BNI005L	**BNI005T**	**BNI005U**	**BNI005W**
	BNI IOL-302-000-K006	BNI IOL-302-S01-K006	BNI IOL-302-000-K006-C01	BNI IOL-302-S01-K006-C01
	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
	2 mounting holes	2 mounting holes	2 mounting holes	2 mounting holes
	115×50×31	115×50×31 mm	115×50×31 mm	115×50×31 mm
	PC	PC	PC	PC
	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



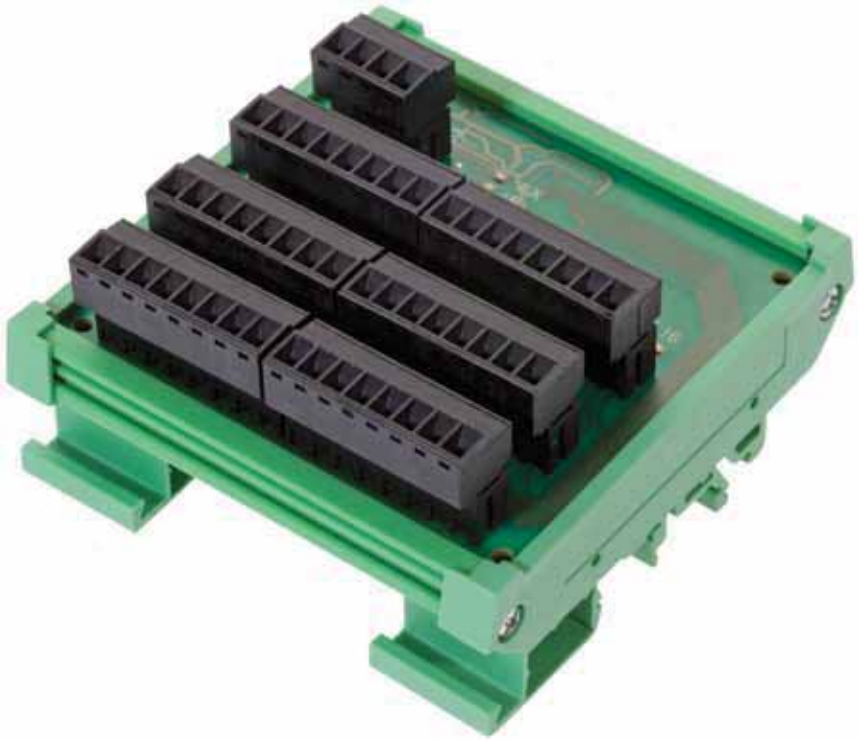


Sensor/actuator hubs, IP 20

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 the 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.

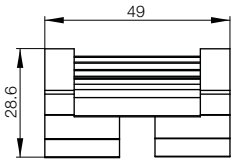
IO-Link for integration in devices and device modules
Circuit board variants are available for the integration in spatially limited and complex functional units which can be integrated via spacing bolts.

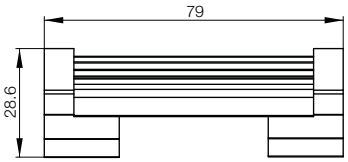


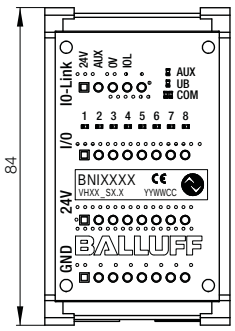
Sensor/actuator hubs, IP 20

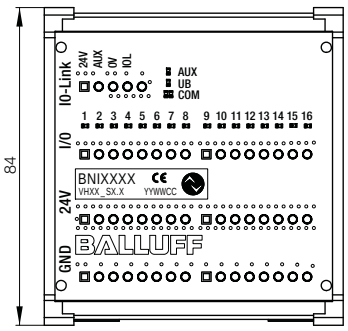
IO-Link	Device	Device
Version	8× DI/DO	16× DI/DO
Ordering code	**BNI004K**	**BNI004L**
Part number	BNI IOL-309-000-K024	BNI IOL-310-000-K025
Supply voltage U_B	18…30 V DC	18…30 V DC
Function indicator IO-Link RUN	Green LED	Green LED
Power-on indicator	Green LED	Green LED
Connection: IO-Link	Spring force or screw terminals, plug-in	Spring force or screw terminals, plug-in
Connection U_O	Spring force or screw terminals, plug-in	Spring force or screw terminals, plug-in
Connection U_A	Spring force or screw terminals, plug-in	Spring force or screw terminals, plug-in
Connection: I/O ports	Spring force or screw terminals, plug-in	Spring force or screw terminals, plug-in
No. of I/O ports	8	16
Number of inputs	Max. 8	Max. 16
Number of outputs	Max. 8	Max. 16
Configurable/parameterizable	Yes	Yes
Single-channel monitoring	No	No
Max. load current, sensors/channel	100 mA	100 mA
Max. load current actuators/channel	400 mA	400 mA
Port status indicator	Yellow LED	Yellow LED
Total current U_T	< 1.4 A	< 1.4 A
Total current U_O	< 1.4 A	< 1.4 A
Degree of protection as per IEC 60529	IP 20	IP 20
Operating temperature T_a	–5…+50 °C	–5…+50 °C
Storage temperature	–25…+75 °C	–25…+75 °C
Fastener	Top-hat rail fitting over plastic shell	Top-hat rail fitting over plastic shell
Dimensions (L×W×H)	49×84×43 mm	79×84×43 mm

IO-Link			
No. of IO-Link ports		1× device	1× device
Max. cycle time		3 ms	12 ms
IO-Link process data length		1 input byte/1 output byte	2 input bytes/2 output bytes
Indicators	Communication	Green LED, pulsing	Green LED, pulsing
	Error	Red LED	Red LED









Accessories:

Screw terminals		
for	**Ordering code**	**BAM01ZF**
BNI004K	Part number	BAM IA-NI-008-K024
for	**Ordering code**	**BAM01ZH**
BNI004L	Part number	BAM IA-NI-008-K025
Spring terminals		
for	**Ordering code**	**BAM01ZI**
BNI004K	Part number	BAM IA-NI-010-K024
for	**Ordering code**	**BAM01ZK**
BNI004L	Part number	BAM IA-NI-010-K025

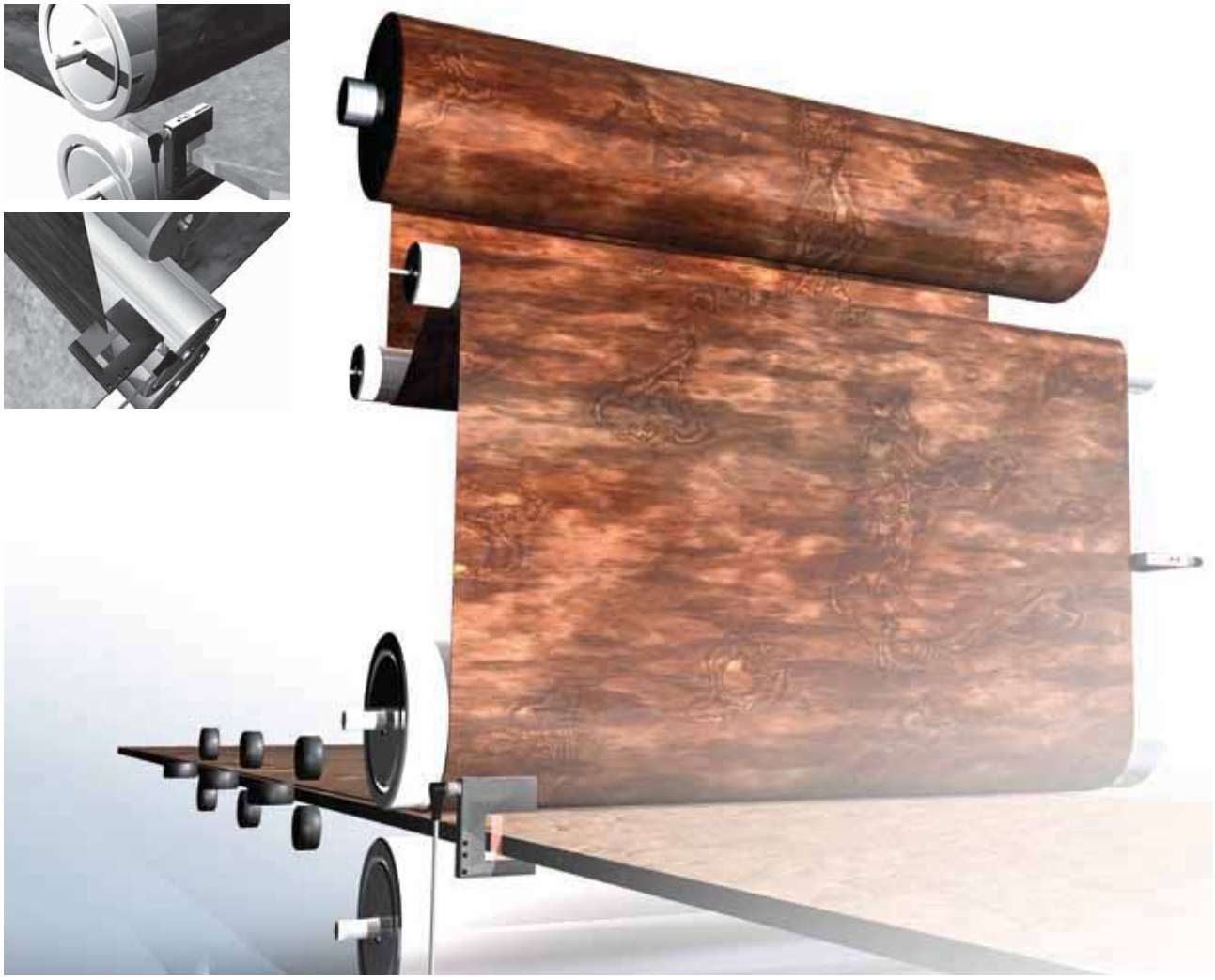
Fork sensors BGL

In-process correction

Thanks to their band of light, 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

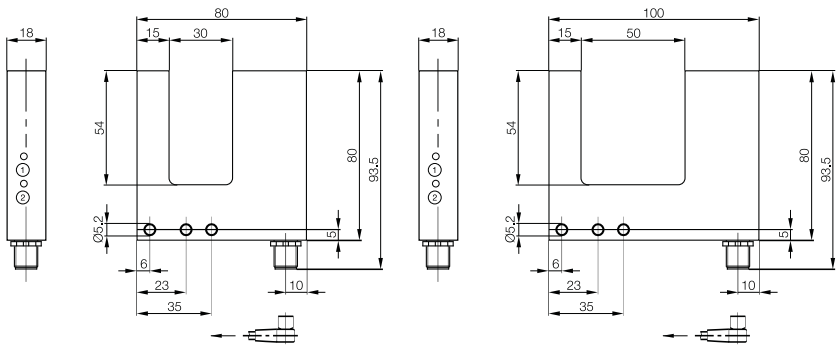
- Analog signal proportional to the skin depth of the object
- Constant value, even in the event of height variations
- Fieldbus connection with IO-Link



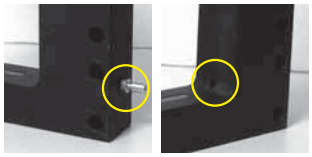
Fork sensors BGL

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	**Ordering code**	**BGL0035**	**BGL003F**
	Part number	BGL 30C-007-S4	BGL 50C-007-S4
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 indicators		2 x yellow LED	2 x yellow LED
Response time		≤ 1 ms	≤ 1 ms
Settings		2× teach button	2× 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
Degree of protection as 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		
Mode	COM 2	COM 2
Transfer 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
Parameter	Switching points/switching range, button disable, NO/NC switch, analog value characteristics	Switching points/switching range, button disable, NO/NC switch, analog value characteristics



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



Color sensor BFS 26K

Robotics, automation, quality assurance and production processes are among the applications for color sensors. The color sensor **BFS 26K** is suitable for

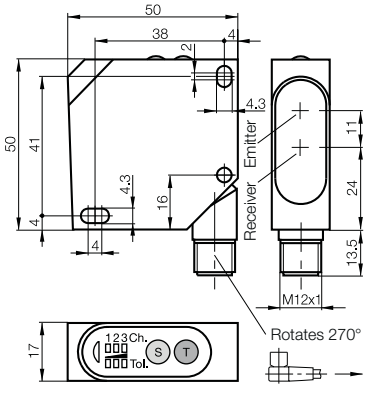
- Quality assurance
- Selection of components
- Detection of cable wires

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
PNP	**Ordering code**	**BFS000F**
	Part number	BFS 26K-GI-L04-S92
Supply voltage U_B		12...28 V DC
Residual ripple		10%
No-load supply current I_0 max.		≤ 40 mA
Switching output		3×PNP transistor
Output current		100 mA
Switching type		Light switching
Voltage drop U_d at I_e		≤ 2.4 V
Settings		Teach-in
Emitter, light type		Pulsed white light
Light spot geometry		Round
Light spot diameter		∅ 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
Output function indicator Tol. 1...Tol. 5		3×Red LED
Ready delay		300 ms
Response time		1 ms
Switching frequency f		500 Hz
Time functions		50 ms turn-off delay, switchable
Dimensions		50×50×17 mm
Connection		M12 connector, 4-pin
Housing material		Impact-resistant ABS
Optical surface		PMMA
Weight		40 g
Degree of protection as 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

Mode	COM 2
Transfer rate	38.4 kbaud
IO-Link process data length	2 input bytes
Parameter	Max. 5 colors, 5 tolerance ranges, NC/NO, button disable



Laser distance sensor BOD 63 M

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

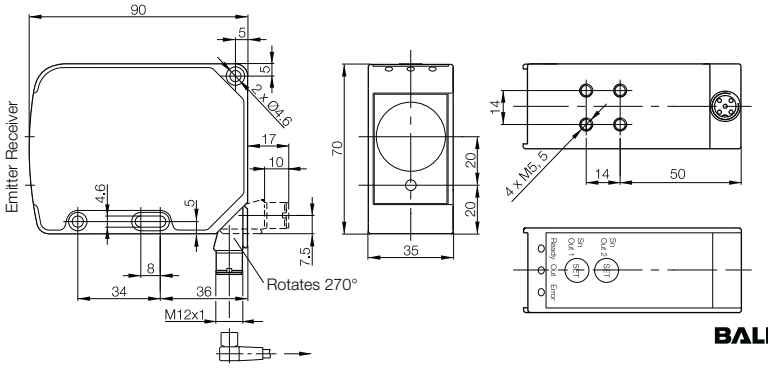
The BOD 63M with rugged metal housing has a working range of 200...6000 mm. Its data is transmitted via IO-Link mode, which makes setup and operation extremely easy: two teach-in buttons are provided for initiating startup. You can set both switching points directly from the controller, deactivate the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

IO-Link

Series		**BOD 63M**
Output signal		**IO-Link**
Working range		200...6000 mm
Measuring range		5800 mm
PNP	**Ordering code**	**BOD0012**
	Part number	BOD 63M-LI06-S4
Supply voltage U_B		18...30 V DC
No-load supply current I_0 max.		90 mA
Settings		Teach-in
Switching points		2
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
Max. characteristic deviation		± 1% of Wh
Switching hysteresis (in % of S_r)		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
Degree of protection as 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

Mode	COM 2
Transfer 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
Parameter	Switching points, laser on/off, button disable



IO-Link

Inductive distance sensor BAW M18

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

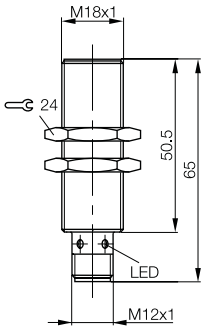
Features

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

Size		**M18×1**
Output signal		**IO-Link**
Installation type		Flush
Linear range s_l		1...5 mm
Ordering code		**BAW002F**
Part number		BAW M18MI-BLC50B-S04G
Supply voltage U_B		18...30 V DC
Residual ripple		≤ 15% of U_e
Rated insulation voltage U_i		250 V AC
Effective distance s_e		3 mm
Load resistance R_L		≤ 2 kΩ
Load resistance R_T		
No-load supply current I_0 at U_e		≤ 10 mA
Polarity reversal protected		Yes
Short-circuit protected		Yes
Ambient temperature T_a		–10...+70 °C
Repeat accuracy R_{BWN}		±8 µm
Non-linearity		≤ ±120 µm
Measuring speed		≤ 40 m/s
Response time		2 ms
Temperature coefficient TC	Typical	–2 µm/K
In the optimum range	Min.	+1 µm/K
From +10...+50 °C	Max.	–8 µm/K
Degree of protection as per IEC 60529		IP 67
Housing material		Nickel-plated CuZn
Material of sensing face		PBT
Connection		Connector
Recommended connector		BCCM415/BCCM425
Display		Out of range

IO-Link

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



Inductive distance sensor
BAW Z01

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

- 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

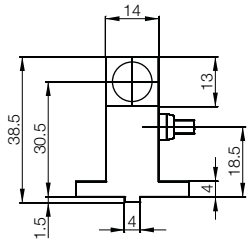
Application

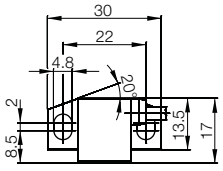
In addition to distance detection, thickness and width measurement, part inspection, parts identification and metering tasks, the main application area of the BAW Z01... is linear position monitoring of drive screws for

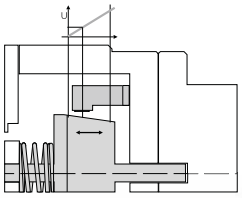
- Tools
- Workpieces

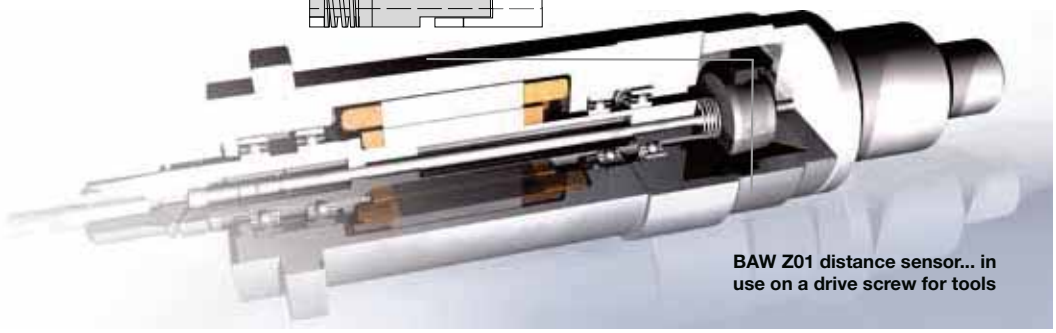
Size	**14×38.5×17 mm**
Output signal	**IO-Link**
Installation type	Flush
Linear range s_l	1...5 mm
Ordering code	**BAW003A**
Part number	BAW Z01AC-BLD50B-DP03
Supply voltage U_B	18...30 V DC
Residual ripple	≤ 15% of U_e
Rated insulation voltage U_i	75 V AC
No-load supply current I_0 at U_e	≤ 12 mA
Polarity reversal protected	Yes
Short-circuit protected	Yes
Ambient temperature T_a	–10...+60 °C
Repeat accuracy R_{BWN}	±10 µm
Non-linearity	≤ ±150 µm
Response time	5 ms
Degree of protection as per IEC 60529	IP 67
Housing material	Anodized aluminum
Material of sensing face	LCP
Connection	Cable

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









BAW Z01 distance sensor... in use on a drive screw for tools

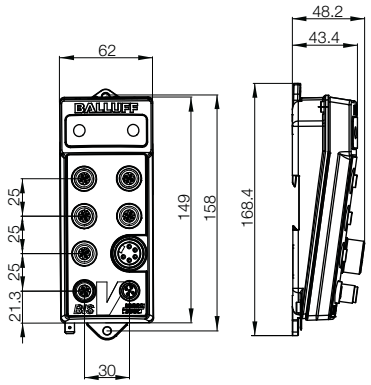
Industrial RFID system BIS V – The new generation for more efficiency

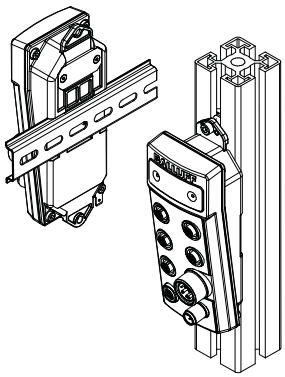
Typical applications for combining RFID processor units and sensors include identification tasks for material flow control in production systems, for conveyor systems in mechanical engineering, in assembly lines and electric suspension systems or in the entire field of intralogistics.

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

Description		BIS V RFID processor unit
Profibus	**Ordering code**	**BIS00T3**
	Part number	BIS V-6102-019-C001
EtherCAT	**Ordering code**	**BIS00U9**
	Part number	BIS V-6110-063-C002
CC-Link	**Ordering code**	**BIS010P – in preparation**
	Part number	BIS V-6111-073-C003
Power supply		24 V DC ±10% LPS Class 2
Residual ripple		≤ 10%
Power supply		≤ 2 A
Ambient temperature T_a		0...+60 °C
Degree of protection as per IEC 60529		IP 65
Housing material		Cast zinc
Weight		800 g
Connection H1 - H4		M12 socket, 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…

CC-Link and **EtherNet/IP** will be available as additional interfaces in the second half of 2013.





The compact EMC-protected metal housing with small dimensions (170×60×40 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 BIS V industrial RFID system was developed and qualified according to the principles of GAMP® 5. Please contact via e-mail for more information: **rfidpharma@balluff.com**

Industrial RFID systems BIS L
Read unit

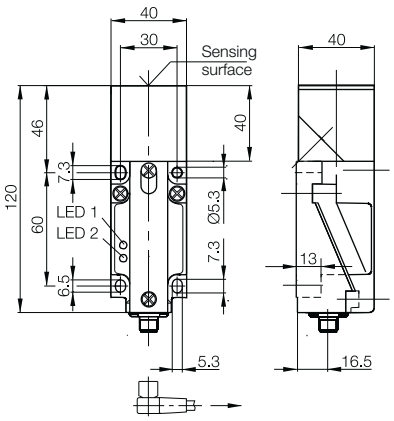
The key areas of application for the non-contact **BIS L-409-045-001-07-S4** identification system are in equipment organization and production, e.g.:

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

Information preprogrammed into data carriers can be read and transmitted using non-contact data recognition. This data is transmitted to the IO-Link master via the serial IO-Link port. BIS L-409-045-001-07-S4 is an autonomous unit. No cable-carried power source is required because the energy required is supplied by the integrated read head.

Description/dimensions	**40×40×120 mm**	
Output signal	**IO-Link**	
Housing material	PBT	
Antenna type	Round	
Ordering code	**BIS00CZ**	
Part number	BIS L-409-045-001-07-S4	
Power supply	24 V DC +10%/–20%	
Residual ripple	≤ 10%	
Power supply	≤ 150 mA	
Ambient temperature T_a	0...+70 °C	
Degree of protection as per IEC 60529	IP 67	
Mounting in steel	Not flush	
LED function indicator	Yes	
Connection	M12 connector, 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	

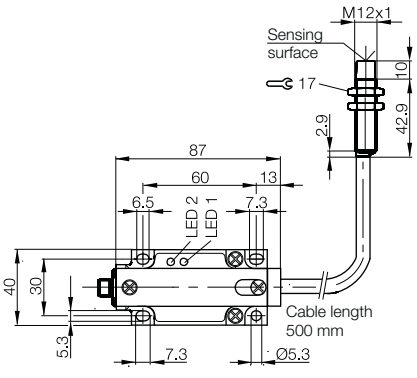


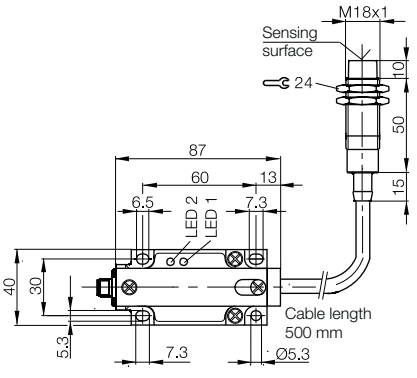
Refer to the Industrial Identification catalog or visit our website for information on data carriers and other identification systems.

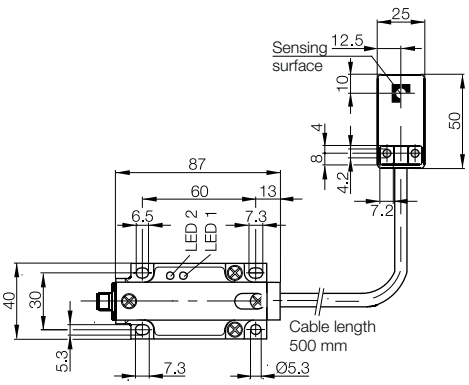
www.balluff.com

Industrial RFID systems BIS L
Read unit

	M12×1	**M18×1**	**25×50×10 mm**
	IO-Link	**IO-Link**	**IO-Link**
	PBT/nickel-plated brass	PBT/nickel-plated brass	PBT/ABS
	Round	Round	Round
	BIS00E1	**BIS00E0**	**BIS00E2**
	BIS L-409-045-003-07-S4	BIS L-409-045-002-07-S4	BIS L-409-045-004-07-S4
	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
	Not flush	Not flush	Not flush
	Yes	Yes	Yes
	M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
	170 g	200 g	200 g
	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





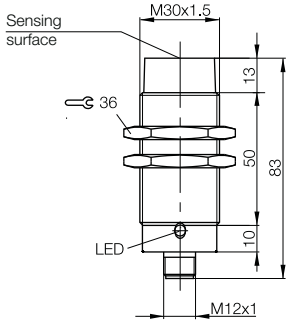


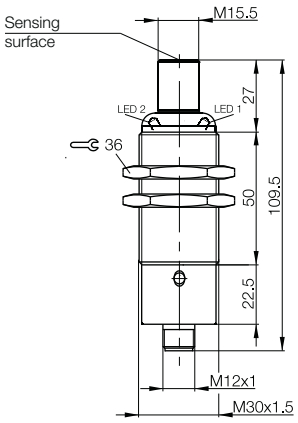
Industrial RFID systems BIS M
Read/write unit

Description/dimensions		**M30×1.5**	**M30×1.5**	
Output signal		**IO-Link**	**IO-Link**	
Housing material		Nickel-plated CuZn	Nickel-plated CuZn	
Antenna type		Round	Round	
10 bytes	**Ordering code**	**BIS00LH**	**BIS00LJ**	
	Part number	BIS M-400-045-001-07-S4	BIS M-400-045-002-07-S4	
32 bytes	**Ordering code**	**BIS0102**	**BIS0103**	
	Part number	BIS M-401-072-001-07-S4	BIS M-451-072-001-07-S4	
Power supply		18...30 V DC	18...30 V DC	
Residual ripple		≤ 1.3 V_{pp}	≤ 1.3 V_{pp}	
Power supply		≤ 150 mA	≤ 150 mA	
Ambient temperature T_a		0...+70 °C	0...+70 °C	
Degree of protection as per IEC 60529		IP 67	IP 67	
Mounting in steel		Not flush	Not flush	
LED function indicator		Yes	Yes	
Connection		M12 connector, 4-pin	M12 connector, 4-pin	
Weight		100 g	100 g	

IO-Link

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	





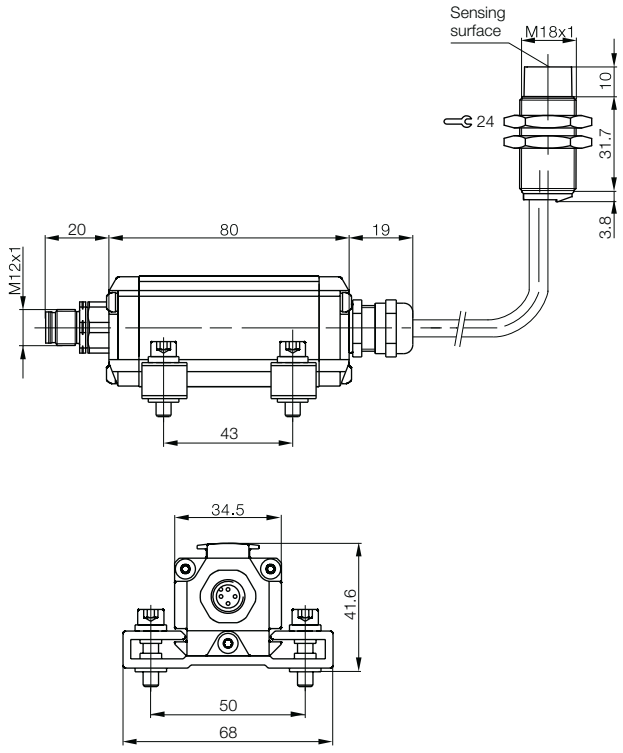
Refer to the Industrial Identification catalog or visit our website for information on data carriers and other identification systems.

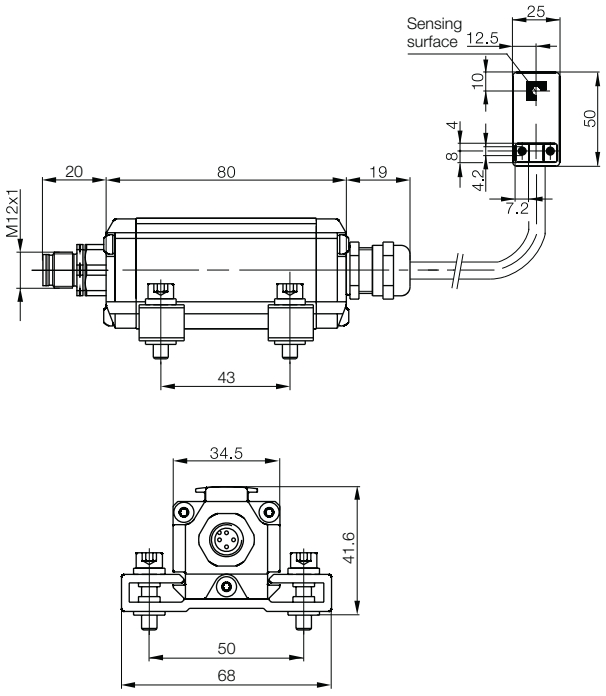
www.balluff.com

Industrial RFID systems BIS M
Read/write unit

	M18×1	**25×50×10 mm**
	IO-Link	**IO-Link**
	AlMgSio.S/nickel-plated brass	AlMgSi 0.5/ABS-GF16
	Round	Round
	BIS00LW	**BIS00M1**
	BIS M-402-045-002-07-S4	BIS M-402-045-004-07-S4
	BIS0106	**BIS0108**
	BIS M-402-072-004-07-S4	BIS M-400-072-001-07-S4
	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
	Not flush	Not flush
	Yes	Yes
	M12 connector, 4-pin	M12 connector, 4-pin
	220 g	220 g

	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



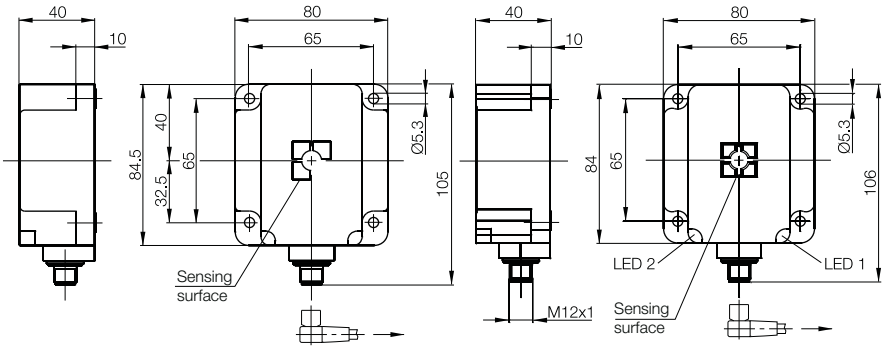


Industrial RFID systems BIS M
Read/write unit

Description/dimensions		**80×80×40 mm**	**80×80×40 mm**
Output signal		**IO-Link**	**IO-Link**
Housing material		PBT	PBT
Antenna type		Round	Rod
10 bytes	**Ordering code**	**BIS00LK**	**BIS00LM**
	Part number	BIS M-401-045-001-07-S4	BIS M-451-045-001-07-S4
32 bytes	**Ordering code**	**BIS0104**	**BIS0105**
	Part number	BIS M-400-072-002-07-S4	BIS M-402-072-002-07-S4
Power supply		18...30 V DC	18...30 V DC
Residual ripple		≤ 1.3 Vpp	≤ 1.3 Vpp
Power supply		≤ 150 mA	≤ 150 mA
Ambient temperature T_a		0...+70 °C	0...+70 °C
Degree of protection as per IEC 60529		IP 67	IP 67
Mounting in steel		Not flush	Not flush
LED function indicator		Yes	Yes
Connection		M12 connector, 4-pin	M12 connector, 4-pin
Weight		190 g	360 g

IO-Link

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



Refer to the Industrial Identification catalog or visit our website for information on data carriers and other identification systems.

www.balluff.com

Mechanical multiple position switches BNS Series 100

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

- Positive-opening contacts and rigid plunger for additional security as 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

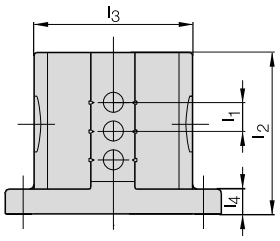
- Function indicators for choice of three voltage ranges

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	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

Number of plungers

02 2×
03 3×
04 4×
...

Number of style

D Chisel
K Ball
R Roller
L Roller bearing
E Chisel plunger with wiper plate

Plunger spacing

12 12 mm
16 16 mm

Connector

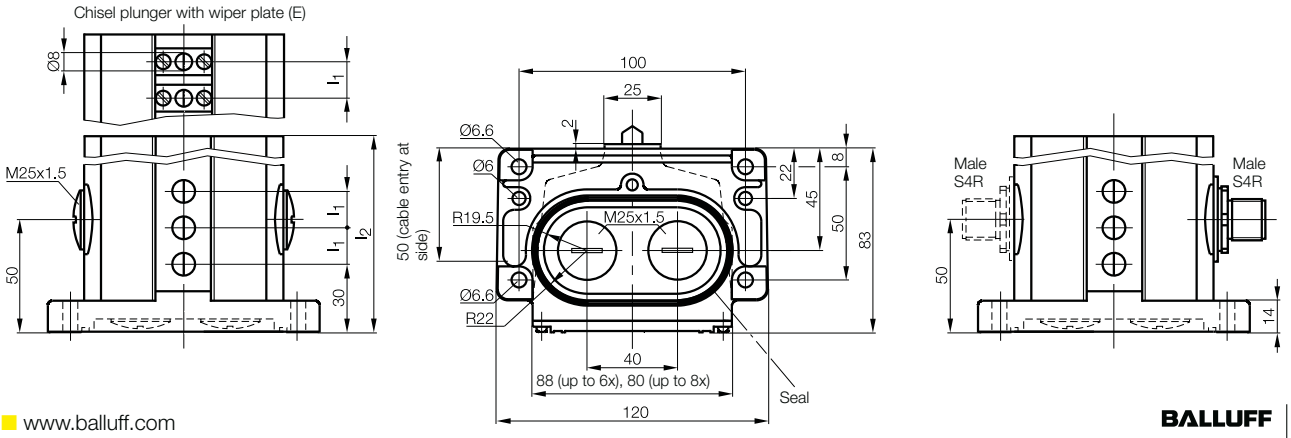
S4R 4-pin, right
S4L 4-pin, left

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

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 connector
Ambient temperature range		–5...+85 °C
Degree of protection as per IEC 60529		IP 67
With switch element		**BSE 30.0**
Ordering code		
Part number		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
Startup 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	
Mode	COM 2
Transfer rate	38.4 kbaud
IO-Link process data length	2 input bytes
Parameter	NC/NO



Mechanical multiple position switches BNS Series 46

Multiple position switches for standard applications

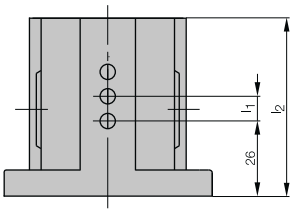
- Smallest plunger spacing for mechanical multiple position switches (8 mm or 10 mm)
- Dual-chamber system with IP 67 degree of protection: wear-free membrane with hermetic sealing of plunger mechanism and switch chamber
- Maintenance-free, self-lubricating plunger guide with slide bearing

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

Number of plungers

02	2×
03	3×
04	4×
...	

Number of style

D	Chisel
K	Ball
R	Roller
E	Chisel plunger with wiper plate

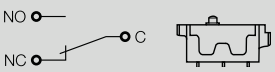
Plunger spacing

08	8 mm
10	10 mm

Connector

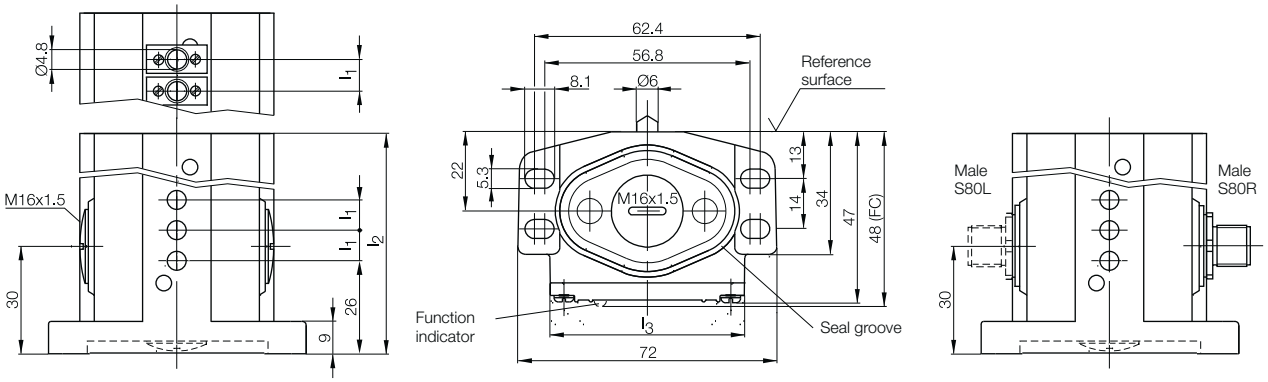
S4R	4-pin, right
S4L	4-pin, left

Mechanical multiple position switches BNS Series 46

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 connector
Ambient temperature range		–5...+85 °C
Degree of protection as per IEC 60529		IP 67
With switch element		**BSE 73**
Ordering code		
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	
Mode	COM 2
Transfer rate	38.4 kbaud
IO-Link process data length	2 input bytes
Parameter	NC/NO

Chisel plunger with wiper plate (E)



MICROPULSE®

Micropulse transducer BTL6-PF
Flat design for free-moving and guided encoders

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

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 rulers and LVDTs. The measurement section is protected inside an extruded aluminum profile.
A passive encoder with no power supply marks the measuring point on the measuring path without making contact. Measuring ranges between 50 and 4500 mm are possible.

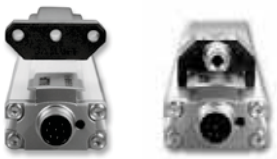
For information on our micropulse transducers BTL and BIW, refer to our new catalog or visit our website at **www.balluff.com**

Micropulse transducer BTL6-PF
Flat design for free-moving and guided encoders

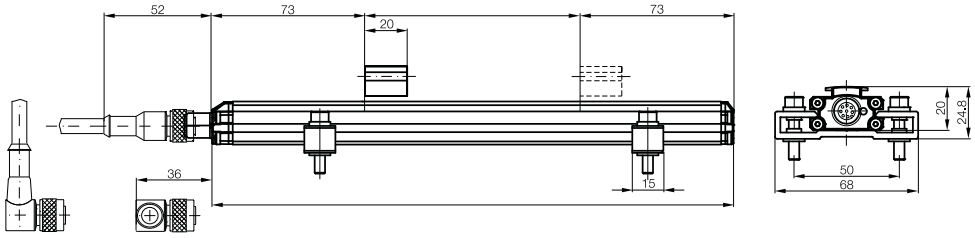
- Non-contact measurement of the measurement position
- IP 67, insensitive to contamination
- Wear-free
- Insensitive to shock and vibration
- Absolute output signal
- Max. resolution of 0.001 mm (depending on the processing electronics)
- Adjustable measuring range
- Diagnostic LED
- Free-moving and guided encoders
- Maximum distance of 15 mm between the position measuring system and the floating position encoder

Series	BTL6-PF
Shock load	50 g/6 ms as per IEC 60068-2-27
Vibration	12 g, 10...2000 Hz as 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)
Degree of protection as per IEC 60529	IP 67 (with IP 67 connector BKS-S... attached)
Housing material	Anodized aluminum
Housing attachment	Compression clamps
Connection	Connector
EMC testing	
Radio interference 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 transient bursts	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 strokes [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

Free-moving and guided encoders



Maximum distance of **15 mm** between the distance measurement system and the free-moving encoder.



Micropulse position measurer BTL6, profile PF IO-Link
Simple to configure, time-saving to install and bring into operation

MICROPULSE®

IO-Link

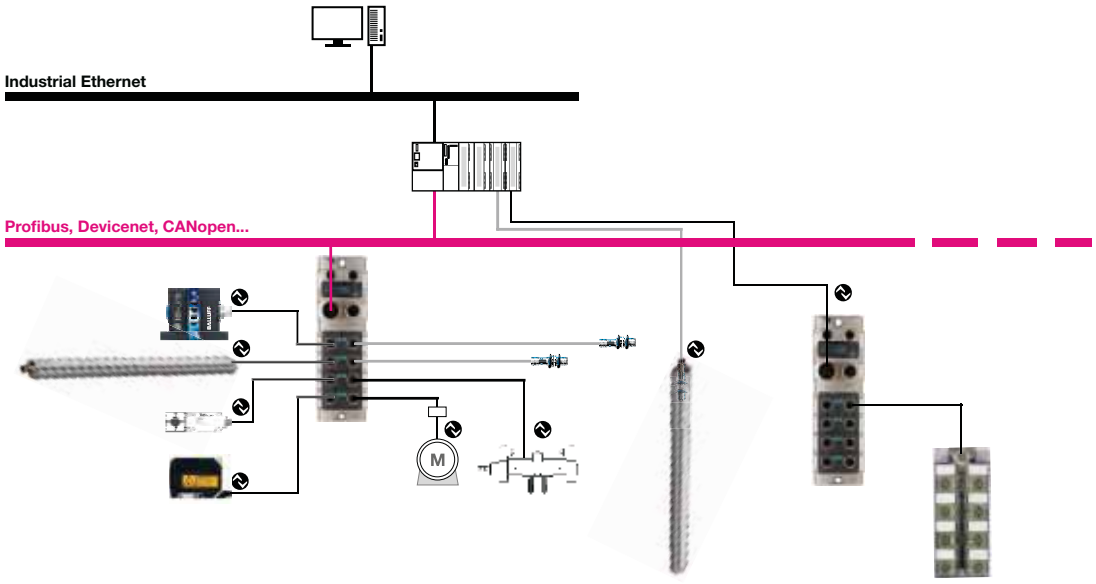
Contactless position measurement technology with IO-Link

Micropulse PF IO-Link is an absolute and non-contact position measuring 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. Via IO-Link, the user interface can be mapped based on an IODD (IO Device Description) in the engineering system. 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



Micropulse position measurer BTL6, profile PF IO-Link
Simple to configure, time-saving to install and bring into operation

Micropulse position measuring systems enclosed in a PF profiled 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 measuring systems tolerate a lateral offset as well as a height offset of up to 15 mm.

Advantages and characteristics of the PF profile

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

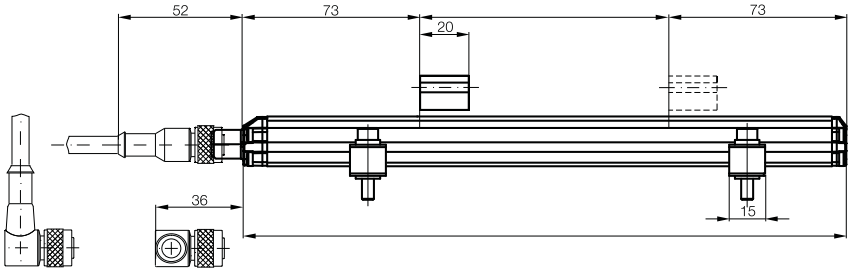
Ordering example:

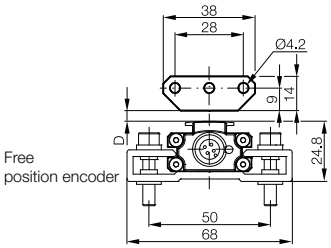
BTL6-U110-M_ _ _ _-PF-S4

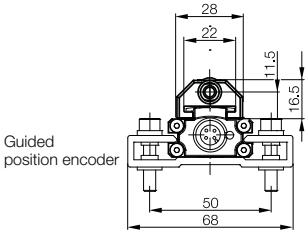
IO-Link V1.1

Rated length [mm]
50...4570 mm in 5 mm increments

BLT6 profile PF measurement detector with free and guided position encoder and plug connection S4







Valve cluster switch for SMC VQC

New options in installation, diagnostics and activation

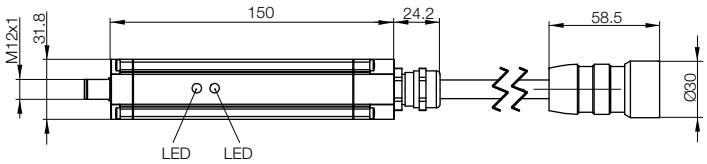
The BNI IOL-770-V06-A027 module connects process-related, installed valve clusters in the simplest way with the control level. As common with IO-Link, it is ready to connect and has a simple, 3-wire standard cable. Eliminates complicated parallel wiring and risk of mixing up cables. Because the "intelligence"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

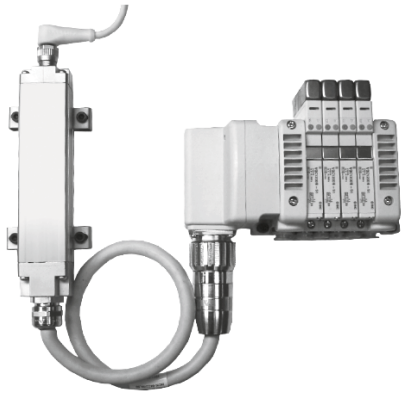
The valve cluster activation combines 24 double valves with the control level. The module is connected to the VQC valve cluster types from SMC via the preinstalled, 26-pin round plug. This saves enormous wiring effort and reduces sources of error very substantially. A common 3-wire standard cable is 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: -
Version	Power Aux valve terminal connector
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
Transfer rate	COM 2/38.4 kBaud
Interface area	M27 socket, 26 pin
IO-Link process data length	9 byte input/4 byte output
Cycle time min.	5.5 ms IO-Link version 1.1
Operating temperature T_a	–5...+70 °C
Storage temperature	–25...+70 °C
Dimensions	187×32×32 mm without cable
Housing material	Aluminum
Total current U_S	1.2 A
Degree of protection	IP 65
Cable length with M27 socket	50 cm

Cable material	Color	Length	Ordering code
			Part number
PVC	Gray	0.5 m	**BNI004W**
			BNI IOL-770-V06-A027





- 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

IO-Link Version 1.1

Universal IO-Link interface

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.

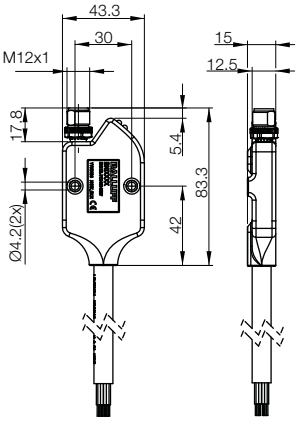
In a process-related manner, pumps, signal lights, control panels, valve clusters, switch units, transfer units, and much more are connected with the control level in the simplest way. The module provides both the fast IO-Link connection via the standard sensor line and an open cable with 10 or 18 wires,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

The benefits to you
- 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
Version	IO-Link interface
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
Transfer rate	COM 2 (38.4 kBaud)
Cycle time min.	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 U_O	1.2 A
Degree of protection	IP 54

Cable material	Color	Length	Ordering code
			Part number
PVC	Gray	0.4 m	**BNI005M**
			BNI IOL-771-000-K027



IO-Link Version 1.1

Valve terminal connectors

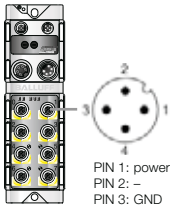
The advantages of IO-Link apply to valve terminal connectors as well. Our **BNI IOL-750** and **751** allow you to connect decentrally installed valve terminals and the control level with incredible ease.

Additional advantages

- 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 connector

Use
Connection to valve terminal for power supply

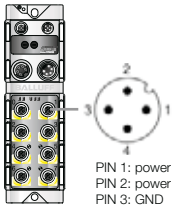


PIN 1: power supply and controller
PIN 2: –
PIN 3: GND
PIN 4: Q/C, IO-Link

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



PIN 1: power supply and controller
PIN 2: power supply and valve
PIN 3: GND
PIN 4: Q/C, IO-Link

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!

IO-Link

Series	
Output signal	
Interface	
Ordering code	
Part number	
Outputs	
IO-Link process data length	
Cycle time min.	
Ordering code	
Part number	
Outputs	
IO-Link process data length	
Cycle time min.	

Number of outputs	
IO-Link	
Cycle time min.	
Operating temperature	
Storage temperature	
Housing material	
Dimensions	
Cable length with M12	
Degree of protection	
Error indicator	
Communication indicator	
Supply voltage U_B	
Total current U_S	
IO-Link port pin assignments (M12, A-coded, male)	

IO-Link

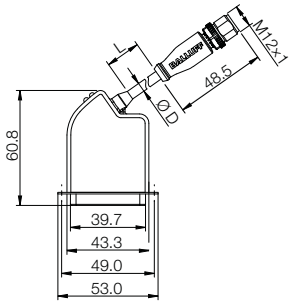
Mode	
Transfer rate	

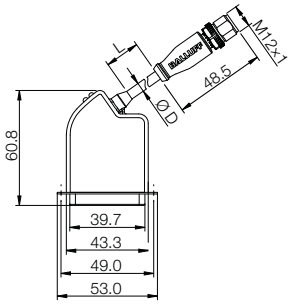
Valve terminal connectors

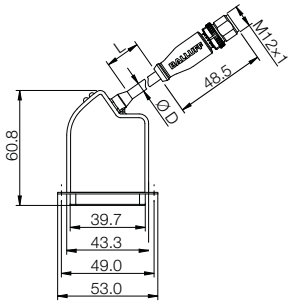
Festo CPV,
Bosch Rexroth LS04, HF04

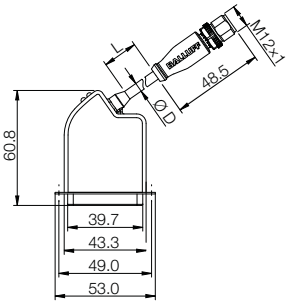
SMC VQC

	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
	BNI001E	**BNI001L**	**BNI001J**	**BNI001N**
	BNI IOL-750-V02-K007	BNI IOL-751-V02-K007	BNI IOL-750-V04-K007	BNI IOL-751-V04-K007
	16	16	16	16
	2 bytes	2 bytes	2 bytes	2 bytes
	3 ms	3 ms	3 ms	3 ms
	BNI001F	**BNI001K**	**BNI001H**	**BNI001M**
	BNI IOL-750-V01-K007	BNI IOL-751-V01-K007	BNI IOL-750-V03-K007	BNI IOL-751-V03-K007
	24	24	24	24
	3 bytes	3 bytes	3 bytes	3 bytes
	12 ms	12 ms	12 ms	12 ms
	16	16	24	24
	2 bytes	2 bytes	3 bytes	3 bytes
	2.5 ms	2.5 ms	10 ms	10 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
	COM 2	COM 2	COM 2	COM 2
	38.4 kbaud	38.4 kbaud	38.4 kbaud	38.4 kbaud









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.

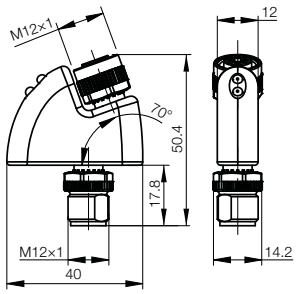
Our IO-Link analog plugs provide the fix. They provide considerable cost reduction potential for systems with limited analog value formation.
Expensive shielded cables are replaced with simple unshielded three-core cables. The signal neutrality of the IO-Link ports on the IO-Link master modules, together with the IO-Link analog plugs, ensures maximum signal variance. This makes "mixing" different input/output/current and voltage signals in one module possible.

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

IO-Link	Device	
Version	1 AI, 0...10 V DC	
Ordering code	**BNI0042**	
Part number	BNI IOL-714-000-K023	
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	
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	
Operating temperature T_a	–5…+70 °C	
Storage temperature	–25…+70 °C	
Weight	21 g	
Dimensions (L×W×H)	40×12×50 mm	
Housing material	Plastic	

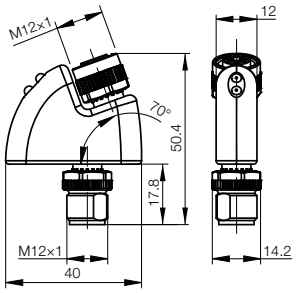
IO-Link

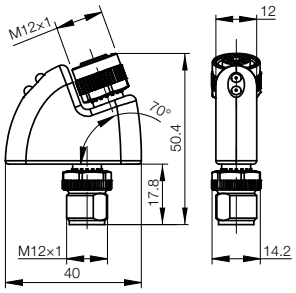
Max. cycle time		3 ms
IO-Link process data length		2 input bytes
Indicators	Communication	Green LED, pulsing
	Module OK	Green LED

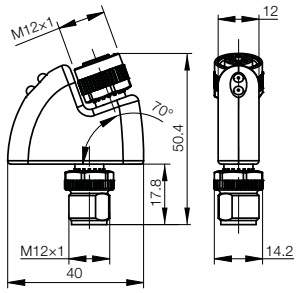


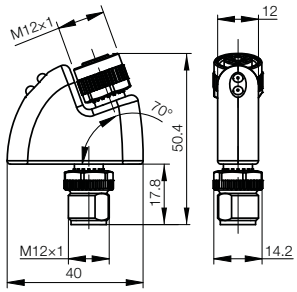



	Device	Device	Device	Device
	1 AI, 4...20 mA	1 AI, PT100	1 AO, 4...20 mA	1 AO, 0...10 V DC
	BNI0041	**BNI004T**	**BNI004C**	**BNI004E**
	BNI IOL-712-000-K023	BNI IOL-716-000-K023	BNI IOL-722-000-K023	BNI IOL-724-000-K023
	18…30 V DC	18…30 V DC	18…30 V DC	18…30 V DC
	M12, A-coded, male	M12, A-coded, male	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 screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–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
	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









Ultrasonic sensors BUS _18M

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 scanning ranges 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 the complete support of the IO-Link interface. Via 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.

Features
- 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

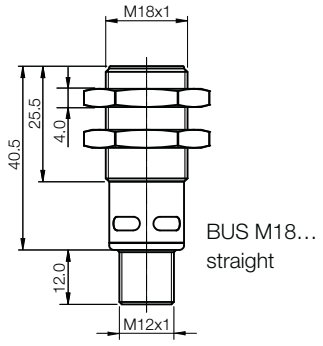
IO-Link

Operating scanning range			
BUS M18M switching output, straight			
Resolution			
push/pull	NO/NC	**Ordering code**	
	IO-Link	Part number	
BUS W18M switching output, right-angle			
Resolution			
push/pull	NO/NC	**Ordering code**	
	IO-Link	Part number	
Size			
Supply voltage			
Output current			
Degree of protection as per EN 60529			
Operating temperature			
Material		Housing	
		Plastic parts	
		Sensing surface	
Connection			

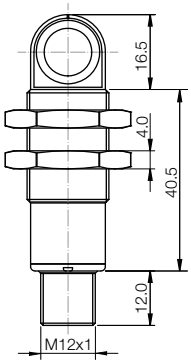
Control foil sag and monitor roll diameter
Using an ultrasonic sensor with analog output, the material on a roll is detected and the roll drive or a brake readjusted. Another sensor with analog output readjusts the material infeed at the dancer roller as a function of the cable loop.




	20…150 mm	30…250 mm	65…350 mm	120…1000 mm
	0.069 mm	0.069 mm	0.069 mm	0.069 mm
	BUS0020	**BUS0029**	**BUS004Z**	**BUS004P**
	BUS M18M1-GPXI-02/015-S92G	BUS M18M1-GPXI-03/025-S92G	BUS M18M1-GPXI-07/035-S92G	BUS M18M1-GPXI-12/100-S92G
	0.069 mm	0.069 mm	0.069 mm	0.069 mm
	BUS0023	**BUS002A**	**BUS004Y**	**BUS004N**
	BUS W18M1-GPXI-02/015-S92G	BUS W18M1-GPXI-03/025-S92G	BUS W18M1-GPXI-07/035-S92G	BUS W18M1-GPXI-12/100-S92G
	M18×1	M18×1	M18×1	M18×1
	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



BUS M18…
straight



BUS W18…
right-angle

IO-Link

IO-Link — the new standard

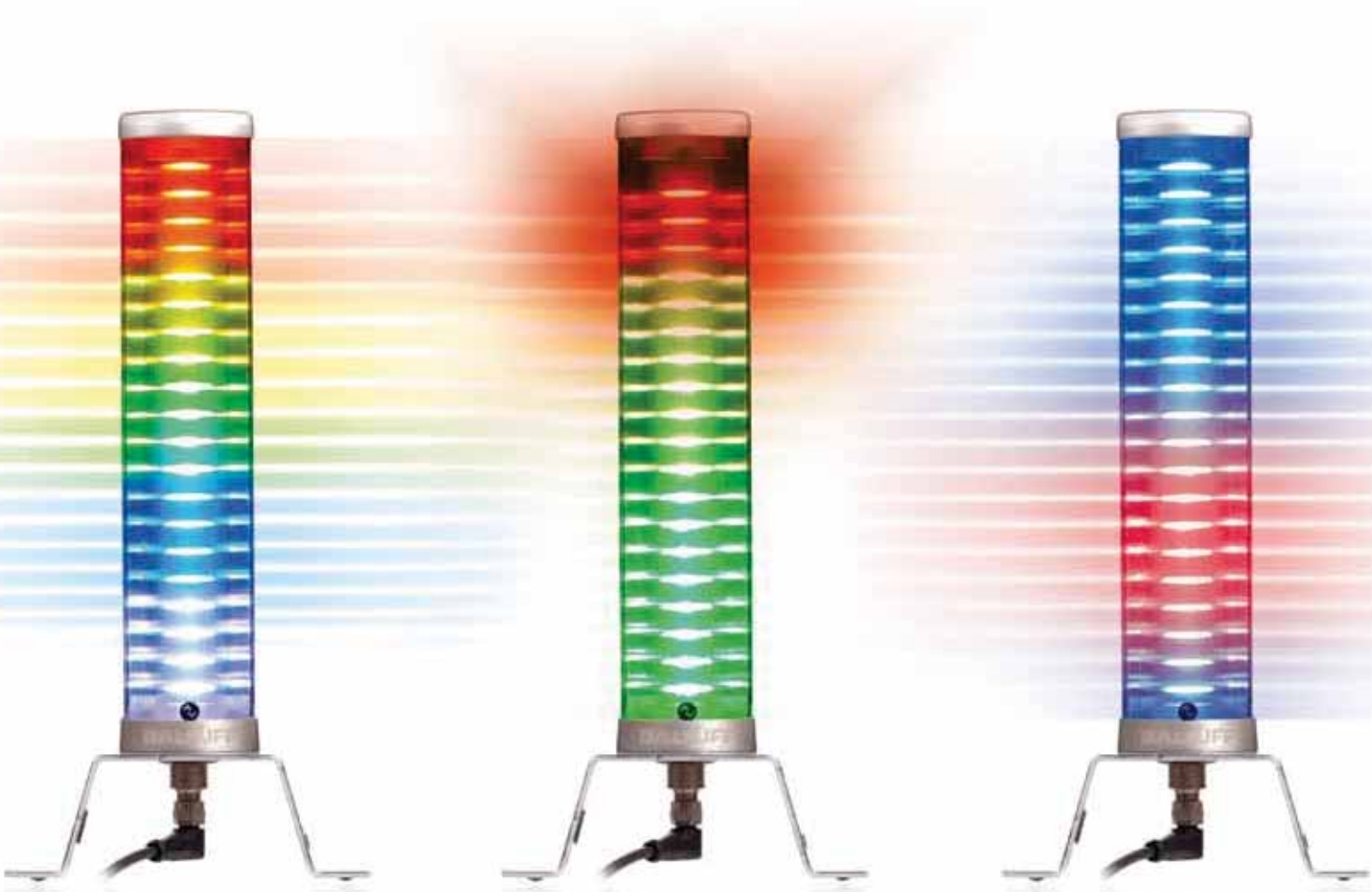
The IO-Link interface allows you to meet all of the prerequisites for gapless communication through all levels of the system architecture all the way to the sensor. Commissioning and maintenance of a machine are simplified and productivity increased.

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

Colors can be set individually for maximum flexibility
Connection and installation are easy. All that is needed to screw them in is a four-wire sensor cable.
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 programmed via the PLC in an incredibly simple way 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 tower lights.

Naturally, our SmartLight allows you to implement all of the functions that could be displayed for the user on systems previously available as well. 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.



Holder not included in the standard scope of delivery.

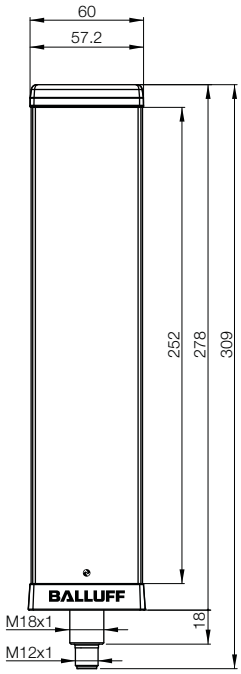
IO-Link SmartLight – the intelligent lamp
- The first LED signal tower light with an IO-Link interface
- Maximum flexibility
- Very easy to program
- Extremely fast and easy to install
- Different colors can be easily assigned without having to mechanically change the LED tower lights

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.
- Segment 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	Device
Description	SmartLight
Ordering code	**BNI0072**
Part number	BNI IOL-802-000-Z036
Supply voltage U_B	18…30 V DC
Function indicator IO-Link RUN	Green LED
Power-on indicator	Green LED
Connection: IO-Link	M12, A-coded, male
Connection U_A	via IO-Link interface
Configurable	Yes
Max. load current of actuators	0.35 A
Degree of protection as per IEC 60529	IP 54 (only in plugged-in and screwed-down state)
Operating temperature T_a	–5…+70 °C
Storage temperature	–25…+70 °C
Fastener	M18 thread
Dimensions (L×W×H)	55×55×295 mm
Housing material	Transparent polycarbonate, nickel-plated die-cast zinc

IO-Link Version 1.1

Transfer rate		COM 2 (38.4 kBaud)
Cycle time		5 ms with IO-Link 1.1 Master 20 ms with IO-Link 1.0 Master
Indicators	Communication	LED green flashing
	Power	Static green LED
IO-Link process data length		3 output byte



USB IO-Link master

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

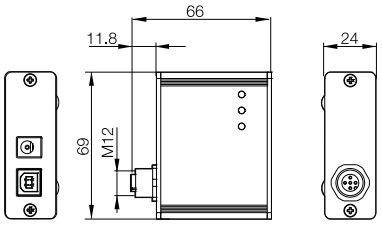
You can now operate an IO-Link, access process parameters and import all service parameters separately from the controller. The USB port ensures that connecting to a laptop is easy. Software simplifies operation.

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 + device tool software	**Ordering code**	**BNI002U**
	Part number	BNI USB-901-000-A501
Just box	**Ordering code**	**BNI0073**
	Part number	BNI USB-901-013-A501
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
Degree of protection as per IEC 60529		IP 40 (when attached)
Operating temperature T_a		–5...+55 °C
Storage temperature		–25...+70 °C
Weight		Approx. 96 g
Fastener		none
Dimensions (L×W×H)		70×55×25 mm
Housing material		Al

IO-Link

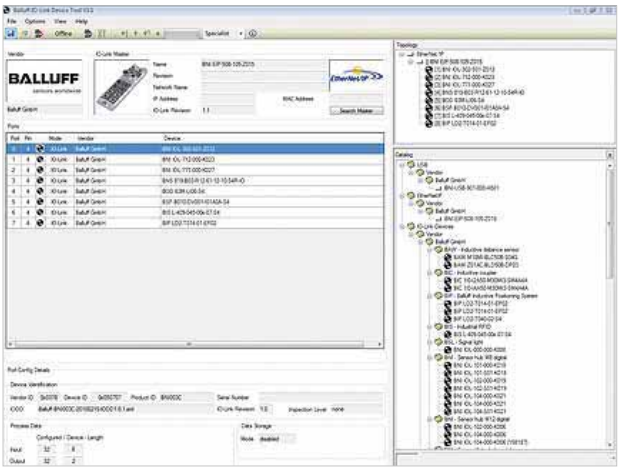
IO-Link	Master
Operating mode	SIO, COM 1, COM 2, COM 3
Communication indicator	Green LED



Device tool software available separately on request.

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.

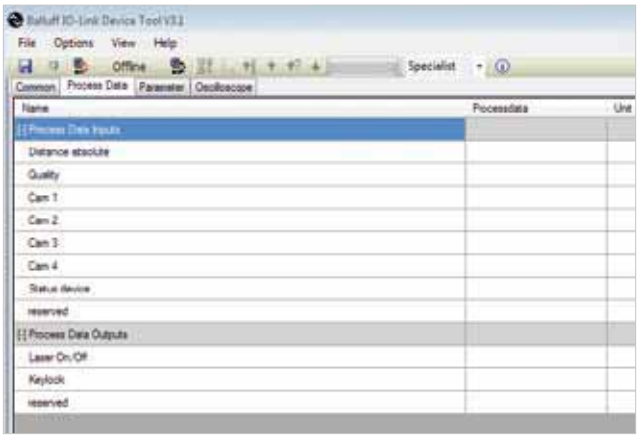
The **device tool software** simplifies operation. Supply voltage for the IO-Link devices is provided directly through the USB port. An external power supply is used if more power is needed.

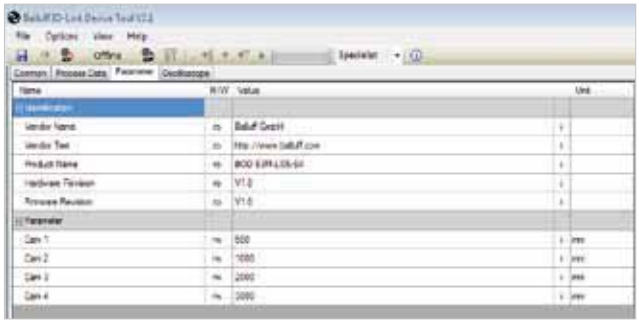


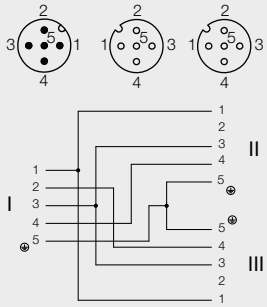
Device tool software
Each IO-Link device delivery contains an IODD (Input Output Device Description). This electronic file can be used to import the data for the device into the **device tool software**. This means you can configure and run diagnostics on any IO-Link device.

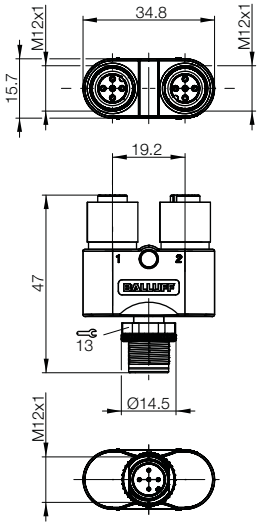
The **device tool software** can be used to address any IO-Link device using the **USB master box**. But even the existing system infrastructure can be used for communicating using the device tool software.

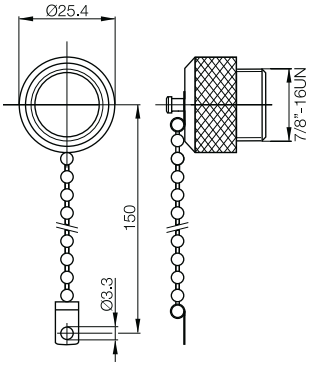
If you are using Ethernet-based IO-Link masters such as Balluff Profinet or Ethernet/IP IO-Link masters, you can establish a direct UDP connection from the **device tool software** to those modules. This provides direct access to each individual IO-Link port and allows you to configure and run diagnostics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

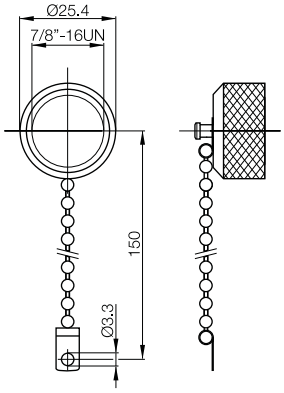




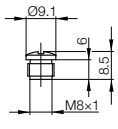
Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

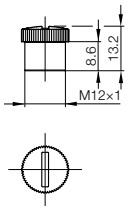


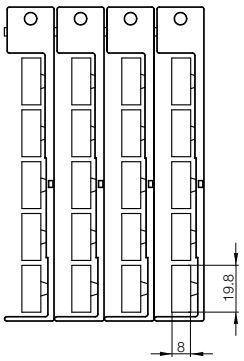


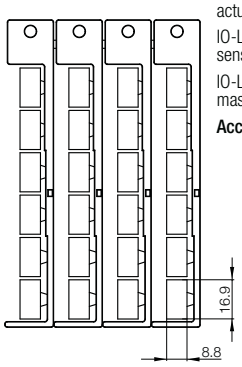



Description	M8 locking screw	M12 locking screw	Marking sleeve	Label set	Label set
Use	IP 65 threaded cover for unused ports	IP 65 threaded cover for unused ports	For labeling connectors	Port labels for modules BNI PBS..., BNI PNT..., BNI DNT..., BNI EIP..., BNI CCL...	Port labels for sensor hub BNI IOL...K006, BNI IOL...K018, BNI IOL...K021
Ordering code	**BAM01C1**	**BAM01C2**		**BAM01AT**	
Part number	BAM CS-XA-001-M8-C	BAM CS-XA-002-M12-A	BAM IA-CC-002-01	BNI ACC-L01-000	BSB ZM01-L01
Ambient temperature T_a	–20...+80 °C	–20...+80 °C			
Housing material	Plastic	Plastic		Plastic	Plastic









3-wire connector BCC; see the chapter "Connectors and Cables" beginning on **page 288.**

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.

Contents

Knowledge

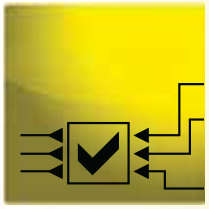
Information

Data

Increase in diagnostic accuracy and functionality

IO-Link

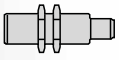
- Continuous signal
- Diagnostics
- Parameter configuration



- Switching signal
- Diagnostics
- Warning messages

DESINA

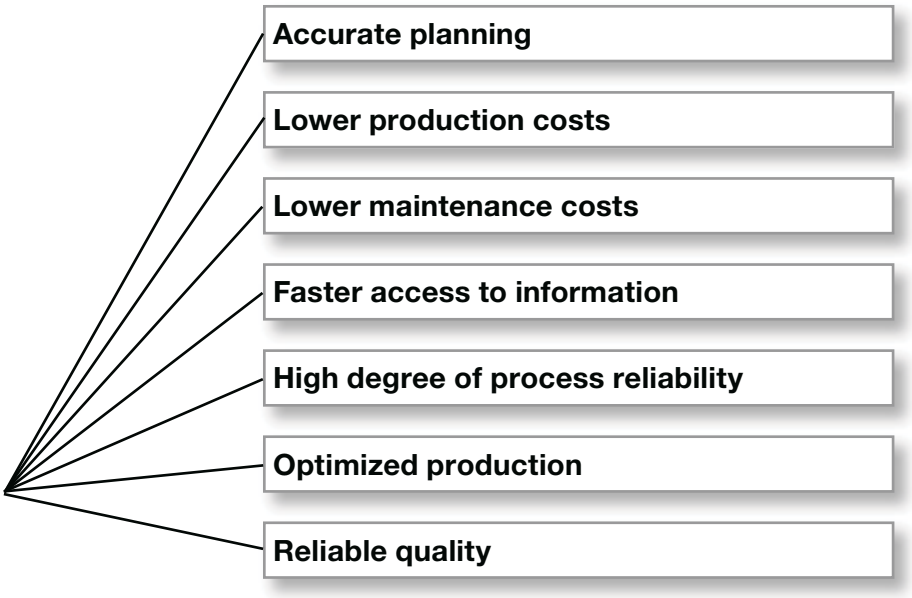
- Switching signal
- Diagnostics



1/0

- Switching signal

Dynamic Sensor Control



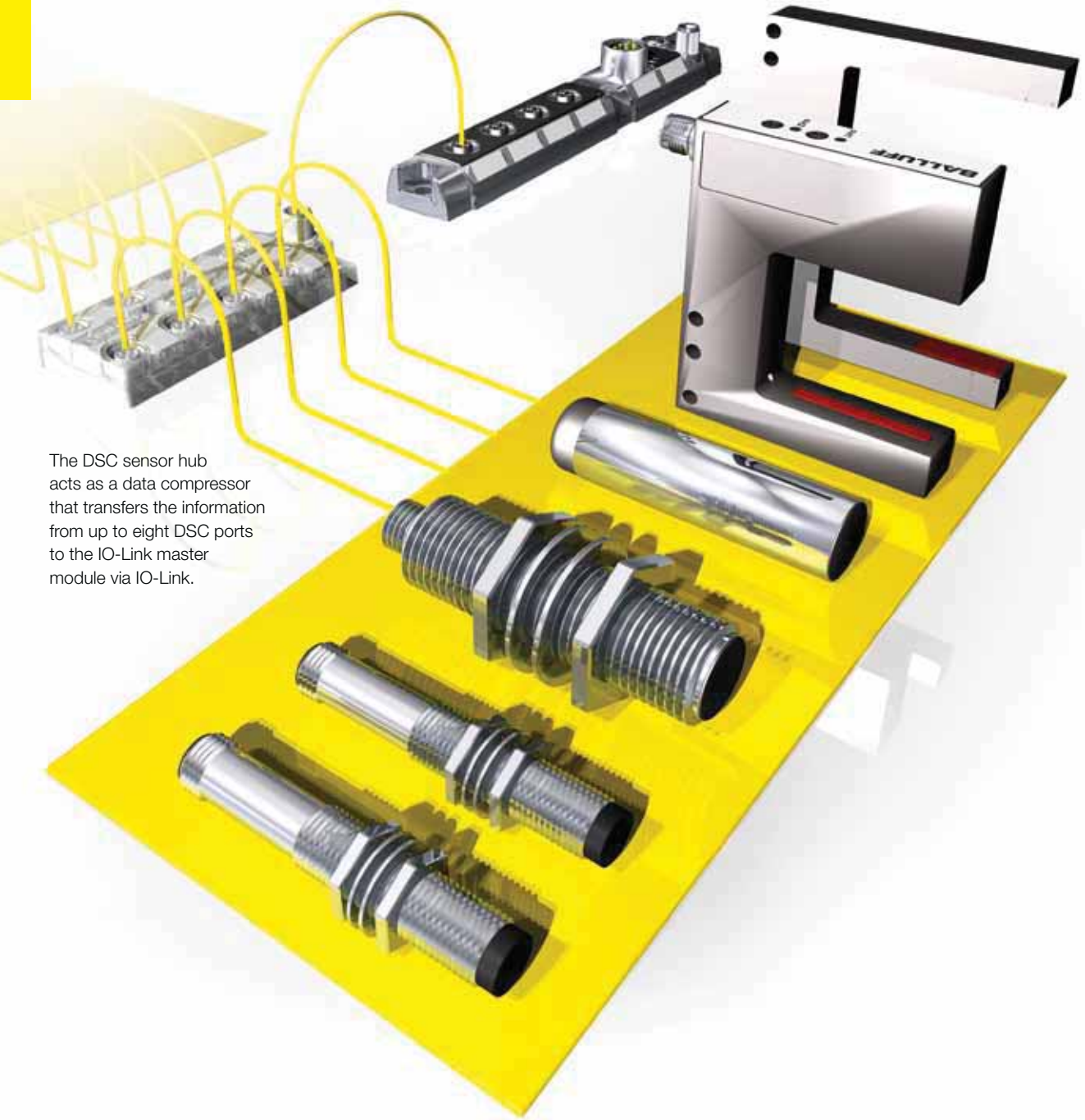
Reliable and timely detection of changing ambient conditions or machine states is often a decisive factor in being able to initiate repair actions in the production process in a timely manner. Dynamic Sensor Control (DSC) provides high-quality information in addition to the sensor function. This lets 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.

∑ Reduce your total cost of ownership

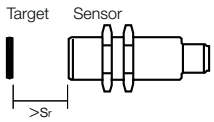
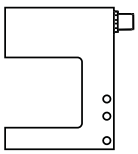
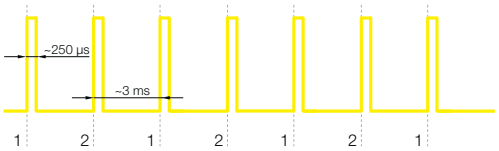
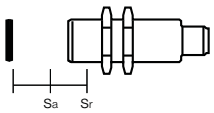
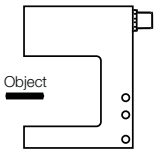
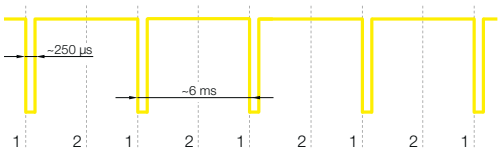
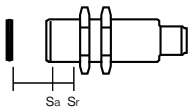
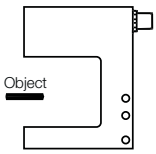
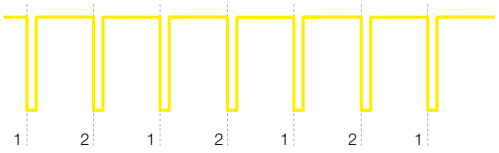
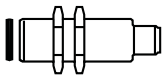
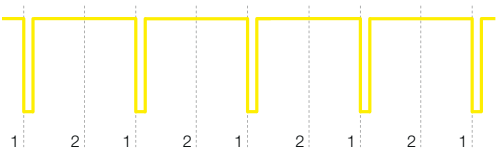
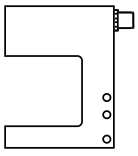
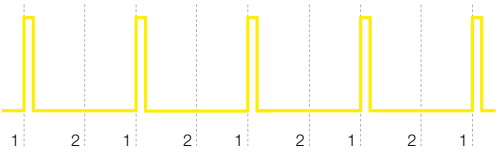
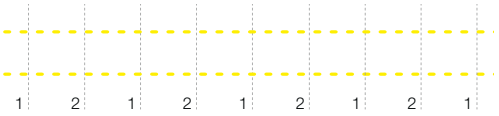
Marketing and sales of machines and systems	Development and design	Installation	Operation	Maintenance
Functional reliability	**"Condition monitoring inside"**	**Optimized commissioning**	**Increase in productivity**	**Preventive maintenance**

Dynamic Sensor Control
Condition monitoring

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  LED off		 	**Switching state OK** Output low
Target between s_a and s_r (typical)  LED flashing frequency low	Lens dirty  	 	**Warning message** Output high
Target in the safe area  LED stable on	 	 	**Switching state OK** Output high
Target too close  LED flashing frequency high		 	**Warning message** Output high
	Lens dirty 	 	**Warning message** Output low
Sensor defective  **Dynamic Sensor Control** Diagnostics from **A** to **O**	Sensor defective	 Coil break, fault in the processing electronics, output stage defective.	**Error** No pulses Output high or low

Capacitive Ø 20 mm sensor with Dynamic Sensor Control

Ordering code	BCS0001
Part number	BCS 20MG10-XPA1Y-8B-03
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
Degree of protection as per IEC 60529	IP 63
Approvals	CE
Housing material	V2A, EP
Connection	3 m cable PUR, 3×0.25 mm²

Inductive M12 sensors with Dynamic Sensor Control

Ordering code	BES02MC	BES02M5	BES02M8
Part number	BES 113-356-SA6-S4	BES 113-3019-SA1-S4	BES 113-356-SA31-S4
Switching type PNP NO		■	
Switching type PNP NC	■		■
Rated switching distance s_n	3.7 mm		4 mm
Size, installation type	M12×1, not flush		
Supply voltage U_B	20...30 V DC		
Function indicator	No		
Degree of protection as 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

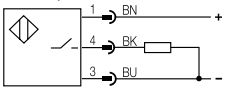
Switching state:	Target yes/no
Warning message:	–
Error message:	Sensor OK? Yes/No

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

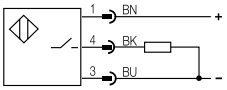
Ordering code
Part number

		BES03EN BES M08EI-PSY15B-S49G-D01	**BES03EP** BES M08EH-PSY25F-S49G-D01	**BES03EL** BES M08EI-PSY15B-S04G-D01	**BES03EM** BES M08EH1-PSY25F-S04G-D01	**BES03ER** BES M12MI-PSY20B-S04G-D01	**BES03ET** BES M12MH-PSY40F-S04G-D01	**BES03EU** BES M18MI-PSY50B-S04G-D01	**BES03EW** BES M18MG-PSY80F-S04G-D01	**BES03EY** BES M30MI-PSY10B-S04G-D01	**BES03EZ** BES M30MF1-PSY15F-S04G-D01
Size		M8	M8	M8	M8	M12	M12	M18	M18	M30	M30
Switching type	PNP NO	■	■	■	■	■	■	■	■	■	■
Rated switching distance s_n		1.5 mm	2.5 mm	1.5 mm	2.5 mm	2 mm	4 mm	5 mm	8 mm	10 mm	15 mm
Installation type	Flush	■		■		■		■		■	
	Not flush		■		■		■		■		■
Supply voltage U_B		18...30 V DC									
Function indicator		Yes									
Degree of protection as per IEC 60529		IP 67									
Approvals		CE, cULus									
Housing material		Stainless steel				CuZn coated					
Connection		M8, 3-pin		M12, 3-pin							

M8, 3-pin



M12, 3-pin



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

■ **Ordering code**
□ Part number

		BGL0036 BGL 30C-009-S4	**BGL003H** BGL 50C-009-S4	**BGL003N** BGL 30A-013-S49	**BGL003P** BGL 50A-013-S49	**BGL003R** BGL 80A-013-S49
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

■ **Ordering code**
□ Part number

		BOS01CU BOS 18M-PUD-RD30-S4	**BOS01CT** BOS 18M-PUD-PR30-S4	**BOS01CW** BOS 18M-PUD-RE30-S4
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		
Degree of protection as 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

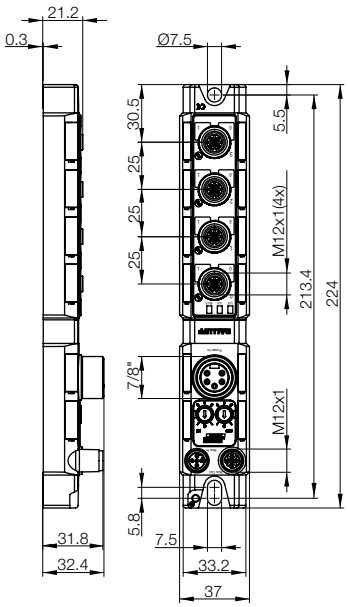
High-end photoelectric sensors

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

Fieldbus	Profibus DP
Version	4× IO-Link ports or 4 standard I/O ports
Ordering code	**BNI000Z**
Part number	BNI-PBS-507-000-Z011
Supply voltage U_B	18...30 V DC
Connection: Fieldbus	M12, B-coded
Supply voltage connection	7/8"
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	4
Number of inputs	Max. 8
Number of outputs	Max. 8
Configurable	Yes
Max. load current, sensors/channel	200 mA
Max. load current, output	≤ 1.6 A
Total current $U_{Actuator}$	≤ 9 A
Total current U_{Sensor}	≤ 9 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)
Operating temperature T_a	–5...+55 °C
Storage temperature	–25...+70 °C
Dimensions (L×W×H)	224×37×32 mm
Housing material	Nickel-plated GdZn

IO-Link

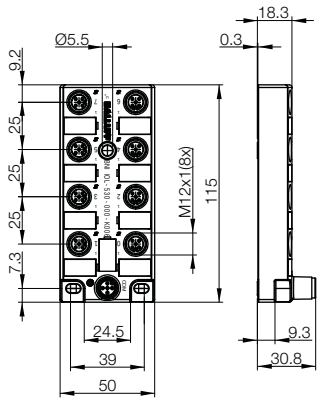
No. of IO-Link ports	4× master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3
Communication indicator	Green LED
Error indicator	Red LED
Max. load current for IO-Link device	≤ 1.6 A

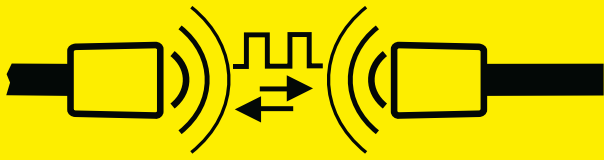


IO-Link	Device
Version	8× DSC or 8× I/O ports
Ordering code	**BNI002Z**
Part number	BNI IOL-530-000-K006
Supply voltage U_B	18...30 V DC
Connection: IO-Link	M12, A-coded, male
Connection: I/O ports	M12, A-coded, female
No. of I/O ports	8
No. of DSC ports	8
No. of digital inputs	8
Max. load current, sensors/channel	200 mA
Total current U_T	< 1.2 A
Degree of protection as per IEC 60529	IP 67 (when screwed into place)
Operating temperature T_a	–5...+55 °C
Storage temperature	–25...+85 °C
Dimensions (L×W×H)	115×50×31 mm
Housing material	PC

IO-Link

Operating mode	COM 2
Parameter	– Enable/disable DSC – DSC sensitivity – Diagnostics reset – NC/NO





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.

Inductive Couplers
Contents

Inductive Couplers
Overview

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.

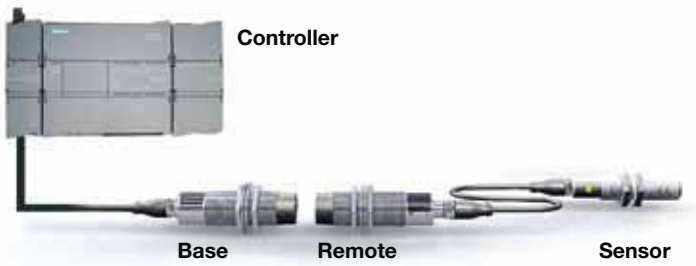
System components
- Sensor – mechanical, inductive, optical, magnetic or capacitive
- Remote – for connecting the sensors to the inductive system, installed on the mobile side
- Base – connects the system to the controller: transmits power to the remote, receives the status information from the sensor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

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

Unidirectional systems
- Signal transfer 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



Symbols

Undirectional, digital

Bidirectional, digital

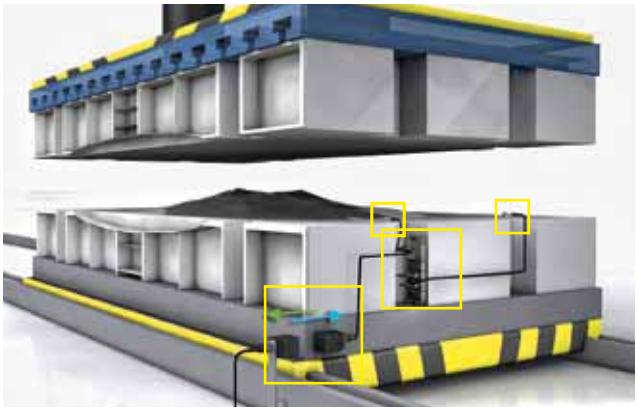
Unidirectional, analog

Power

Group	Series	Signal shape	Number of signals/ process data length	
Axial	Power only	–	0	
Axial	Unidirectional	digital	1	
		digital	1	
		digital	4	
		digital	4	
		digital	8	
		digital	8	
		digital	8	
		digital	8	
		digital	8	
Axial		Analog	1	
		–	1	
Axial	Bidirectional	digital	4+4	
Axial	Active unit	IO-Link IN	3 bytes, 11 bytes	
Radial	Unidirectional	digital	8	
		Analog	4	
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	**BIC0052** **BIC0008**	**BIC0051** **BIC0007**	233
	M12 + M18	–	–	Special detectors or mechanical switches	**BIC003W** **BIC003Z**	**BIC002T** **BIC002P**	212
	M18 + M30	12 V DC	30 mA	2-wire and 3-wire sensors, inductive	**BIC0012** **BIC000Y**	**BIC0011** **BIC000W**	213
	M18	12 V DC	30 mA	2-wire and 3-wire sensors, inductive, capacitive optical or mechanical	**BIC002L** **BIC002K**	**BIC002C** **BIC0029**	214
	M30	12 V DC	40 mA		**BIC0044**	**BIC002E**	215
	M18 + M30	–	–	Special detectors or mechanical switches	**BIC001N** **BIC001T**	**BIC0069** **BIC0015** **BIC001A**	218
	80×80×40	12 V DC	100 mA	2-wire and 3-wire sensors, inductive, capacitive, optical or mechanical	**BIC001Y**	**BIC001J**	219
	M30	12 V DC	150 mA		**BIC0045**	**BIC0048** **BIC006A**	221
	40×40×75	12 V DC	200 mA		**BIC0021** **BIC0022**	**BIC0026** **BIC0027**	220
	90×90×45	24 V DC	300 mA		**BIC0023**	**BIC0028**	221
	M18	18 V DC	15 mA	0…10 VDC	**BIC0043**	**BIC0046**	228
	M18	–	–	PT100	**BIC0041** **BIC004C**	**BIC0047**	229
	90×90×45	24 V DC	300 mA	2-wire and 3-wire sensors, inductive, capacitive, optical or mechanical	**BIC0039**	**BIC003C**	223
	M30 + Q40	24 V DC	500 mA	Sensor hub	**BIC000A**	**BIC0009**	234
	Ø 45	24 V DC	160 mA	2-wire and 3-wire sensors, inductive, capacitive, optical or mechanical	**BIC003P**	**BIC003N**	225
	Ø 45	18 V DC	180 mA	0…10 VDC	**BIC004A**	**BIC0049**	227
	M18 + M30	–	–	Mechanical switches	**BIC0004** **BIC0005** **BIC0006**	**BES01CE** **BES01CE** **BES0166**	210

Load carrier:
BIC as plug replacement
Sensors mounted on moving load carriers detect the presence of components.
The inductive coupling system takes over supplying power for the sensors and transmitting sensor signals, making mechanical contacts superfluous.



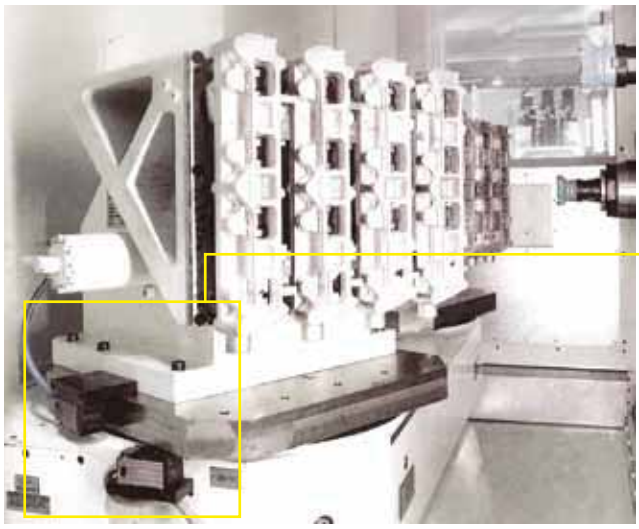
Change tools:
BIC as plug replacement and for tool identification
Sensors attached to change tools detect the presence of materials. The sensor signals are transmitted to the controller via the inductive couplers, thereby ensuring correct positioning of the material.
In conjunction with a networking interface BNI, tools can also be identified.
BIC couplers enable automatic tool changing since manually connecting mechanical connectors is unnecessary.

Robotics:
BIC as plug replacement on a robot's tool changer
Inductive couplers BIC make mechanical plug-in contacts unnecessary because the signals can be reliably transmitted over an air gap without contact. This ensures freedom from wear, guarantees tools are changed quickly and provides a large degree of flexibility and high dynamic response.

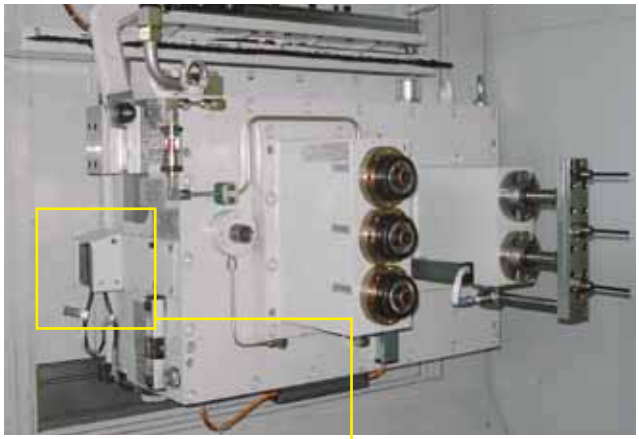
Rotary table:
BIC as replacement for slip rings and cable routing
Slip rings or cable connects are subjected to mechanical stress whenever sensor data has to be transmitted from a moving part to a stationary part (such as a turntable). Wear results in failures and expensive downtime.

Wirelessly operating BIC systems make slip rings and cable connections unnecessary on a rotary table. They transmit sensor signals and power for sensors.

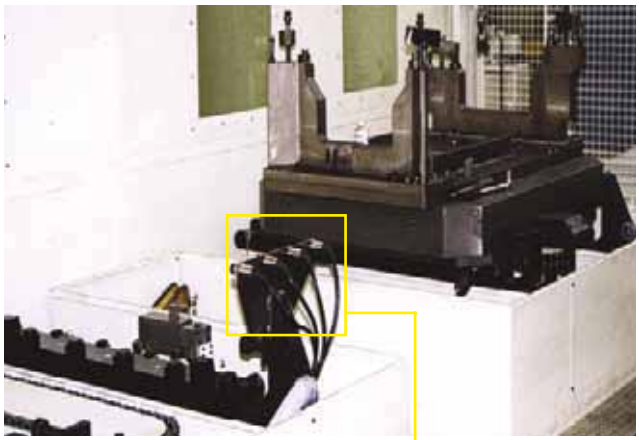
Machining center



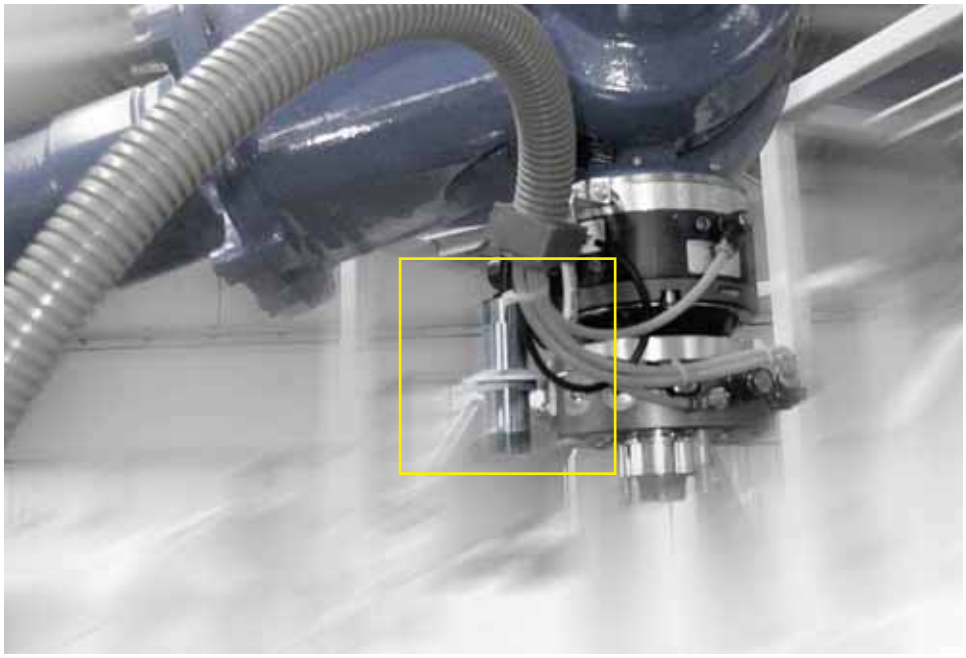
Monitoring clamping jaws in the working area of a 2-spindle machining center.
Clamping jaws can also be monitored during machining using inductive couplers BIC. On a swinging table with two rotary indexing tables, 8 sensors on each indexing table transmit information without contact. Power for the sensor function is also provided inductively. The separable inductive coupling of power and signals also guarantees greater flexibility in machining centers.



Reliable workpiece position detection in machining centers at MTU Friedrichshafen
Inductive couplers BIC are used for independent workpiece detection on the pallet to deal with the variety of parts. Up to 16 sensors detect the positions and recognize the part to be machined based on certain features. After loading, the pallet is conveyed into the machining area where the recorded information is used to execute the machining program.



Checking slide settings on an interchangeable drill head
The BIC system supplies power to inductive sensors and sends back sensor information.
When the drill head is automatically changed, no connections need to be disconnected. The system operates using induction, allowing it to be disconnected quickly.



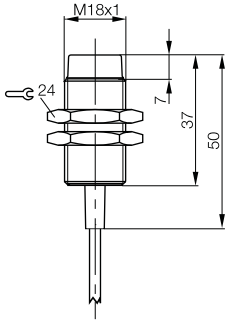
Robot gripper
The sensor determines whether the gripper has collected the workpiece. The switching state of the sensors is transmitted without contact.

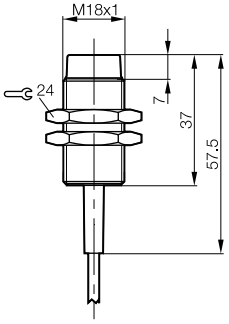
Flexible production – wireless sensor/actuator connection for greater freedom of design
High-speed tool changes require signal transmission without contact. Inductive coupling with IO-Link is ideal for this task. When a tool is changed with BIC, no mechanical parts are required for signal contacting. There is no wear and no bad contacts.

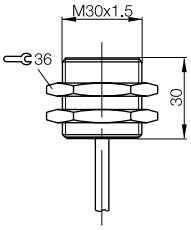
Contactless transmission ensures a high number of cycles
Robots are indispensable for the precision loading and unloading of parts in machining centers. The high movement speed of the gripper often leads to problems with the sensor cabling. Federal Mogul Friedberg GmbH has taken on the problem and installed a radial BIC system at the interface between the gripper and robot arm. The energy for powering the sensors as well as the position information is inductively coupled.
This concept ensures reliable transmission, whether stationary or in motion.

Programmable cams
M18, M30

Size			**M18×1**	**M18×1**	**M30×1.5**
Installation			Not flush	Not flush	Not 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	**Ordering code**	**BIC0004**	**BIC0005**	**BIC0006**
		Part number	BPN 18M-F-02-03	BPN 18M-F-03-PU-03	BPN 30M-B-04-PU-03
Ambient temperature T_a			–25...+70 °C	–25...+70 °C	–25...+70 °C
Degree of protection as 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 mm²	2×0.34 mm²	2×0.34 mm²
			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

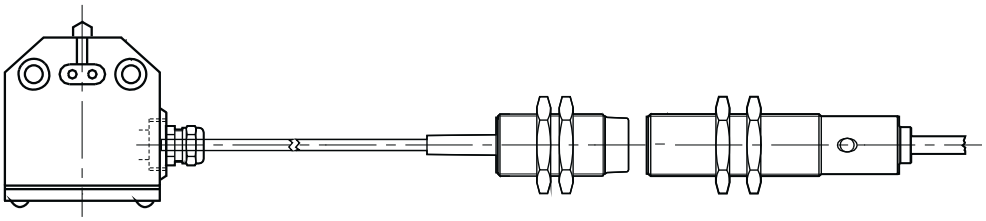






Simple principle for non-contact transmission of the switching state of a mechanical switch.

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

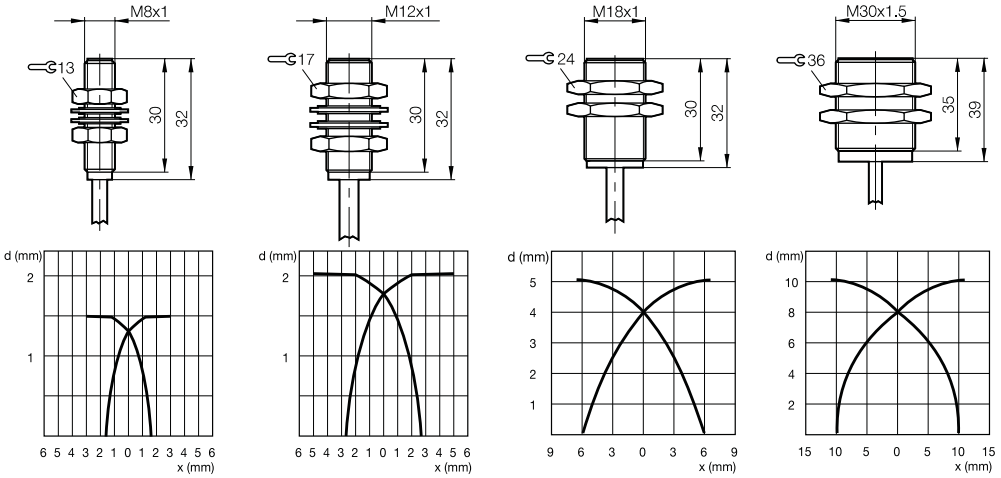


Mechanical switch

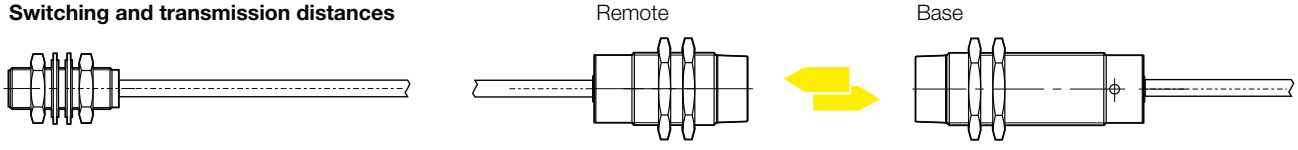
Programming cams

Inductive sensor as output sensor

Size		**M8 × 1**	**M12×1**	**M18×1**	**M30×1.5**
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
NO	**Ordering code**	**BIC004M**		**BIC004W**	**BIC0050**
1 m cable	Part number	BIC 915-D2-M08EE-EPX02-010		BIC 905-D2-M18ME-EPX02-010	BIC 910-D2-M30MF-EPX02-010
NO	**Ordering code**		**BIC004N**		
2 m cable	Part number		BIC 902-D2-M12ME-EPX02-020		
NO	**Ordering code**		**BIC004P**		
10 m cable	Part number		BIC 902-D2-M12ME-EPX02-100		
NO	**Ordering code**		**BIC004R**		
15 m cable	Part number		BIC 902-D2-M12ME-EPX02-150		
Ambient temperature T_a		0...+50 °C	0...+50 °C	0...+50 °C	0...+50 °C
Degree of protection as 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



Switching and transmission distances



BIC 9 ...

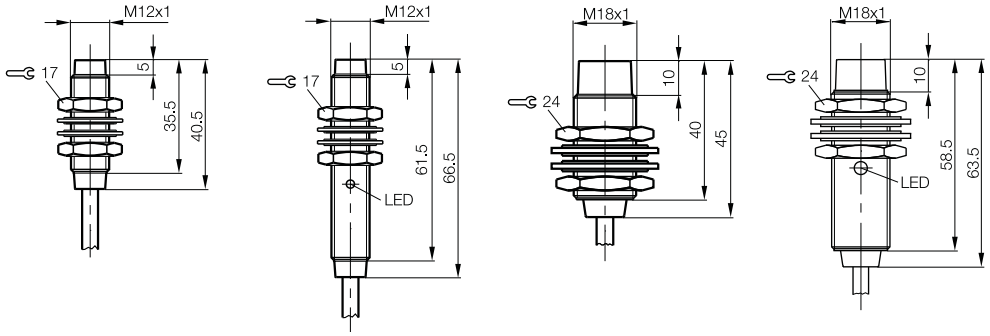
BIC 2 ...

BIC 1 ...

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

		Connection for 1 detector (2-wire) or mechanical switch			
Size		**M12×1**	**M12×1**	**M18×1**	**M18×1**
Working range		**2 mm**		**5 mm**	
Installation		Not flush	Not flush	Not flush	Not flush
Remote	**Ordering code**	**BIC003W**		**BIC003Z**	
5 m cable	Part number	BIC 2I0-D1001-M12ME1-BPX02-050		BIC 2I0-D1001-M18ME1-BPX02-050	
Base PNP	**Ordering code**		**BIC002T**		**BIC002P**
5 m cable	Part number		BIC 1I0-P2001-M12MM1-BPX03-050		BIC 1I0-P2001-M18MI-BPX03-050
Supply voltage U_B, including residual ripple			24 V ±5%		24 V ±5%
Rated operating current I_o			≤ 100 mA		≤ 100 mA
No-load supply current I_0 max.			≤ 25 mA		≤ 25 mA
Max. current load per output			≤ 50 mA		≤ 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
Degree of protection as 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
Number of conductors × conductor cross-section		2×0.5 mm²	3×0.3 mm²	2×0.5 mm²	3×0.3 mm²

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

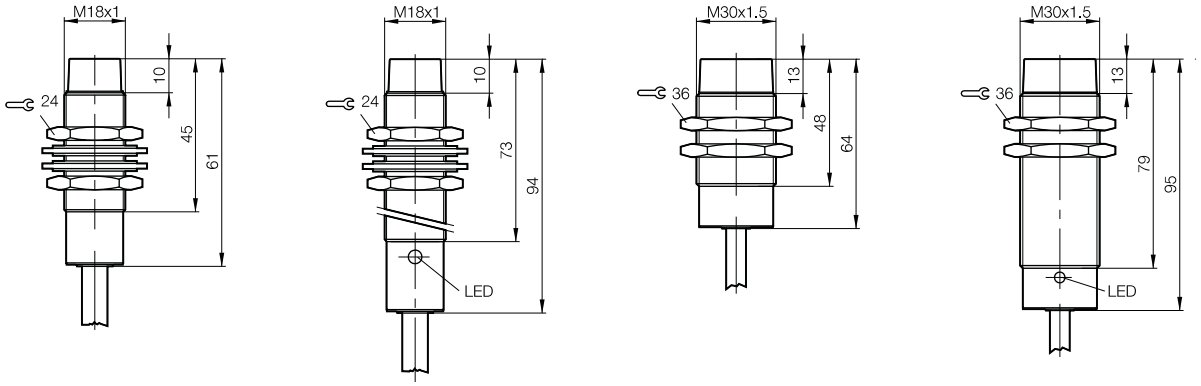


Switching and transmission distances

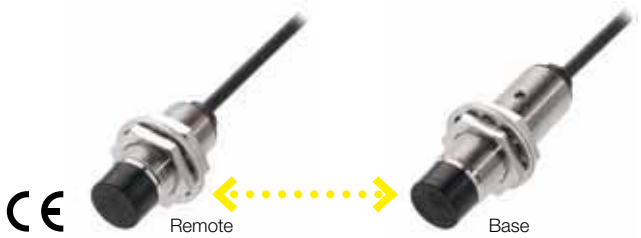
Detector				**Remote**			**Base**		
Ordering code	Size	Rated switching distance		Ordering code	Size	Transmission distance	Ordering code	Size	Output circuit
BIC004M	M8	1.5 mm							
BIC004N	M12	2 mm		BIC003W	M12	2 mm	BIC002T	M12	PNP/NO
BIC004W	M18	5 mm		BIC003Z	M18	5 mm	BIC002P	M18	PNP/NO
BIC0050	M30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

Inductive Couplers
For up to eight detectors

Connection for max. 8 detectors or mechanical switches			
M18×1	**M18×1**	**M30×1.5**	**M30×1.5**
5 mm		**10 mm**	
Not flush	Not flush	Not flush	Not flush
BIC0012		**BIC000Y**	
BIC 2I3-P2A40-M18MF2-BPX09-050		BIC 2I3-P2A40-M30ME2-BPX09-050	
	BIC0011		**BIC000W**
	BIC 1I3-P2A40-M18MN2-BPX0B-050		BIC 1I3-P2A40-M30M02-BPX0B-050
	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
12×0.18 mm²	12×0.18 mm²	12×0.18 mm²	12×0.18 mm²

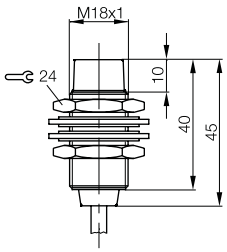


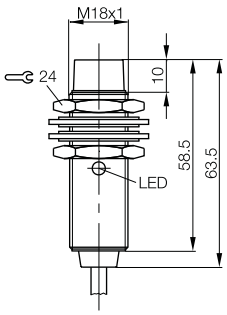
Detector			Remote			Base		
Ordering code	Size	Rated switching distance	Ordering code	Size	Transmission distance	Ordering code	Size	Output circuit
BIC004M	M8	1.5 mm						
BIC004N	M12	2 mm	BIC003W	M12	2 mm	BIC002T	M12	PNP/NO
BIC004W	M18	5 mm	BIC003Z	M18	5 mm	BIC002P	M18	PNP/NO
BIC0050	M30	10 mm						



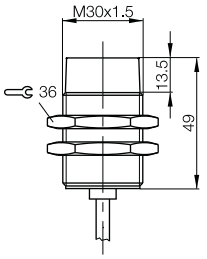
		Connection for 1 sensor		
Size		**M18×1**	**M18×1**	
Working range		**2.5 mm**		
Installation		Not flush	Not flush	
Remote NPN	**Ordering code**	**BIC002L**		
1 m cable	Part number	BIC 2I0-N2A02-M18ME-BPX03-010		
Remote PNP	**Ordering code**	**BIC002K**		
2 m cable	Part number	BIC 2I0-P2A02-M18ME-BPX03-020		
Remote PNP	**Ordering code**			
3 m cable	Part number			
Base NPN	**Ordering code**		**BIC002C**	
2 m cable	Part number		BIC 1I0-N2A02-M18MI-BPX03-020	
Base PNP	**Ordering code**		**BIC0029**	
5 m cable	Part number		BIC 1I0-P2A02-M18MI-BPX03-050	
Supply voltage U_B, including residual ripple			24 V DC ±5%	
Rated operating current I_o			≤ 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	
Degree of protection as 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 × conductor cross-section		3×0.34 mm²	3×0.34 mm²	

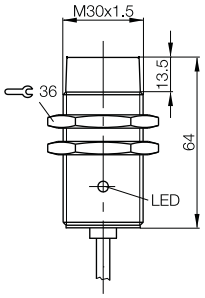
We ask that you request the user's guide for your electrical project planning.





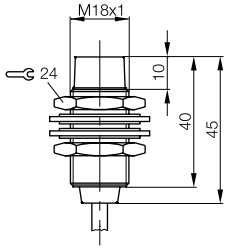
	M30×1.5	**M30×1.5**		
	4.5 mm			
	Not flush	Not flush		
	BIC0044			
	BIC 2I0-P2A05-M30MF-BPX03-030			
		BIC002E		
		BIC 1I0-P2A02-M30MI-BPX03-050		
		24 V DC ±5%		
		≤ 250 mA		
		≤ 150 mA		
		≤ 50 mA		
		Yes		
	12 ±1.5 V DC			
	≤ 30 mA			
	75 V DC			
		40 ms		
	0...+50 °C	0...+50 °C		
	–25...+75 °C	–25...+75 °C		
	±3 mm			
		25 Hz		
		Yes/Yes		
	40 Nm	40 Nm		
	IP 67	IP 67		
	Nickel-plated CuZn	Nickel-plated CuZn		
	ABS/PBT	ABS/PBT		
	PUR cable	PUR cable		
	3×0.34 mm²	3×0.34 mm²		

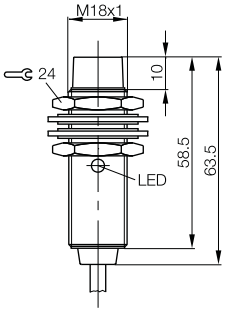




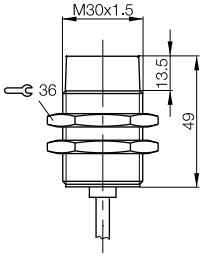
		Connection for 1 sensor (Teflon-coated housing)		
Size		**M18×1**	**M18×1**	
Working range		**2.5 mm**		
Installation		Not flush	Not flush	
Remote PNP	**Ordering code**			
3 m cable	Part number			
Remote DC-2 wire	**Ordering code**			
3 m cable	Part number			
Remote NPN	**Ordering code**	**BIC005P**		
5 m cable	Part number	BIC 2I0-N2A02-M18TI-BPX03-050		
Remote DC-2 wire	**Ordering code**	**BIC005R**		
5 m cable	Part number	BIC 2I0-D2A02-M18TI-BPX03-050		
Base NPN	**Ordering code**			
3 m cable	Part number			
Base PNP	**Ordering code**			
3 m cable	Part number			
Base NPN	**Ordering code**		**BIC005T**	
5 m cable	Part number		BIC 1I0-N2A02-M18TI-BPX03-050	
Supply voltage U_B, including residual ripple			24 V DC ±5%	
Rated operating current I_o			≤ 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	
Degree of protection as 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 × conductor cross-section		3×0.34 mm²	3×0.34 mm²	

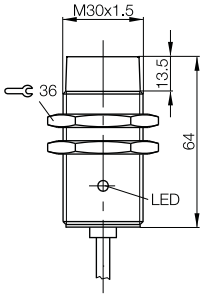
We ask that you request the user's guide for your electrical project planning.





	M30×1.5	**M30×1.5**		
	4.5 mm			
	Not flush	Not flush		
	BIC005K			
	BIC 2I0-P2A02-M30TI-BPX03-030			
	BIC005M			
	BIC 2I0-D2A02-M30TI-BPX03-030			
		BIC005N		
		BIC 1I0-N2A02-M30TI-BPX03-030		
		BIC005L		
		BIC 1I0-P2A02-M30TI-BPX03-030		
		24 V DC ±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		
	3×0.34 mm²	3×0.34 mm²		

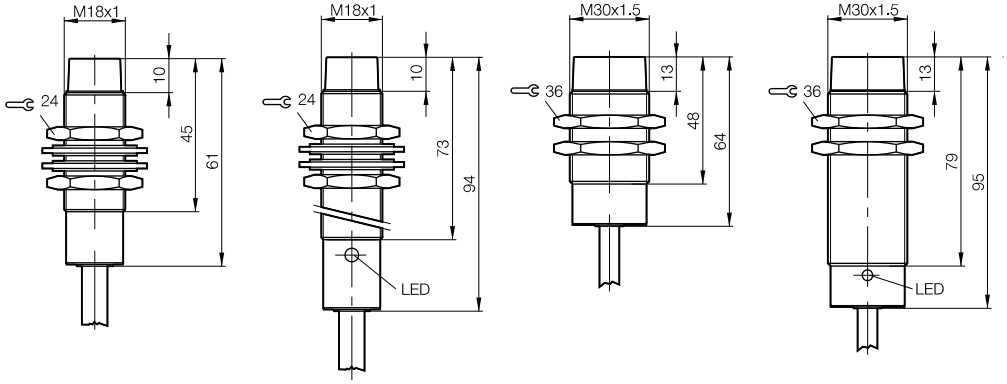




Inductive Couplers
Unidirectional for up to four sensors

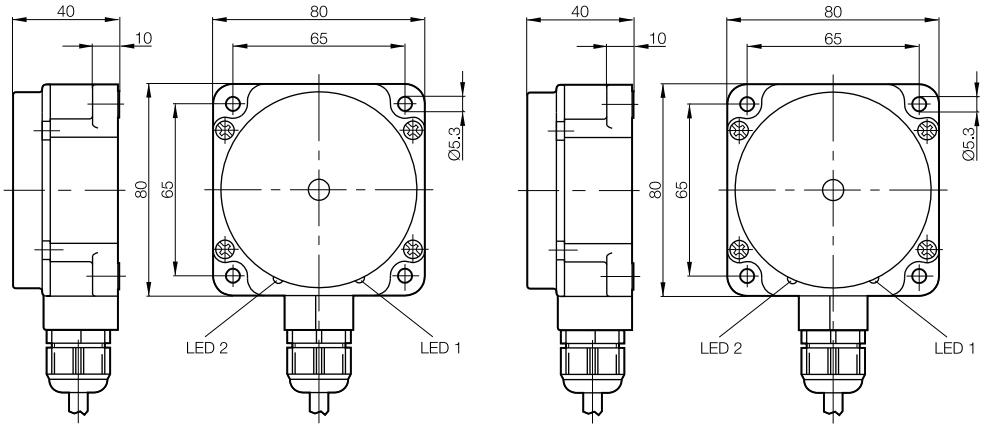
		for max. 4 sensors			
Size		**M18×1**	**M18×1**	**M30×1.5**	**M30×1.5**
Working range		**3 mm**		**5 mm**	
Installation		Not flush	Not flush	Not flush	Not flush
Remote PNP	**Ordering code**	**BIC001N**		**BIC001T**	
5 m cable	Part number	BIC 2I2-P2A02-M18MF2-EPX07-050		BIC 2I2-P2A03-M30MF2-EPX07-050	
Base NPN	**Ordering code**		**BIC0069**		
5 m cable	Part number		BIC 1I2-N1A02-M18MN2-EPX07-050		
Base PNP	**Ordering code**		**BIC0015**		**BIC001A**
5 m cable	Part number		BIC 1I2-P2A02-M18MN2-EPX07-050		BIC 1I2-P2A03-M30MO2-EPX07-050
Supply voltage U_B including residual ripple			24 V DC ±5%		24 V DC ±5%
Rated operating current I_o			≤ 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	0...+50 °C	0...+50 °C
Storage temperature		–25...+75 °C	–25...+75 °C	–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	40 Nm	40 Nm
Degree of protection as 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		PA 12	PA 12	PA 12	PA 12
Connection		PUR cable	PUR cable	PUR cable	PUR cable
Number of conductors × conductor cross-section		7×0.3 mm²	7×0.3 mm²	7×0.3 mm²	7×0.3 mm²

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

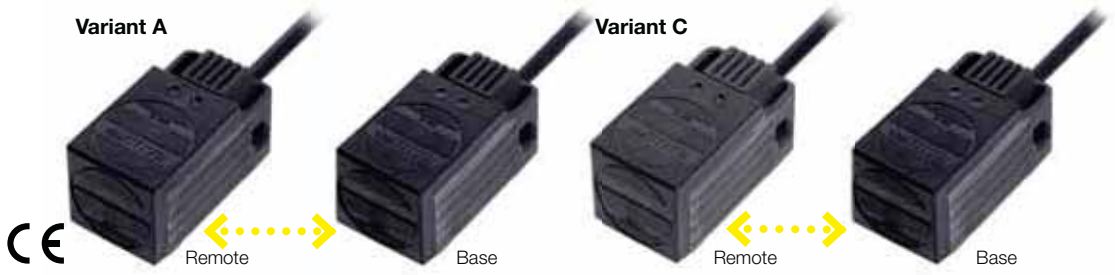


Inductive Couplers
Unidirectional for up to eight sensors

Connection for max. 8 sensors		
80×80×40 mm	**80×80×40 mm**	
10 mm		
Not flush	Not flush	
BIC001Y		
BIC 2I3-P2A05-Q80KA-GPX0C-050		
	BIC001J	
	BIC 1I3-P2A05-Q80KA-GPX0C-050	
	24 V DC ±5%	
	≤ 950 mA	
	≤ 300 mA	
	≤ 50 mA	
	Yes	
12 ±1.5 V DC		
≤ 100 mA		
75 V DC		
	40 ms	
0...+50 °C	0...+50 °C	
–25...+75 °C	–25...+75 °C	
±6 mm		
	30 Hz	
	Yes/Yes	
IP 67	IP 67	
PBT	PBT	
PBT	PBT	
PUR cable	PUR cable	
12×0.18 mm²	12×0.18 mm²	

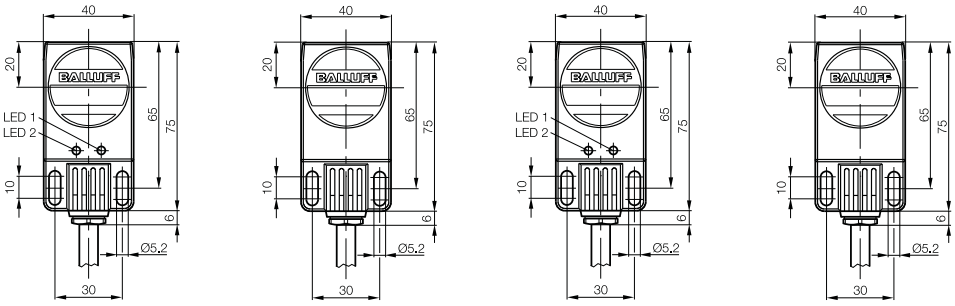


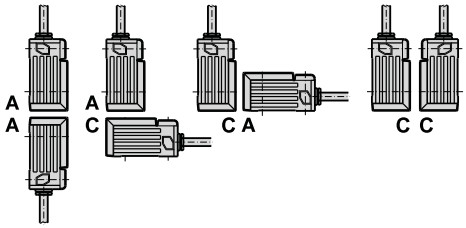
Unidirectional, power for up to eight sensors



		Connection for max. 8 sensors			
Size		**40×75×40 mm**	**40×75×40 mm**	**40×75×40 mm**	**40×75×40 mm**
Working range		**8 mm**		**8 mm**	
Installation		Not flush	Not flush	Not flush	Not flush
Remote PNP	**Ordering code**	**BIC0021**		**BIC0022**	
5 m cable	Part number	BIC 2I3-P2A20-Q40A**A**-GPX0B-050		BIC 2I3-P2A20-Q40A**C**-GPX0B-050	
Base PNP	**Ordering code**		**BIC0026**		**BIC0027**
5 m cable	Part number		BIC 1I3-P2A20-Q40A**A**-GPX0B-050		BIC 1I3-P2A20-Q40A**C**-GPX0B-050
Base NPN	**Ordering code**				
5 m cable	Part number				
Supply voltage U_B including residual ripple			24 V DC ±10%		24 V DC ±10%
Rated operating current I_o			≤ 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
Degree of protection as 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
Number of conductors × conductor cross-section		9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²

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

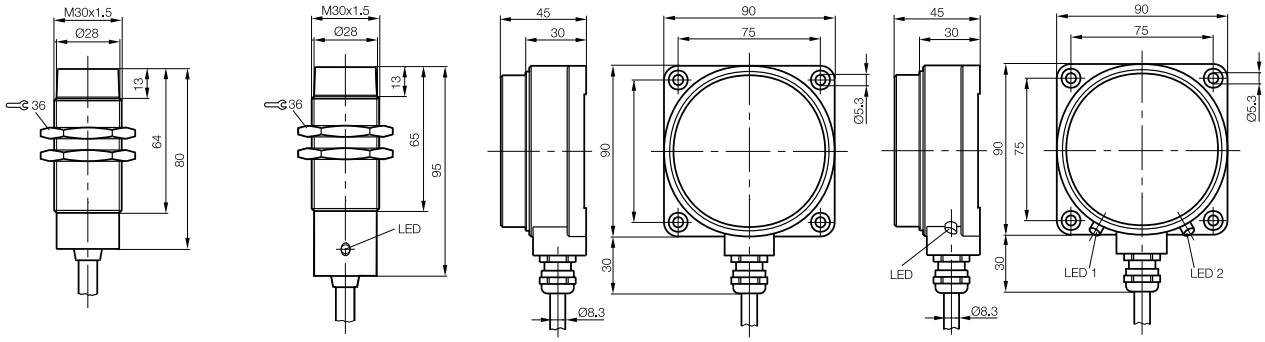




Select between versions **A** or **C**
Version A: sensing surface, front
Version B: sensing surface, side

Inductive Couplers
Unidirectional, power for up to eight sensors

Connection for max. 8 sensors			
M30×1.5	**M30×1.5**	**90×90×45 mm**	**90×90×45 mm**
5 mm		**4...12 mm**	
Not flush	Not flush	Not flush	Not flush
BIC0045		**BIC0023**	
BIC 2I3-P2A15-M30MI2-BPX0B-050		BIC 2I3-P2A30-Q90AA-GPX0B-050	
	BIC0048		**BIC0028**
	BIC 1I3-P2A15-M30MM3-BPX0B-050		BIC 1I3-P2A30-Q90AA-GPX0B-050
	BIC006A		
	BIC 1I3-N1A15-M30MM3-BPX0B-050		
	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
9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²



Inductive Couplers
Bidirectional
Four sensor signals and four actuator signals

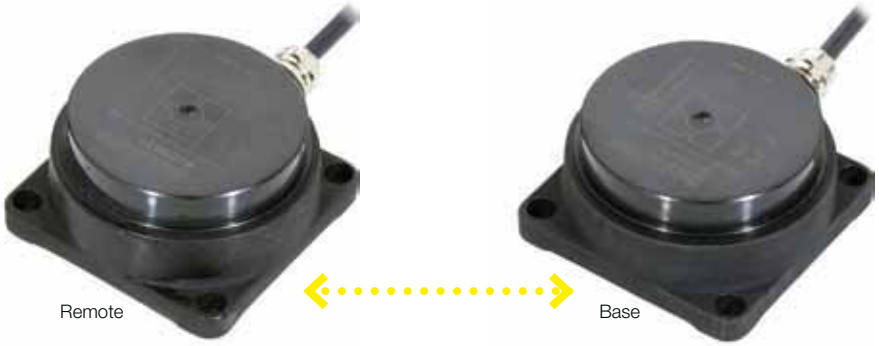
BIC bidirectional is the coupler system for four sensor signals and four actuator control signals.
The bidirectional system transmits signals inductively in both directions. The remote unit can now be used for controlling individual sensors and clamping units.
From the stationary side base, up to four signals can be transmitted, and four channels can be independently controlled.

CE

Size		
Working range		
Installation		
Remote PNP	**Ordering code**	
5 m cable	Part number	
Base PNP	**Ordering code**	
5 m cable	Part number	
Supply voltage U_B including residual ripple		
Rated operating current I_o		
No-load supply current I_0 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		
Degree of protection as per IEC 60529		
Housing material		
Material of sensing face		
Connection		
Number of conductors × conductor cross-section		

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

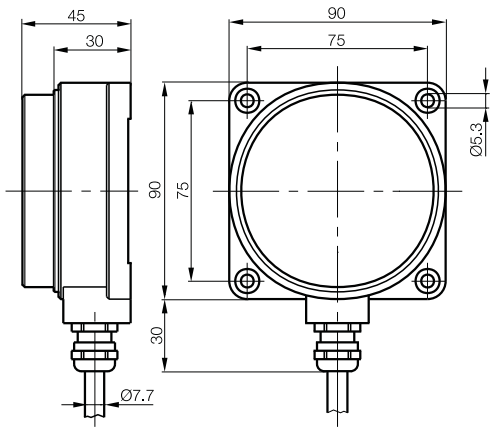
Inductive Couplers
Bidirectional
Four sensor signals and four actuator signals

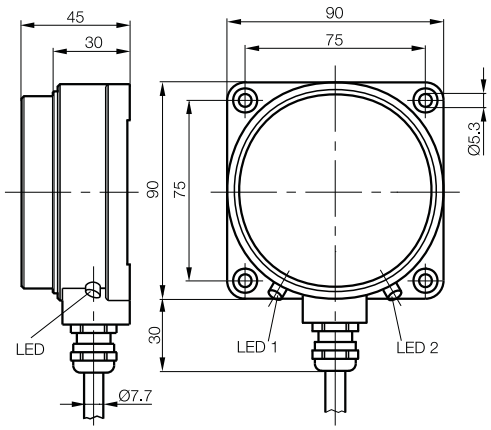


Connection for max. 4 sensors + 4 actuators		
90×90×45 mm	**90×90×45 mm**	
3...10 mm		
Not flush	Not flush	
BIC0039		
BIC 2B2-P2A30-Q90AQ-GPX0B-050		
	BIC003C	
	BIC 1B2-P2A30-Q90AQ-GPX0B-050	
	24 V DC ±10%	
	≤ 1.5 A	
	≤ 800 mA	
	≤ 50 mA	
	Yes	
24 ±1.5 V DC		
≤ 300 mA		
75 V DC		
	30 ms	
0...+50 °C	0...+50 °C	
–25...+75 °C	–25...+75 °C	
±7 mm		
	40 Hz	
	Yes/Yes	
IP 67	IP 67	
Al	Al	
ABS/PBT	ABS/PBT	
PUR cable	PUR cable	
9×0.18 mm² + 2×0.5 mm²	9×0.18 mm² + 2×0.5 mm²	

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.





Radial system for up to eight sensors

No slip rings necessary
The modularly designed radial BIC system enables contactless transmission of signals and power during rotation. The switching states of up to 8 digital sensors can be transmitted to a stationary base from rotating shafts, axes and tables. Transmission is always reliable even under the hardest conditions, regardless of speed. Radial BIC systems do not require any service or maintenance work since there is no mechanical contact.

- Intelligent, compact and interference-free
- Contactless, making it wear-free
- Connection for up to 8 sensors
- Power supply for sensors already integrated
- Plug-and-Play: plug in, switch on and evaluate data

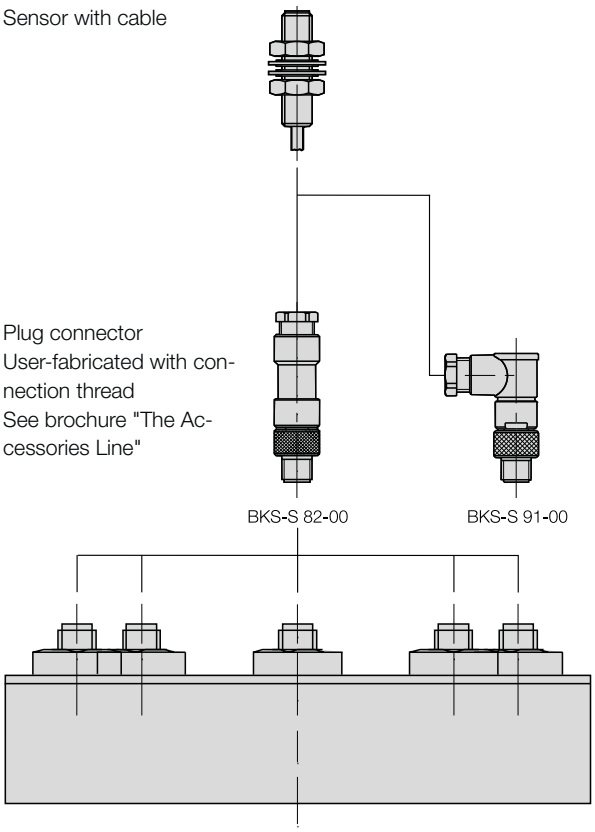
CE

Size		
Working range		
Installation		
Remote PNP	**Ordering code**	
	Part number	
Base PNP	**Ordering code**	
	Part number	
Supply voltage U_B, including residual ripple		
Rated operating current I_o		
No-load supply current I_0 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		
Degree of protection as per IEC 60529		
Housing material		
Material of sensing face		
Connection		
Recommended connector		
Weight		

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

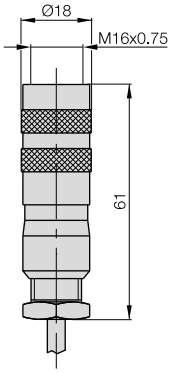
Sensor with cable

Plug connector
User-fabricated with connection thread
See brochure "The Accessories Line"

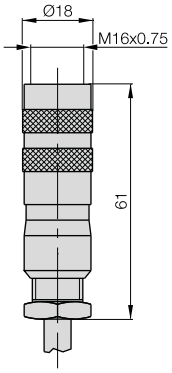


Plug connector

BCC014K
BKS-S 96-PU-05



BCC014M
BKS-S 97-PU-05

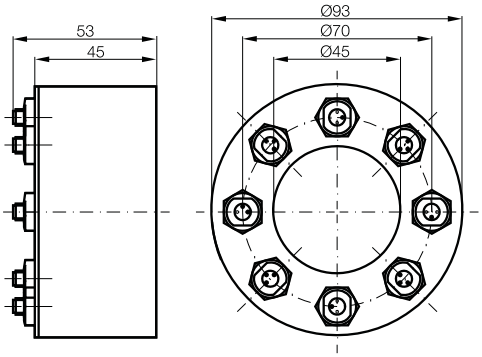


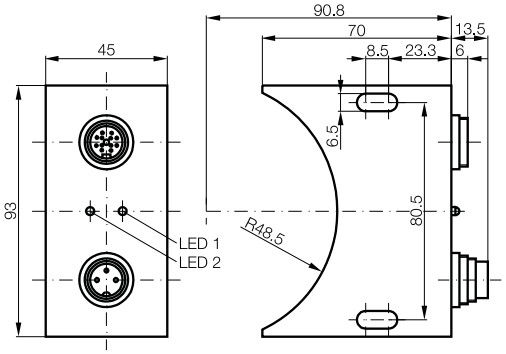
Radial system for up to eight sensors

Remote

Base

Connection for 8 sensors		
Ø 93	**93×83×45 mm**	
2 mm		
on shaft Ø 45 mm	stationary	
BIC003P		
BIC 2I3-P2A16-R01K01-SM3A30		
	BIC003N	
	BIC 1I3-P2A16-R01K01-C03	
	24 V DC ±5%	
	≤ 700 mA	
	≤ 700 mA	
	≤ 30 mA	
Yes	Yes	
24 V DC		
≤ 160 mA		
75 V DC		
	2 ms	
0...+70 °C	0...+70 °C	
–25...+75 °C	–25...+75 °C	
±1 mm		
	1000 Hz	
	Yes/Yes	
IP 67	IP 67	
PETP	PETP	
PETP	PETP	
Plug connector	Plug connector	
BKS-S 82-00/BKS-S 91-00	1× BKS-S 96 and 1× BKS-S 97	
755 g	340 g	





Recommended accessories:
(please order separately)

Description	Ordering code
Cover cap	**BAM0113**

Set ordering:
BAV BP-PP-00014-01 **Set00W2**

Set contains: 1× BIC003N Base
1× BCC014K BKS-S96
1× BCC014M BKS-S97

You can find special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads,** in our **Object Detection** catalog.

More mechanical accessories: You can find a large selection of mounting components of all types, such as clamping holders, mounting brackets and the Balluff mounting system BMS, in our **Accessory Product Line** catalog.

Radial system for up to four analog signals 0...10 V DC

Non-contact inductive energy and analog signal transmission for applications where cables are not permitted
Transmitting sensor signals from rotating machine parts or change tools and transmitting power are often a difficult task for design engineers.
This is because, in addition to a reliable connection with high availability, establishing a connection for transmitting power and data is frequently required. Conventional solution approaches are usually based on solutions prone to contact and wear, such as slip rings or mechanical connectors.

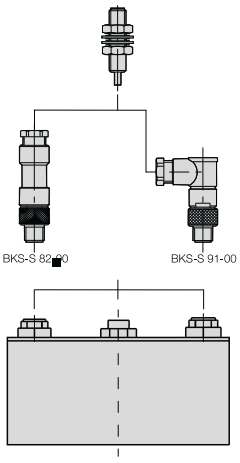
The radial BIC system from Balluff is the contactless and wear-free alternative. Thanks to the radial and axial coupling options, it opens up entirely new possibilities for users to transmit up to 4 independent analog signals.
The generously allotted supply of power ensures contactless signal transfer of inductive distance sensors BAW or magneto-inductive displacement sensors BIL and other analog systems. This allows even the transducer series BTL with an analog output to be connected without restriction.

CE

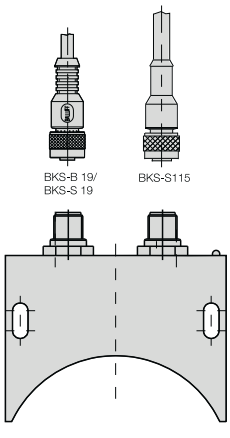
Size		
Working range		
Installation		
Remote PNP	**Ordering code**	
	Part number	
Base PNP	**Ordering code**	
	Part number	
Supply voltage U_B including residual ripple		
Rated operating current I_o		
No-load supply current I_0 max.		
Load resistance R_L (per output)		
Resolution		
Measuring range	Output voltage	
	Output voltage	
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		
Degree of protection as per IEC 60529		
Housing material		
Material of sensing face		
Connection		
Recommended connector		
Weight		

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

Plug connector BKS-S 82-00 or BKS-S 91-00

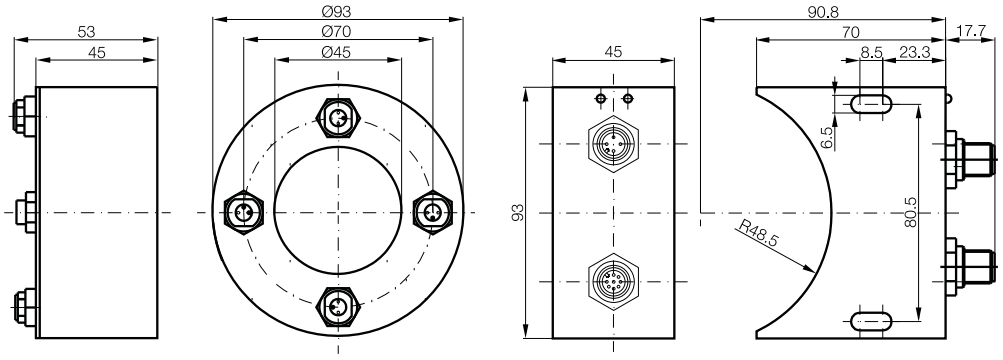


Plug connector BCC M415-000... and BKS-S115



Radial system for up to four analog signals 0...10 V DC

Connection for 4 analog sensors	
Ø 93	**93×70×45 mm**
2 mm	
on shaft Ø 45 mm	stationary
BIC004A	
BIC 2I2-V1A18-R01K01-SM3A30	
	BIC0049
	BIC 1I2-V1A18-R01K01-C01
	24 V DC ±5%
	≤ 800 mA
	≤ 250 mA
	1 kΩ
12 bit	12 bit
4×0...10.65 V DC	
	4×0...10.65 V DC
Yes	Yes
24 V DC	
≤ 180 mA	
75 V DC	
	≤ 10 ms
0...+70 °C	0...+70 °C
–25...+75 °C	–25...+75 °C
±1 mm	±1 mm
	250 Hz/channel
	Yes/Yes
IP 67	IP 67
PETP	PETP
PETP	PETP
Plug connector	Plug connector
BKS-S 82-00/BKS-S 91-00	1× BKS-B 19-1-PU-_ _ and 1× BKS-S115-PU-_ _
650 g	250 g



Recommended accessories:
(please order separately)

Description	Ordering code
Cover cap	**BAM0113**

You can find special accessories for photoelectric sensors, such as **reflectors, apertures, lenses, filters and deflection heads,** in our **Object Detection** catalog.

For one analog displacement sensor 0...10 V DC

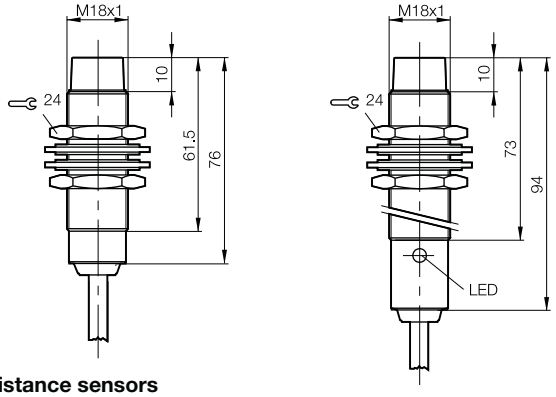
Remote – detect moving components

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 is 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		**M18×1**	**M18×1**
Working range		**2.5 mm**	
Installation		Not flush	Not flush
Remote	**Ordering code**	**BIC0043**	
5 m cable	Part number	BIC 2I0-V1A01-M18MI2-BPX03-050	
Base	**Ordering code**		**BIC0046**
5 m cable	Part number		BIC 1I0-V1003-M18MN2-BPX03-050
Supply voltage U_B including residual ripple			24 V DC ±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 kΩ	
max. non-linearity		≤ ±0.8% of U_a max.	
Resolution		≤ ±0.05 V DC	≤ 0.1%
Temperature drift		≤ ±0.04%/°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 °C	0...+60 °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
Degree of protection as 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		3×0.34 mm²	3×0.34 mm²

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



Examples of compatible inductive distance sensors

Part number	Size	Output signal	Linear range S_l
BAW M08EI-UAD15B-	M8 × 1	0...10 V	0.5...1.5 mm
BAW M12MG2-UAC20B-	M12×1	0...10 V	0.5...2.0 mm
BAW M12MF2-UAC40F-	M12×1	0...10 V	1.0...4.0 mm
BAW M18MI-UAC50B-S04G	M18×1	0...10 V	1.0 ... 5.0 mm
BAW M18ME-UAC50B-	M18×1	0...10 V	1.0 ... 5.0 mm
BAW M18MG-UAC80F-S04G	M18×1	0...10 V	2.0...8.0 mm
BAW M30ME-UAC10B-S04G	M30×1.5	0...10 V	2.0 ... 10.0 mm

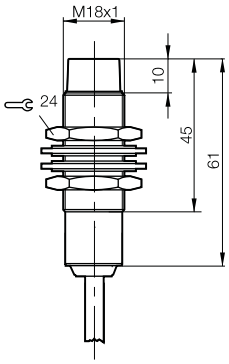
See Position and Distance Measurement brochure

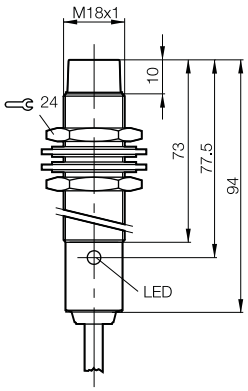
Remote – non-contact transmission of temperature values

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		**M18×1**	**M18×1**
Working range		**1...4 mm**	
Installation		Not flush	Not flush
Remote	**Ordering code**	**BIC0041**	
5 m cable	Part number	BIC 2I0-R1002-M18MF2-BPX03-050	
Remote	**Ordering code**	**BIC004C**	
5 m cable	Part number	BIC 2I0-R3002-M18MF2-BPX03-050	
Base	**Ordering code**		**BIC0047**
5 m cable	Part number		BIC 1I0-C1A02-M18MN2-BPX03-050
Supply voltage U_B including residual ripple			24 V DC ±5%
Rated operating current I_o			≤ 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			≤ 400 Ω
Measurement deviation			≤ ±0.8% of I_a max.
Delay time		0.5 s	
Temperature drift			≤ ±0.04%/°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
Degree of protection as 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		3×0.3 mm²	3×0.3 mm²

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





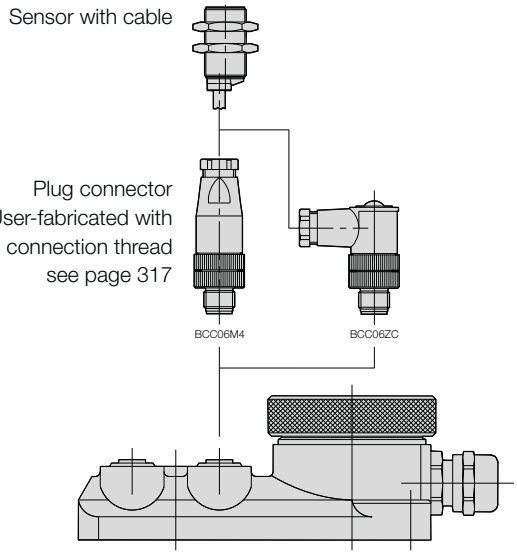
Compatible PT100 thermocouples

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

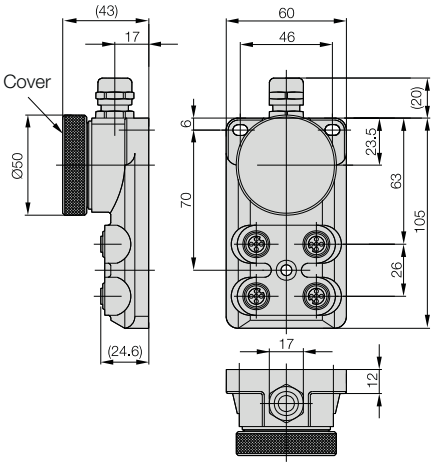
Remote

Ordering code	Part number	Temperature measuring range
BIC0041	BIC 2I0-R1002-M18MF2-BPX03-050	0...+100 °C
BIC004C	BIC 2I0-R3002-M18MF2-BPX03-050	0...+300 °C

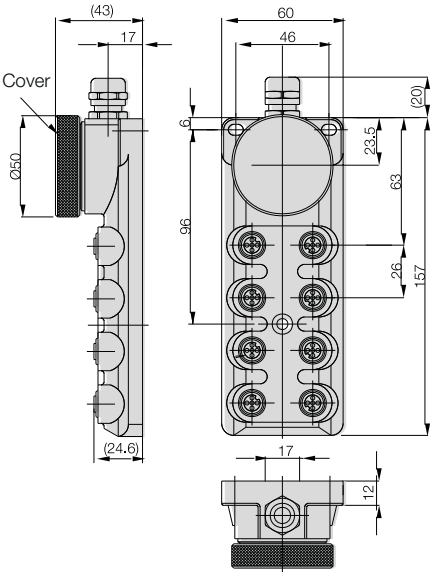
Rugged splitter boxes for easily connecting the sensors to the remote with cable outlet. The remote sensor is connected using a terminal block with spring clamps – no screws required.
The sensors are connected using standard M12 connectors.



Distribution list
BPI0069
BPI 4M4A40-2M-IC-THF7



Distribution list
BPI006C
BPI 8M4A40-2M-IC-THFC



Rapid disconnection of power and signals

For maximum flexibility – Non-contacting 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 allows up to 16 sensors per system and lets you connect to the bus environment.

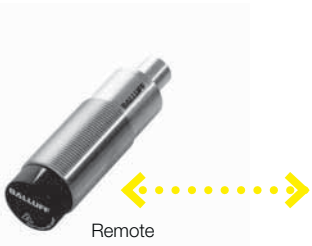
The best solutions for the application can be selected from various performance classes in a compact design.

Inductive Couplers
Power only

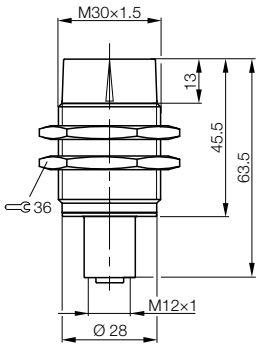
- Simple connection, quick startup
- Wear-free
- Robust, even in harsh environments

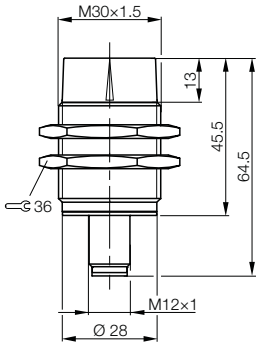
Size	
Working range	
Installation	
Ordering code	
Part number	
Supply voltage U_B including residual ripple	
Rated operating current I_o	
No-load supply current I_0 max.	
Max. current load per output	
Short-circuit protected	
Remote output voltage	
Power supply, continuous output current	
Rated insulation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

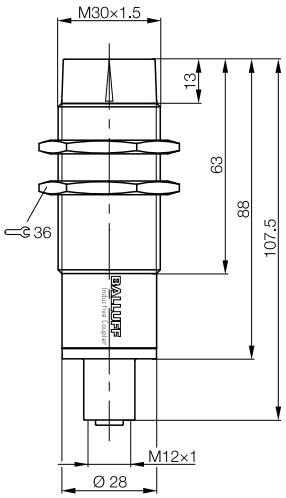
Retrofitting is simple – Plug-and-Play lets you quickly install BIC. Your maintenance costs are reduced to a minimum since cable breaks and mechanical wear become a thing of the past.

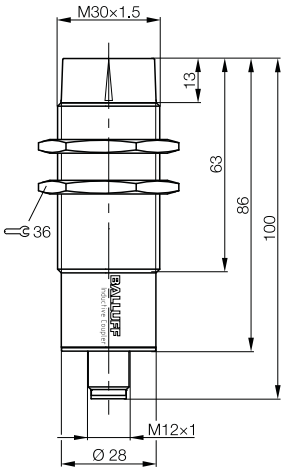


Power only with 0.2 A of power		Power only with 0.5 A of power	
M30×1.5	**M30×1.5**	**M30×1.5**	**M30×1.5**
0...5 mm	**0...5 mm**	**0...5 mm**	**0...5 mm**
Not flush	Not flush	Not flush	Not flush
BIC0052	**BIC0051**	**BIC0008**	**BIC0007**
BIC 2P0-P2A20-M30ME1-SM4A5A	BIC 1P0-P2A20-M30ME-SM4A4A	BIC 2P0-P2A50-M30MI3-SM4A5A	BIC 1P0-P2A50-M30MI3-SM4A4A
	24 V DC ±10%		24 V DC ±10%
	max. 500 mA		max. 1 A
	100 mA		100 mA
Yes	Yes	Yes	Yes
24 V DC ±5%		24 V DC ±5%	
200 mA		500 mA	
150 V DC/125 V AC	150 V DC/125 V AC	150 V DC/125 V AC	150 V DC/125 V AC
< 1 ms		< 100 ms	
–5...+55 °C	–5...+55 °C	0...+55 °C	0...+55 °C
–25...+75 °C	–25...+75 °C	–25...+75 °C	–25...+75 °C
±4 mm		±4 mm	
10 Hz	10 Hz	10 Hz	10 Hz
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
70 Nm	70 Nm	70 Nm	70 Nm
IP 67	IP 67	IP 67	IP 67
CuZn coated	CuZn coated	CuZn coated	CuZn coated
PC	PC	PC	PC
M12 connector, female, 5-pin	M12 connector, male, 4-pin	M12 connector, female, 5-pin	M12 connector, male, 4-pin









You can find more information on inductive couplers BIC online at **www.balluff.com**

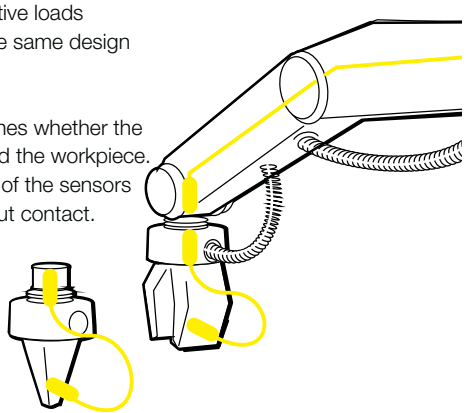
	Uni-standard with 0.5 A power and 8 signals		
Size	**M30×1.5**	**M30×1.5**	
Working range	**0...5 mm**	**0...5 mm**	
Installation	Not flush	Not flush	
Ordering code	**BIC000A**	**BIC0009**	
Part number	BIC 2I3-P2A50-M30MI3-SM4ACA	BIC 1I3-P2A50-M30MI3-SM4ACA	
Supply voltage U_B, including residual ripple		24 V DC ±10%	
Rated operating current I_o		max. 1 A	
No-load supply current I_0 max.		100 mA	
Max. current load per output		50 mA	
Short-circuit protected	Yes	Yes	
Remote output voltage	24 V DC ±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	40 Hz	40 Hz	
Function/power-on indicator	Yes/Yes	Yes/Yes	
Tightening torque	70 Nm	70 Nm	
Degree of protection as per IEC 60529	IP 67	IP 67	
Housing material	CuZn coated	CuZn coated	
Material of sensing face	PC	PC	
Connection	M12 connector, female, 12-pin	M12 connector, male, 12-pin	
IO-Link			
Transfer rate			
Cycle time min.			
Process data cycle			
IO-Link process data length			
Frame type			

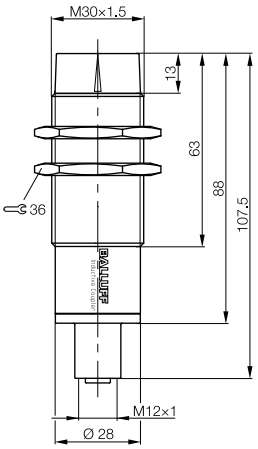
Additional advantages

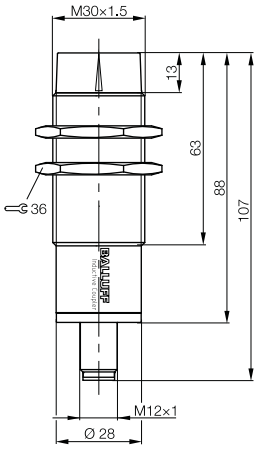
- Simple wiring of rotary index tables, interchangeable stamping heads, etc.
- Plug-in connection for M12
- Control of capacitive loads
- More power in the same design

Robot gripper

The sensor determines whether the gripper has collected the workpiece. The switching state of the sensors is transmitted without contact.

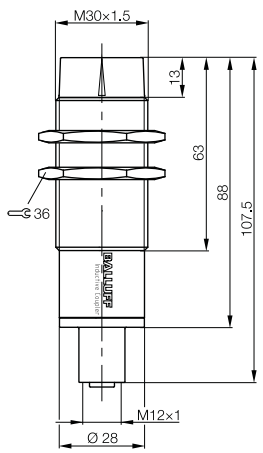


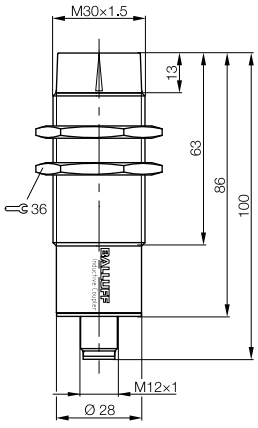


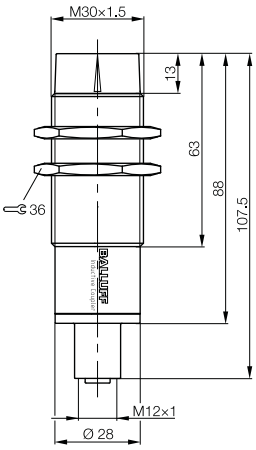


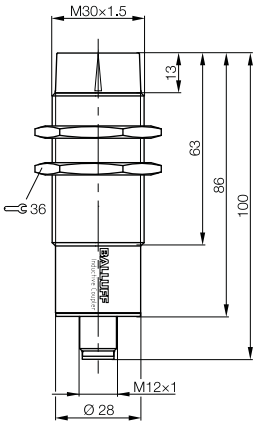
	Together with sensor hub		Together with analog hub	
	 Remote	 Base	 Remote	 Base
	IO-Link interface 16 IN		**IO-Link interface 4×, analog**	
	M30×1.5	**M30×1.5**	**M30×1.5**	**M30×1.5**
	0...5 mm	**0...5 mm**	**0...5 mm**	**0...5 mm**
	Not flush	Not flush	Not flush	Not flush
	BIC000E	**BIC000C**	**BIC0054**	**BIC0053**
	BIC 2I0-I2A50-M30MI3-SM4A5A	BIC 1I0-I2A50-M30MI3-SM4A4A	BIC 2I0-IAA50-M30MI3-SM4A5A	BIC 1I0-IAA50-M30MI3-SM4A4A
		24 V DC ±10%		24 V DC ±10%
		max. 1 A		max. 1 A
	Yes	Yes	Yes	Yes
	24 V DC ±5%		24 V DC ±5%	
	500 mA		500 mA	
	150 V DC/125 V AC	150 V DC/125 V AC	150 V DC/125 V AC	150 V DC/125 V AC
	< 100 ms		< 100 ms	
	0...+55 °C	0...+55 °C	0...+55 °C	0...+55 °C
	–25...+75 °C	–25...+75 °C	–25...+75 °C	–25...+75 °C
	±4 mm		±4 mm	
	IO-Link*	IO-Link*	IO-Link*	IO-Link*
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
	70 Nm	70 Nm	70 Nm	70 Nm
	IP 67	IP 67	IP 67	IP 67
	CuZn coated	CuZn coated	CuZn coated	CuZn coated
	PC	PC	PC	PC
	M12 connector, female, 5-pin 	M12 connector, male, 4-pin 	M12 connector, female, 5-pin 	M12 connector, male, 4-pin 
	38.4 kbaud	38.4 kbaud	38.4 kbaud	38.4 kbaud
	3 ms	3 ms	3 ms	3 ms
	12 ms	12 ms	33 ms	33 ms
	3 input bytes	3 input bytes	11 input bytes	11 input bytes
	1	1	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.







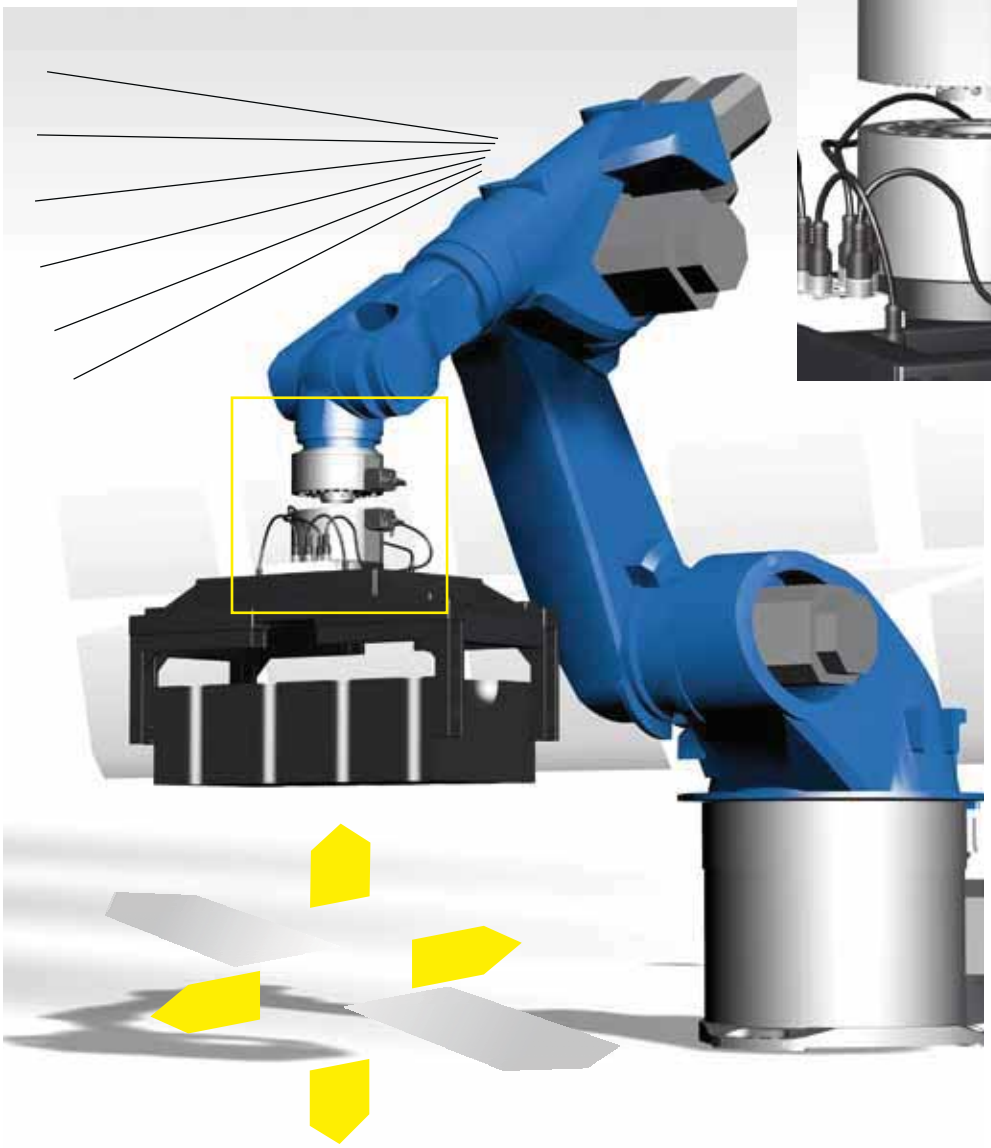


IO-Link unidirectional in 40×40 mm Unicompact housing

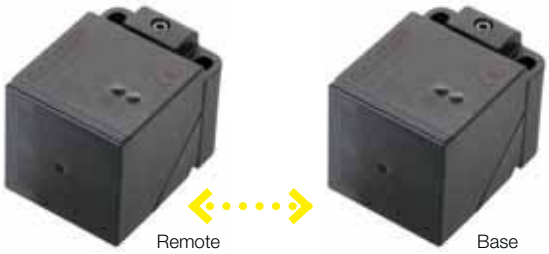
IO-Link unidirectional in 40×40 mm Unicompact housing
The IO-Link interface guarantees simple installation IO-Link can be wired quickly and the new housing concept also reduces interfering variables.
Inductive couplers make mechanical plug-in contacts unnecessary because the signals can be reliably transmitted without contact via an air gap. This ensures freedom from wear, rapid format changes and great flexibility. This makes IO-Link unidirectional in the compact 40×40 housing ideal for robotics coupling.

- No mechanical wear
- Maintenance-free
- Increased system availability
- Fast replacement of change tools
- Simple system design
- Quick wiring for tools

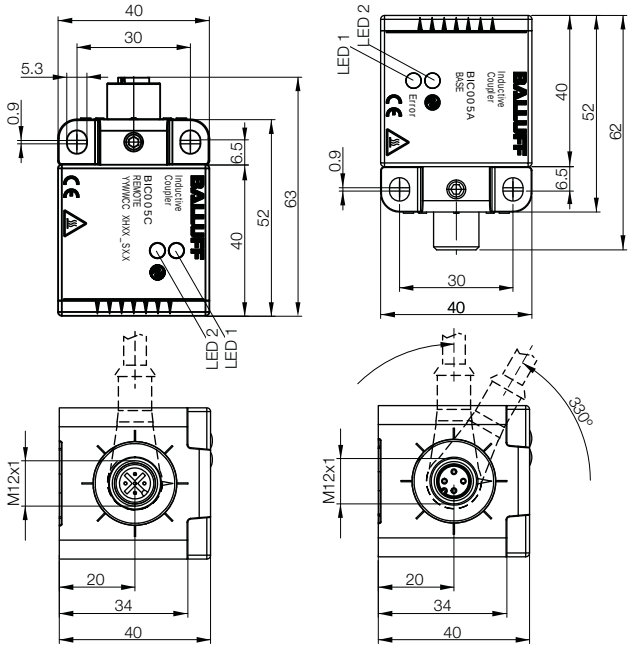
Gripper change in robotics



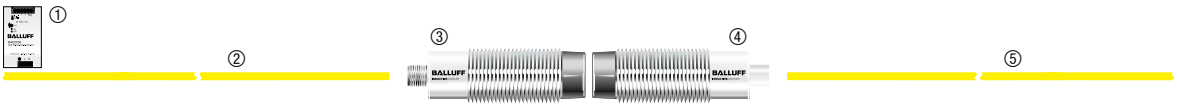
IO-Link unidirectional in 40×40 mm Unicompact housing



	IO-Link	
Size	**40×40×63 mm**	**40×40×63 mm**
Working range	1 mm...5 mm	1 mm...5 mm
Ordering code	**BIC005C**	**BIC005A**
Part number	BIC 2I0-I2A50-Q40KFU-SM4A5A	BIC 1I0-I2A50-Q40KFU-SM4A4A
Supply voltage U_B including residual ripple		24 V DC ±10%
Rated operating current I_o		1000 mA
No-load supply current I_0 max.		100 mA
Max. current load per output	800 mA	
Short-circuit protected	Yes	Yes
Remote output voltage	24 V DC ±5%	
Power supply, continuous output current	500 mA	
Operational readiness	< 100 ms	
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
Degree of protection as per IEC 60529	IP 67	IP 67
Housing material	PBTP	PBTP
Material of sensing face	PBTP	PBTP
Connection	M12 connector, female, 5-pin, A-coded 	M12 connector, male, 4-pin, A-coded 
IO-Link		
Transfer rate	38.4 kbaud	38.4 kbaud
Cycle time min.	3 ms	3 ms
Process data cycle		12 ms at minimum cycle time
IO-Link process data length	3 input bytes	3 input bytes
Frame type	1	1

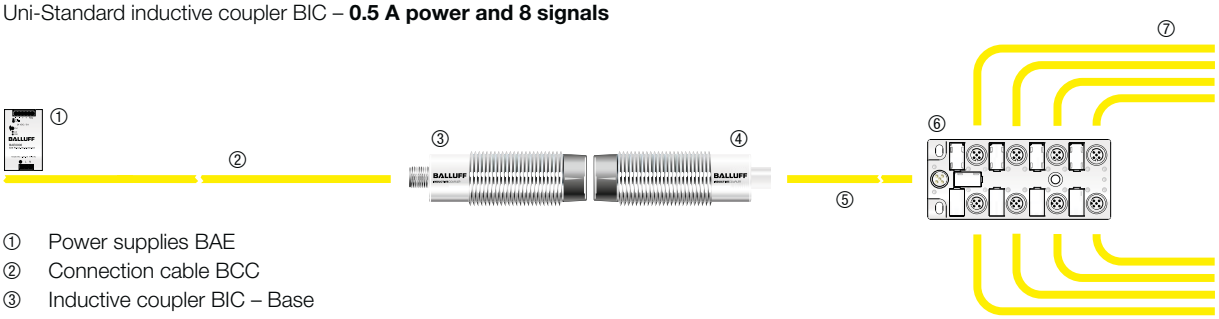


Power only inductive coupler BIC – **0.5 A of power**



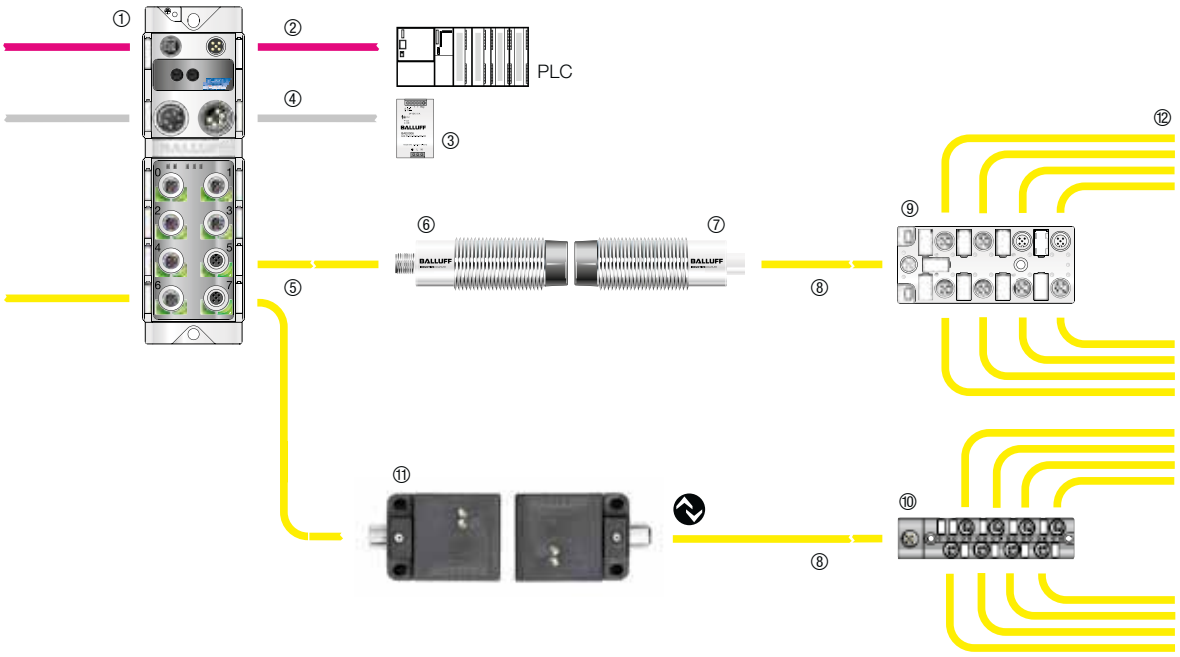
① Power supplies BAE
② Connection cable BCC
③ Inductive coupler BIC – Base
④ Inductive coupler BIC – Remote
⑤ Connection cable BCC

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



① Power supplies BAE
② Connection cable BCC
③ Inductive coupler BIC – Base
④ Inductive coupler BIC – Remote
⑤ Connection cable BCC
⑥ M12 passive splitter boxes BPI or
⑦ Sensor connection

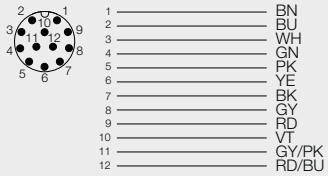
Inductive coupler BIC – **IO-Linkconnection, 0.5 A power and 8 or 16 signals (depending on the sensor hub)**



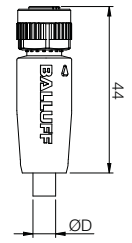
① IO-Link master BNI
② Bus connection
③ Power supplies BAE
④ 7/8" power cable BCC
⑤ Connection cable BCC
⑥ Inductive coupler BIC – Base
⑦ Inductive coupler BIC – Remote
⑧ Connection cable BCC
⑨ M12 sensor hub BNI or
⑩ M8 sensor hub BNI
⑪ IO-Link unidirectional in 40x40 mm Unicompact housing
⑫ Sensor connection

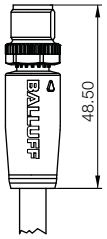
Inductive Couplers

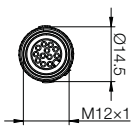
M12 female straight connector, 12-pin
M12 male straight, 12-pin

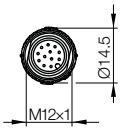
View of female/ Plug side			
Max. supply voltage AC U_B		30 V DC	30 V DC
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		12×0.25 mm²	12×0.25 mm²
Degree of protection as per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	–40...+90 °C/–25...+90 °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		BIC0009 Base	BIC000A Remote

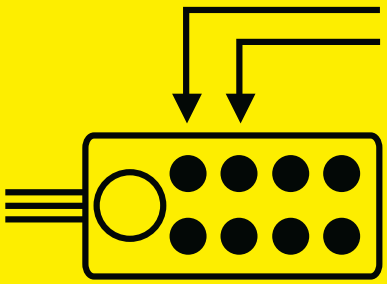
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC06UK**	**BCC06UU**
			BCC M41C-0000-1A-049-PX0C25-020	BCC M41C-0000-2A-049-PX0C25-020
PUR	Black	5 m	**BCC06UL**	**BCC06UW**
			BCC M41C-0000-1A-049-PX0C25-050	BCC M41C-0000-2A-049-PX0C25-050
PUR	Black	10 m	**BCC06UM**	**BCC06UY**
			BCC M41C-0000-1A-049-PX0C25-100	BCC M41C-0000-2A-049-PX0C25-100
PVC	Gray	2 m	**BCC06UP**	**BCC06UZ**
			BCC M41C-0000-1A-049-VX8C25-020	BCC M41C-0000-2A-049-VX8C25-020
PVC	Gray	5 m	**BCC06UR**	**BCC06W0**
			BCC M41C-0000-1A-049-VX8C25-050	BCC M41C-0000-2A-049-VX8C25-050
PVC	Gray	10 m	**BCC06UT**	**BCC06W1**
			BCC M41C-0000-1A-049-VX8C25-100	BCC M41C-0000-2A-049-VX8C25-100



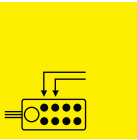








Passive Splitters



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. A fully enclosed housing provides a higher enclosure rating as well as better shock and vibration resistance characteristics. Though 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 and the mounting bore holes are centrally positioned. Additional mounting bore 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 BPI passive interface— a multi-talent, even under demanding conditions

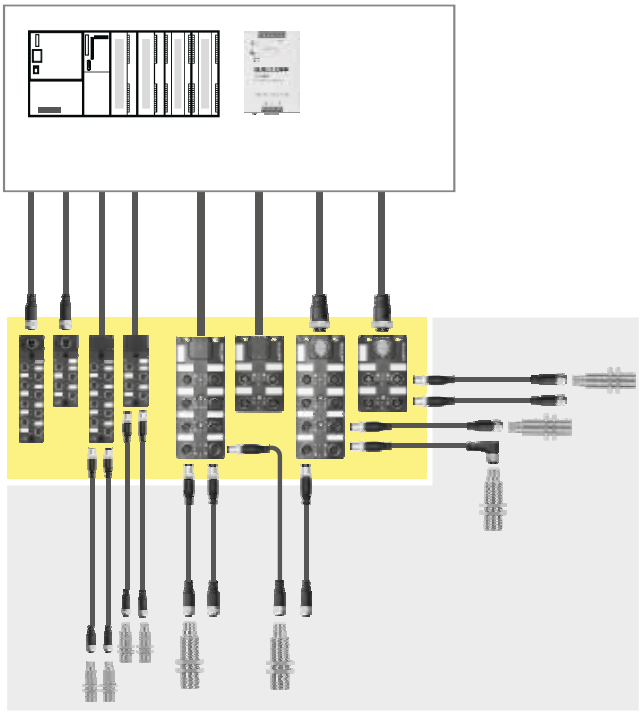
- Outstanding design
- Fully potted housing
- High shock and vibration ratings
- Metal screw inserts
- Flexible mounting options

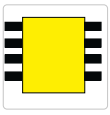
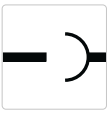
Product topology

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

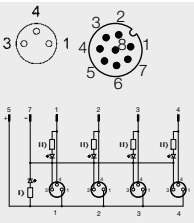
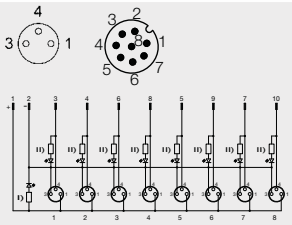
Typical applications for the plastic version
- Assembly and handling machines
- Packaging technology
- Specialty machine construction



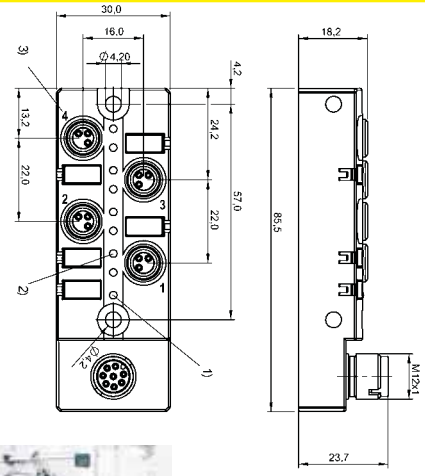
	Conventional splitter boxes or wiring directly in the switching cabinet	Use of passive splitter boxes	
Assembly time			Machines, systems and connectivity components are divided into transportable sections and dismantled prior to delivery. **During commissioning, installation times are normally reduced 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.**

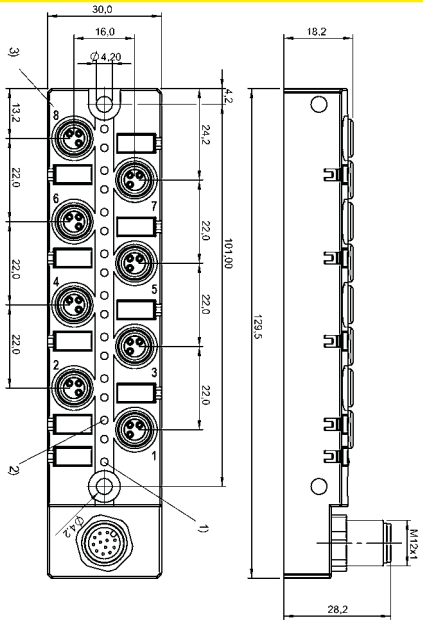
Passive Splitters

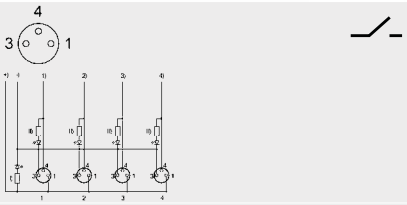
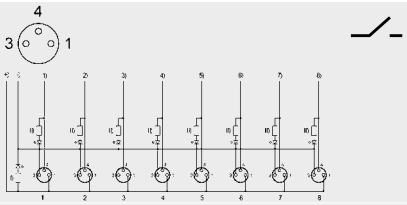
M8, 3-pin, with M12 plug connection, LED

View of female/ Plug side		
Version	4-way	8-way
Rated power supply U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Function indicator	Yes	Yes
Power-on indicator	Green LED	Green LED
Sensor connection	3-pin female, M8×1	3-pin female, M8×1
Controller connection	M12 connector	M12 connector
Number of connections	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Ambient temperature T_a	–5...+60 °C	–5...+60 °C
Use	PNP normally open (NO) ⏥-	PNP normally open (NO) ⏥-
Recommended connector - port	BCC M313...	BCC M313...
M12 plug connection	BCC M418...	BCC M41C...

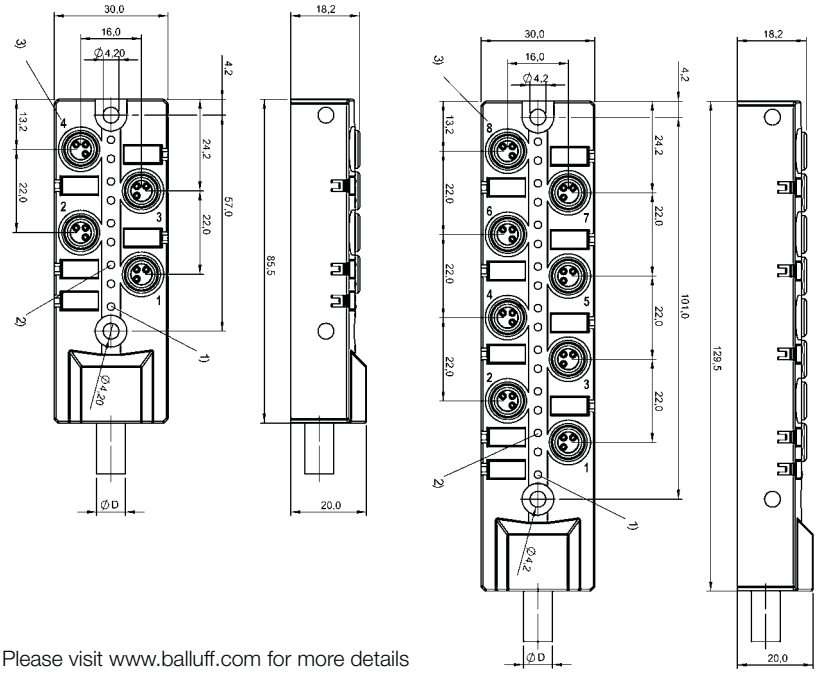
	Ordering code	
	Part number	
	BPI003P	**BPI003T**
	BPI 4M303P-2K-00-SM48T	BPI 8M303P-2K-00-SM4CT



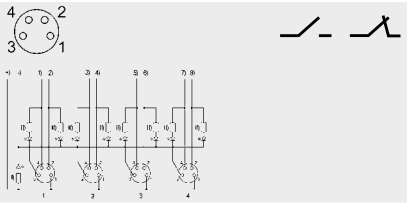
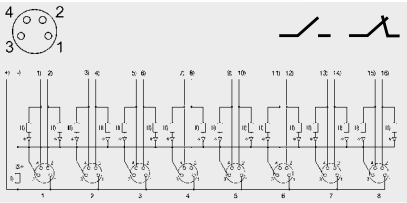


View of female/ Plug side		
Version	4-way	8-way
Rated power supply U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Function indicator	Yes	Yes
Power-on indicator	Green LED	Green LED
Sensor connection	3-pin female, M8×1	3-pin female, M8×1
Controller connection	Permanently connected cable	Permanently connected cable
Number of connections	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Ambient temperature T_a	–5...+60 °C	–5...+60 °C
Use	PNP normally open (NO) ⎍-	PNP normally open (NO) ⎍-
Recommended connector - port	BCC M313...	BCC M313...

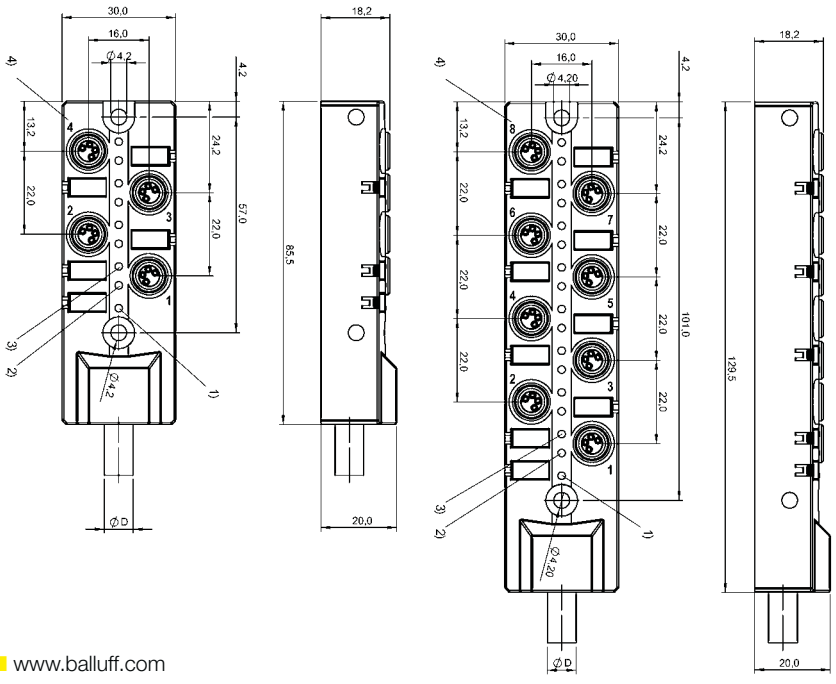
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	3 m	**BPI002N**	**BPI0030**
			BPI 4M303P-2K-00-KPX60-030	BPI 8M303P-2K-00-KPXA0-030
PUR	Black	5 m	**BPI002P**	**BPI0031**
			BPI 4M303P-2K-00-KPX60-050	BPI 8M303P-2K-00-KPXA0-050
PUR	Black	10 m	**BPI002R**	**BPI0032**
			BPI 4M303P-2K-00-KPX60-100	BPI 8M303P-2K-00-KPXA0-100
PUR	Black	15 m	**BPI002T**	**BPI0033**
			BPI 4M303P-2K-00-KPX60-150	BPI 8M303P-2K-00-KPXA0-150

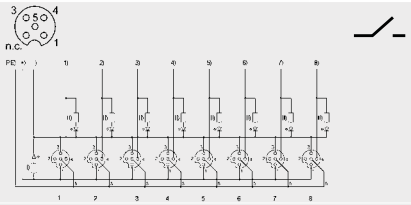


Passive Splitters
M8, 4-pin with cable, LED

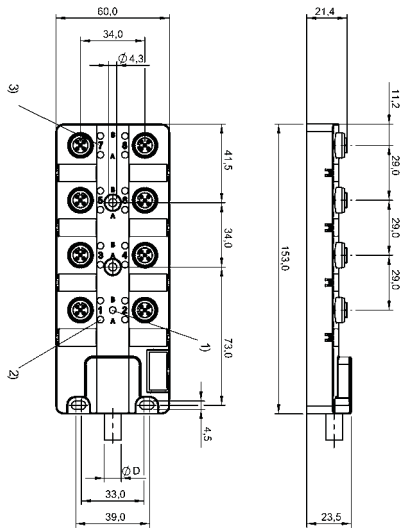
		
	4-way	8-way
	24 V DC	24 V DC
	10...30 V DC	10...30 V DC
	Yes	Yes
	Green LED	Green LED
	4-pin female, M8×1	4-pin female, M8×1
	Permanently connected cable	Permanently connected cable
	4	8
	2 A	2 A
	6 A	6 A
	PBT, GF	PBT, GF
	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–5...+60 °C	–5...+60 °C
	PNP normally open/normally closed (NO/NC) ⎍ / ⎍	PNP normally open/normally closed (NO/NC) ⎍ / ⎍
	BCC M314...	BCC M314...

	Ordering code	
	Part number	
	BPI0038	**BPI003K**
	BPI 4M304P-2K-00-KPXA0-030	BPI 8M304P-2K-00-KPXK0-030
	BPI0039	**BPI003L**
	BPI 4M304P-2K-00-KPXA0-050	BPI 8M304P-2K-00-KPXK0-050
	BPI003A	**BPI003M**
	BPI 4M304P-2K-00-KPXA0-100	BPI 8M304P-2K-00-KPXK0-100
	BPI003C	**BPI003N**
	BPI 4M304P-2K-00-KPXA0-150	BPI 8M304P-2K-00-KPXK0-150

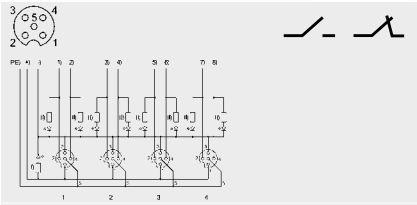
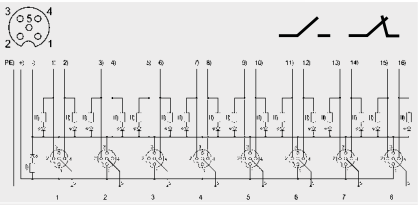


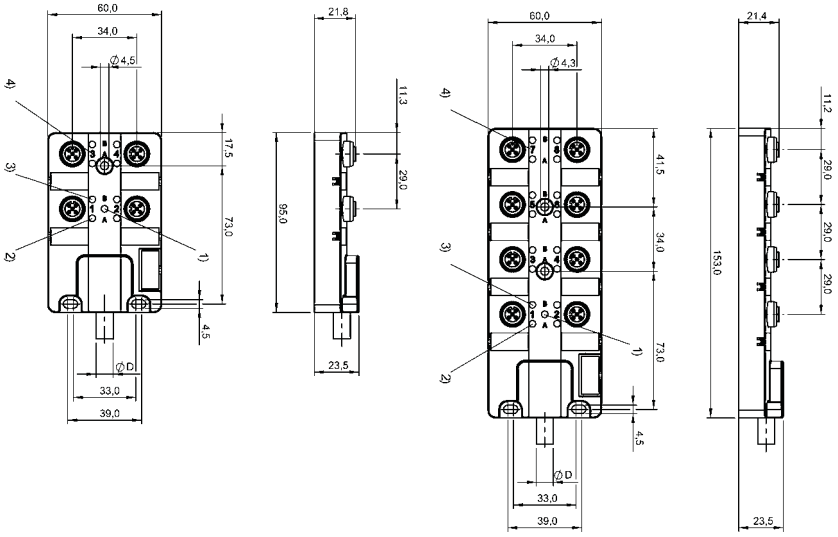
View of female/ Plug side			
Version	8-way		
Rated power supply U_e	24 V DC		
Supply voltage U_B	10...30 V DC		
Function indicator	Yes		
Power-on indicator	Green LED		
Sensor connection	4-pin female, M12×1		
Controller connection	Permanently connected cable		
Number of connections	8		
Current load capacity	2 A		
Total current	6 A		
Housing material	PBT, GF		
Degree of protection as per IEC 60529	IP 67 (when screwed into place)		
Ambient temperature T_a	–5...+60 °C		
Use	PNP normally open (NO) ⎍-		
Recommended connector - port	BCC M414...		

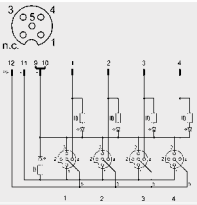
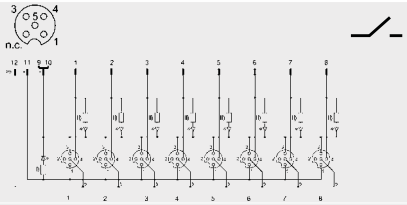
Cable material	Color	Length	Ordering code		
			Part number		
PUR	Black	3 m	**BPI0059**		
			BPI 8M4A4P-2K-00-KPXB0-030		
PUR	Black	5 m	**BPI005A**		
			BPI 8M4A4P-2K-00-KPXB0-050		
PUR	Black	10 m	**BPI005C**		
			BPI 8M4A4P-2K-00-KPXB0-100		
PUR	Black	15 m	**BPI005E**		
			BPI 8M4A4P-2K-00-KPXB0-150		



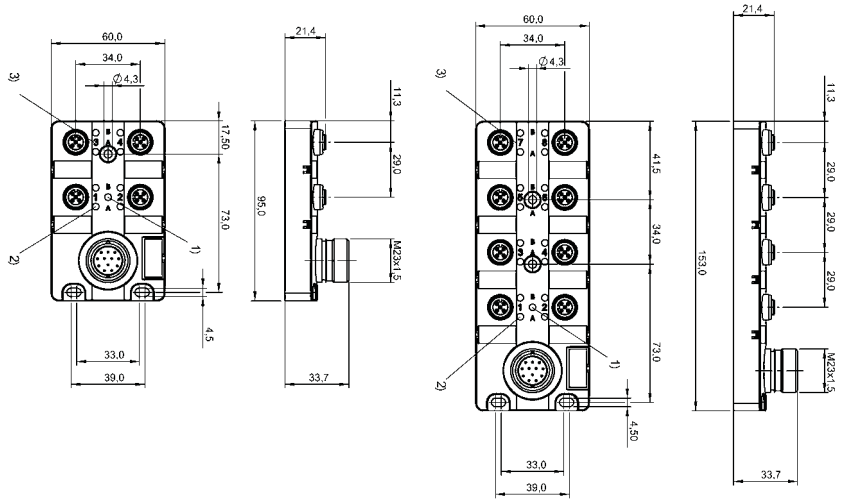
Passive Splitters
M12, 5-pin with cable, LED

		
	4-way	8-way
	24 V DC	24 V DC
	10...30 V DC	10...30 V DC
	Yes	Yes
	Green LED	Green LED
	5-pin female, M12×1	5-pin female, M12×1
	Permanently connected cable	Permanently connected cable
	4	8
	2 A	2 A
	6 A	6 A
	PBT, GF	PBT, GF
	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–5...+60 °C	–5...+60 °C
	PNP normally open/normally closed (NO/NC) ⎍ / ⎍	PNP normally open/normally closed (NO/NC) ⎍ / ⎍
	BCC M415...	BCC M415...
Ordering code		
Part number		
BPI0049	**BPI004R**	
BPI 4M4A5P-2K-00-KPXB0-030	BPI 8M4A5P-2K-00-KPXL0-030	
BPI004A	**BPI004T**	
BPI 4M4A5P-2K-00-KPXB0-050	BPI 8M4A5P-2K-00-KPXL0-050	
BPI004C	**BPI004U**	
BPI 4M4A5P-2K-00-KPXB0-100	BPI 8M4A5P-2K-00-KPXL0-100	
BPI004E	**BPI004W**	
BPI 4M4A5P-2K-00-KPXB0-150	BPI 8M4A5P-2K-00-KPXL0-150	

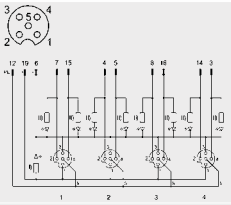


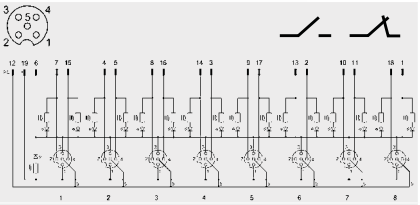
View of female/ Plug side		
Version	4-way	8-way
Rated power supply U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Function indicator	Yes	Yes
Power-on indicator	Green LED	Green LED
Sensor connection	4-pin female, M12×1	4-pin female, M12×1
Controller connection	M23 connector	M23 connector
Number of connections	4	8
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Degree of protection as per IEC 60529	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Ambient temperature T_a	–5...+60 °C	–5...+60 °C
Use	PNP normally open (NO) ⎍-	PNP normally open (NO) ⎍-
Recommended connector - port	BCCM414	BCCM414
M23 recommended connectors	M23 12-pin BCC M61C..., page 202	M23 12-pin BCC M61C..., page 202

	Ordering code	
	Part number	
	BPI004Y	**BPI0050**
	BPI 4M4A4P-2K-00-SM6CT	BPI 8M4A4P-2K-00-SM6CT



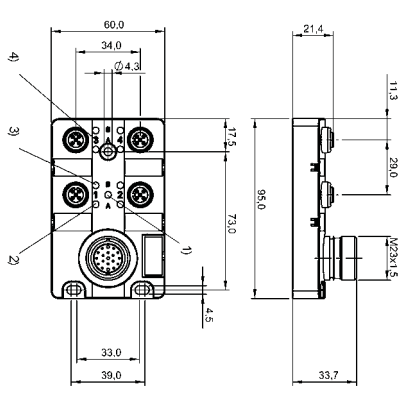
Passive Splitters
M12, 5-pin
with M23 plug connection, LED

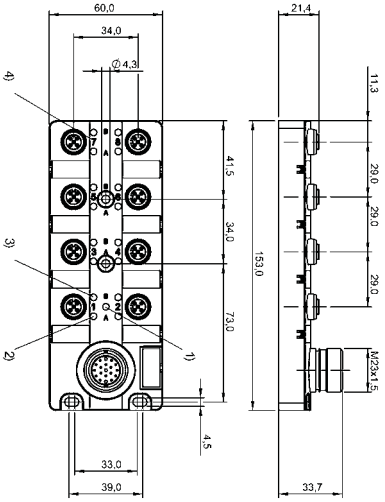




4-way	8-way
24 V DC	24 V DC
10...30 V DC	10...30 V DC
Yes	Yes
Green LED	Green LED
5-pin female, M12×1	5-pin female, M12×1
M23 connector	M23 connector
4	8
2 A	2 A
6 A	6 A
PBT, GF	PBT, GF
IP 67 (when screwed into place)	IP 67 (when screwed into place)
–5...+60 °C	–5...+60 °C
PNP normally open/normally closed (NO/NC)	PNP normally open/normally closed (NO/NC)
BCCM415	BCCM415
M23 19-pin BCC M61L..., page 203	M23 19-pin BCC M61L..., page 203

Ordering code	
Part number	
BPI004Z	**BPI0051**
BPI 4M4A5P-2K-00-SM6LT	BPI 8M4A5P-2K-00-SM6LT



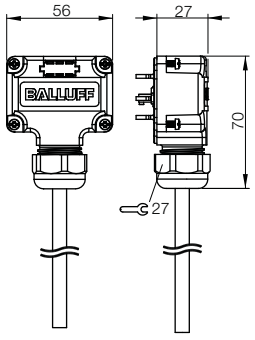


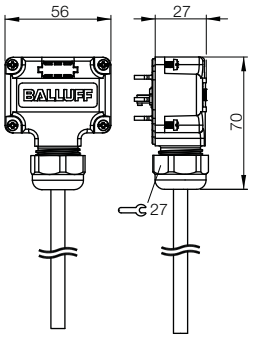
Passive Splitters
M12, 4-pin, with cap and cable

Passive splitters
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. A fully enclosed housing provides a higher enclosure rating 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 and the mounting bore 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.

Version	4-way, cap with cable	8-way, cap with cable
Rated power supply U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Function indicator		
Power-on indicator		
Sensor connection		
Controller connection	Cap connection with cable	Cap connection with cable
Number of connections		
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Degree of protection as per IEC 60529		
Ambient temperature T_a	–25...+80 °C	–25...+80 °C
Use	for base	for base
Recommended connector - port		

Cable material	Color	Length	Ordering code Part number	
PUR	Black	3 m	**BPI007Z** BPI T009-K-00-KPX70-030	**BPI0083** BPI T00E-K-00-KPXB0-030
PUR	Black	5 m	**BPI0080** BPI T009-K-00-KPX70-050	**BPI0084** BPI T00E-K-00-KPXB0-050
PUR	Black	10 m	**BPI0081** BPI T009-K-00-KPX70-100	**BPI0085** BPI T00E-K-00-KPXB0-100
PUR	Black	15 m	**BPI0082** BPI T009-K-00-KPX70-150	**BPI0086** BPI T00E-K-00-KPXB0-150

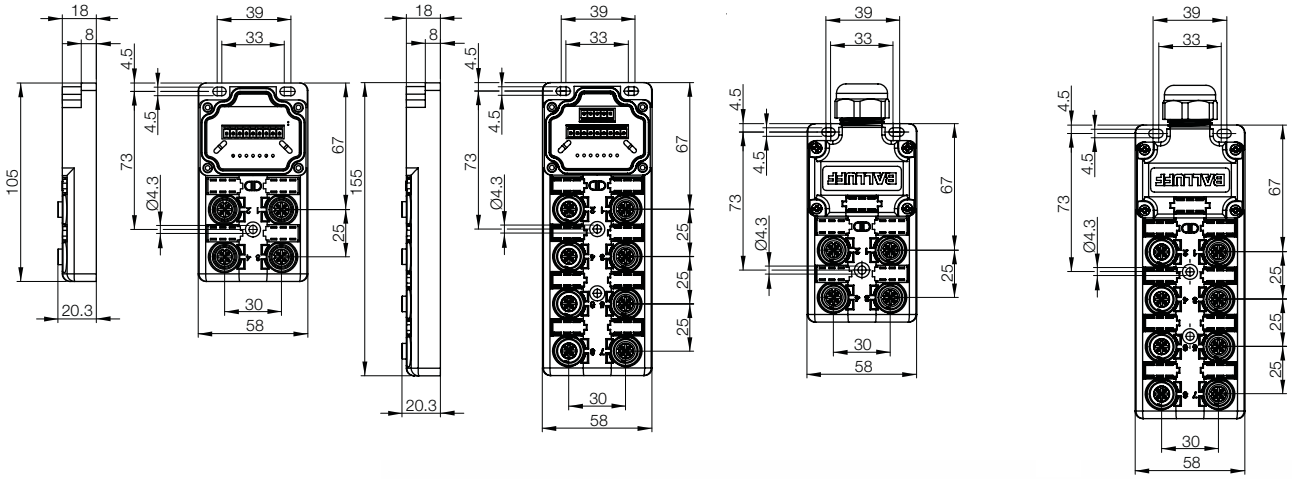




Passive Splitters
M12, 4-pin, with cap and cable, LED




	4-way, base with LEDs	8-way, base with LEDs	4-way, M12 with LEDs	8-way, M12 with LEDs
	24 V DC	24 V DC	24 V DC	24 V DC
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	Yes	Yes	Yes	Yes
	Green LED	Green LED	Green LED	Green LED
	4-pin female, M12×1	4-pin female, M12×1	4-pin female, M12×1	4-pin female, M12×1
	Cap connection with/without cable	Cap connection with/without cable	Cap connection without cable	Cap connection without cable
	4	8	4	8
	2 A	2 A	2 A	2 A
	6 A	6 A	6 A	6 A
	PBT, GF, fully potted	PBT, GF, fully potted	PBT, GF, fully potted	PBT, GF, fully potted
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
	PNP normally open (NO) –/-	PNP normally open (NO) –/-	PNP normally open (NO) –/-	PNP normally open (NO) –/-
	BCC M414...	BCC M414...	BCC M414...	BCC M414...
Ordering code				
Part number				
	BPI007A	**BPI007E**	**BPI007L**	**BPI007J**
	BPI 4M4A4P-2K-00-TP09	BPI 8M4A4P-2K-00-TP0E	BPI 4M4A4P-2K-00-TPS9	BPI 8M4A4P-2K-00-TPSE

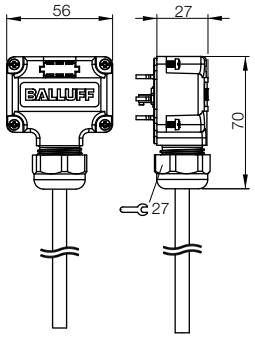


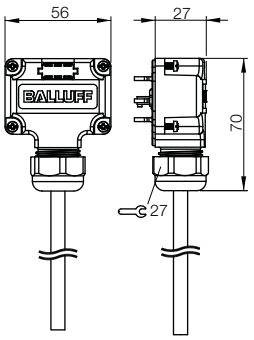
Areas of application
Passive splitter boxes are ideal for use in decentralized assembly and handling machine installations, packaging technology or special purpose machine manufacturing.

Balluff Passive Interface BPI – A multi-talent, 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

Version	4-way, cap with cable	8-way, cap with cable
Rated power supply U_e	24 V DC	24 V DC
Supply voltage U_B	10...30 V DC	10...30 V DC
Function indicator		
Power-on indicator		
Sensor connection		
Controller connection	Cap connection with cable	Cap connection with cable
Number of connections		
Current load capacity	2 A	2 A
Total current	6 A	6 A
Housing material	PBT, GF	PBT, GF
Degree of protection as per IEC 60529		
Ambient temperature T_a	–25...+80 °C	–25...+80 °C
Use	for base	for base
Recommended connector - port		

Cable material	Color	Length	Ordering code Part number	
PUR	Black	3 m	**BPI007M** BPI T00G-K-00-KPXB0-030	**BPI007T** BPI T00N-K-00-KPXL0-030
PUR	Black	5 m	**BPI007N** BPI T00G-K-00-KPXB0-050	**BPI007U** BPI T00N-K-00-KPXL0-050
PUR	Black	10 m	**BPI007P** BPI T00G-K-00-KPXB0-100	**BPI007W** BPI T00N-K-00-KPXL0-100
PUR	Black	15 m	**BPI007R** BPI T00G-K-00-KPXB0-150	**BPI007Y** BPI T00N-K-00-KPXL0-150

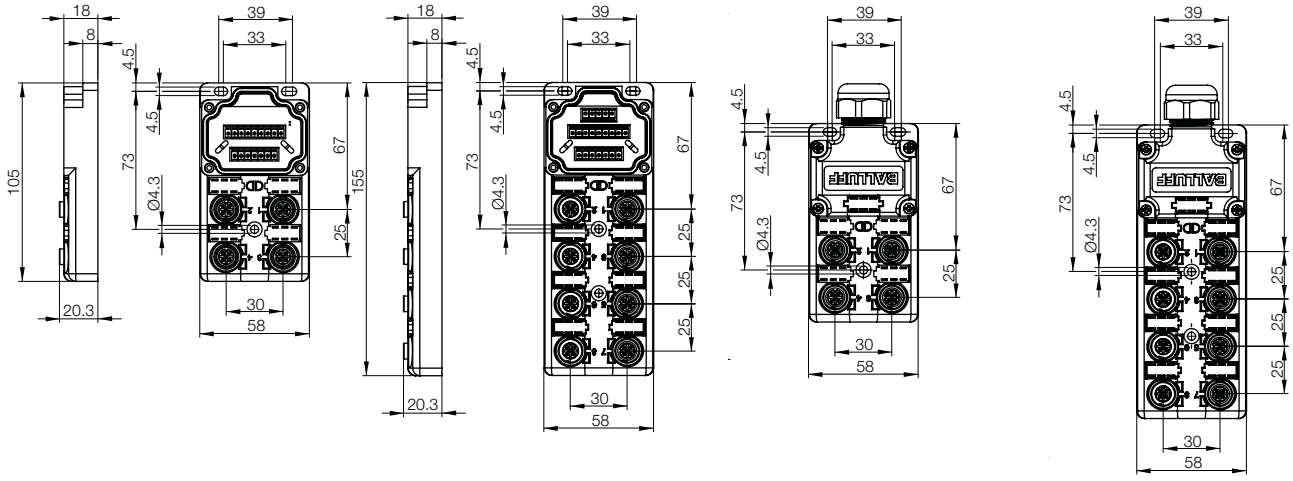




Passive Splitters
M12, 5-pin, with cap and cable, LED




	4-way, base with LEDs	8-way, base with LEDs	4-way, M12 with LEDs	8-way, M12 with LEDs
	24 V DC	24 V DC	24 V DC	24 V DC
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	Yes	Yes	Yes	Yes
	Green LED	Green LED	Green LED	Green LED
	5-pin female, M12×1	5-pin female, M12×1	5-pin female, M12×1	5-pin female, M12×1
	Cap connection with/without cable	Cap connection with/without cable	Cap connection without cable	Cap connection without cable
	4	8	4	8
	2 A	2 A	2 A	2 A
	6 A	6 A	6 A	6 A
	PBT, GF, fully potted	PBT, GF, fully potted	PBT, GF, fully potted	PBT, GF, fully potted
	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
	–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
	PNP normally open/normally closed (NO/NC) ⎍ / ⎍	PNP normally open/normally closed (NO/NC) ⎍ / ⎍	PNP normally open/normally closed (NO/NC) ⎍ / ⎍	PNP normally open/normally closed (NO/NC) ⎍ / ⎍
	BCC M415...	BCC M415...	BCC M415...	BCC M415...
Ordering code				
Part number				
	BPI007C	**BPI007F**	**BPI007K**	**BPI007H**
	BPI 4M4A5P-2K-00-TP0G	BPI 8M4A5P-2K-00-TP0N	BPI 4M4A5P-2K-00-TPSG	BPI 8M4A5P-2K-00-TPSN

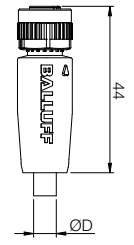


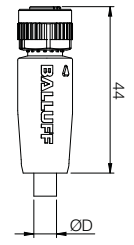
Passive Splitters

M12 female straight connector, 8-pin
M12 female straight connector, 12-pin

Connector diagram and wiring		
Max. supply voltage AC U_B	60 V DC	60 V DC
Max. supply voltage DC U_B	60 V DC	60 V DC
Cable	Molded	Molded
Number of conductors × conductor cross-section	8×0.25 mm²	12×0.25 mm²
Degree of protection as 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	BPI, M8, 3-pin, 4-way	BPI, M8, 3-pin, 4-way

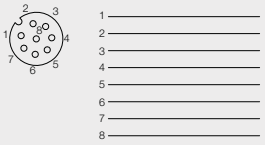
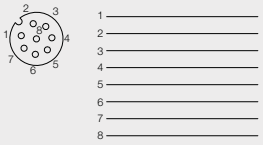
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC06K1**	**BCC06UK**
			BCC M418-0000-1A-044-PX0825-020	BCC M41C-0000-1A-049-PX0C25-020
PUR	Black	5 m	**BCC06K2**	**BCC06UL**
			BCC M418-0000-1A-044-PX0825-050	BCC M41C-0000-1A-049-PX0C25-050
PUR	Black	10 m	**BCC06K3**	**BCC06UM**
			BCC M418-0000-1A-044-PX0825-100	BCC M41C-0000-1A-049-PX0C25-100
PVC	Gray	2 m		**BCC06UP**
				BCC M41C-0000-1A-049-VX8C25-020
PVC	Gray	5 m		**BCC06UR**
				BCC M41C-0000-1A-049-VX8C25-050
PVC	Gray	10 m		**BCC06UT**
				BCC M41C-0000-1A-049-VX8C25-100



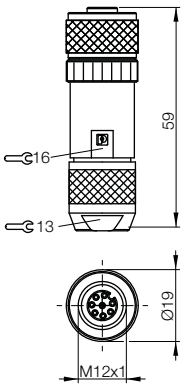


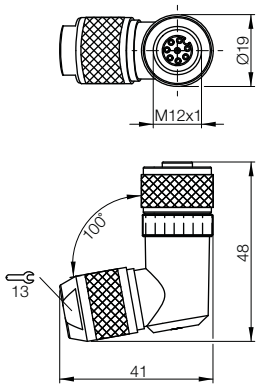
Passive Splitters

M12 female straight and right-angle connector, 8-pin, customized assembly

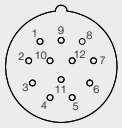
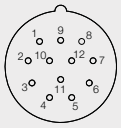
View of female/ Plug side		
Version	Female straight	Female right-angle
Max. supply voltage AC U_B	30 V AC	30 V AC
Max. supply voltage DC U_B	30 V DC	30 V DC
Cable diameter	4...8 mm	4...8 mm
Cable	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	8×0.14...0.25 mm²	8×0.14...0.25 mm²
Housing material	CuZn	CuZn
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85° C	–25...+85° C
Use	BPI, M8, 3-pin, 8-way, BIC	BPI, M8, 3-pin, 8-way, BIC

	Ordering code	
	Part number	
	BCC04MC	**BCC04ME**
	BCC M478-0000-1A-000-43X834-000	BCC M488-0000-1A-000-43X834-000

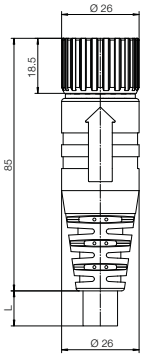


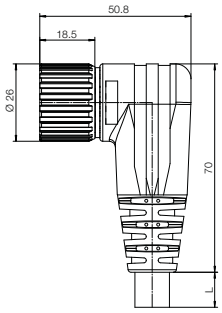


M23 female connector, straight or right-angle, 12-pin

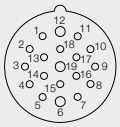
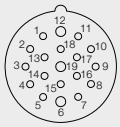
View of female/ Plug side			
Rated power supply U_e	240 V DC	240 V DC	
Supply voltage U_B	18...30 V DC	18...30 V DC	
Cable	Permanently molded PUR	Permanently molded PUR	
Number of conductors × conductor cross-section	8×0.50 mm² and 3×1.0 mm²	8×0.50 mm² and 3×1.0 mm²	
Housing material	TPU	TPU	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	–25...+80° C	–25...+80° C	
Use	BPI, M12, 4-pin, 4/8-way	BPI, M12, 4-pin, 4/8-way	

Cable material	Color	Length	Ordering code		
			Part number		
PUR	Black	2 m	**BCC06KN**	**BCC06KT**	
			BCC M61C-0000-10-065-PX0BP4-020	BCC M62C-0000-10-065-PX0BP4-020	
PUR	Black	5 m	**BCC06KP**	**BCC06KU**	
			BCC M61C-0000-10-065-PX0BP4-050	BCC M62C-0000-10-065-PX0BP4-050	
PUR	Black	10 m	**BCC06KR**	**BCC06KW**	
			BCC M61C-0000-10-065-PX0BP4-100	BCC M62C-0000-10-065-PX0BP4-100	

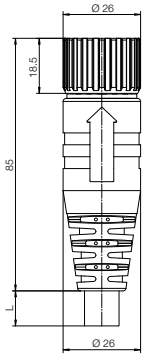


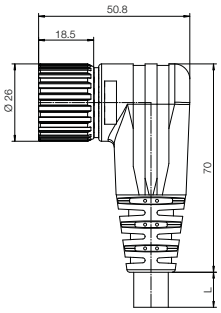


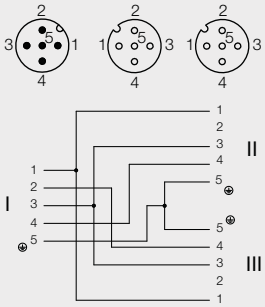
M23 female connector, straight or right-angle, 19-pin

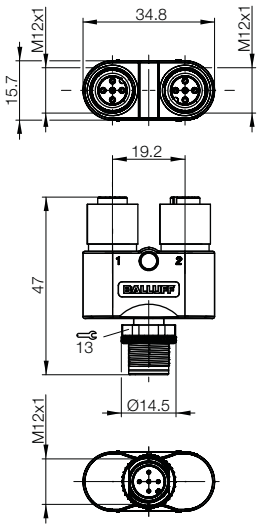
		
	120 V DC	120 V DC
	18...30 V DC	18...30 V DC
	Permanently molded PUR	Permanently molded PUR
	16×0.50 mm² and 3×1.0 mm²	16×0.50 mm² and 3×1.0 mm²
	TPU	TPU
	IP 67	IP 67
	–25...+80° C	–25...+80° C
	BPI, M12, 5-pin, 4/8-way	BPI, M12, 5-pin, 4/8-way

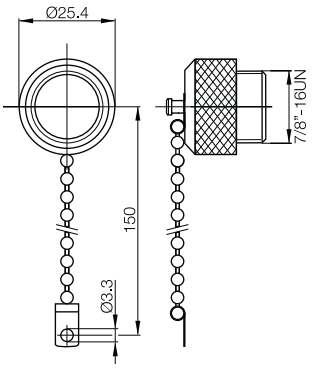
	Ordering code	
	Part number	
	BCC06KY	**BCC06L1**
	BCC M61L-0000-10-022-PX0LP4-020	BCC M62L-0000-10-022-PX0LP4-020
	BCC06KZ	**BCC06L2**
	BCC M61L-0000-10-022-PX0LP4-050	BCC M62L-0000-10-022-PX0LP4-050
	BCC06L0	**BCC06L3**
	BCC M61L-0000-10-022-PX0LP4-100	BCC M62L-0000-10-022-PX0LP4-100

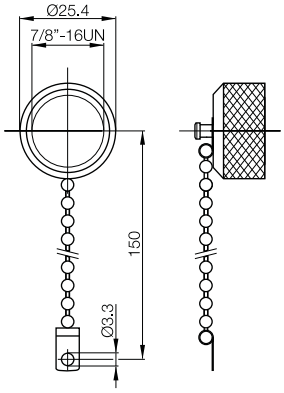




Connector diagram and wiring			
Description	T splitter	Screw plug 7/8"	Screw plug 7/8"
Use	2× M12 female to 1× M12 male	Cover for the power ports	Cover for the power ports
Ordering code	**BCC089P**	**BAM012T**	**BAM012U**
Part number	BCC M415-M415-M415-U0003-000	BKS-7/8-CS-00-A	BKS-7/8-CS-00-I
Supply voltage U_B	125 V		
Rated operating current I_e	4 A		
Degree of protection as per IEC 60529	IP 67		
Ambient temperature T_a	–25...+80 °C	–20...+80 °C	–20...+80 °C
Housing material	PA 6.6 + GF	Nickel-plated CuZn	Nickel-plated CuZn

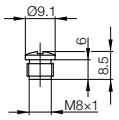


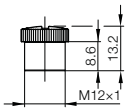






Description	M8 locking screw	M12 locking screw	Marking sleeve	
Use	IP 65 threaded cover for unused ports	IP 65 threaded cover for unused ports	For labeling connectors	
Ordering code	**BAM01C1**	**BAM01C2**		
Part number	BAM CS-XA-001-M8-C	BAM CS-XA-002-M12-A	BAM IA-CC-002-01	
Ambient temperature T_a	–20...+80 °C	–20...+80 °C		
Housing material	Plastic	Plastic		





Assembly wrench
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	Ordering code
	Part number
Assembly wrench for 12 and 19-pin M23 connectors	**BAM01TY**
	BAM TO-CC-002-M6

Refer to the chapter Connectors on for more accessories.

Connectors and Valve Connectors

Connectors and Valve Connectors

Connectors and Valve Connectors
Contents

Breakdown of the part number BCC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
				Head 1					**Head 2**																										
B	C	C		M	4	1	4	–	0	0	0	0	–	1	A	–	0	0	8	–	P	X	0	4	3	4	–	0	5	0				

Head 1

5th–8th digit

Head 1:
– Design
M = Metric
V = valve connector
– Size
.3 = M8
.4 = M12
– Type
..1 = Plastic molded, straight
..2 = Plastic molded, right-angle
..3 = Plastic fabricated, straight
..4 = Plastic fabricated, right-angle
– Number of visible holes or pins
...3 = 3
...4 = 4

10th–13th digit

Head 2:
– Design
0 = not assigned
– Size
0 = not assigned
– Type
0 = not assigned
– Number of visible holes or pins
0 = not assigned

15th–16th digit

Female/male
Coding
1 = female
2 = male
A = A-coded
B = B-coded
...

18th–20th digit

Wiring
001 = 3 wires without LED
004 = 3 wires with LED
...

22nd–27th digit

Cable
– Cable type
P = PUR
V = PVC
– Specification
.X = Standard
.W = Welding
.H = Higher temperatures
– Cable color
..0 = Black
..8 = Gray
– Number
...3 = 3-wire
...4 = 4-wire
...5 = 5-wire
– Cross-section
....34 = 0.34 mm²
....50 = 0.50 mm²
....A1 = 1.50 mm²

29th–32nd digit

Cable length
020 = 2 m
100 = 10 m

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
				Head 1					**Head 2**																										
B	C	C		M	4	2	4	–	M	4	1	3	–	3	A	–	3	0	0	–	P	X	0	4	3	4	–	0	2	0				

Head 1 + Head 2

5th–8th digit

Head 1:
– Design
M = Metric
V = valve connector
– Size
.3 = M8
.4 = M12
– Type
..1 = Plastic molded, straight
..2 = Plastic molded, right-angle
..3 = Plastic fabricated, straight
..4 = Plastic fabricated, right-angle
– Number of visible holes or pins
...3 = 3
...4 = 4

10th–13th digit

Head 2:
– Design
M = Metric
V = valve connector
– Size
.3 = M8
.4 = M12
– Type
..1 = Plastic molded, straight
..2 = Plastic molded, right-angle
..3 = Plastic fabricated, straight
..4 = Plastic fabricated, right-angle
– Number of visible holes or pins
...3 = 3
...4 = 4

15th–16th digit

Female/male
Coding
3 = female/male
A = A-coded
B = B-coded
0 = without coding

18th–20th digit

Wiring
300 = 3 wires without LED
600 = 3 wires with LED
304 = 4 wires without LED

22nd–27th digit

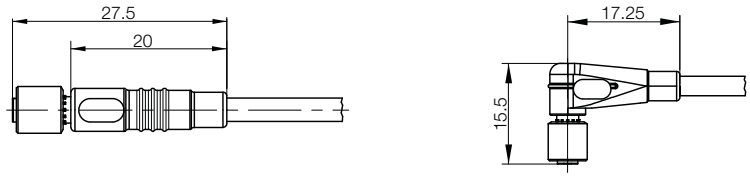
Cable
– Cable type
P = PUR
V = PVC
– Specification
.X = Standard
.W = Welding
.H = Higher temperatures
– Cable color
..0 = Black
..8 = Gray
– Number
...3 = 3-wire
...4 = 4-wire
...5 = 5-wire
– Cross-section
....34 = 0.34 mm²
....50 = 0.50 mm²
....A1 = 1.50 mm²

29th–32nd digit

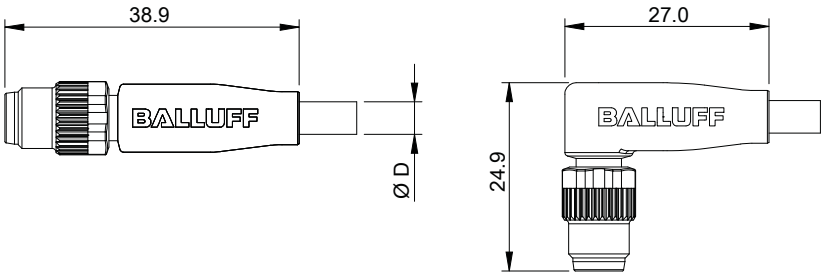
Cable length
006 = 60 cm
020 = 2 m

All order numbers illustrated are only examples and may vary from those of other BCC connectors.

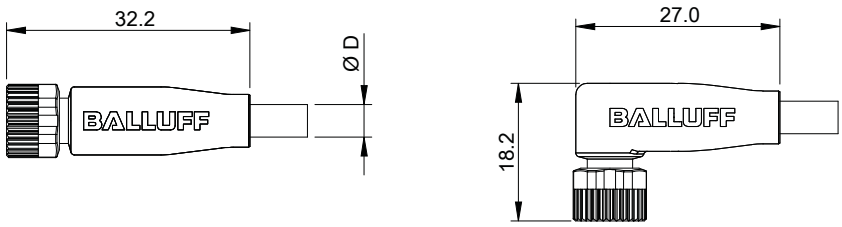
M5 connectors, female straight and right-angle



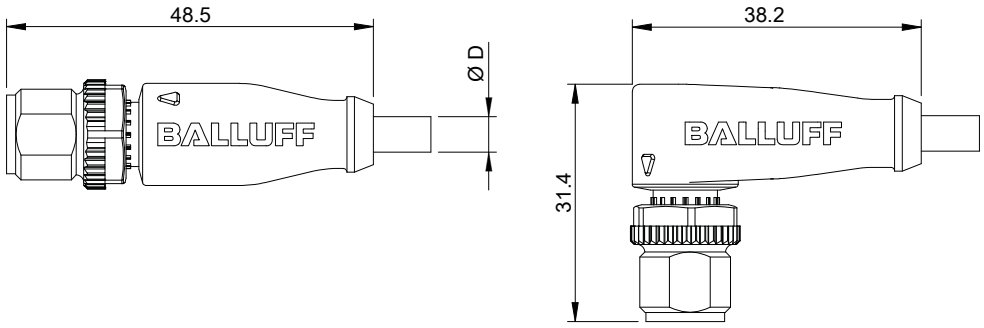
M8 connectors, male straight and right-angle



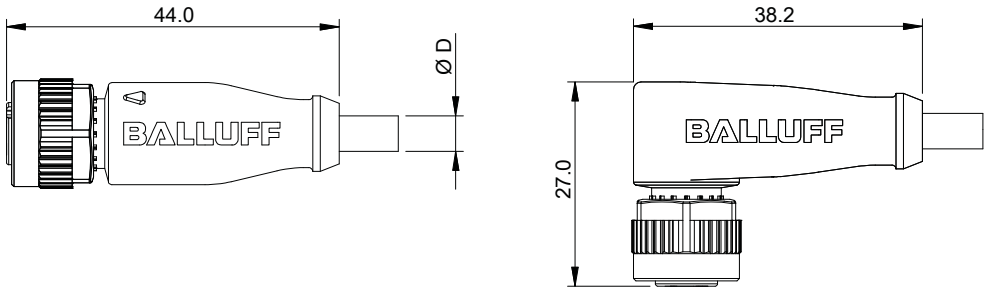
M8 connectors, female straight and right-angle



M12 connectors, male straight and right-angle



M12 connectors, female straight and right-angle



Connectors and Valve Connectors

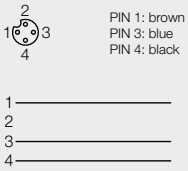
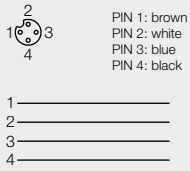
Connectors and Cables

Contents

Faster, simpler connection
Clearly visible markings on the grip for easy alignment. The special BCC tool allows you to screw on the connector or set the tightening torque via the hex.

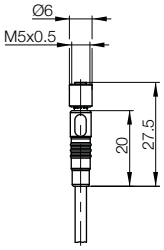
Highly visible LEDs
The LEDs are clearly visible from various directions, even under difficult lighting conditions.

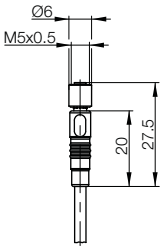
M5 female straight, 3 and 4-pin, no LED

Connector diagram and wiring				
Max. supply voltage AC U_B			30 V AC	30 V AC
Max. supply voltage DC U_B			30 V DC	30 V DC
Cable			Molded	Molded
Number of conductors × conductor cross-section			3×0.14 mm²	4×0.14 mm²
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a	Static	PUR	–25...+80 °C	–25...+80 °C
	Tensioned	PUR	–5...+80 °C	–5...+80 °C
Use			Normally open (NO)	Complementary (NO/NC)

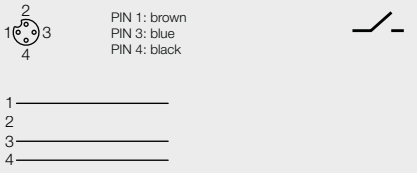
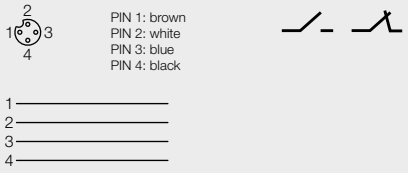
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	3 m	**BCC00HE**	**BCC00HK**
			BKS-B 25-1-PU-03	BKS-B 25-3-PU-03
PUR	Black	5 m		**BCC00HL**
				BKS-B 25-3-PU-05

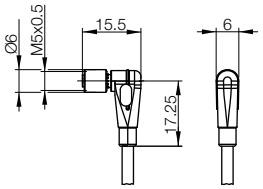
Other cable materials, colors, and lengths on request.

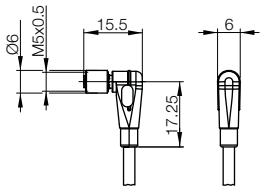




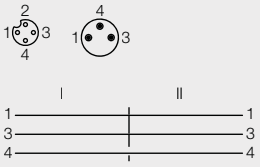
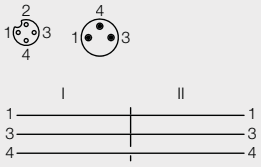
M5 female right-angle, 3 and 4-pin, without LED

		
30 V AC	30 V AC	
30 V DC	30 V DC	
Molded	Molded	
4×0.14 mm²	4×0.14 mm²	
IP 67	IP 67	
–25...+80 °C	–25...+80 °C	
–5...+80 °C	–5...+80 °C	
Normally open (NO)	Complementary (NO/NC)	
Ordering code		
Part number		
BCC00HM	**BCC00HP**	
BKS-B 26-1-PU-03	BKS-B 26-3-PU-03	
	BCC00HR	
	BKS-B 26-3-PU-05	



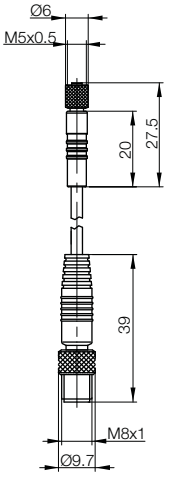


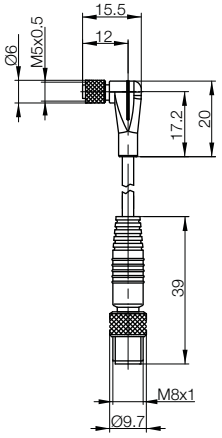
M5 female straight or right-angle ↔ M8 male straight, 3-pin, no LED

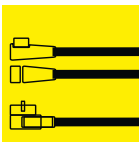
Connector diagram and wiring				
Max. supply voltage AC U_B			60 V AC	60 V AC
Max. supply voltage DC U_B			60 V DC	60 V DC
Cable			Molded	Molded
Number of conductors × conductor cross-section			3×0.14 mm²	3×0.14 mm²
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a	Static	PUR	–25...+80 °C	–25...+80 °C
	Tensioned	PUR	–5...+80 °C	–5...+80 °C
Use			Normally open (NO) ⎍	Normally open (NO) ⎍

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m	**BCC00HF**	
			BKS-B 25-1/GS49-PU-00,3	
PUR	Black	0.6 m	**BCC00HH**	
			BKS-B 25-1/GS49-PU-00,6	
PUR	Black	1 m	**BCC00HJ**	**BCC00HN**
			BKS-B 25-1/GS49-PU-01	BKS-B 26-1/GS49-PU-01

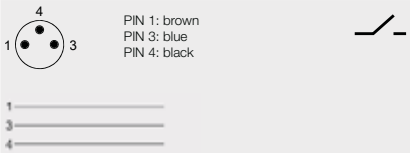
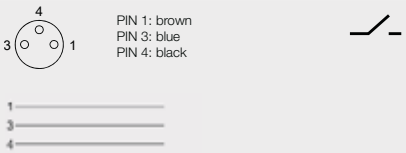
Other cable materials, colors, and lengths on request.





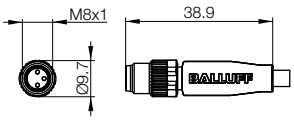


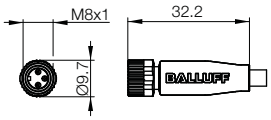
M8 male straight, M8 female straight, 3-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		60 V AC	60 V AC
Max. supply voltage DC U_B		60 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as 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)
LED			

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC02M2**	**BCC02M8**
			BCC M313-0000-20-001-PX0334-020	BCC M313-0000-10-001-PX0334-020
PUR	Black	5 m	**BCC02M3**	**BCC02M9**
			BCC M313-0000-20-001-PX0334-050	BCC M313-0000-10-001-PX0334-050
PUR	Black	10 m	**BCC02M4**	**BCC02MA**
			BCC M313-0000-20-001-PX0334-100	BCC M313-0000-10-001-PX0334-100
PVC	Gray	2 m	**BCC02NL**	**BCC02NU**
			BCC M313-0000-20-001-VX8334-020	BCC M313-0000-10-001-VX8334-020
PVC	Gray	5 m	**BCC02NM**	**BCC02NW**
			BCC M313-0000-20-001-VX8334-050	BCC M313-0000-10-001-VX8334-050
PVC	Gray	10 m	**BCC02NN**	**BCC02NY**
			BCC M313-0000-20-001-VX8334-100	BCC M313-0000-10-001-VX8334-100

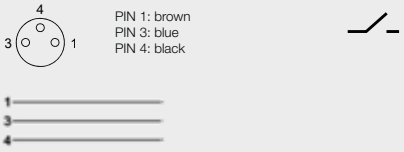
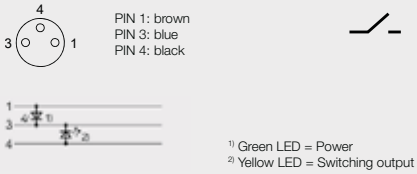
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.



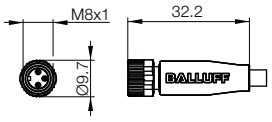


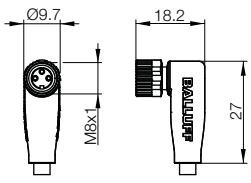
Connectors

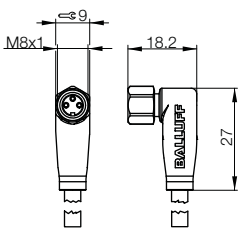
M8 female straight or right-angle, 3-pin, with and without LED

			
		60 V AC	
	30 V DC	60 V DC	30 V DC
	Molded	Molded	Molded
	3×0.34 mm²	3×0.34 mm²	3×0.34 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)
	Green/yellow		Green/yellow

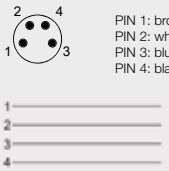
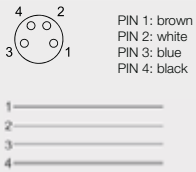
Ordering code		
Part number		
BCC0AW9	**BCC02ML**	**BCC02MH**
BCC M313-0000-10-004-PX0334-020	BCC M323-0000-10-001-PX0334-020	BCC M323-0000-10-004-PX0334-020
BCC0AWA	**BCC02MM**	**BCC02MJ**
BCC M313-0000-10-004-PX0334-050	BCC M323-0000-10-001-PX0334-050	BCC M323-0000-10-004-PX0334-050
BCC0AWC	**BCC02MN**	**BCC02MK**
BCC M313-0000-10-004-PX0334-100	BCC M323-0000-10-001-PX0334-100	BCC M323-0000-10-004-PX0334-100
BCC0C06	**BCC02P5**	**BCC02P2**
BCC M313-0000-10-004-VX8334-020	BCC M323-0000-10-001-VX8334-020	BCC M323-0000-10-004-VX8334-020
BCC0AY0	**BCC02P6**	**BCC02P3**
BCC M313-0000-10-004-VX8334-050	BCC M323-0000-10-001-VX8334-050	BCC M323-0000-10-004-VX8334-050
BCC0C07	**BCC02P7**	**BCC02P4**
BCC M313-0000-10-004-VX8334-100	BCC M323-0000-10-001-VX8334-100	BCC M323-0000-10-004-VX8334-100





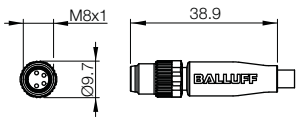


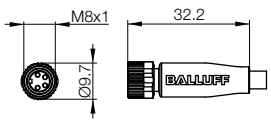
M8 male straight, M8 female straight, 4-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		30 V AC	30 V AC
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	4×0.34 mm²
Degree of protection as 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)
LED			

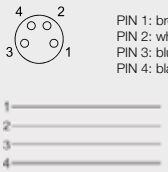
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC02MU**	**BCC02N2**
			BCC M314-0000-20-003-PX0434-020	BCC M314-0000-10-003-PX0434-020
PUR	Black	5 m	**BCC02MW**	**BCC02N3**
			BCC M314-0000-20-003-PX0434-050	BCC M314-0000-10-003-PX0434-050
PUR	Black	10 m	**BCC02MY**	**BCC02N4**
			BCC M314-0000-20-003-PX0434-100	BCC M314-0000-10-003-PX0434-100
PVC	Gray	2 m	**BCC02PC**	**BCC02PL**
			BCC M314-0000-20-003-VX8434-020	BCC M314-0000-10-003-VX8434-020
PVC	Gray	5 m	**BCC02PE**	**BCC02PM**
			BCC M314-0000-20-003-VX8434-050	BCC M314-0000-10-003-VX8434-050
PVC	Gray	10 m	**BCC02PF**	**BCC02PN**
			BCC M314-0000-20-003-VX8434-100	BCC M314-0000-10-003-VX8434-100

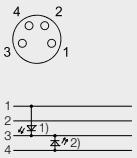
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.





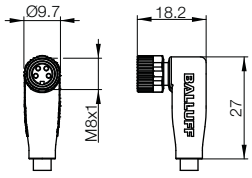
M8 female right-angle, 4-pin, without and with LED

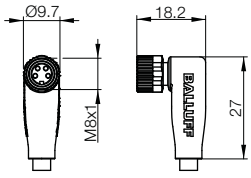


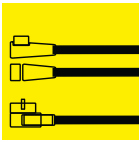


30 V AC		
30 V DC	30 V DC	
Molded	Molded	
4×0.34 mm²	4×0.34 mm²	
IP 67	IP 67	
–25...+90 °C/–25...+90 °C (UL 80 °C)	–25...+90 °C/–25...+90 °C (UL 80 °C)	
–25...+105 °C/–5...+90 °C (UL 80 °C)	–25...+105 °C/–5...+90 °C (UL 80 °C)	
	Green/yellow	

Ordering code		
Part number		
BCC02NC	**BCC02N8**	
BCC M324-0000-10-003-PX0434-020	BCC M324-0000-10-008-PX0434-020	
BCC02NE	**BCC02N9**	
BCC M324-0000-10-003-PX0434-050	BCC M324-0000-10-008-PX0434-050	
BCC02NF	**BCC02NA**	
BCC M324-0000-10-003-PX0434-100	BCC M324-0000-10-008-PX0434-100	
BCC02PZ	**BCC02PU**	
BCC M324-0000-10-003-VX8434-020	BCC M324-0000-10-008-VX8434-020	
BCC02R0	**BCC02PW**	
BCC M324-0000-10-003-VX8434-050	BCC M324-0000-10-008-VX8434-050	
BCC02R1	**BCC02PY**	
BCC M324-0000-10-003-VX8434-100	BCC M324-0000-10-008-VX8434-100	

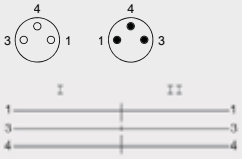
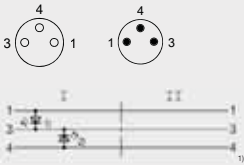






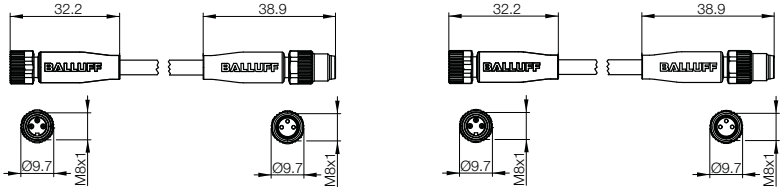
Connection cable

M8 female straight ↔ M8 male straight or right-angle, 3-pin, with and without LED

Connector diagram and wiring				 [1] Green LED = Power [2] Yellow LED = Switching output
Max. supply voltage AC U_B			60 V AC	
Max. supply voltage DC U_B			60 V DC	30 V DC
Cable			Molded	Molded
Number of conductors × conductor cross-section			3×0.34 mm²	3×0.34 mm²
Degree of protection as per IEC 60529			IP 67	IP 67
Ambient temperature T_a	Static	PUR	–25...+90 °C/–25...+90 °C (UL 80 °C)	–25...+90 °C/–25...+90 °C (UL 80 °C)
	Tensioned	PUR	–25...+105 °C/–5...+105 °C (UL 80 °C)	–25...+105 °C/–5...+105 °C (UL 80 °C)
LED				Green/yellow

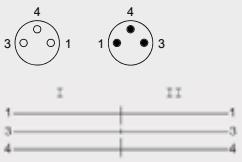
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m	**BCC02R5**	**BCC0AZA**
			BCC M313-M313-30-300-PX0334-003	BCC M313-M313-30-602-PX0334-003
PUR	Black	0.6 m	**BCC02R6**	**BCC0AZC**
			BCC M313-M313-30-300-PX0334-006	BCC M313-M313-30-602-PX0334-006
PUR	Black	1 m	**BCC02R7**	**BCC0AZE**
			BCC M313-M313-30-300-PX0334-010	BCC M313-M313-30-602-PX0334-010
PUR	Black	1.5 m	**BCC02R8**	**BCC0AZF**
			BCC M313-M313-30-300-PX0334-015	BCC M313-M313-30-602-PX0334-015
PUR	Black	2 m	**BCC02R9**	**BCC0AZH**
			BCC M313-M313-30-300-PX0334-020	BCC M313-M313-30-602-PX0334-020
PUR	Black	3 m	**BCC02RA**	**BCC0AZJ**
			BCC M313-M313-30-300-PX0334-030	BCC M313-M313-30-602-PX0334-030
PUR	Black	5 m	**BCC02RC**	**BCC0AZK**
			BCC M313-M313-30-300-PX0334-050	BCC M313-M313-30-602-PX0334-050
PVC	Gray	0.3 m	**BCC02UR**	
			BCC M313-M313-30-300-VX8334-003	
PVC	Gray	0.6 m	**BCC02UT**	
			BCC M313-M313-30-300-VX8334-006	
PVC	Gray	1 m	**BCC02UU**	
			BCC M313-M313-30-300-VX8334-010	
PVC	Gray	1.5 m	**BCC02UW**	
			BCC M313-M313-30-300-VX8334-015	
PVC	Gray	2 m	**BCC02UY**	
			BCC M313-M313-30-300-VX8334-020	
PVC	Gray	3 m	**BCC02UZ**	
			BCC M313-M313-30-300-VX8334-030	
PVC	Gray	5 m	**BCC02W0**	
			BCC M313-M313-30-300-VX8334-050	

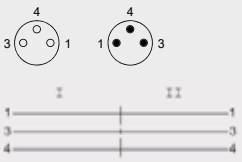
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

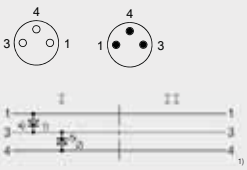


Connection Cables

M8 female straight or right-angle ↔ M8 male straight or right-angle, 3-pin, with and without LED

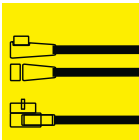


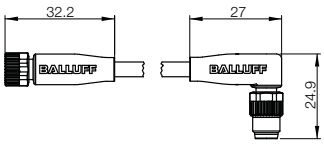


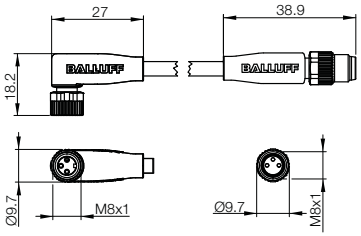


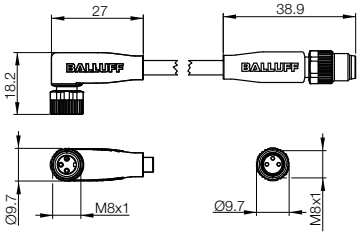
[1] Green LED = Power
[2] Yellow LED = Switching output

	60 V AC	60 V AC	
	60 V DC	60 V DC	30 V DC
	Molded	Molded	Molded
	3×0.34 mm²	3×0.34 mm²	3×0.34 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...+105 °C (UL 80 °C)	–25...+105 °C/–5...+105 °C (UL 80 °C)	–25...+105 °C/–5...+105 °C (UL 80 °C)
			Green/yellow
Ordering code			
Part number			
BCC02RE	**BCC02RZ**	**BCC02RN**	
BCC M313-M323-30-300-PX0334-003	BCC M323-M313-30-300-PX0334-003	BCC M323-M313-30-602-PX0334-003	
BCC02RF	**BCC02T0**	**BCC02RP**	
BCC M313-M323-30-300-PX0334-006	BCC M323-M313-30-300-PX0334-006	BCC M323-M313-30-602-PX0334-006	
BCC02RH	**BCC02T1**	**BCC02RR**	
BCC M313-M323-30-300-PX0334-010	BCC M323-M313-30-300-PX0334-010	BCC M323-M313-30-602-PX0334-010	
BCC02RJ	**BCC02T2**	**BCC02RT**	
BCC M313-M323-30-300-PX0334-015	BCC M323-M313-30-300-PX0334-015	BCC M323-M313-30-602-PX0334-015	
BCC02RK	**BCC02T3**	**BCC02RU**	
BCC M313-M323-30-300-PX0334-020	BCC M323-M313-30-300-PX0334-020	BCC M323-M313-30-602-PX0334-020	
BCC02RL	**BCC02T4**	**BCC02RW**	
BCC M313-M323-30-300-PX0334-030	BCC M323-M313-30-300-PX0334-030	BCC M323-M313-30-602-PX0334-030	
BCC02RM	**BCC02T5**	**BCC02RY**	
BCC M313-M323-30-300-PX0334-050	BCC M323-M313-30-300-PX0334-050	BCC M323-M313-30-602-PX0334-050	
BCC02W1	**BCC02WJ**	**BCC02W8**	
BCC M313-M323-30-300-VX8334-003	BCC M323-M313-30-300-VX8334-003	BCC M323-M313-30-602-VX8334-003	
BCC02W2	**BCC02WK**	**BCC02W9**	
BCC M313-M323-30-300-VX8334-006	BCC M323-M313-30-300-VX8334-006	BCC M323-M313-30-602-VX8334-006	
BCC02W3	**BCC02WL**	**BCC02WA**	
BCC M313-M323-30-300-VX8334-010	BCC M323-M313-30-300-VX8334-010	BCC M323-M313-30-602-VX8334-010	
BCC02W4	**BCC02WM**	**BCC02WC**	
BCC M313-M323-30-300-VX8334-015	BCC M323-M313-30-300-VX8334-015	BCC M323-M313-30-602-VX8334-015	
BCC02W5	**BCC02WN**	**BCC02WE**	
BCC M313-M323-30-300-VX8334-020	BCC M323-M313-30-300-VX8334-020	BCC M323-M313-30-602-VX8334-020	
BCC02W6	**BCC02WP**	**BCC02WF**	
BCC M313-M323-30-300-VX8334-030	BCC M323-M313-30-300-VX8334-030	BCC M323-M313-30-602-VX8334-030	
BCC02W7	**BCC02WR**	**BCC02WH**	
BCC M313-M323-30-300-VX8334-050	BCC M323-M313-30-300-VX8334-050	BCC M323-M313-30-602-VX8334-050	



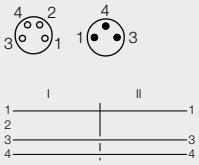






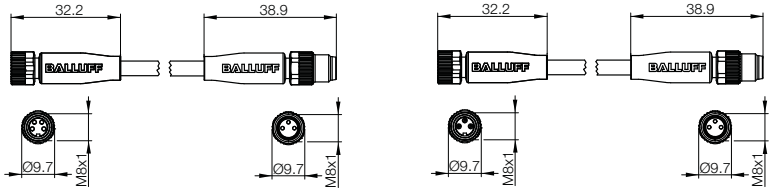
Connection Cables

M8 female straight ↔ M8 male straight, 3 or 4-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		60 V AC	30 V AC
Max. supply voltage DC U_B		60 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	4×0.34 mm²
Degree of protection as 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			

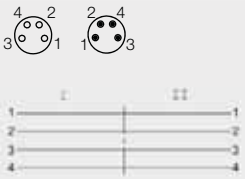
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC0CAH** BCC M314-M313-30-300-PX0334-003	**BCC02TF** BCC M314-M314-30-304-PX0434-003
PUR	Black	0.6 m	**BCC0AUL** BCC M314-M313-30-300-PX0334-006	**BCC02TH** BCC M314-M314-30-304-PX0434-006
PUR	Black	1 m	**BCC0A77** BCC M314-M313-30-300-PX0334-010	**BCC02TJ** BCC M314-M314-30-304-PX0434-010
PUR	Black	1.5 m		**BCC02TK** BCC M314-M314-30-304-PX0434-015
PUR	Black	2 m	**BCC0A78** BCC M314-M313-30-300-PX0334-020	**BCC02TL** BCC M314-M314-30-304-PX0434-020
PUR	Black	3 m	**BCC0C6A** BCC M314-M313-30-300-PX0334-030	**BCC02TM** BCC M314-M314-30-304-PX0434-030
PUR	Black	5 m	**BCC0C6C** BCC M314-M313-30-300-PX0334-050	**BCC02TN** BCC M314-M314-30-304-PX0434-050
PVC	Gray	0.3 m		**BCC02Y2** BCC M314-M314-30-304-VX8434-003
PVC	Gray	0.6 m		**BCC02Y3** BCC M314-M314-30-304-VX8434-006
PVC	Gray	1 m		**BCC02Y4** BCC M314-M314-30-304-VX8434-010
PVC	Gray	1.5 m		**BCC02Y5** BCC M314-M314-30-304-VX8434-015
PVC	Gray	2 m		**BCC02Y6** BCC M314-M314-30-304-VX8434-020
PVC	Gray	3 m		**BCC02Y7** BCC M314-M314-30-304-VX8434-030
PVC	Gray	5 m		**BCC02Y8** BCC M314-M314-30-304-VX8434-050

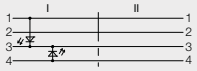
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.



Connection Cables

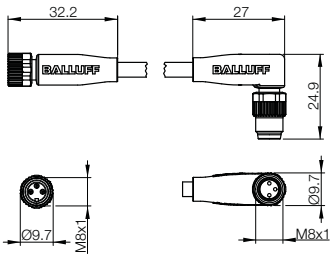
M8 female straight or right-angle ↔ M8 male straight or right-angle, 4-pin, with and without LED

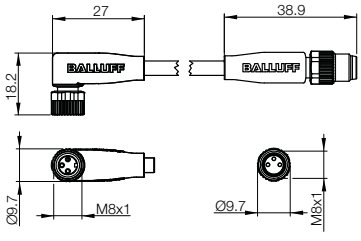


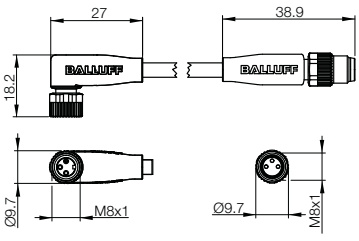


30 V AC	30 V AC	
30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
IP 67	IP 67	IP 67
–25...+90 °C/–25...+90 °C (UL 80 °C)	–25...+90 °C/–25...+90 °C (UL 80 °C)	–25...+90 °C/–25...+90 °C (UL 80 °C)
–25...+105 °C/–5...+105 °C (UL 80 °C)	–25...+105 °C/–5...+105 °C (UL 80 °C)	–25...+105 °C/–5...+105 °C (UL 80 °C)
		Green/yellow

Ordering code		
Part number		
BCC02TP	**BCC02U7**	**BCC02U0**
BCC M314-M324-30-304-PX0434-003	BCC M324-M314-30-304-PX0434-003	BCC M324-M314-30-606-PX0434-003
BCC02TR	**BCC02U8**	**BCC02U1**
BCC M314-M324-30-304-PX0434-006	BCC M324-M314-30-304-PX0434-006	BCC M324-M314-30-606-PX0434-006
BCC02TT	**BCC02U9**	**BCC02U2**
BCC M314-M324-30-304-PX0434-010	BCC M324-M314-30-304-PX0434-010	BCC M324-M314-30-606-PX0434-010
BCC02TU	**BCC02UA**	**BCC02U3**
BCC M314-M324-30-304-PX0434-015	BCC M324-M314-30-304-PX0434-015	BCC M324-M314-30-606-PX0434-015
BCC02TW	**BCC02UC**	**BCC02U4**
BCC M314-M324-30-304-PX0434-020	BCC M324-M314-30-304-PX0434-020	BCC M324-M314-30-606-PX0434-020
BCC02TY	**BCC02UE**	**BCC02U5**
BCC M314-M324-30-304-PX0434-030	BCC M324-M314-30-304-PX0434-030	BCC M324-M314-30-606-PX0434-030
BCC02TZ	**BCC02UF**	**BCC02U6**
BCC M314-M324-30-304-PX0434-050	BCC M324-M314-30-304-PX0434-050	BCC M324-M314-30-606-PX0434-050
BCC02Y9	**BCC02YU**	**BCC02YK**
BCC M314-M324-30-304-VX8434-003	BCC M324-M314-30-304-VX8434-003	BCC M324-M314-30-606-VX8434-003
BCC02YA	**BCC02YW**	**BCC02YL**
BCC M314-M324-30-304-VX8434-006	BCC M324-M314-30-304-VX8434-006	BCC M324-M314-30-606-VX8434-006
BCC02YC	**BCC02YY**	**BCC02YM**
BCC M314-M324-30-304-VX8434-010	BCC M324-M314-30-304-VX8434-010	BCC M324-M314-30-606-VX8434-010
BCC02YE	**BCC02YZ**	**BCC02YN**
BCC M314-M324-30-304-VX8434-015	BCC M324-M314-30-304-VX8434-015	BCC M324-M314-30-606-VX8434-015
BCC02YF	**BCC02Z0**	**BCC02YP**
BCC M314-M324-30-304-VX8434-020	BCC M324-M314-30-304-VX8434-020	BCC M324-M314-30-606-VX8434-020
BCC02YH	**BCC02Z1**	**BCC02YR**
BCC M314-M324-30-304-VX8434-030	BCC M324-M314-30-304-VX8434-030	BCC M324-M314-30-606-VX8434-030
BCC02YJ	**BCC02Z2**	**BCC02YT**
BCC M314-M324-30-304-VX8434-050	BCC M324-M314-30-304-VX8434-050	BCC M324-M314-30-606-VX8434-050

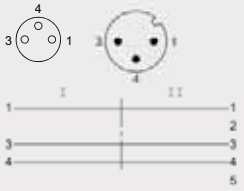
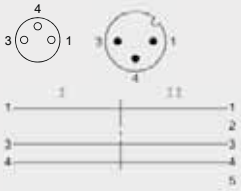






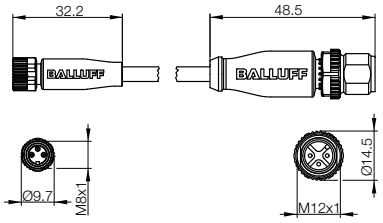
Connection Cables

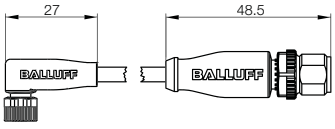
M8 female straight or right-angle ↔ M12 male straight
3-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		60 V AC	60 V AC
Max. supply voltage DC U_B		60 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as 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)
LED			

Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC03F4** BCC M313-M413-3E-300-PX0334-003	**BCC03FM** BCC M323-M413-3E-300-PX0334-003
PUR	Black	0.6 m	**BCC03F5** BCC M313-M413-3E-300-PX0334-006	**BCC03FN** BCC M323-M413-3E-300-PX0334-006
PUR	Black	1 m	**BCC03F6** BCC M313-M413-3E-300-PX0334-010	**BCC03FP** BCC M323-M413-3E-300-PX0334-010
PUR	Black	1.5 m	**BCC03F7** BCC M313-M413-3E-300-PX0334-015	**BCC03FR** BCC M323-M413-3E-300-PX0334-015
PUR	Black	2 m	**BCC03F8** BCC M313-M413-3E-300-PX0334-020	**BCC03FT** BCC M323-M413-3E-300-PX0334-020
PUR	Black	3 m	**BCC03F9** BCC M313-M413-3E-300-PX0334-030	**BCC03FU** BCC M323-M413-3E-300-PX0334-030
PUR	Black	5 m	**BCC03FA** BCC M313-M413-3E-300-PX0334-050	**BCC03FW** BCC M323-M413-3E-300-PX0334-050
PVC	Gray	0.3 m	**BCC03HE** BCC M313-M413-3E-300-VX8334-003	**BCC03HZ** BCC M323-M413-3E-300-VX8334-003
PVC	Gray	0.6 m	**BCC03HF** BCC M313-M413-3E-300-VX8334-006	**BCC03J0** BCC M323-M413-3E-300-VX8334-006
PVC	Gray	1 m	**BCC03HH** BCC M313-M413-3E-300-VX8334-010	**BCC03J1** BCC M323-M413-3E-300-VX8334-010
PVC	Gray	1.5 m	**BCC03HJ** BCC M313-M413-3E-300-VX8334-015	**BCC03J2** BCC M323-M413-3E-300-VX8334-015
PVC	Gray	2 m	**BCC03HK** BCC M313-M413-3E-300-VX8334-020	**BCC03J3** BCC M323-M413-3E-300-VX8334-020
PVC	Gray	3 m	**BCC03HL** BCC M313-M413-3E-300-VX8334-030	**BCC03J4** BCC M323-M413-3E-300-VX8334-030
PVC	Gray	5 m	**BCC03HM** BCC M313-M413-3E-300-VX8334-050	**BCC03J5** BCC M323-M413-3E-300-VX8334-050

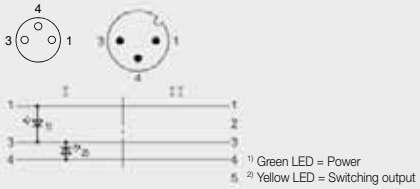
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.





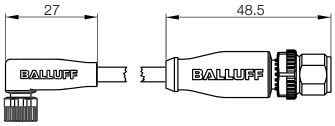
Connection Cables

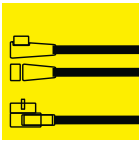
M8 female right-angle ↔ M12 male straight, 3-pin, with LED



30 V DC	
Molded	
3×0.34 mm²	
IP 67	
–25...+90 °C/–25...+90 °C (UL 80 °C)	
–25...+105 °C/–5...+90 °C (UL 80 °C)	
Green/yellow	

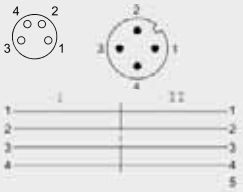
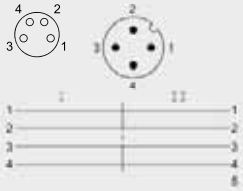
Ordering code	
Part number	
BCC03H5	
BCC M323-M413-3E-602-PX0334-003	
BCC03H6	
BCC M323-M413-3E-602-PX0334-006	
BCC03H7	
BCC M323-M413-3E-602-PX0334-010	
BCC03H8	
BCC M323-M413-3E-602-PX0334-015	
BCC03H9	
BCC M323-M413-3E-602-PX0334-020	
BCC03HA	
BCC M323-M413-3E-602-PX0334-030	
BCC03HC	
BCC M323-M413-3E-602-PX0334-050	
BCC03JF	
BCC M323-M413-3E-602-VX8334-003	
BCC03JH	
BCC M323-M413-3E-602-VX8334-006	
BCC03JJ	
BCC M323-M413-3E-602-VX8334-010	
BCC03JK	
BCC M323-M413-3E-602-VX8334-015	
BCC03JL	
BCC M323-M413-3E-602-VX8334-020	
BCC03JM	
BCC M323-M413-3E-602-VX8334-030	
BCC03JN	
BCC M323-M413-3E-602-VX8334-050	





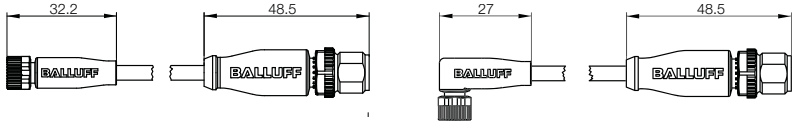
Connection Cables

M8 female straight or right-angle↔ M12 male straight 4-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		30 V AC	30 V AC
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	4×0.34 mm²
Degree of protection as 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)
LED			

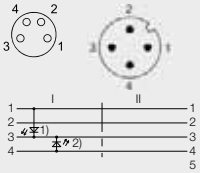
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC03JP** BCC M314-M414-3E-304-PX0434-003	**BCC03K7** BCC M324-M414-3E-304-PX0434-003
PUR	Black	0.6 m	**BCC03JR** BCC M314-M414-3E-304-PX0434-006	**BCC03K8** BCC M324-M414-3E-304-PX0434-006
PUR	Black	1 m	**BCC03JT** BCC M314-M414-3E-304-PX0434-010	**BCC03K9** BCC M324-M414-3E-304-PX0434-010
PUR	Black	1.5 m	**BCC03JU** BCC M314-M414-3E-304-PX0434-015	**BCC03KA** BCC M324-M414-3E-304-PX0434-015
PUR	Black	2 m	**BCC03JW** BCC M314-M414-3E-304-PX0434-020	**BCC03KC** BCC M324-M414-3E-304-PX0434-020
PUR	Black	3 m	**BCC03JY** BCC M314-M414-3E-304-PX0434-030	**BCC03KE** BCC M324-M414-3E-304-PX0434-030
PUR	Black	5 m	**BCC03JZ** BCC M314-M414-3E-304-PX0434-050	**BCC03KF** BCC M324-M414-3E-304-PX0434-050
PVC	Gray	0.3 m	**BCC03L1** BCC M314-M414-3E-304-VX8434-003	**BCC03LJ** BCC M324-M414-3E-304-VX8434-003
PVC	Gray	0.6 m	**BCC03L2** BCC M314-M414-3E-304-VX8434-006	**BCC03LK** BCC M324-M414-3E-304-VX8434-006
PVC	Gray	1 m	**BCC03L3** BCC M314-M414-3E-304-VX8434-010	**BCC03LL** BCC M324-M414-3E-304-VX8434-010
PVC	Gray	1.5 m	**BCC03L4** BCC M314-M414-3E-304-VX8434-015	**BCC03LM** BCC M324-M414-3E-304-VX8434-015
PVC	Gray	2 m	**BCC03L5** BCC M314-M414-3E-304-VX8434-020	**BCC03LN** BCC M324-M414-3E-304-VX8434-020
PVC	Gray	3 m	**BCC03L6** BCC M314-M414-3E-304-VX8434-030	**BCC03LP** BCC M324-M414-3E-304-VX8434-030
PVC	Gray	5 m	**BCC03L7** BCC M314-M414-3E-304-VX8434-050	**BCC03LR** BCC M324-M414-3E-304-VX8434-050

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



Connection Cables

M8 female right-angle ↔ M12 male straight, 4-pin, with LED



30 V DC	
Molded	
4×0.34 mm²	
IP 67	
–25...+90 °C/–25...+90 °C (UL 80 °C)	
–25...+105 °C/–5...+90 °C (UL 80 °C)	
Green/yellow	

Ordering code	
Part number	
BCC03KR	
BCC M324-M414-3E-606-PX0434-003	
BCC03KT	
BCC M324-M414-3E-606-PX0434-006	
BCC03KU	
BCC M324-M414-3E-606-PX0434-010	
BCC03KW	
BCC M324-M414-3E-606-PX0434-015	
BCC03KY	
BCC M324-M414-3E-606-PX0434-020	
BCC03KZ	
BCC M324-M414-3E-606-PX0434-030	
BCC03L0	
BCC M324-M414-3E-606-PX0434-050	
BCC03M2	
BCC M324-M414-3E-606-VX8434-003	
BCC03M3	
BCC M324-M414-3E-606-VX8434-006	
BCC03M4	
BCC M324-M414-3E-606-VX8434-010	
BCC03M5	
BCC M324-M414-3E-606-VX8434-015	
BCC03M6	
BCC M324-M414-3E-606-VX8434-020	
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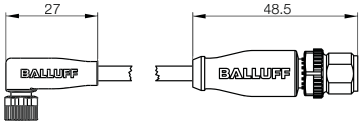
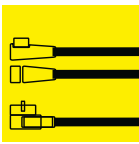
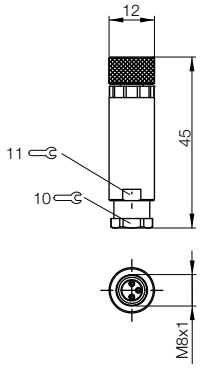
BCC03M8	
BCC M324-M414-3E-606-VX8434-050	

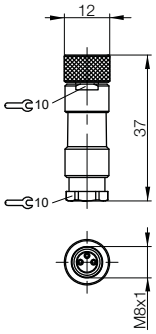





Connector diagram			
Version	Female straight	Female straight	
Max. supply voltage AC U_B	60 V	60 V	
Max. supply voltage DC U_B	60 V	60 V	
Cable	User-fabricated	User-fabricated	
Number of conductors × conductor cross-section	3×0.14...0.5 mm²	3×0.14...0.5 mm²	
Cable diameter	Ø 3.5...5 mm	Ø 3.5...5 mm	
Connection	Screw terminal	Soldered connection	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	–25...+85 °C	–25...+85 °C	

Switching function	**Ordering code**		
	Part number		
No LED, NC or NO	**BCC06Z1**	**BCC06YW**	
	BCC M333-0000-10-000-31X350-000	BCC M333-0000-10-000-34X325-000	

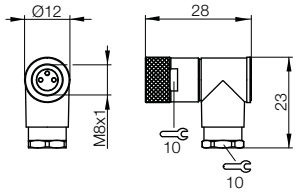


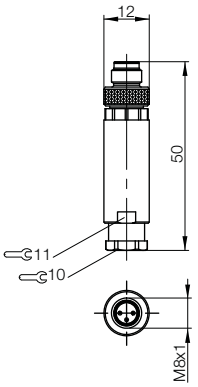


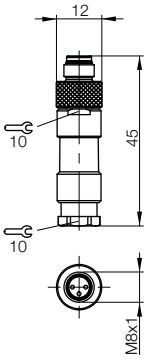
M8 female right-angle, M8 male straight or right-angle, User-fabricated, 3-pin

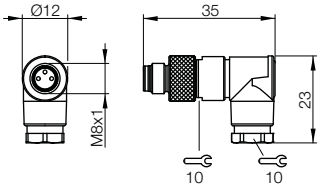



				
	Female right-angle	Male straight	Male straight	Male right-angle
	60 V	60 V	60 V	60 V
	60 V	60 V	60 V	60 V
	User-fabricated	User-fabricated	User-fabricated	User-fabricated
	3×0.14...0.5 mm²	3×0.14...0.5 mm²	3×0.14...0.5 mm²	3×0.14...0.5 mm²
	Ø 3.5...5 mm	Ø 2.2...5 mm	Ø 3.5...5 mm	Ø 3.5...5 mm
	Soldered connection	Screw terminal	Soldered connection	Soldered connection
	IP 67	IP 67	IP 67	IP 67
	–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C
Ordering code				
Part number				
	BCC06YY	**BCC0E7N**	**BCC06YZ**	**BCC06Z0**
	BCC M343-0000-10-000-34X325-000	BCC M333-0000-20-000-31X350-000-C027	BCC M333-0000-20-000-34X325-000	BCC M343-0000-20-000-34X325-000









M8 female straight, M8 male straight, User-fabricated, 3-pin

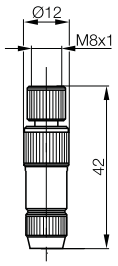
Quick-connect system

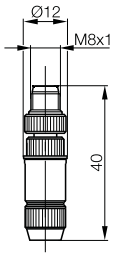
Quick-connect system

Connector diagram			
Version	Female straight	Male straight	
Max. supply voltage AC U_B	32 V DC	32 V DC	
Max. supply voltage DC U_B	32 V DC	32 V DC	
Cable	User-fabricated	User-fabricated	
Number of conductors × conductor cross-section	3×0.14...0.34 mm²	3×0.14...0.34 mm²	
Cable diameter min.	Ø 3.2...5.4 mm	Ø 3.2...5.4 mm	
Connection	Insulation displacement connector technology	Insulation displacement connector technology	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a	–25...+85 °C*	–25...+85 °C*	

Switching function	**Ordering code**		
	Part number		
No LED, NC or NO	**BCC02HC**	**BCC02HE**	
	BKS-S111-RT13	BKS-S113-RT13	
No LED, NO and NC			

*Cable installation on the plug in the temperature range –5...+50 °C



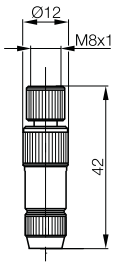


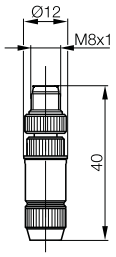
M8 female straight, M8 male straight, User-fabricated, 3 and 4-pin

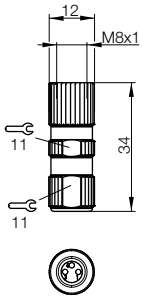
Quick-connect system

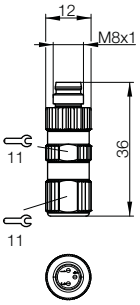
Quick-connect system

				
	Female straight	Male straight	Female straight	Male straight
	32 V DC	32 V DC	60 V DC	60 V DC
	32 V DC	32 V DC	60 V DC	60 V DC
	User-fabricated	User-fabricated	User-fabricated	User-fabricated
	4×0.14...0.34 mm²	4×0.14...0.34 mm²	3×0.14...0.38 mm²	3×0.14...0.38 mm²
	Ø 3.2...5.4 mm	Ø 3.2...5.4 mm	Ø 3...5 mm	Ø 3...5 mm
	Insulation displacement connector technology	Insulation displacement connector technology	Penetration technology	Penetration technology
	IP 67	IP 67	IP 67	IP 67
	–25...+85 °C*	–25...+85 °C*	–25...+85 °C*	–25...+85 °C*
Ordering code				
Part number				
			BCC09EU	**BCC09EW**
			BCC M333-0000-10-000-22X334-000	BCC M333-0000-20-000-22X334-000
BCC02HF	**BCC02HH**			
BKS-S216-RT14	BKS-S218-RT14			





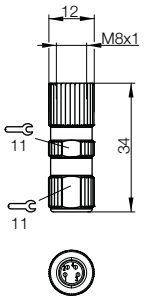


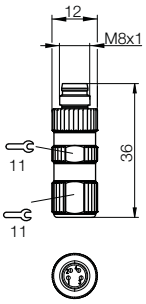


M8 female straight, M8 male straight, User-fabricated, 4-pin

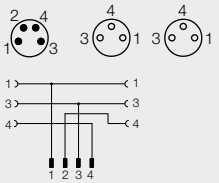
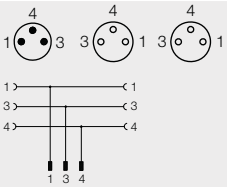
Connector diagram		
Version	Female straight	Male straight
Max. supply voltage AC U_B	30 V	30 V
Max. supply voltage DC U_B	30 V	30 V
Cable	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	4×0.14...0.38 mm²	4×0.14...0.38 mm²
Cable diameter min.	Ø 3...5 mm	Ø 3...5 mm
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

Switching function	**Ordering code**	
	Part number	
No LED, NO and NC	**BCC09EY**	**BCC09EZ**
	BCC M334-0000-10-000-22X434-000	BCC M334-0000-20-000-22X434-000



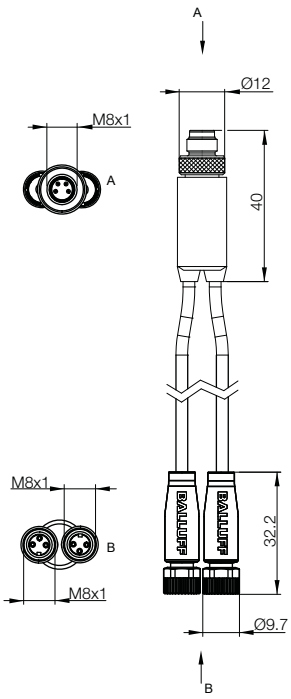


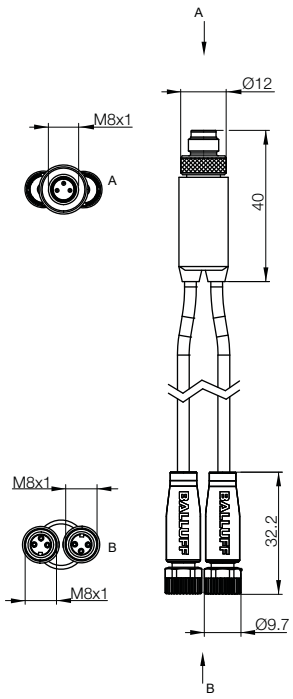
Y-connector

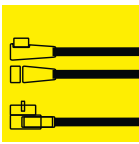
Connector diagram and wiring		
Max. supply voltage AC U_B	30 V	30 V
Max. supply voltage DC U_B	30 V	30 V
Cable	Molded	Molded
Number of conductors × conductor cross-section	3×0.14 mm²	3×0.14 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m	**BCC0AFL**	**BCC0A07**
			BCC M314-M313-M313-U2024-003	BCC M313-M313-M313-U2017-003
PUR	Black	1 m	**BCC0AFM**	
			BCC M314-M313-M313-U2024-010	

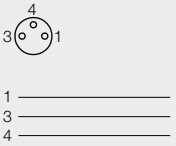
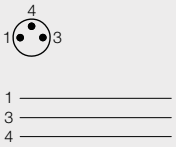
Other cable lengths on request.





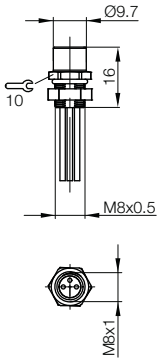


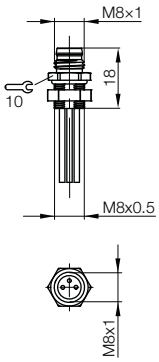
M8 flange socket, M8 flange plug, 3-pin

Connector diagram and wiring		
Max. supply voltage AC U_B	30 V	30 V
Max. supply voltage DC U_B	30 V	30 V
Number of conductors × conductor cross-section	3×0.25 mm²	3×0.25 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

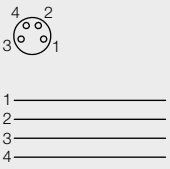
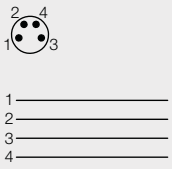
Cable length	Ordering code	
	Part number	
0.5 m	**BCC0E4Y**	**BCC0E50**
	BCC M353-0000-10-RM049-005	BCC M353-0000-20-RM049-005
2 m	**BCC0E4Z**	**BCC0E51**
	BCC M353-0000-10-RM049-020	BCC M353-0000-20-RM049-020

Other cable lengths on request.

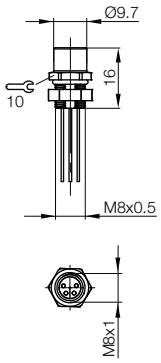


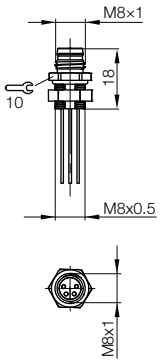


M8 flange socket, M8 flange plug, 4-pin

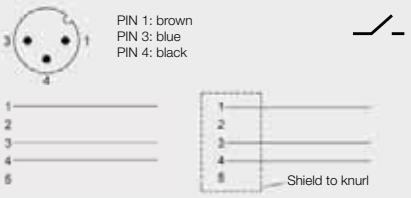
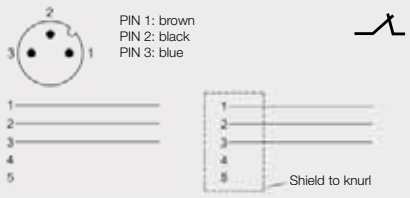
		
30 V	30 V	
30 V	30 V	
4×0.25 mm²	4×0.25 mm²	
IP 67	IP 67	
–25...+85 °C	–25...+85 °C	

Ordering code		
Part number		
BCC0E35	**BCC0E2Z**	
BCC M354-0000-10-RM050-005	BCC M354-0000-20-RM050-005	
BCC0E38	**BCC0E32**	
BCC M354-0000-10-RM050-020	BCC M354-0000-20-RM050-020	



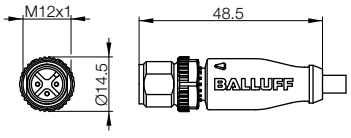


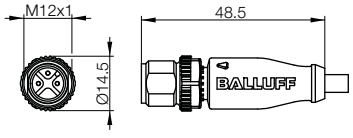
M12 male straight, 3-pin, no LED

Connector diagram and wiring			
Max. supply voltage AC U_B		250 V AC	250 V AC
Max. supply voltage DC U_B		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as 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	–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C
	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)	–20...+105 °C (UL 80 °C)
Use		Normally open (NO)	Normally closed (NC)
LED			

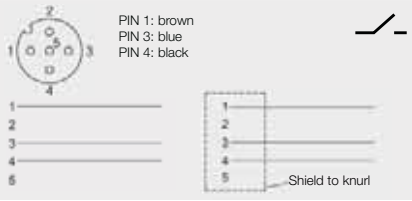
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC02ZA**	**BCC02ZF**
			BCC M413-0000-2A-001-PX0334-020	BCC M413-0000-2A-002-PX0334-020
PUR	Black	5 m	**BCC02ZC**	**BCC02ZH**
			BCC M413-0000-2A-001-PX0334-050	BCC M413-0000-2A-002-PX0334-050
PUR	Black	10 m	**BCC02ZE**	**BCC02ZJ**
			BCC M413-0000-2A-001-PX0334-100	BCC M413-0000-2A-002-PX0334-100
PUR shielded	Black	2 m	**BCC02ZK**	**BCC02ZN**
			BCC M413-0000-2A-036-PS0334-020	BCC M413-0000-2A-037-PS0334-020
PUR shielded	Black	5 m	**BCC02ZL**	**BCC02ZP**
			BCC M413-0000-2A-036-PS0334-050	BCC M413-0000-2A-037-PS0334-050
PUR shielded	Black	10 m	**BCC02ZM**	**BCC02ZR**
			BCC M413-0000-2A-036-PS0334-100	BCC M413-0000-2A-037-PS0334-100
PVC	Gray	2 m	**BCC0334**	**BCC0337**
			BCC M413-0000-2A-001-VX8334-020	BCC M413-0000-2A-002-VX8334-020
PVC	Gray	5 m	**BCC0335**	**BCC0338**
			BCC M413-0000-2A-001-VX8334-050	BCC M413-0000-2A-002-VX8334-050
PVC	Gray	10 m	**BCC0336**	**BCC0339**
			BCC M413-0000-2A-001-VX8334-100	BCC M413-0000-2A-002-VX8334-100
PVC shielded	Gray	2 m	**BCC033A**	**BCC033F**
			BCC M413-0000-2A-036-VS8334-020	BCC M413-0000-2A-037-VS8334-020
PVC shielded	Gray	5 m	**BCC033C**	**BCC033H**
			BCC M413-0000-2A-036-VS8334-050	BCC M413-0000-2A-037-VS8334-050
PVC shielded	Gray	10 m	**BCC033E**	**BCC033J**
			BCC M413-0000-2A-036-VS8334-100	BCC M413-0000-2A-037-VS8334-100

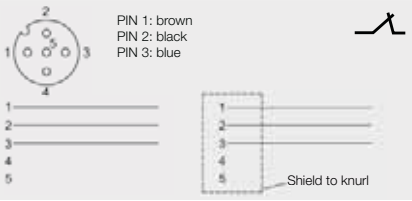
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.





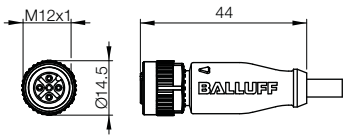
Connectors
M12 female straight, 3-pin, with and without LED

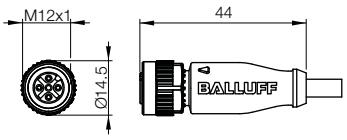


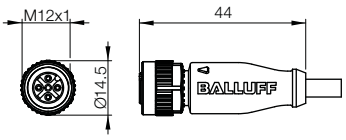


250 V AC	250 V AC	
250 V DC	250 V DC	30 V DC
Molded	Molded	Molded
3×0.34 mm²	3×0.34 mm²	3×0.34 mm²
IP 68	IP 68	IP 68
–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)
–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C	
–40...+105 °C/–5...+105 °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)	PNP normally open (NO)
		Green/yellow

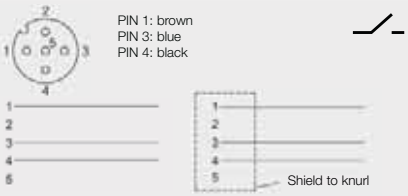
Ordering code		
Part number		
BCC030K	**BCC030N**	**BCC030A**
BCC M415-0000-1A-001-PX0334-020	BCC M415-0000-1A-002-PX0334-020	BCC M415-0000-1A-004-PX0334-020
BCC030L	**BCC030P**	**BCC030C**
BCC M415-0000-1A-001-PX0334-050	BCC M415-0000-1A-002-PX0334-050	BCC M415-0000-1A-004-PX0334-050
BCC030M	**BCC030R**	**BCC030E**
BCC M415-0000-1A-001-PX0334-100	BCC M415-0000-1A-002-PX0334-100	BCC M415-0000-1A-004-PX0334-100
BCC030T	**BCC030Y**	
BCC M415-0000-1A-036-PS0334-020	BCC M415-0000-1A-037-PS0334-020	
BCC030U	**BCC030Z**	
BCC M415-0000-1A-036-PS0334-050	BCC M415-0000-1A-037-PS0334-050	
BCC030W	**BCC0310**	
BCC M415-0000-1A-036-PS0334-100	BCC M415-0000-1A-037-PS0334-100	
BCC034A	**BCC034F**	**BCC0344**
BCC M415-0000-1A-001-VX8334-020	BCC M415-0000-1A-002-VX8334-020	BCC M415-0000-1A-004-VX8334-020
BCC034C	**BCC034H**	**BCC0345**
BCC M415-0000-1A-001-VX8334-050	BCC M415-0000-1A-002-VX8334-050	BCC M415-0000-1A-004-VX8334-050
BCC034E	**BCC034J**	**BCC0346**
BCC M415-0000-1A-001-VX8334-100	BCC M415-0000-1A-002-VX8334-100	BCC M415-0000-1A-004-VX8334-100
BCC034K	**BCC034N**	
BCC M415-0000-1A-036-VS8334-020	BCC M415-0000-1A-037-VS8334-020	
BCC034L	**BCC034P**	
BCC M415-0000-1A-036-VS8334-050	BCC M415-0000-1A-037-VS8334-050	
BCC034M	**BCC034R**	
BCC M415-0000-1A-036-VS8334-100	BCC M415-0000-1A-037-VS8334-100	





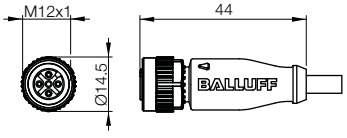


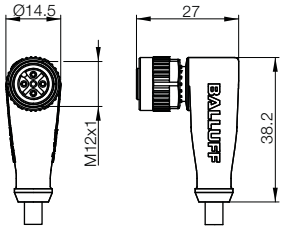
M12 female straight and right-angle, 3-pin, without and with LED

Connector diagram and wiring			
Max. supply voltage AC U_B			250 V AC
Max. supply voltage DC U_B		30 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as 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		–40...+80 °C/–25...+80 °C
	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		PNP normally closed (NC)	Normally open (NO)
LED		Green/yellow	

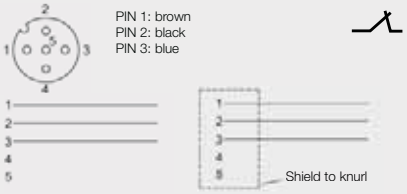
Cable material	Color	Length	Ordering code Part number	
PUR	Black	2 m	**BCC030F** BCC M415-0000-1A-005-PX0334-020	**BCC0317** BCC M425-0000-1A-001-PX0334-020
PUR	Black	5 m	**BCC030H** BCC M415-0000-1A-005-PX0334-050	**BCC0318** BCC M425-0000-1A-001-PX0334-050
PUR	Black	10 m	**BCC030J** BCC M415-0000-1A-005-PX0334-100	**BCC0319** BCC M425-0000-1A-001-PX0334-100
PUR shielded	Black	2 m		**BCC031F** BCC M425-0000-1A-036-PS0334-020
PUR shielded	Black	5 m		**BCC031H** BCC M425-0000-1A-036-PS0334-050
PUR shielded	Black	10 m		**BCC031J** BCC M425-0000-1A-036-PS0334-100
PVC	Gray	2 m	**BCC0347** BCC M415-0000-1A-005-VX8334-020	**BCC0351** BCC M425-0000-1A-001-VX8334-020
PVC	Gray	5 m	**BCC0348** BCC M415-0000-1A-005-VX8334-050	**BCC0352** BCC M425-0000-1A-001-VX8334-050
PVC	Gray	10 m	**BCC0349** BCC M415-0000-1A-005-VX8334-100	**BCC0353** BCC M425-0000-1A-001-VX8334-100
PVC shielded	Gray	2 m		**BCC0357** BCC M425-0000-1A-036-VS8334-020
PVC shielded	Gray	5 m		**BCC0358** BCC M425-0000-1A-036-VS8334-050
PVC shielded	Gray	10 m		**BCC0359** BCC M425-0000-1A-036-VS8334-100

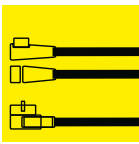
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

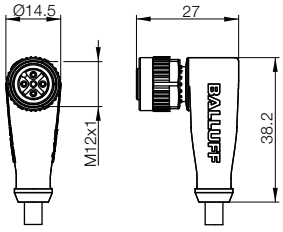


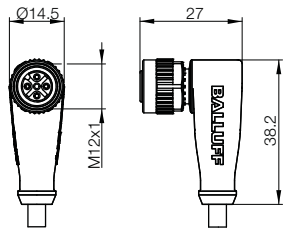


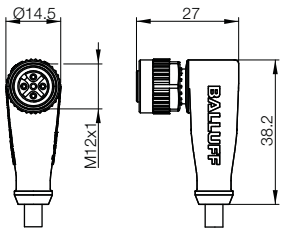
M12 female right-angle, 3-pin, without and with LED

			
	250 V AC		
	250 V DC	30 V DC	30 V DC
	Molded	Molded	Molded
	3×0.34 mm²	3×0.34 mm²	3×0.34 mm²
	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...+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)		
	Normally closed (NC)	PNP normally open (NO)	PNP normally closed (NC)
		Green/yellow	Green/yellow
Ordering code			
Part number			
BCC031A	**BCC0311**	**BCC0314**	
BCC M425-0000-1A-002-PX0334-020	BCC M425-0000-1A-004-PX0334-020	BCC M425-0000-1A-005-PX0334-020	
BCC031C	**BCC0312**	**BCC0315**	
BCC M425-0000-1A-002-PX0334-050	BCC M425-0000-1A-004-PX0334-050	BCC M425-0000-1A-005-PX0334-050	
BCC031E	**BCC0313**	**BCC0316**	
BCC M425-0000-1A-002-PX0334-100	BCC M425-0000-1A-004-PX0334-100	BCC M425-0000-1A-005-PX0334-100	
BCC031K			
BCC M425-0000-1A-037-PS0334-020			
BCC031L			
BCC M425-0000-1A-037-PS0334-050			
BCC031M			
BCC M425-0000-1A-037-PS0334-100			
BCC0354	**BCC034T**	**BCC034Y**	
BCC M425-0000-1A-002-VX8334-020	BCC M425-0000-1A-004-VX8334-020	BCC M425-0000-1A-005-VX8334-020	
BCC0355	**BCC034U**	**BCC034Z**	
BCC M425-0000-1A-002-VX8334-050	BCC M425-0000-1A-004-VX8334-050	BCC M425-0000-1A-005-VX8334-050	
BCC0356	**BCC034W**	**BCC0350**	
BCC M425-0000-1A-002-VX8334-100	BCC M425-0000-1A-004-VX8334-100	BCC M425-0000-1A-005-VX8334-100	
BCC035A			
BCC M425-0000-1A-037-VS8334-020			
BCC035C			
BCC M425-0000-1A-037-VS8334-050			
BCC035E			
BCC M425-0000-1A-037-VS8334-100			



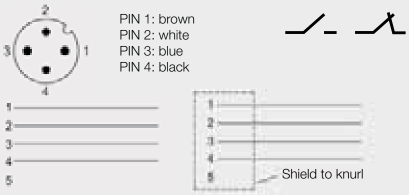
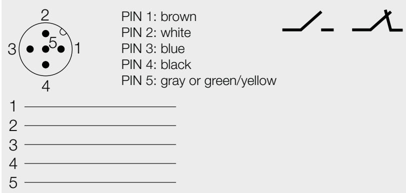






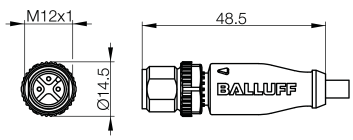
Connectors

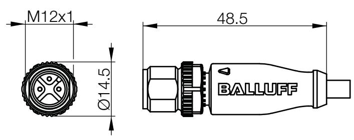
M12 male, straight
4-pin and 5-pin, without LED


Connector diagram and wiring			
Max. supply voltage AC U_B		250 V AC	125 V AC
Max. supply voltage DC U_B		250 V DC	125 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	5×0.34 mm²
Degree of protection as per IEC 60529		IP 68	IP 68
Ambient temperature T_a Static/moving	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	–40...+80 °C/–25...+80 °C
	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)	–20...+105 °C (UL 80 °C)
Use		Complementary (NO/NC) /	Complementary (NO/NC) /
LED			

Cable material	**Color**	**Length**	**Ordering code** Part number	
PUR	Black	2 m	**BCC031N** BCC M414-0000-2A-003-PX0434-020	**BCC0C76** BCC M415-0000-2A-017-PX0534-020
PUR	Black	5 m	**BCC031P** BCC M414-0000-2A-003-PX0434-050	**BCC0C77** BCC M415-0000-2A-017-PX0534-050
PUR	Black	10 m	**BCC031R** BCC M414-0000-2A-003-PX0434-100	**BCC0C78** BCC M415-0000-2A-017-PX0534-100
PUR shielded	Black	2 m	**BCC031T** BCC M414-0000-2A-014-PS0434-020	**BCC08JE** BCC M415-0000-2A-034-PX0534-020
PUR shielded	Black	5 m	**BCC031U** BCC M414-0000-2A-014-PS0434-050	**BCC08JC** BCC M415-0000-2A-034-PX0534-050
PUR shielded	Black	10 m	**BCC031W** BCC M414-0000-2A-014-PS0434-100	**BCC0JA** BCC M415-0000-2A-034-PX0534-100
PVC	Gray	2 m	**BCC035F** BCC M414-0000-2A-003-VX8434-020	**BCC0AU3** BCC M415-0000-2A-017-VX8534-020
PVC	Gray	5 m	**BCC035H** BCC M414-0000-2A-003-VX8434-050	**BCC0AT6** BCC M415-0000-2A-017-VX8534-050
PVC	Gray	10 m	**BCC035J** BCC M414-0000-2A-003-VX8434-100	**BCC0AUK** BCC M415-0000-2A-017-VX8534-100
PVC shielded	Gray	2 m	**BCC035K** BCC M414-0000-2A-014-VS8434-020	
PVC shielded	Gray	5 m	**BCC035L** BCC M414-0000-2A-014-VS8434-050	
PVC shielded	Gray	10 m	**BCC035M** BCC M414-0000-2A-014-VS8434-100	

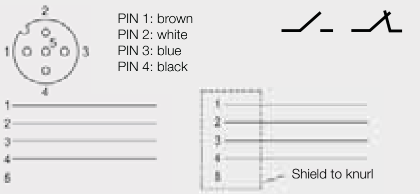
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

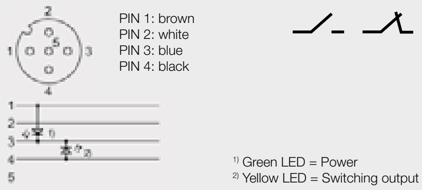


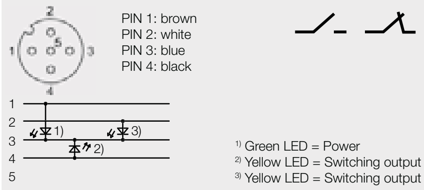


Connectors
M12 female straight, 4-pin, with and without LED



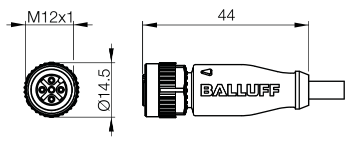


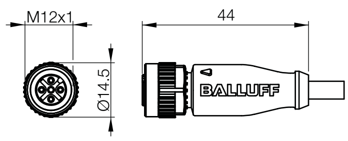


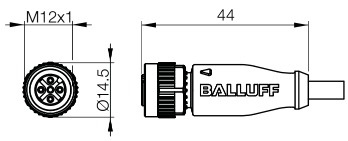


250 V AC		
250 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
IP 68	IP 68	IP 68
–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)
–40...+80 °C/–25...+80 °C		
–40...+105 °C/–5...+105 °C (UL 80 °C)	–40...+105 °C/–5...+105 °C (UL 80 °C)	–40...+105 °C/–5...+105 °C (UL 80 °C)
–20...+105 °C (UL 80 °C)		
Complementary (NO/NC)	PNP complementary (NO/NC)	PNP complementary (NO/NC)
	Green/yellow	Green/yellow/white

Ordering code Part number		
BCC032F BCC M415-0000-1A-003-PX0434-020	**BCC0327** BCC M415-0000-1A-008-PX0434-020	**BCC032A** BCC M415-0000-1A-010-PX0434-020
BCC032H BCC M415-0000-1A-003-PX0434-050	**BCC0328** BCC M415-0000-1A-008-PX0434-050	**BCC032C** BCC M415-0000-1A-010-PX0434-050
BCC032J BCC M415-0000-1A-003-PX0434-100	**BCC0329** BCC M415-0000-1A-008-PX0434-100	**BCC032E** BCC M415-0000-1A-010-PX0434-100
BCC032K BCC M415-0000-1A-014-PS0434-020		
BCC032L BCC M415-0000-1A-014-PS0434-050		
BCC032M BCC M415-0000-1A-014-PS0434-100		
BCC0367 BCC M415-0000-1A-003-VX8434-020	**BCC0361** BCC M415-0000-1A-008-VX8434-020	**BCC0364** BCC M415-0000-1A-010-VX8434-020
BCC0368 BCC M415-0000-1A-003-VX8434-050	**BCC0362** BCC M415-0000-1A-008-VX8434-050	**BCC0365** BCC M415-0000-1A-010-VX8434-050
BCC0369 BCC M415-0000-1A-003-VX8434-100	**BCC0363** BCC M415-0000-1A-008-VX8434-100	**BCC0366** BCC M415-0000-1A-010-VX8434-100
BCC036A BCC M415-0000-1A-014-VS8434-020		
BCC036C BCC M415-0000-1A-014-VS8434-050		
BCC036E BCC M415-0000-1A-014-VS8434-100		

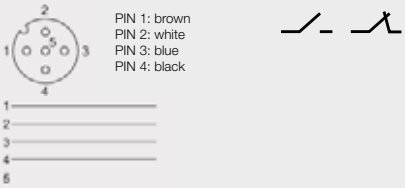
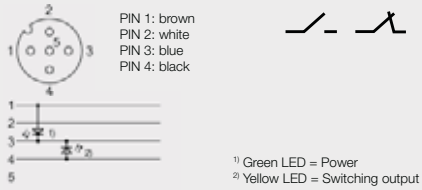






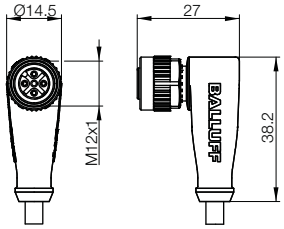
Connectors and cables
Connectors M5
Connection cables M5↔M8
Connectors M8
Connection cables M8↔M8
Connection cables M8↔M12
Connectors M12
Connection cables M12↔M8
Connection cables M12↔M12
Tees, adapters
Y-connectors
Accessories
Special properties

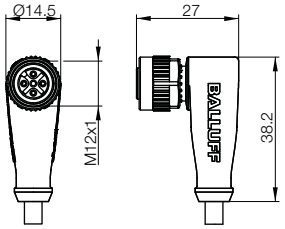
M12 female right-angle, 4-pin, without and with LED

Connector diagram and wiring			
Max. supply voltage AC U_B		250 V AC	
Max. supply voltage DC U_B		250 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	4×0.34 mm²
Degree of protection as 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	–40...+80 °C/–25...+80 °C	
	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) ⌐-/-⌐	PNP complementary (NO/NC) ⌐-/-⌐
LED			Green/yellow

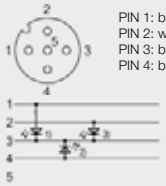
Cable material	Color	Length	Ordering code Part number	
PUR	Black	2 m	**BCC032Y** BCC M425-0000-1A-003-PX0434-020	**BCC032N** BCC M425-0000-1A-008-PX0434-020
PUR	Black	5 m	**BCC032Z** BCC M425-0000-1A-003-PX0434-050	**BCC032P** BCC M425-0000-1A-008-PX0434-050
PUR	Black	10 m	**BCC0330** BCC M425-0000-1A-003-PX0434-100	**BCC032R** BCC M425-0000-1A-008-PX0434-100
PUR shielded	Black	2 m	**BCC0331** BCC M425-0000-1A-014-PS0434-020	
PUR shielded	Black	5 m	**BCC0332** BCC M425-0000-1A-014-PS0434-050	
PUR shielded	Black	10 m	**BCC0333** BCC M425-0000-1A-014-PS0434-100	
PVC	Gray	2 m	**BCC036N** BCC M425-0000-1A-003-VX8434-020	**BCC036F** BCC M425-0000-1A-008-VX8434-020
PVC	Gray	5 m	**BCC036P** BCC M425-0000-1A-003-VX8434-050	**BCC036H** BCC M425-0000-1A-008-VX8434-050
PVC	Gray	10 m	**BCC036R** BCC M425-0000-1A-003-VX8434-100	**BCC036J** BCC M425-0000-1A-008-VX8434-100
PVC shielded	Gray	2 m	**BCC036T** BCC M425-0000-1A-014-VS8434-020	
PVC shielded	Gray	5 m	**BCC036U** BCC M425-0000-1A-014-VS8434-050	
PVC shielded	Gray	10 m	**BCC036W** BCC M425-0000-1A-014-VS8434-100	

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





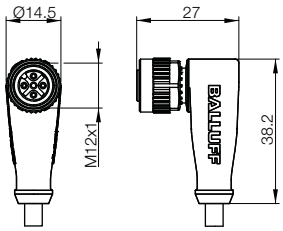
M12 female right-angle, 4-pin, with LED



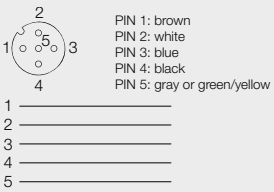
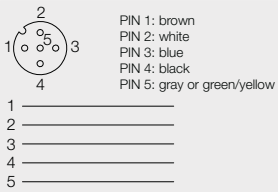
[1] Green LED = Power
[2] Yellow LED = Switching output
[3] White LED = Switching output

30 V DC	
Molded	
4×0.34 mm²	
IP 68	
–40...+90 °C/–25...+90 °C (UL 80° C)	
–40...+105 °C/–5...+105 °C (UL 80 °C)	
PNP complementary (NO/NC) ⎍-/⎍	
Green/yellow/white	

Ordering code	
Part number	
BCC032T	
BCC M425-0000-1A-010-PX0434-020	
BCC032U	
BCC M425-0000-1A-010-PX0434-050	
BCC032W	
BCC M425-0000-1A-010-PX0434-100	
BCC036K	
BCC M425-0000-1A-010-VX8434-020	
BCC036L	
BCC M425-0000-1A-010-VX8434-050	
BCC036M	
BCC M425-0000-1A-010-VX8434-100	

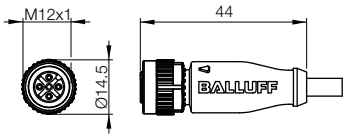


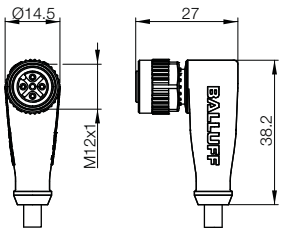
M12 female straight and right-angle, 5-pin, no LED

Connector diagram and wiring			
Max. supply voltage AC U_B	125 V AC	125 V AC	
Max. supply voltage DC U_B	125 V DC	125 V DC	
Cable	Molded	Molded	
Number of conductors × conductor cross-section	5×0.34 mm²	5×0.34 mm²	
Degree of protection as 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) ⌐-/-⌐	Complementary (NO/NC) ⌐-/-⌐	
LED			

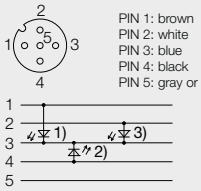
Cable material	Color	Length	Ordering code		
			Part number		
PUR Pin 5 gray	Black	2 m	**BCC08FE** BCC M415-0000-1A-017-PX0534-020	**BCC09H7** BCC M425-0000-1A-017-PX0534-020	
PUR Pin 5 gray	Black	5 m	**BCC098C** BCC M415-0000-1A-017-PX0534-050	**BCC08FC** BCC M425-0000-1A-017-PX0534-050	
PUR Pin 5 gray	Black	10 m	**BCC0860** BCC M415-0000-1A-017-PX0534-100	**BCC08FA** BCC M425-0000-1A-017-PX0534-100	
PUR Pin 5 green/gray	Black	2 m	**BCC09H4** BCC M415-0000-1A-034-PX0534-020	**BCC08F9** BCC M425-0000-1A-034-PX0534-020	
PUR Pin 5 green/gray	Black	5 m	**BCC09H5** BCC M415-0000-1A-034-PX0534-050	**BCC08F8** BCC M425-0000-1A-034-PX0534-050	
PUR Pin 5 green/gray	Black	10 m	**BCC09H6** BCC M415-0000-1A-034-PX0534-100	**BCC08F7** BCC M425-0000-1A-034-PX0534-100	
PVC Pin 5 gray	Gray	5 m	**BCC0AT5** BCC M415-0000-1A-017-VX8534-050		
PVC Pin 5 gray	Gray	10 m	**BCC0AN9** BCC M415-0000-1A-017-VX8534-100		

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



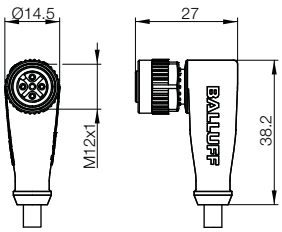


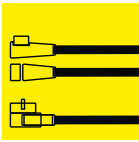
M12 female right-angle, 5-pin, with LED



30 V DC	
Molded	
5×0.34 mm²	
IP 68	
–40...+90 °C/–25...+90 °C (UL 80° C)	
–40...+105 °C/–5...+105 °C (UL 80 °C)	
PNP complementary (NO/NC) ⎍-/-⎍	
Green/yellow/white	

Ordering code	
Part number	
BCC08F6	
BCC M425-0000-1A-039-PX0534-020	
BCC08F5	
BCC M425-0000-1A-039-PX0534-050	
BCC08F4	
BCC M425-0000-1A-039-PX0534-100	
BCC08HP	
BCC M425-0000-1A-040-PX0534-020	
BCC08HR	
BCC M425-0000-1A-040-PX0534-050	
BCC08HT	
BCC M425-0000-1A-040-PX0534-100	



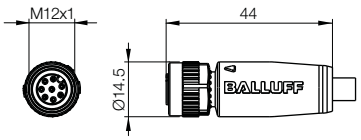


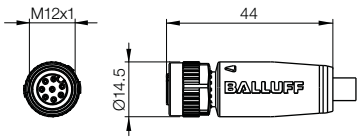
M12 female straight, 8-pin, no LED

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
Max. supply voltage AC U_B	60 V AC		60 V AC
Max. supply voltage DC U_B	60 V DC		60 V DC
Cable	Molded		Molded
Number of conductors × conductor cross-section	8×0.25 mm²		8×0.25 mm²
Degree of protection as 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		–40...+80 °C/–25...+80 °C

Cable material	Color	Length	Ordering code Part number	
PUR	Black	2 m	**BCC06K1** BCC M418-0000-1A-044-PX0825-020	**BCC09J3** BCC M418-0000-1A-069-PX0825-020
PUR	Black	5 m	**BCC06K2** BCC M418-0000-1A-044-PX0825-050	**BCC09J4** BCC M418-0000-1A-069-PX0825-050
PUR	Black	10 m	**BCC06K3** BCC M418-0000-1A-044-PX0825-100	**BCC085Z** BCC M418-0000-1A-069-PX0825-100
PUR shielded	Black	2 m		**BCC0994** BCC M418-0000-1A-046-PS0825-020
PUR shielded	Black	5 m		**BCC0995** BCC M418-0000-1A-046-PS0825-050
PUR shielded	Black	10 m		**BCC0996** BCC M418-0000-1A-046-PS0825-100

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





M12 female straight and right-angle, 8-pin, no LED

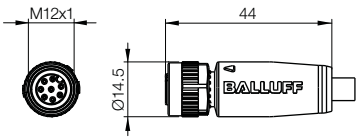
1	BN
2	WS
3	BU
4	BK
5	GY
6	PK
7	VT
8	OR

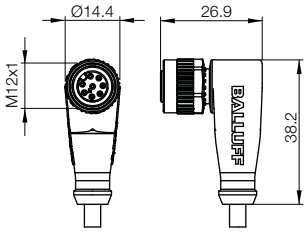
1	WH
2	GN
3	YE
4	GY
5	BN
6	PK
7	BU
8	RD

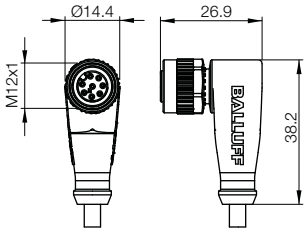
1	BN
2	WS
3	BU
4	BK
5	GY
6	PK
7	VT
8	OR

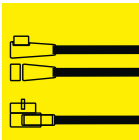
60 V AC	60 V AC	60 V AC
60 V DC	60 V DC	60 V DC
Molded	Molded	Molded
8×0.25 mm²	8×0.25 mm²	8×0.25 mm²
IP 68	IP 68	IP 68
–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C
–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C	–40...+80 °C/–25...+80 °C

Ordering code		
Part number		
BCC09HC	**BCC06K4**	**BCC09H8**
BCC M418-0000-1A-045-PX0825-020	BCC M428-0000-1A-044-PX0825-020	BCC M428-0000-1A-045-PX0825-020
BCC09HE	**BCC06K5**	**BCC09H9**
BCC M418-0000-1A-045-PX0825-050	BCC M428-0000-1A-044-PX0825-050	BCC M428-0000-1A-045-PX0825-050
BCC09HF	**BCC06K6**	**BCC09HA**
BCC M418-0000-1A-045-PX0825-100	BCC M428-0000-1A-044-PX0825-100	BCC M428-0000-1A-045-PX0825-100
	BCC0997	
	BCC M428-0000-1A-046-PS0825-020	
	BCC0998	
	BCC M428-0000-1A-046-PS0825-050	
	BCC0999	
	BCC M428-0000-1A-046-PS0825-100	

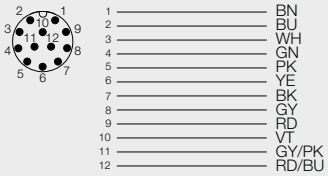




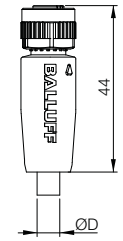


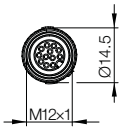


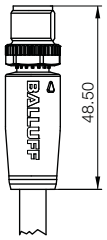
M12 female straight, 12-pin
M12 male straight, 12-pin

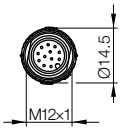
View of female/ Plug side			
Max. supply voltage AC U_B		30 V DC	30 V DC
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		12×0.25 mm²	12×0.25 mm²
Degree of protection as per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	–40...+90 °C/–25...+90 °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		BIC0009 Base	BIC000A Remote

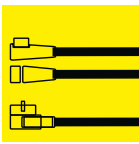
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC06UK**	**BCC06UU**
			BCC M41C-0000-1A-049-PX0C25-020	BCC M41C-0000-2A-049-PX0C25-020
PUR	Black	5 m	**BCC06UL**	**BCC06UW**
			BCC M41C-0000-1A-049-PX0C25-050	BCC M41C-0000-2A-049-PX0C25-050
PUR	Black	10 m	**BCC06UM**	**BCC06UY**
			BCC M41C-0000-1A-049-PX0C25-100	BCC M41C-0000-2A-049-PX0C25-100
PVC	Gray	2 m	**BCC06UP**	**BCC06UZ**
			BCC M41C-0000-1A-049-VX8C25-020	BCC M41C-0000-2A-049-VX8C25-020
PVC	Gray	5 m	**BCC06UR**	**BCC06W0**
			BCC M41C-0000-1A-049-VX8C25-050	BCC M41C-0000-2A-049-VX8C25-050
PVC	Gray	10 m	**BCC06UT**	**BCC06W1**
			BCC M41C-0000-1A-049-VX8C25-100	BCC M41C-0000-2A-049-VX8C25-100





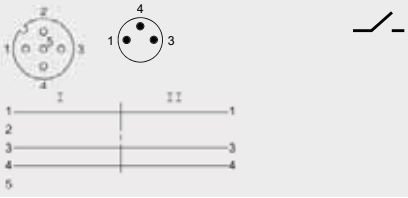
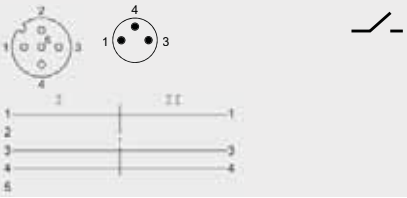






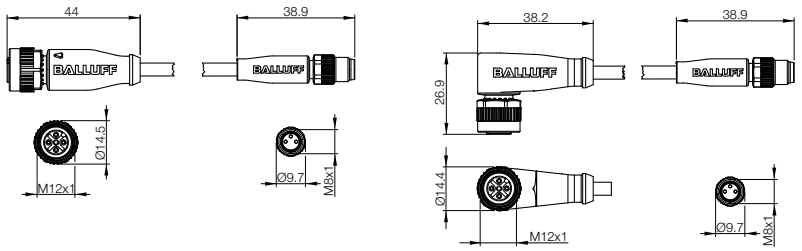
Connection Cables

M12 female straight or right-angle ↔ M8 male straight, 3-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		60 V AC	60 V AC
Max. supply voltage DC U_B		60 V DC	60 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as 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	–5...+105 °C/–5...+90 °C (UL 80 °C)	–5...+105 °C/–5...+90 °C (UL 80 °C)
Use		Normally open (NO) ⎍-	Normally open (NO) ⎍-
LED			

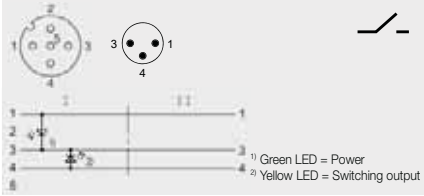
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC03M9** BCC M415-M313-3F-300-PX0334-003	**BCC03MU** BCC M425-M313-3F-300-PX0334-003
PUR	Black	0.6 m	**BCC03MA** BCC M415-M313-3F-300-PX0334-006	**BCC03MW** BCC M425-M313-3F-300-PX0334-006
PUR	Black	1 m	**BCC03MC** BCC M415-M313-3F-300-PX0334-010	**BCC03MY** BCC M425-M313-3F-300-PX0334-010
PUR	Black	1.5 m	**BCC03ME** BCC M415-M313-3F-300-PX0334-015	**BCC03MZ** BCC M425-M313-3F-300-PX0334-015
PUR	Black	2 m	**BCC03MF** BCC M415-M313-3F-300-PX0334-020	**BCC03N0** BCC M425-M313-3F-300-PX0334-020
PUR	Black	3 m	**BCC03MH** BCC M415-M313-3F-300-PX0334-030	**BCC03N1** BCC M425-M313-3F-300-PX0334-030
PUR	Black	5 m	**BCC03MJ** BCC M415-M313-3F-300-PX0334-050	**BCC03N2** BCC M425-M313-3F-300-PX0334-050
PVC	Gray	0.3 m	**BCC03NW** BCC M415-M313-3F-300-VX8334-003	**BCC03PC** BCC M425-M313-3F-300-VX8334-003
PVC	Gray	0.6 m	**BCC03NY** BCC M415-M313-3F-300-VX8334-006	**BCC03PE** BCC M425-M313-3F-300-VX8334-006
PVC	Gray	1 m	**BCC03NZ** BCC M415-M313-3F-300-VX8334-010	**BCC03PF** BCC M425-M313-3F-300-VX8334-010
PVC	Gray	1.5 m	**BCC03P0** BCC M415-M313-3F-300-VX8334-015	**BCC03PH** BCC M425-M313-3F-300-VX8334-015
PVC	Gray	2 m	**BCC03P1** BCC M415-M313-3F-300-VX8334-020	**BCC03PJ** BCC M425-M313-3F-300-VX8334-020
PVC	Gray	3 m	**BCC03P2** BCC M415-M313-3F-300-VX8334-030	**BCC03PK** BCC M425-M313-3F-300-VX8334-030
PVC	Gray	5 m	**BCC03P3** BCC M415-M313-3F-300-VX8334-050	**BCC03PL** BCC M425-M313-3F-300-VX8334-050

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



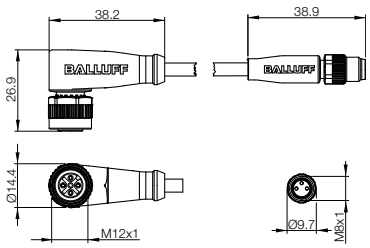
Connection Cables

M12 female right-angle ↔ M8 male straight, 3-pin, with LED



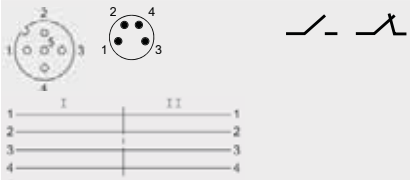
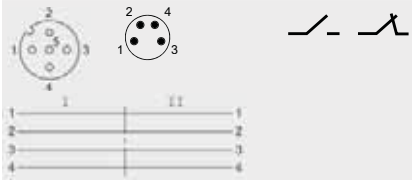
30 V DC	
Molded	
3×0.34 mm²	
IP 67	
–25...+90 °C/–25...+90 °C (UL 80 °C)	
–5...+105 °C/–5...+90 °C (UL 80 °C)	
PNP normally open (NO) ⎍-	
Green/yellow	

Ordering code		
Part number		
BCC03NA		
BCC M425-M313-3F-602-PX0334-003		
BCC03NC		
BCC M425-M313-3F-602-PX0334-006		
BCC03NE		
BCC M425-M313-3F-602-PX0334-010		
BCC03NF		
BCC M425-M313-3F-602-PX0334-015		
BCC03NH		
BCC M425-M313-3F-602-PX0334-020		
BCC03NJ		
BCC M425-M313-3F-602-PX0334-030		
BCC03NK		
BCC M425-M313-3F-602-PX0334-050		
BCC03PY		
BCC M425-M313-3F-602-VX8334-003		
BCC03PZ		
BCC M425-M313-3F-602-VX8334-006		
BCC03R0		
BCC M425-M313-3F-602-VX8334-010		
BCC03R1		
BCC M425-M313-3F-602-VX8334-015		
BCC03R2		
BCC M425-M313-3F-602-VX8334-020		
BCC03R3		
BCC M425-M313-3F-602-VX8334-030		
BCC03R4		
BCC M425-M313-3F-602-VX8334-050		



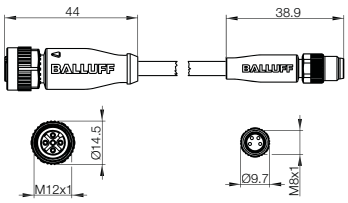
Connection Cables

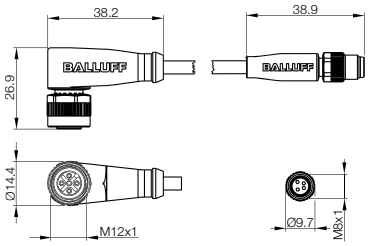
M12 female straight or right-angle ↔ M8 male straight, 4-pin, without LED

Connector diagram and wiring			
Max. supply voltage AC U_B		30 V AC	30 V AC
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	4×0.34 mm²
Degree of protection as 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	–5...+105 °C/–5...+90 °C (UL 80 °C)	–5...+105 °C/–5...+90 °C (UL 80 °C)
Use		Complementary (NO/NC) ⌐-/-⌐	Complementary (NO/NC) ⌐-/-⌐
LED			

Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC03RE** BCC M415-M314-3F-304-PX0434-003	**BCC03RZ** BCC M425-M314-3F-304-PX0434-003
PUR	Black	0.6 m	**BCC03RF** BCC M415-M314-3F-304-PX0434-006	**BCC03T0** BCC M425-M314-3F-304-PX0434-006
PUR	Black	1 m	**BCC03RH** BCC M415-M314-3F-304-PX0434-010	**BCC03T1** BCC M425-M314-3F-304-PX0434-010
PUR	Black	1.5 m	**BCC03RJ** BCC M415-M314-3F-304-PX0434-015	**BCC03T2** BCC M425-M314-3F-304-PX0434-015
PUR	Black	2 m	**BCC03RK** BCC M415-M314-3F-304-PX0434-020	**BCC03T3** BCC M425-M314-3F-304-PX0434-020
PUR	Black	3 m	**BCC03RL** BCC M415-M314-3F-304-PX0434-030	**BCC03T4** BCC M425-M314-3F-304-PX0434-030
PUR	Black	5 m	**BCC03RM** BCC M415-M314-3F-304-PX0434-050	**BCC03T5** BCC M425-M314-3F-304-PX0434-050
PVC	Gray	0.3 m	**BCC03TP** BCC M415-M314-3F-304-VX8434-003	**BCC03U7** BCC M425-M314-3F-304-VX8434-003
PVC	Gray	0.6 m	**BCC03TR** BCC M415-M314-3F-304-VX8434-006	**BCC03U8** BCC M425-M314-3F-304-VX8434-006
PVC	Gray	1 m	**BCC03TT** BCC M415-M314-3F-304-VX8434-010	**BCC03U9** BCC M425-M314-3F-304-VX8434-010
PVC	Gray	1.5 m	**BCC03TU** BCC M415-M314-3F-304-VX8434-015	**BCC03UA** BCC M425-M314-3F-304-VX8434-015
PVC	Gray	2 m	**BCC03TW** BCC M415-M314-3F-304-VX8434-020	**BCC03UC** BCC M425-M314-3F-304-VX8434-020
PVC	Gray	3 m	**BCC03TY** BCC M415-M314-3F-304-VX8434-030	**BCC03UE** BCC M425-M314-3F-304-VX8434-030
PVC	Gray	5 m	**BCC03TZ** BCC M415-M314-3F-304-VX8434-050	**BCC03UF** BCC M425-M314-3F-304-VX8434-050

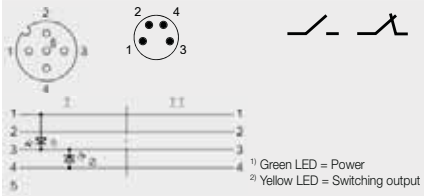
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.





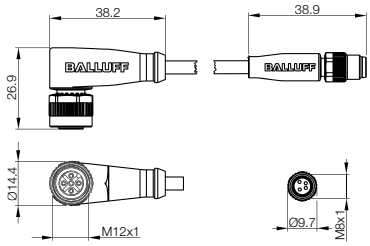
Connection Cables

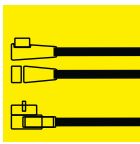
M12 female right-angle ↔ M8 male straight, 4-pin, with LED



30 V DC			
Molded			
4×0.34 mm²			
IP 67			
–25...+90 °C/–25...+90 °C (UL 80 °C)			
–5...+105 °C/–5...+90 °C (UL 80 °C)			
PNP complementary (NO/NC) ⎍-/-⎍			
Green/yellow			

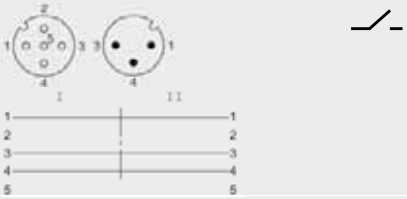
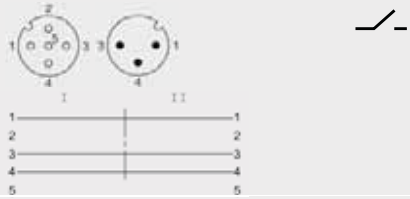
Ordering code			
Part number			
BCC03TF			
BCC M425-M314-3F-606-PX0434-003			
BCC03TH			
BCC M425-M314-3F-606-PX0434-006			
BCC03TJ			
BCC M425-M314-3F-606-PX0434-010			
BCC03TK			
BCC M425-M314-3F-606-PX0434-015			
BCC03TL			
BCC M425-M314-3F-606-PX0434-020			
BCC03TM			
BCC M425-M314-3F-606-PX0434-030			
BCC03TN			
BCC M425-M314-3F-606-PX0434-050			
BCC03UR			
BCC M425-M314-3F-606-VX8434-003			
BCC03UT			
BCC M425-M314-3F-606-VX8434-006			
BCC03UU			
BCC M425-M314-3F-606-VX8434-010			
BCC03UW			
BCC M425-M314-3F-606-VX8434-015			
BCC03UY			
BCC M425-M314-3F-606-VX8434-020			
BCC03UZ			
BCC M425-M314-3F-606-VX8434-030			
BCC03W0			
BCC M425-M314-3F-606-VX8434-050			





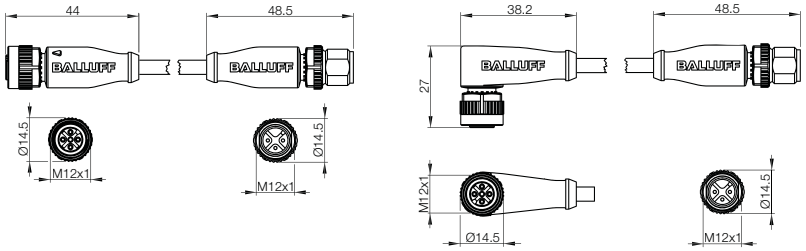
Connection Cables

M12 female straight or right-angle ↔ M12 male straight, 3-pin, without LED

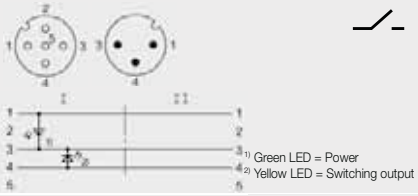
Connector diagram and wiring			
Max. supply voltage AC U_B		250 V AC	250 V AC
Max. supply voltage DC U_B		250 V DC	250 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as per IEC 60529		IP 68	IP 68
Ambient temperature T_a	PUR	–40...+90 °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			

Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC036Y** BCC M415-M413-3A-300-PX0334-003	**BCC037E** BCC M425-M413-3A-300-PX0334-003
PUR	Black	0.6 m	**BCC036Z** BCC M415-M413-3A-300-PX0334-006	**BCC037F** BCC M425-M413-3A-300-PX0334-006
PUR	Black	1 m	**BCC0370** BCC M415-M413-3A-300-PX0334-010	**BCC037H** BCC M425-M413-3A-300-PX0334-010
PUR	Black	1.5 m	**BCC0371** BCC M415-M413-3A-300-PX0334-015	**BCC037J** BCC M425-M413-3A-300-PX0334-015
PUR	Black	2 m	**BCC0372** BCC M415-M413-3A-300-PX0334-020	**BCC037K** BCC M425-M413-3A-300-PX0334-020
PUR	Black	3 m	**BCC0373** BCC M415-M413-3A-300-PX0334-030	**BCC037L** BCC M425-M413-3A-300-PX0334-030
PUR	Black	5 m	**BCC0374** BCC M415-M413-3A-300-PX0334-050	**BCC037M** BCC M425-M413-3A-300-PX0334-050
PVC	Gray	0.3 m	**BCC0386** BCC M415-M413-3A-300-VX8334-003	**BCC038P** BCC M425-M413-3A-300-VX8334-003
PVC	Gray	0.6 m	**BCC0387** BCC M415-M413-3A-300-VX8334-006	**BCC038R** BCC M425-M413-3A-300-VX8334-006
PVC	Gray	1 m	**BCC0388** BCC M415-M413-3A-300-VX8334-010	**BCC038T** BCC M425-M413-3A-300-VX8334-010
PVC	Gray	1.5 m	**BCC0389** BCC M415-M413-3A-300-VX8334-015	**BCC038U** BCC M425-M413-3A-300-VX8334-015
PVC	Gray	2 m	**BCC038A** BCC M415-M413-3A-300-VX8334-020	**BCC038W** BCC M425-M413-3A-300-VX8334-020
PVC	Gray	3 m	**BCC038C** BCC M415-M413-3A-300-VX8334-030	**BCC038Y** BCC M425-M413-3A-300-VX8334-030
PVC	Gray	5 m	**BCC038E** BCC M415-M413-3A-300-VX8334-050	**BCC038Z** BCC M425-M413-3A-300-VX8334-050

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

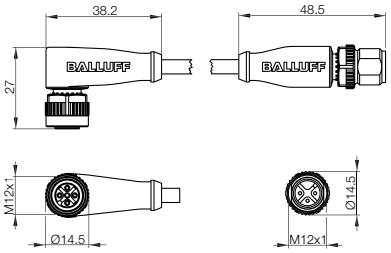


M12 female right-angle ↔ M12 male straight, 3-pin, with LED



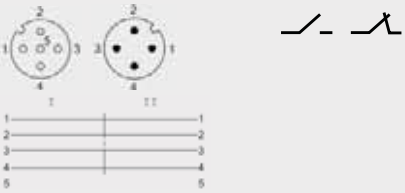
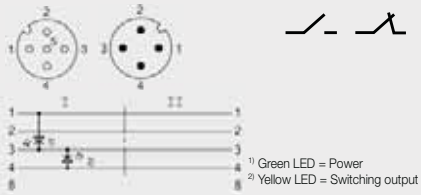
30 V DC	
Molded	
3×0.34 mm²	
IP 68	
–40...+90 °C/–25...+90 °C (UL 80° C)	
–40...+105 °C/–5...+105 °C (UL 80 °C)	
PNP normally open (NO) ⎍-	
Green/yellow	

Ordering code		
Part number		
BCC037Z		
BCC M425-M413-3A-602-PX0334-003		
BCC0380		
BCC M425-M413-3A-602-PX0334-006		
BCC0381		
BCC M425-M413-3A-602-PX0334-010		
BCC0382		
BCC M425-M413-3A-602-PX0334-015		
BCC0383		
BCC M425-M413-3A-602-PX0334-020		
BCC0384		
BCC M425-M413-3A-602-PX0334-030		
BCC0385		
BCC M425-M413-3A-602-PX0334-050		
BCC0397		
BCC M425-M413-3A-602-VX8334-003		
BCC0398		
BCC M425-M413-3A-602-VX8334-006		
BCC0399		
BCC M425-M413-3A-602-VX8334-010		
BCC039A		
BCC M425-M413-3A-602-VX8334-015		
BCC039C		
BCC M425-M413-3A-602-VX8334-020		
BCC039E		
BCC M425-M413-3A-602-VX8334-030		
BCC039F		
BCC M425-M413-3A-602-VX8334-050		



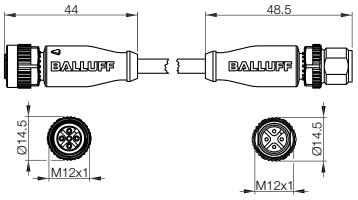
Connection Cables

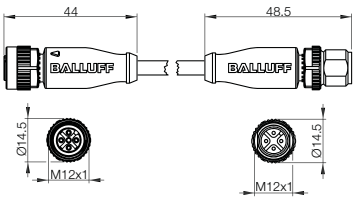
M12 female straight ↔ M12 male straight, 4-pin, without and with LED

Connector diagram and wiring			
Max. supply voltage AC U_B		250 V AC	
Max. supply voltage DC U_B		250 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		4×0.34 mm²	4×0.34 mm²
Degree of protection as 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) ⎍-/⎍	Complementary (NO/NC) ⎍-/⎍
LED			Green/yellow

Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC039H** BCC M415-M414-3A-304-PX0434-003	**BCC03A1** BCC M415-M414-3A-606-PX0434-003
PUR	Black	0.6 m	**BCC039J** BCC M415-M414-3A-304-PX0434-006	**BCC03A2** BCC M415-M414-3A-606-PX0434-006
PUR	Black	1 m	**BCC039K** BCC M415-M414-3A-304-PX0434-010	**BCC03A3** BCC M415-M414-3A-606-PX0434-010
PUR	Black	1.5 m	**BCC039L** BCC M415-M414-3A-304-PX0434-015	**BCC03A4** BCC M415-M414-3A-606-PX0434-015
PUR	Black	2 m	**BCC039M** BCC M415-M414-3A-304-PX0434-020	**BCC03A5** BCC M415-M414-3A-606-PX0434-020
PUR	Black	3 m	**BCC039N** BCC M415-M414-3A-304-PX0434-030	**BCC03A6** BCC M415-M414-3A-606-PX0434-030
PUR	Black	5 m	**BCC039P** BCC M415-M414-3A-304-PX0434-050	**BCC03A7** BCC M415-M414-3A-606-PX0434-050
PVC	Gray	0.3 m	**BCC03C9** BCC M415-M414-3A-304-VX8434-003	**BCC03CU** BCC M415-M414-3A-606-VX8434-003
PVC	Gray	0.6 m	**BCC03CA** BCC M415-M414-3A-304-VX8434-006	**BCC03CW** BCC M415-M414-3A-606-VX8434-006
PVC	Gray	1 m	**BCC03CC** BCC M415-M414-3A-304-VX8434-010	**BCC03CY** BCC M415-M414-3A-606-VX8434-010
PVC	Gray	1.5 m	**BCC03CE** BCC M415-M414-3A-304-VX8434-015	**BCC03CZ** BCC M415-M414-3A-606-VX8434-015
PVC	Gray	2 m	**BCC03CF** BCC M415-M414-3A-304-VX8434-020	**BCC03E0** BCC M415-M414-3A-606-VX8434-020
PVC	Gray	3 m	**BCC03CH** BCC M415-M414-3A-304-VX8434-030	**BCC03E1** BCC M415-M414-3A-606-VX8434-030
PVC	Gray	5 m	**BCC03CJ** BCC M415-M414-3A-304-VX8434-050	**BCC03E2** BCC M415-M414-3A-606-VX8434-050

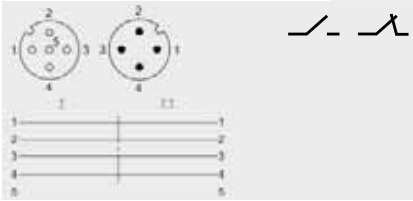
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

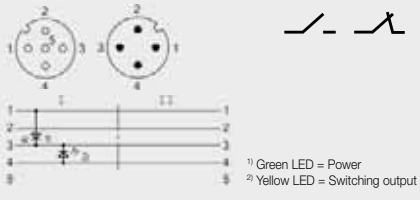


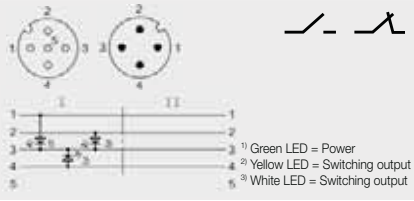


Connection Cables

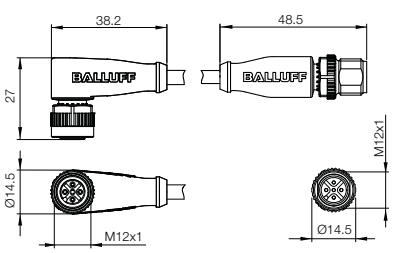
M12 female right-angle ↔ M12 male straight, 4-pin, without and with LED

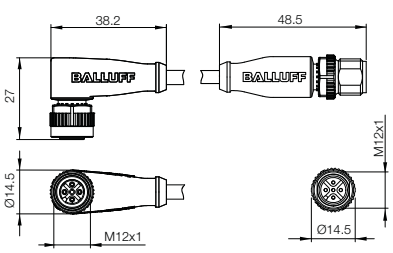


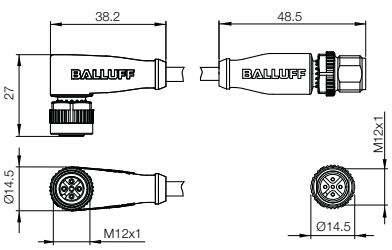




	250 V AC		
	250 V DC	30 V DC	30 V DC
	Molded	Molded	Molded
	4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
	IP 68	IP 68	IP 68
	–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)	–40...+90 °C/–25...+90 °C (UL 80° C)
	–40...+105 °C/–5...+105 °C (UL 80 °C)	–40...+105 °C/–5...+105 °C (UL 80 °C)	–40...+105 °C/–5...+105 °C (UL 80 °C)
	Complementary (NO/NC) ⎍-/⎍	PNP complementary (NO/NC) ⎍-/⎍	PNP complementary (NO/NC) ⎍-/⎍
		Green/yellow	Green/yellow/white
Ordering code			
Part number			
BCC03A8	**BCC03AT**	**BCC03C2**
BCC M425-M414-3A-304-PX0434-003	BCC M425-M414-3A-606-PX0434-003	BCC M425-M414-3A-650-PX0434-003
BCC03A9	**BCC03AU**	**BCC03C3**
BCC M425-M414-3A-304-PX0434-006	BCC M425-M414-3A-606-PX0434-006	BCC M425-M414-3A-650-PX0434-006
BCC03AA	**BCC03AW**	**BCC03C4**
BCC M425-M414-3A-304-PX0434-010	BCC M425-M414-3A-606-PX0434-010	BCC M425-M414-3A-650-PX0434-010
BCC03AC	**BCC03AY**	**BCC03C5**
BCC M425-M414-3A-304-PX0434-015	BCC M425-M414-3A-606-PX0434-015	BCC M425-M414-3A-650-PX0434-015
BCC03AE	**BCC03AZ**	**BCC03C6**
BCC M425-M414-3A-304-PX0434-020	BCC M425-M414-3A-606-PX0434-020	BCC M425-M414-3A-650-PX0434-020
BCC03AF	**BCC03C0**	**BCC03C7**
BCC M425-M414-3A-304-PX0434-030	BCC M425-M414-3A-606-PX0434-030	BCC M425-M414-3A-650-PX0434-030
BCC03AH	**BCC03C1**	**BCC03C8**
BCC M425-M414-3A-304-PX0434-050	BCC M425-M414-3A-606-PX0434-050	BCC M425-M414-3A-650-PX0434-050
BCC03E3	**BCC03EL**	**BCC03EW**
BCC M425-M414-3A-304-VX8434-003	BCC M425-M414-3A-606-VX8434-003	BCC M425-M414-3A-650-VX8434-003
BCC03E4	**BCC03EM**	**BCC03Y4**
BCC M425-M414-3A-304-VX8434-006	BCC M425-M414-3A-606-VX8434-006	BCC M425-M414-3A-650-VX8434-006
BCC03E5	**BCC03EN**	**BCC03EZ**
BCC M425-M414-3A-304-VX8434-010	BCC M425-M414-3A-606-VX8434-010	BCC M425-M414-3A-650-VX8434-010
BCC03E6	**BCC03EP**	**BCC03F0**
BCC M425-M414-3A-304-VX8434-015	BCC M425-M414-3A-606-VX8434-015	BCC M425-M414-3A-650-VX8434-015
BCC03E7	**BCC03ER**	**BCC03F1**
BCC M425-M414-3A-304-VX8434-020	BCC M425-M414-3A-606-VX8434-020	BCC M425-M414-3A-650-VX8434-020
BCC03E8	**BCC03ET**	**BCC03F2**
BCC M425-M414-3A-304-VX8434-030	BCC M425-M414-3A-606-VX8434-030	BCC M425-M414-3A-650-VX8434-030
BCC03E9	**BCC03EU**	**BCC03F3**
BCC M425-M414-3A-304-VX8434-050	BCC M425-M414-3A-606-VX8434-050	BCC M425-M414-3A-650-VX8434-050

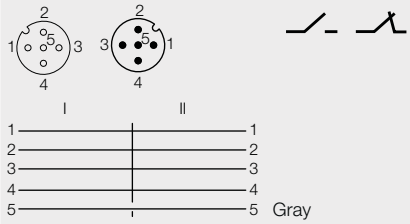
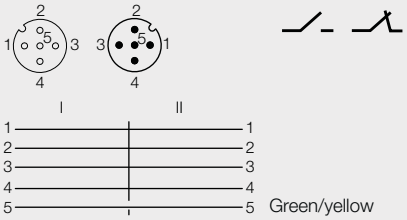






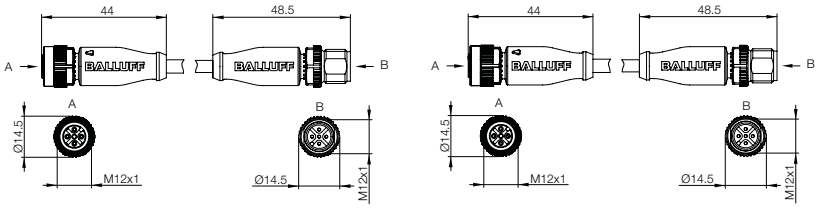
M12 ↔ M12

M12 female straight ↔ M12 male straight, 5-pin, no LED

Connector diagram and wiring			 Gray	 Green/yellow
Max. supply voltage AC U_B			125 V AC	125 V AC
Max. supply voltage DC U_B			125 V DC	125 V DC
Cable			Molded	Molded
Number of conductors × conductor cross-section			5×0.34 mm²	5×0.34 mm²
Degree of protection as per IEC 60529			IP 68	IP 68
Ambient temperature T_a	Static	PUR	–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)
	Tensioned	PUR	–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)
Use			Normally open and normally closed	Normally open and normally closed
LED				

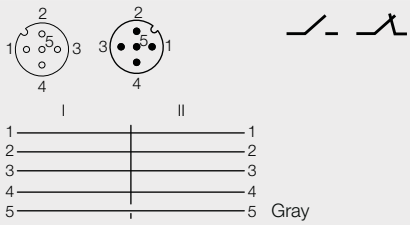
Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC09FL** BCC M415-M415-3A-312-PX0534-003	**BCC09FW** BCC M415-M415-3A-313-PX0534-003
PUR	Black	0.6 m	**BCC09FM** BCC M415-M415-3A-312-PX0534-006	**BCC09FY** BCC M415-M415-3A-313-PX0534-006
PUR	Black	1 m	**BCC09FN** BCC M415-M415-3A-312-PX0534-010	**BCC09FZ** BCC M415-M415-3A-313-PX0534-010
PUR	Black	1.5 m	**BCC09FP** BCC M415-M415-3A-312-PX0534-015	**BCC09H0** BCC M415-M415-3A-313-PX0534-015
PUR	Black	2 m	**BCC09FR** BCC M415-M415-3A-312-PX0534-020	**BCC09H1** BCC M415-M415-3A-313-PX0534-020
PUR	Black	3 m	**BCC09FT** BCC M415-M415-3A-312-PX0534-030	**BCC09H2** BCC M415-M415-3A-313-PX0534-030
PUR	Black	5 m	**BCC09FU** BCC M415-M415-3A-312-PX0534-050	**BCC09H3** BCC M415-M415-3A-313-PX0534-050
PUR	Black	10 m		**BCC0AJC** BCC M415-M415-3A-313-PX0534-100

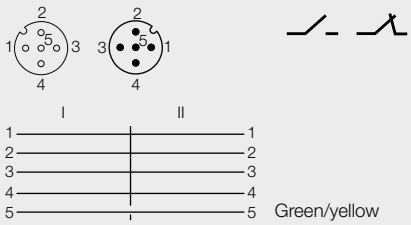
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

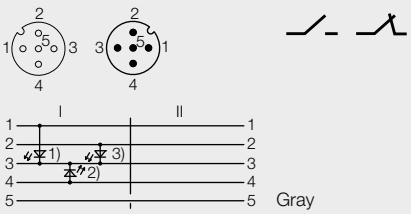


Connection Cables

M12 female right-angle ↔ M12 male straight, 5-pin, with and without LED

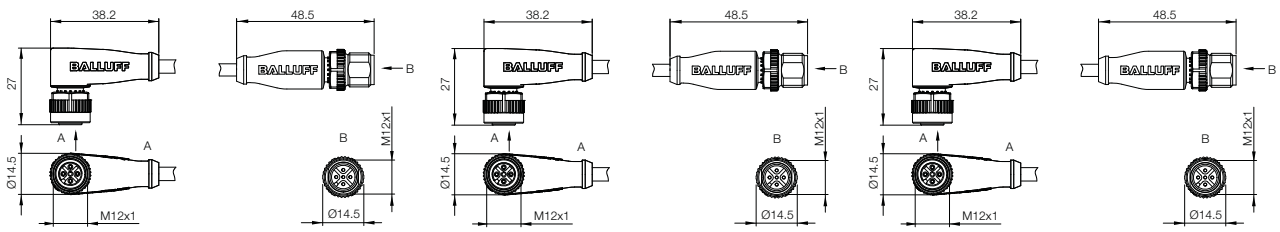






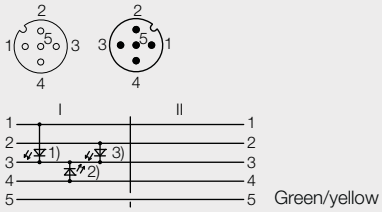
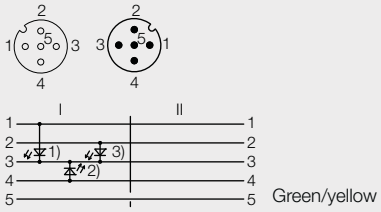
125 V AC	125 V AC	
125 V DC	125 V DC	30 V DC
Molded	Molded	Molded
5×0.34 mm²	5×0.34 mm²	5×0.34 mm²
IP 68	IP 68	IP 68
–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)
–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)
Normally open and normally closed	Normally open and normally closed	Normally open and normally closed
		Green/yellow/white

Ordering code		
Part number		
BCC08H8	**BCC08H0**	**BCC09FA**
BCC M425-M415-3A-312-PX0534-003	BCC M425-M415-3A-313-PX0534-003	BCC M425-M415-3A-660-PX0534-003
BCC08H9	**BCC08H1**	**BCC09FC**
BCC M425-M415-3A-312-PX0534-006	BCC M425-M415-3A-313-PX0534-006	BCC M425-M415-3A-660-PX0534-006
BCC08HA	**BCC08H2**	**BCC09FE**
BCC M425-M415-3A-312-PX0534-010	BCC M425-M415-3A-313-PX0534-010	BCC M425-M415-3A-660-PX0534-010
BCC08HC	**BCC08H3**	**BCC09FH**
BCC M425-M415-3A-312-PX0534-015	BCC M425-M415-3A-313-PX0534-015	BCC M425-M415-3A-660-PX0534-015
BCC08HE	**BCC08H4**	**BCC09FF**
BCC M425-M415-3A-312-PX0534-020	BCC M425-M415-3A-313-PX0534-020	BCC M425-M415-3A-660-PX0534-020
BCC08HF	**BCC08H5**	**BCC09FJ**
BCC M425-M415-3A-312-PX0534-030	BCC M425-M415-3A-313-PX0534-030	BCC M425-M415-3A-660-PX0534-030
BCC08HH	**BCC08H6**	**BCC09FK**
BCC M425-M415-3A-312-PX0534-050	BCC M425-M415-3A-313-PX0534-050	BCC M425-M415-3A-660-PX0534-050



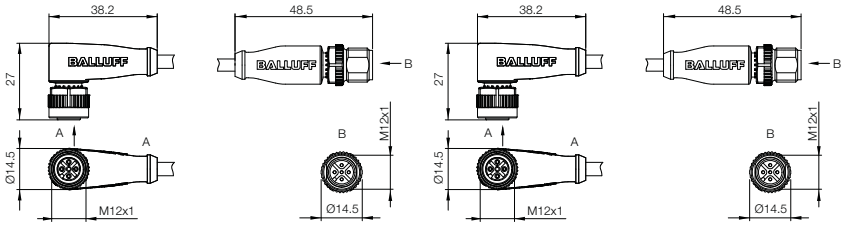
Connection Cables

M12 female right-angle ↔ M12 male straight, 5-pin, with LED

Connector diagram and wiring			 Green/yellow	 Green/yellow	
Max. supply voltage AC U_B					
Max. supply voltage DC U_B			30 V DC	30 V DC	
Cable			Molded	Molded	
Number of conductors × conductor cross-section			5×0.34 mm²	5×0.34 mm²	
Degree of protection as per IEC 60529			IP 68	IP 68	
Ambient temperature T_a	Static	PUR	–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)	
	Tensioned	PUR	–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)	
LED			Green/yellow/white	green/yellow/red	

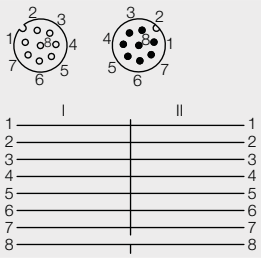
Cable material	Color	Length	Ordering code		
			Part number		
PUR	Black	0.3 m	**BCC09F9**	**BCC0C4J**	
			BCC M425-M415-3A-661-PX0534-003	BCC M425-M415-3A-692-PX0534-003	
PUR	Black	0.6 m	**BCC09F8**	**BCC0C4H**	
			BCC M425-M415-3A-661-PX0534-006	BCC M425-M415-3A-692-PX0534-006	
PUR	Black	1 m	**BCC09F7**	**BCC0C4F**	
			BCC M425-M415-3A-661-PX0534-010	BCC M425-M415-3A-692-PX0534-010	
PUR	Black	1.5 m	**BCC09F3**	**BCC0C4E**	
			BCC M425-M415-3A-661-PX0534-015	BCC M425-M415-3A-692-PX0534-015	
PUR	Black	2 m	**BCC09F4**	**BCC0C4C**	
			BCC M425-M415-3A-661-PX0534-020	BCC M425-M415-3A-692-PX0534-020	
PUR	Black	3 m	**BCC09F5**	**BCC0C4A**	
			BCC M425-M415-3A-661-PX0534-030	BCC M425-M415-3A-692-PX0534-030	
PUR	Black	5 m	**BCC09F6**	**BCC0C49**	
			BCC M425-M415-3A-661-PX0534-050	BCC M425-M415-3A-692-PX0534-050	

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



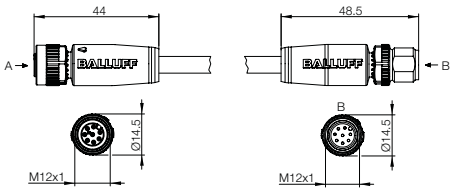
Connection Cables

M12 female straight ↔ M12 male straight, 8-pin, without LED



60 V AC			
60 V DC			
Molded			
8×0.25 mm²			
IP 68			
–40...+90 °C (UL 80 °C)			
–25...+90 °C (UL 80 °C)			

Ordering code		
Part number		
BCC0AC0		
BCC M418-M418-3A-342-PX0825-003		
BCC0AAZ		
BCC M418-M418-3A-342-PX0825-006		
BCC0AC1		
BCC M418-M418-3A-342-PX0825-010		
BCC0AC2		
BCC M418-M418-3A-342-PX0825-015		
BCC0AC3		
BCC M418-M418-3A-342-PX0825-020		
BCC0AC4		
BCC M418-M418-3A-342-PX0825-030		
BCC0AC5		
BCC M418-M418-3A-342-PX0825-050		

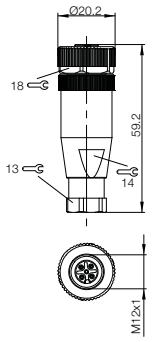


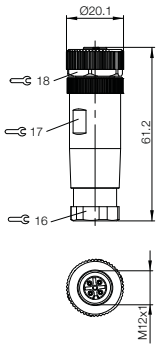
M12 female straight and right-angle, User-fabricated

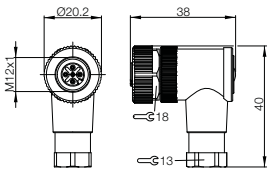


Connector diagram			
Version	M12 female straight	M12 female straight	M12 female right-angle
Max. supply voltage AC U_B	250 V AC	250 V AC	250 V AC
Max. supply voltage DC U_B	250 V DC	250 V DC	250 V DC
Cable	User-fabricated	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	4×0.14...0.75 mm²	4×0.14...0.50 mm²	4×0.14...0.75 mm²
Connection	Screw terminal	Spring clamp terminal	Screw terminal
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67
Ambient temperature T_a	–40...+85 °C	–25...+85 °C	–40...+85 °C

Cable dia.	**Ordering code**		
	Part number		
Ø 4...6 mm, no LED, NO and NC	**BCC06Z9** BCC M435-0000-1A-000-41X475-000		**BCC06ZA** BCC M445-0000-1A-000-41X475-000
Ø 6...8 mm, no LED, NO and NC	**BCC06F6** BCC M435-0000-1A-000-51X475-000	**BCC06Y6** BCC M435-0000-1A-000-55X450-000	**BCC06Y8** BCC M445-0000-1A-000-51X475-000







M12 male straight and right-angle, M12 female straight and right-angle, user-fabricated



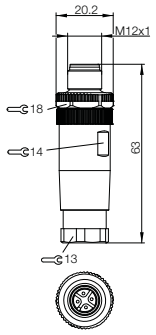


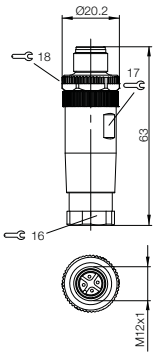


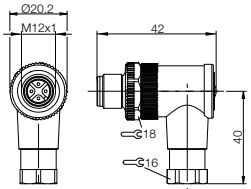


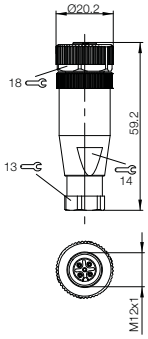
M12 male, straight	M12 male, straight	M12 male right-angle	M12 female straight	M12 female right-angle
250 V AC	250 V AC	250 V AC	125 V AC	125 V AC
250 V DC	250 V DC	250 V DC	125 V DC	125 V DC
User-fabricated	User-fabricated	User-fabricated	User-fabricated	User-fabricated
4×0.14...0.75 mm²	4×0.14...0.50 mm²	4×0.14...0.75 mm²	5×0.14...0.75 mm²	5×0.14...0.75 mm²
Screw terminal	Spring clamp terminal	Screw terminal	Screw terminal	Screw terminal
IP 67	IP 67	IP 67	IP 67	IP 67
–40...+85 °C	–25...+85 °C	–40...+85 °C	–40...+85 °C	–40...+85 °C

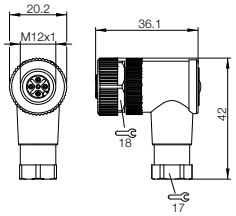
Ordering code				
Part number				
BCC06M4		**BCC06ZC**	**BCC06ZF**	**BCC06ZH**
BCC M434-0000-2A-000-41X475-000		BCC M444-0000-2A-000-41X475-000	BCC M435-000-1A-000-41X575-000	BCC M445-000-1A-000-41X575-000
BCC06F7	**BCC06Y5**	**BCC06ZE**	**BCC06W9**	**BCC06ZJ**
BCC M434-0000-2A-000-51X475-000	BCC M434-0000-2A-000-55X450-000	BCC M444-0000-2A-000-51X475-000	BCC M435-0000-1A-000-51X575-000	BCC M445-0000-1A-000-51X575-000









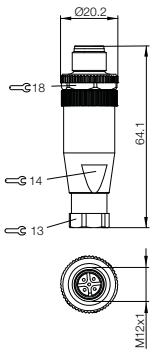


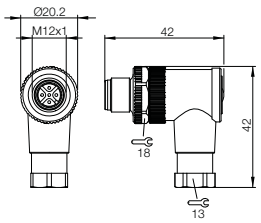
M12 male straight and right-angle, M12 female straight, User-fabricated

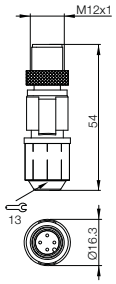


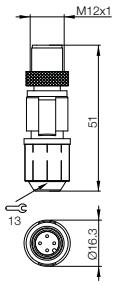

Connector diagram				
Version	Male straight	Male right-angle	Male straight	Female straight
Max. supply voltage AC U_B	125 V AC	125 V AC	125 V AC	125 V AC
Max. supply voltage DC U_B	125 V DC	125 V DC	125 V DC	125 V DC
Cable	User-fabricated	User-fabricated	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	5×0.14...0.75 mm²	5×0.14...0.75 mm²	4×0.14...0.34 mm²	4×0.14...0.34 mm²
Cable diameter			Ø 3.5...6 mm	Ø 3.5...6 mm
Connection	Screw terminal	Screw terminal	Insulation displacement connector technology	Insulation displacement connector technology
Degree of protection as per IEC 60529	IP 67	IP 67	IP 67	IP 67
Ambient temperature T_a	–40...+85 °C	–40...+85 °C	–25...+80 °C	–25...+80 °C
Use			Female S4	Plug sensor S4

Cable dia.	Ordering code			
	Part number			
Ø 4...6 mm, no LED, NO and NC	**BCC06YA** BCC M435-0000-2A-000-41X575-000	**BCC06ZK** BCC M445-000-2A-000-41X575-000	**BCC08C0** BCC M434-0000-2A-000-43X434-000	**BCC06ZY** BCC M435-0000-1A-000-43X434-000
Ø 6...8 mm, no LED, NO and NC	**BCC06EY** BCC M435-0000-2A-000-51X575-000	**BCC06ZL** BCC M445-0000-2A-000-51X575-000		









M12 male straight and right-angle, M12 female straight and right-angle, user-fabricated

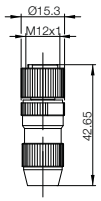
Quick-connect system

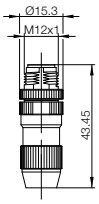
Quick-connect system

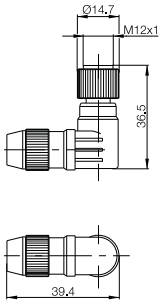
Quick-connect system

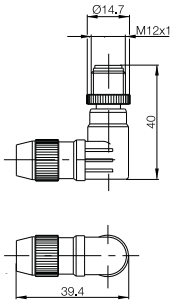
Quick-connect system

				
	Female straight	Male straight	Female right-angle	Male right-angle
	30 V AC	30 V AC	30 V AC	30 V AC
	30 V DC	30 V DC	30 V DC	30 V DC
	User-fabricated	User-fabricated	User-fabricated	User-fabricated
	4×0.14...0.34 mm²	4×0.14...0.34 mm²	4×0.25...0.5 mm²	4×0.25...0.5 mm²
	Ø 2.9...5.1 mm	Ø 2.9...5.1 mm	Ø 4...5.1 mm	Ø 4...5.1 mm
	Insulation displacement connector technology	Insulation displacement connector technology	Insulation displacement connector technology	Insulation displacement connector technology
	IP 67	IP 67	IP 67	IP 67
	–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C
	Plug sensor S4	Female S4	Plug sensor S4	Female S4
Ordering code				
Part number				
	BCC02H8	**BCC02H9**	**BCC02H6**	**BCC02H7**
	BKS-S107-RT14	BKS-S109-RT14	BKS-S 76-RT04	BKS-S 77-RT04





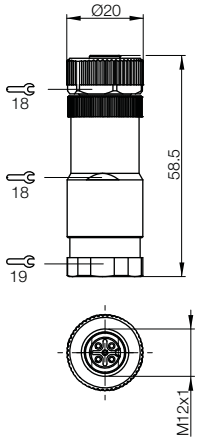


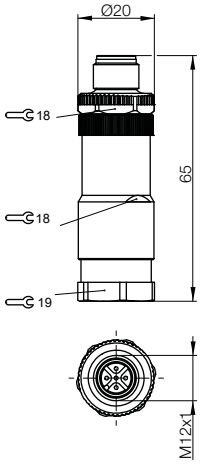


M12 female straight, M12 male straight, user-fabricated, for two cables

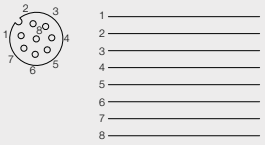
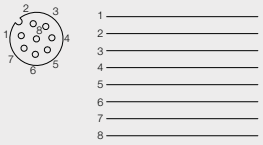
Connector diagram		
Version	Female straight	Male straight
Max. supply voltage AC U_B	125 V AC	125 V AC
Max. supply voltage DC U_B	125 V DC	125 V DC
Cable	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	5×0.14...0.75 mm²	5×0.14...0.75 mm²
Cable diameter 1/2	2.1...3mm/4...5 mm	2.1...3mm/4...5 mm
Connection	Screw terminal	Screw terminal
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–40...+85 °C	–40...+85 °C

Cable material	**Ordering code**	
	Part number	
PUR	**BCC09JP**	**BCC09JW**
	BCC M435-0000-1A-000-A1X575-000	BCC M435-0000-2A-000-A1X575-000

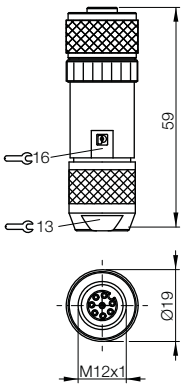


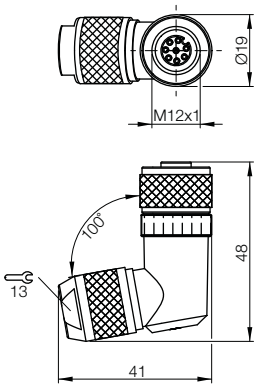


M12 female straight and right-angle, 8-pin, user-fabricated

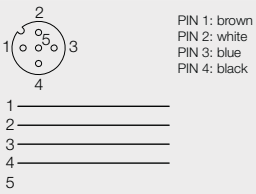
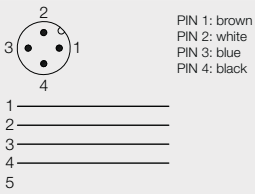
View of female/ male side		
Version	Female straight	Female right-angle
Max. supply voltage AC U_B	30 V AC	30 V AC
Max. supply voltage DC U_B	30 V DC	30 V DC
Cable diameter	4...8 mm	4...8 mm
Cable	User-fabricated	User-fabricated
Number of conductors × conductor cross-section	8×0.14...0.25 mm²	8×0.14...0.25 mm²
Housing material	CuZn	CuZn
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C
Use	BPI, M8, 3-pin, 8-way, BIC	BPI, M8, 3-pin, 8-way, BIC

	Ordering code	
	Part number	
	BCC04MC	**BCC04ME**
	BCC M478-0000-1A-000-43X834-000	BCC M488-0000-1A-000-43X834-000



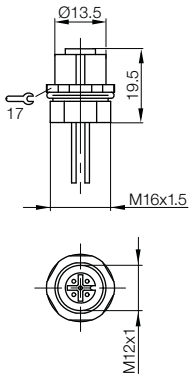


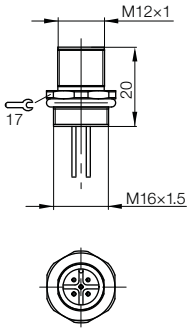
M12 flange socket, M12 flange plug, 4-pin

Connector diagram and wiring		
Max. supply voltage AC U_B	250 V	250 V
Max. supply voltage DC U_B	250 V	250 V
Number of conductors × conductor cross-section	4×0.25 mm²	4×0.25 mm²
Degree of protection as per IEC 60529	IP 68	IP 68
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

Cable length	**Ordering code**	
	Part number	
0.5 m	**BCC099C**	**BCC099A**
	BCC M455-0000-1A-RM020-005	BCC M454-0000-2A-RM020-005
2 m	**BCC0CAE**	**BCC0E53**
	BCC M455-0000-1A-RM020-020	BCC M454-0000-2A-RM020-020

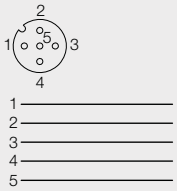
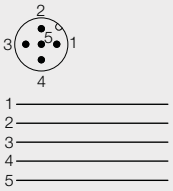
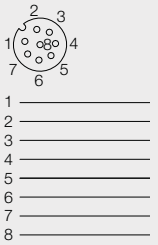
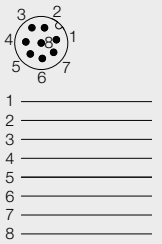
Other cable lengths on request.



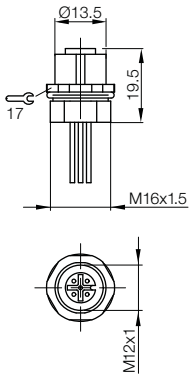


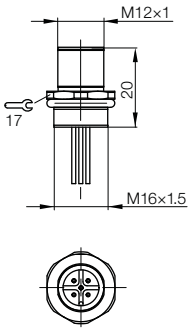
Plug connector
M12 flange socket, M12 flange plug, 5-pin and 8-pin

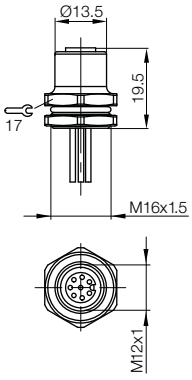


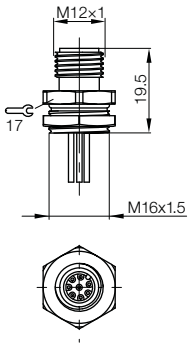

			
250 V	250 V	60 V	60 V
250 V	250 V	60 V	60 V
5×0.25 mm²	5×0.25 mm²	8×0.25 mm²	8×0.25 mm²
IP 68	IP 68	IP 68	IP 68
–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C

Ordering code			
Part number			
BCC09JZ	**BCC09K0**	**BCC0E55**	**BCC0E57**
BCC M455-0000-1A-RM014-005	BCC M455-0000-2A-RM014-005	BCC M458-0000-1A-RM015-005	BCC M458-0000-2A-RM015-005
BCC0E54	**BCC0E5F**	**BCC0E56**	**BCC0E58**
BCC M455-0000-1A-RM014-020	BCC M455-0000-2A-RM014-020	BCC M458-0000-1A-RM015-020	BCC M458-0000-2A-RM015-020

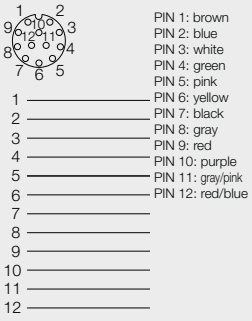
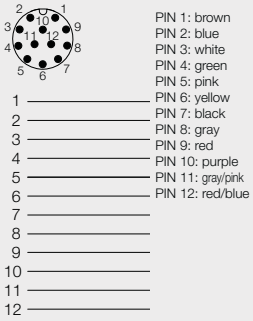






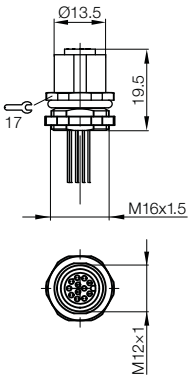


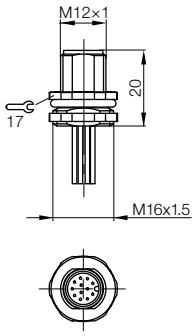
M12 flange socket, M12 flange plug, 12-pin

Connector diagram and wiring		
Max. supply voltage AC U_B	30 V	30 V
Max. supply voltage DC U_B	30 V	30 V
Number of conductors × conductor cross-section	12×0.25 mm²	12×0.25 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a	–25...+85 °C	–25...+85 °C

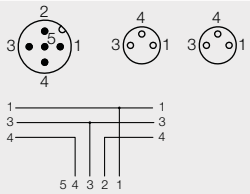
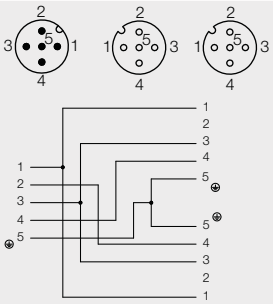
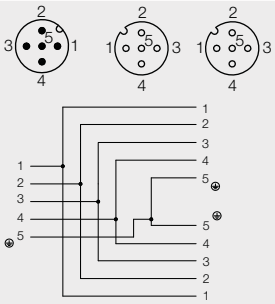
Cable length	Ordering code	
	Part number	
0.5 m	**BCC0E59**	**BCC0E5C**
	BCC M45C-0000-1A-RM081-005	BCC M45C-0000-2A-RM081-005
2 m	**BCC0E5A**	**BCC0E5E**
	BCC M45C-0000-1A-RM081-020	BCC M45C-0000-2A-RM081-020

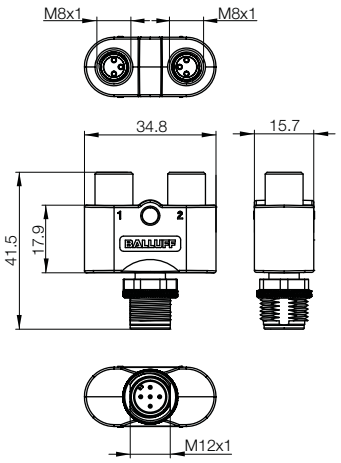
Other cable lengths on request.

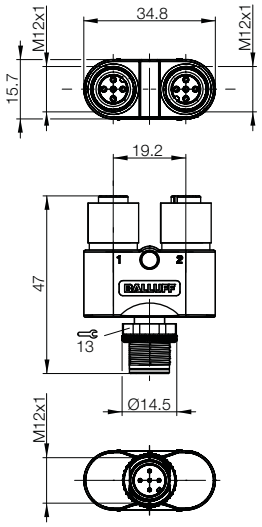


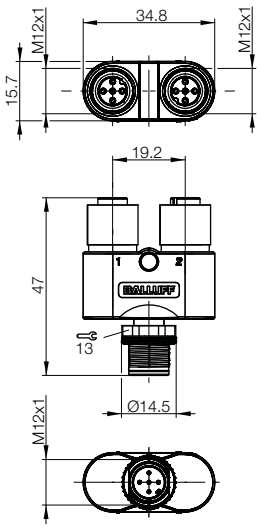


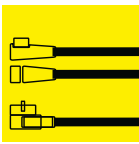
Tees M12 ↔ M8, M12 ↔ M12
Adapter M12 ↔ M8

Connector diagram and wiring			
Ordering code	**BCC09JC**	**BCC089P**	**BCC09MU**
Part number	BCC M415-M313-M313-U0014-000	BCC M415-M415-M415-U0003-000	BCC M415-M415-M415-U0016-000
Supply voltage U_B	60 V	125 V	125 V
Rated operating current I_e	4 A	4 A	4 A
Degree of protection as 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

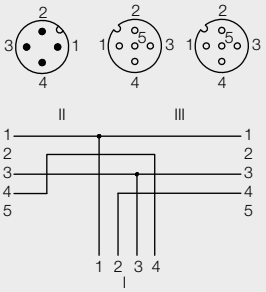
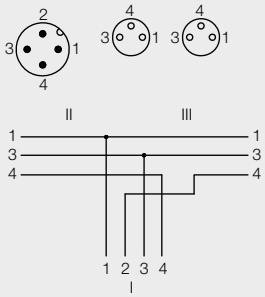
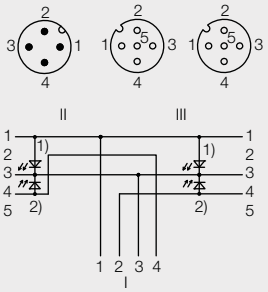




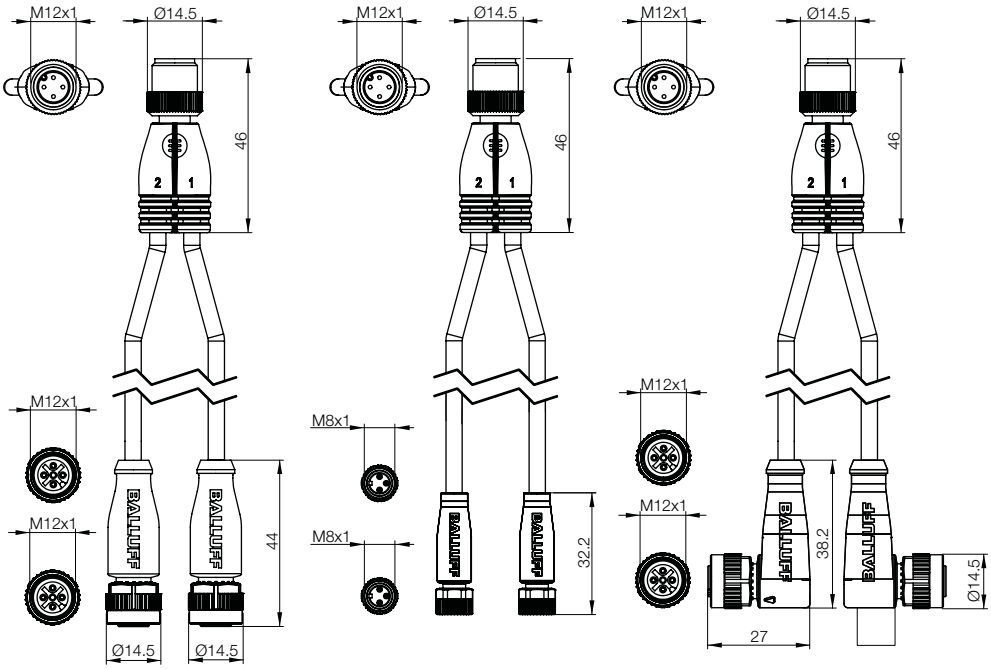




M12 Y connectors

Connector diagram and wiring					
Version			2× M12 straight/M12	2× M8 straight/M12	2× M12 right-angle/M12
Max. supply voltage AC U_B			250 V AC	60 V AC	
Max. supply voltage DC U_B			250 V DC	60 V DC	30 V DC
Cable			Molded-in	Molded-in	Molded-in
No. of conductors x conductor cross-section			4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
Degree of protection as per IEC 60529			IP 68	IP 68	IP 68
Ambient temperature T_a	Static	PUR	–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)	–40...+90 °C (UL 80 °C)
	Tensioned	PUR	–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)	–25...+90 °C (UL 80 °C)

Length	Ordering code		
	Part number		
0.3 m	**BCC0AUA**		**BCC0C9U**
	BCC M414-M415-M415-U2028-003		BCC M414-M425-M425-U2034-003
0.6 m	**BCC0AUC**	**BCC0AFW**	**BCC0C9T**
	BCC M414-M415-M415-U2028-006	BCC M414-M313-M313-U2026-006	BCC M414-M425-M425-U2034-006
1 m	**BCC0AUE**	**BCC0AFY**	**BCC0C9R**
	BCC M414-M415-M415-U2028-010	BCC M414-M313-M313-U2026-010	BCC M414-M425-M425-U2034-010
2 m	**BCC0AUF**	**BCC0AFZ**	**BCC0C9P**
	BCC M414-M415-M415-U2028-020	BCC M414-M313-M313-U2026-020	BCC M414-M425-M425-U2034-020
3 m	**BCC0AUH**	**BCC0AH0**	**BCC0C9N**
	BCC M414-M415-M415-U2028-030	BCC M414-M313-M313-U2026-030	BCC M414-M425-M425-U2034-030



For large quantities or torque adjustments.

Description	Torque	Ordering code
		Part number
Torque wrench for M8	0.4 Nm	**BAM00ZL**
		BAM TO-CC-001-M3-0.4/8.0
Torque wrench for M12	0.6 Nm	**BAM00ZM**
		BAM TO-CC-001-M4-0.6/12.0
Torque wrench for 7/8"	1.5 Nm	**BAM00ZN**
		BAM TO-CC-001-A3-1.5/24.0

Assembly wrench

User-fabricated 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	Ordering code
	Part number
Assembly wrench for 12 and 19-pin M23 connectors	**BAM01TY**
	BAM TO-CC-002-M6

Marking sleeve

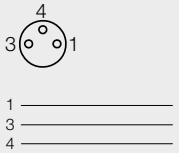
Description	Ordering code
	Part number
For labeling connectors	
	BAM IA-CC-002-01

M8 female straight, 3-pin, without LED, for temperatures up to 120 °C

Connector BCC up to 120 °C
The durable connectors BCC with IP 68 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.

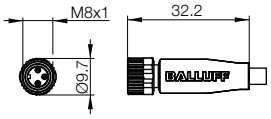
- Temperature range –25…+120 °C
- Degree of protection IP 68
- Flame-resistant
- Straight and right-angle
- 3-pin, 4-pin
- Easy to find notches on the handle body

120 °C
High Temperature

Connector diagram and wiring		
Max. supply voltage AC U_B	250 V AC	
Max. supply voltage DC U_B	250 V DC	
Cable	Molded	
Number of conductors x conductor cross-section	3×0.34 mm²	
Degree of protection as per IEC 60529	IP 67	
Ambient temperature T_a	**–25...+120 °C**	
Use	Normally open (NO) –/-	

Cable material	Color	Length	Ordering code Part number
PUR	Black	2 m	
PUR	Black	5 m	**BCC0836** BCC M313-0000-10-001-PH0334-050
PUR	Black	10 m	

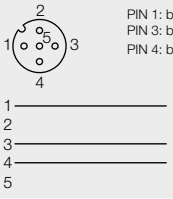
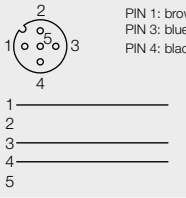
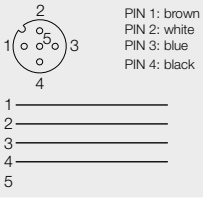
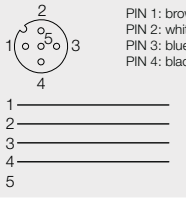
Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

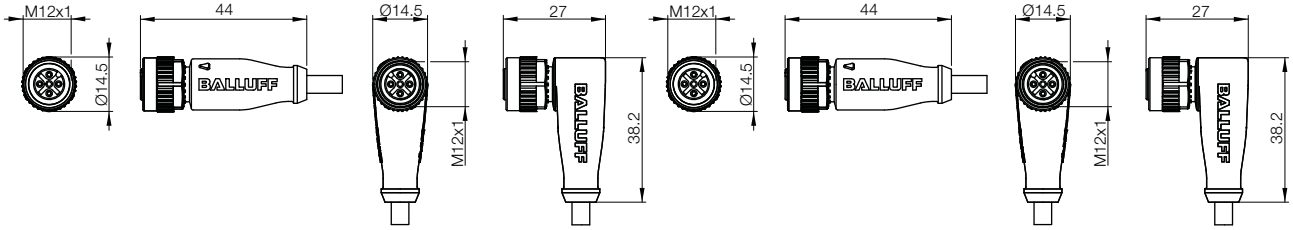


Connectors

M12 female straight and right-angle, 3 and 4-pin, without LED, for temperatures up to 120 °C




	 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
	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
	3×0.34 mm²	3×0.34 mm²	4×0.34 mm²	4×0.34 mm²
	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)
Ordering code				
Part number				
	BCC082W	**BCC0832**	**BCC0AA9**	**BCC0AAE**
	BCC M415-0000-1A-001-PH0334-020	BCC M425-0000-1A-001-PH0334-020	BCC M415-0000-1A-003-PH0434-020	BCC M425-0000-1A-003-PH0434-020
	BCC082Y	**BCC0833**	**BCC0AAA**	**BCC0AAF**
	BCC M415-0000-1A-001-PH0334-050	BCC M425-0000-1A-001-PH0334-050	BCC M415-0000-1A-003-PH0434-050	BCC M425-0000-1A-003-PH0434-050
	BCC082Z	**BCC0AA8**	**BCC0AAC**	**BCC0AAH**
	BCC M415-0000-1A-001-PH0334-100	BCC M425-0000-1A-001-PH0334-100	BCC M415-0000-1A-003-PH0434-100	BCC M425-0000-1A-003-PH0434-100

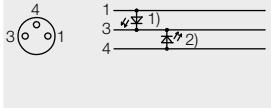
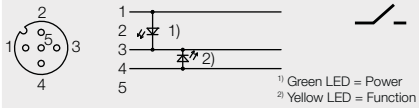


M8 female right-angle, 3-pin, with LED
M12 female right-angle, 3-pin, with LED
IP 69K–ECOLAB

IP 69K

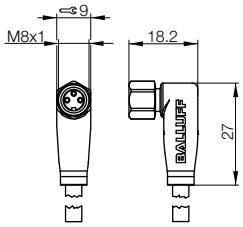
H_2O_2 resistant

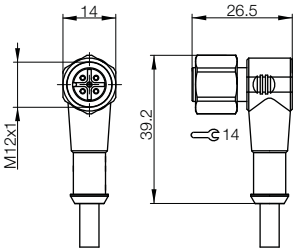
ECOLAB

Connector diagram and wiring		 1) Green LED = Power 2) Yellow LED = Function	 1) Green LED = Power 2) Yellow LED = Function
Max. supply voltage AC U_B			
Max. supply voltage DC U_B		30 V DC	30 V DC
Cable		Molded	Molded
Number of conductors × conductor cross-section		3×0.34 mm²	3×0.34 mm²
Degree of protection as per IEC 60529		**IP 69K**	**IP 69K**
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		PNP	PNP normally open (NO) ⎍-
LED		Green/yellow	Green/yellow

Cable material	Color	Length	Ordering code Part number	
PUR	Black	2 m	**BCC08CZ** BCC S323-0000-10-004-PX0334-020	**BCC08CM** BCC S425-0000-1A-004-PX0334-020
PUR	Black	3 m	**BCC0A2F** BCC S323-0000-10-004-PX0334-030	**BCC08CN** BCC S425-0000-1A-004-PX0334-030
PUR	Black	5 m	**BCC08E0** BCC S323-0000-10-004-PX0334-050	**BCC08CP** BCC S425-0000-1A-004-PX0334-050
PUR	Black	10 m	**BCC0A2H** BCC S323-0000-10-004-PX0334-100	**BCC08CR** BCC S425-0000-1A-004-PX0334-100
PUR	Black	15 m		**BCC06UE** BCC S425-0000-1A-004-PX0334-150
PUR	Black	20 m		**BCC06UF** BCC S425-0000-1A-004-PX0334-200
PUR	Black	25 m		**BCC06UH** BCC S425-0000-1A-004-PX0334-250
PUR	Black	40 m		**BCC06UJ** BCC S425-0000-1A-004-PX0334-400
PVC	gray, black	5 m		**BCC0A2L** BCC S425-0000-1A-004-VX8334-050
PVC	gray, black	10 m		**BCC0A2M** BCC S425-0000-1A-004-VX8334-100
PVC	gray, black	15 m		**BCC06U9** BCC S425-0000-1A-004-VX8334-150
PVC	gray, black	20 m		**BCC06UA** BCC S425-0000-1A-004-VX8334-200
PVC	gray, black	25 m		**BCC06UC** BCC S425-0000-1A-004-VX8334-250
PVC	Gray	30 m		
PVC	Gray	35 m		

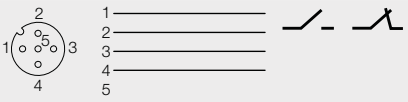
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.

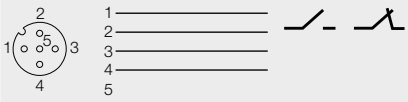


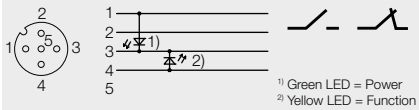


Connectors

M12 female straight and right-angle, 4-pin, with and without LED
IP 69K–ECOLAB

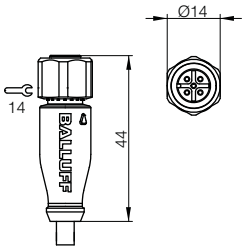


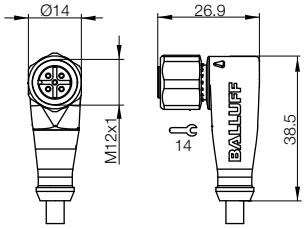


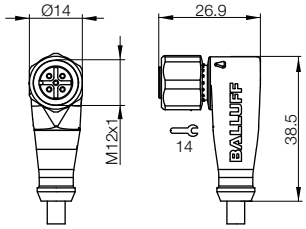


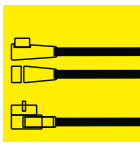
1) Green LED = Power
2) Yellow LED = Function

	250 V AC	250 V AC	
	250 V DC	250 V DC	30 V DC
	Molded	Molded	Molded
	4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
	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...+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) ⌐-/-⌐	Complementary (NO/NC) ⌐-/-⌐	PNP complementary (NO/NC) ⌐-/-⌐
			Green/yellow
Ordering code			
Part number			
			BCC08CU
			BCC S425-0000-1A-008-PX0434-050
			BCC0A2K
			BCC S425-0000-1A-008-PX0434-100
			BCC0CTE
			BCC S425-0000-1A-008-VX0434-050
BCC06M7	**BCC06MF**		**BCC0CTC**
BCC S415-0000-1A-003-VX8434-100	BCC S425-0000-1A-003-VX8434-100		BCC S425-0000-1A-008-VX0434-100
BCC06M8	**BCC06MH**		**BCC0CTA**
BCC S415-0000-1A-003-VX8434-150	BCC S425-0000-1A-003-VX8434-150		BCC S425-0000-1A-008-VX0434-150
BCC06M9	**BCC06MJ**		**BCC0CT9**
BCC S415-0000-1A-003-VX8434-200	BCC S425-0000-1A-003-VX8434-200		BCC S425-0000-1A-008-VX0434-200
BCC06MA	**BCC06MK**		**BCC0CT8**
BCC S415-0000-1A-003-VX8434-250	BCC S425-0000-1A-003-VX8434-250		BCC S425-0000-1A-008-VX0434-250
BCC06MC	**BCC06ML**		
BCC S415-0000-1A-003-VX8434-300	BCC S425-0000-1A-003-VX8434-300		
BCC06ME	**BCC06MM**		
BCC S415-0000-1A-003-VX8434-350	BCC S425-0000-1A-003-VX8434-350		









Connectors and cables
Special properties
High-temperature resistant
IP69 K–ECOLAB
Weld splatter-resistant PUR lines
Y-connectors, weld splatter-resistant
Pottable connectors

Weld splatter-resistant PUR lines

PUR lines for especially tough conditions
Standard PUR lines have numerous advantages. They are resilient, wear-resistant, impact-resistant and resistant against solvents. With the new weld splatter-resistant versions to ISO 14001, you can easily 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
- Degree of protection IP 68
- ISO 14001 compliant – not hazardous waste
- Replacement for crosslinked lines
- Jacket color: Black
- Torsional stress 180 °C
- Fulfill all requirements of the automotive industry

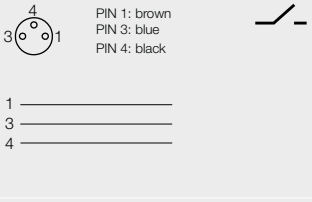
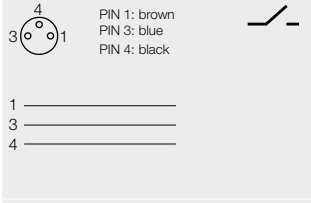
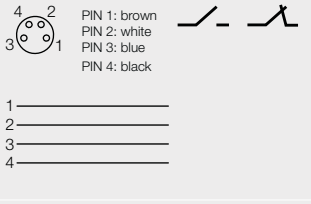
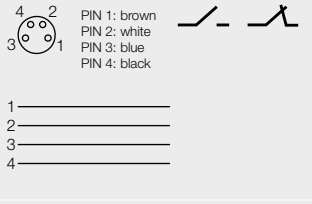
Connector diagram and wiring		
Max. supply voltage AC U_B		
Max. supply voltage DC U_B		
Cable		
Number of conductors x conductor cross-section		
Degree of protection as per IEC 60529		
Ambient temperature T_a	Static	
	Tensioned	

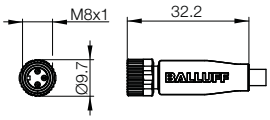
Cable material	Color	Length	
PUR	Black	5 m	
PUR	Black	10 m	

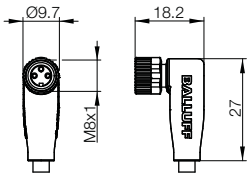
Other cable materials, colors and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

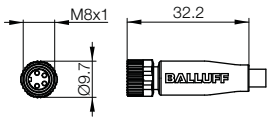
M8 female, 3- and 4-pin, without LED

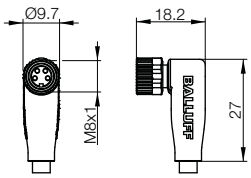



			
60 V AC	60 V AC	60 V AC	60 V AC
60 V DC	60 V DC	60 V DC	60 V DC
Molded	Molded	Molded	Molded
3×0.34 mm²	3×0.34 mm²	3×0.34 mm²	4×0.34 mm²
IP 67	IP 67	IP 67	IP 68
–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
Ordering code			
Part number			
BCC0AJK	**BCC0AJR**	**BCC0AJM**	**BCC0AJW**
BCC M313-0000-10-001-PW0334-050	BCC M323-0000-10-001-PW0334-050	BCC M314-0000-10-003-PW0434-050	BCC M324-0000-10-003-PW0434-050
BCC0CAP			
BCC M313-0000-10-001-PW0334-100			



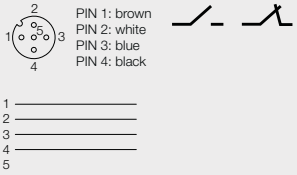
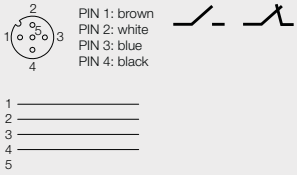






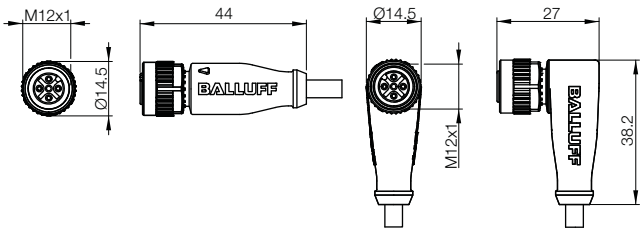
Connectors and cables
Special properties
High-temperature resistant
IP69 K–ECOLAB
Weld splatter-resistant PUR lines
Y-connectors, weld splatter-resistant
Pottable connectors

M12 female, 4-pin, no LED

Connector diagram and wiring			
Max. supply voltage AC U_B	250 V AC	250 V AC	
Max. supply voltage DC U_B	250 V DC	250 V DC	
Cable	Molded	Molded	
No. of conductors × conductor cross-section	4×0.34 mm²	4×0.34 mm²	
Degree of protection as per IEC 60529	IP 68	IP 68	
Ambient temperature T_a Static	–40...+80 °C	–40...+80 °C	
Ambient temperature T_a Tensioned	–25...+80 °C	–25...+80 °C	
Use	Complementary (NO/NC) ⌐-/-⌐	Complementary (NO/NC) ⌐-/-⌐	

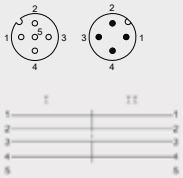
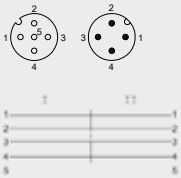
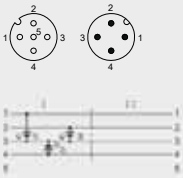
Cable material	Color	Length	Ordering code Part number		
PUR	Black	2 m	**BCC0AK4** BCC M415-0000-1A-003-PW0434-020		
PUR	Black	5 m	**BCC0AK5** BCC M415-0000-1A-003-PW0434-050	**BCC0AKE** BCC M425-0000-1A-003-PW0434-050	
PUR	Black	10 m	**BCC0AK6** BCC M415-0000-1A-003-PW0434-100	**BCC0AKF** BCC M425-0000-1A-003-PW0434-100	

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



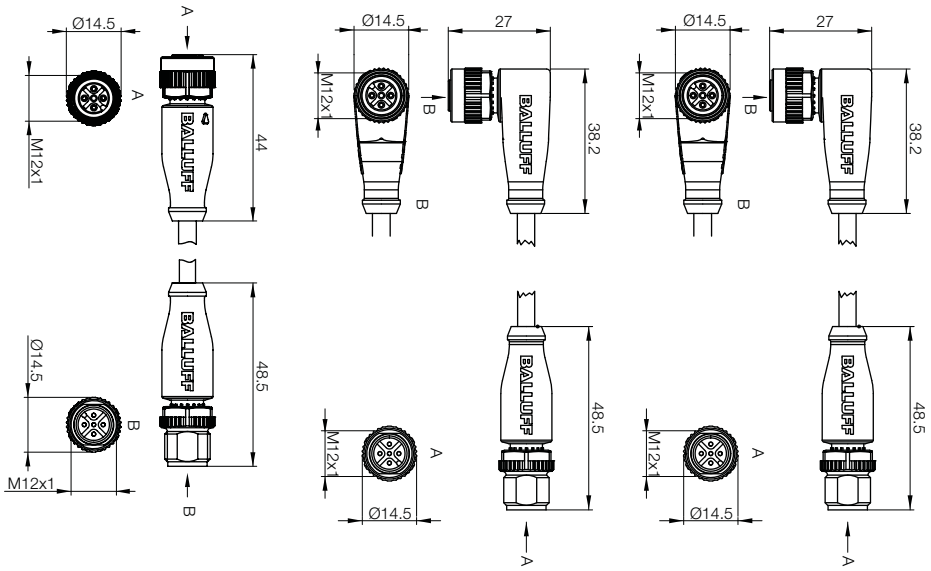
Connection Cables

Weld splatter-resistant PUR lines
M12 female straight or right-angle ↔ M12 male straight, 4-pin, without and with LED

Connector diagram and wiring				 1) Green LED = Power 2) Yellow LED = Switching output 3) White LED = Switching output
Max. supply voltage AC U_B		250 V AC	250 V AC	
Max. supply voltage DC U_B		250 V DC	250 V DC	30 V DC
Cable		Molded	Molded	Molded
Number of conductors x conductor cross-section		4×0.34 mm²	4×0.34 mm²	4×0.34 mm²
Degree of protection as per IEC 60529		IP 68	IP 68	IP 68
Ambient temperature T_a	Static	–40...+80 °C	–40...+80 °C	–25...+80 °C/–25...+80 °C
	Tensioned	–25...+80 °C	–25...+80 °C	–25...+80 °C/–5...+80 °C
Use		Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC)
LED, transparent head				Green/yellow/white

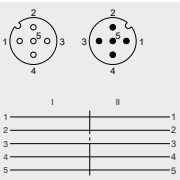
Cable material	Color	Length	Ordering code Part number		
PUR	Black	0.3 m	**BCC0AP1** BCC M415-M414-3A-304-PW0434-003	**BCC0ANP** BCC M425-M414-3A-304-PW0434-003	**BCC0ANE** BCC M425-M414-3A-650-PW0434-003
PUR	Black	0.6 m	**BCC0AP2** BCC M415-M414-3A-304-PW0434-006	**BCC0ANR** BCC M425-M414-3A-304-PW0434-006	**BCC0ANF** BCC M425-M414-3A-650-PW0434-006
PUR	Black	1 m	**BCC0AP3** BCC M415-M414-3A-304-PW0434-010	**BCC0ANT** BCC M425-M414-3A-304-PW0434-010	**BCC0ANH** BCC M425-M414-3A-650-PW0434-010
PUR	Black	1.5 m	**BCC0AP4** BCC M415-M414-3A-304-PW0434-015	**BCC0ANU** BCC M425-M414-3A-304-PW0434-015	**BCC0ANJ** BCC M425-M414-3A-650-PW0434-015
PUR	Black	2 m	**BCC0AP5** BCC M415-M414-3A-304-PW0434-020	**BCC0ANW** BCC M425-M414-3A-304-PW0434-020	**BCC0ANK** BCC M425-M414-3A-650-PW0434-020
PUR	Black	3 m			
PUR	Black	5 m	**BCC0AP7** BCC M415-M414-3A-304-PW0434-050	**BCC0ANZ** BCC M425-M414-3A-304-PW0434-050	**BCC0ANM** BCC M425-M414-3A-650-PW0434-050

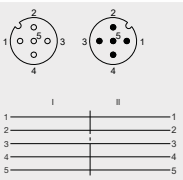
Other cable lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

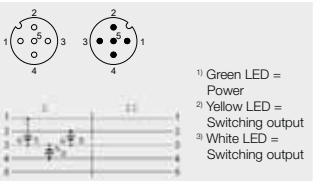


Connection Cables

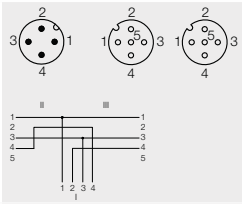
Weld splatter-resistant PUR lines
M12 female straight or right-angle ↔
M12 male straight, 5-pin, with and without LED



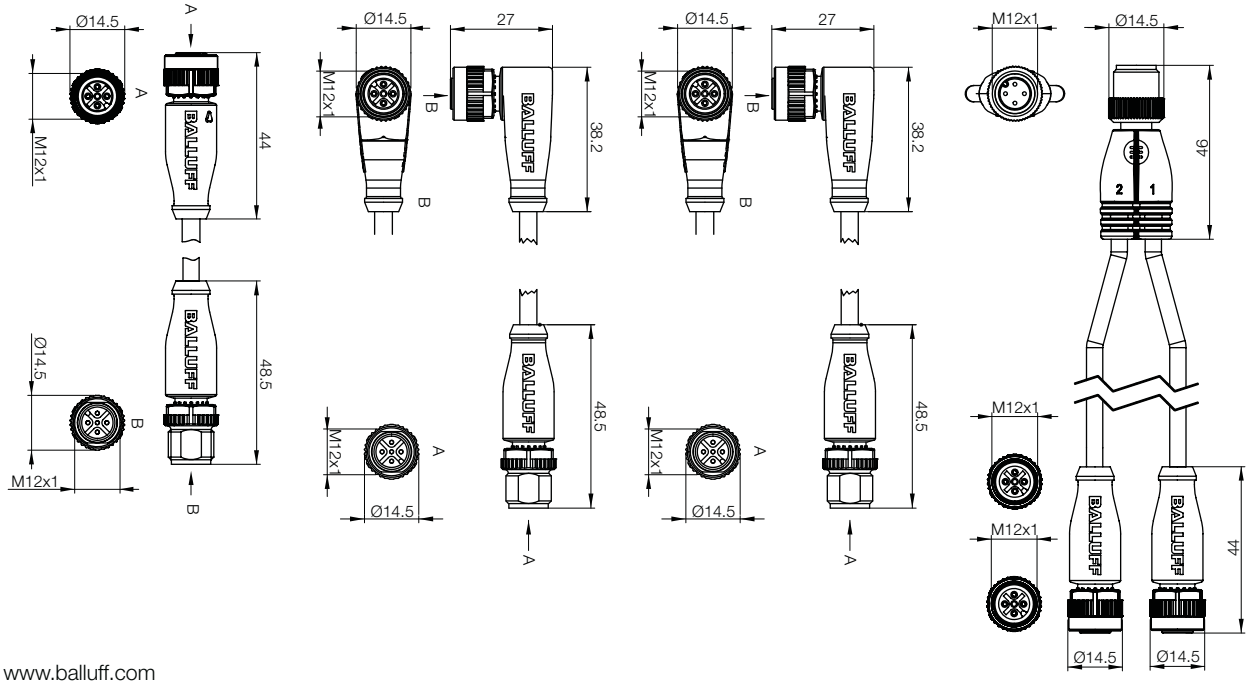




1) Green LED = Power
2) Yellow LED = Switching output
3) White LED = Switching output



	125 V AC 125 V DC	125 V AC 125 V DC	30 V DC	250 V AC 250 V DC
	Molded	Molded	Molded	Molded
	5×0.34 mm²	5×0.34 mm²	5×0.34 mm²	3×0.34 mm²
	IP 68	IP 68	IP 68	IP 67
	–40...+80 °C	–40...+80 °C	–25...+80 °C/–25...+80 °C	–40...+80 °C
	–25...+80 °C	–25...+80 °C	–25...+80 °C/–5...+80 °C	–25...+80 °C
	Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC) Green/yellow/white	
Ordering code				
Part number				
				BCC0AK1
				BCC M414-M415-M415-U2027-003
BCC0AJJ	**BCC0AKH**	**BCC0C0N**		**BCC0AK2**
BCC M415-M415-3A-313-PW0534-006	BCC M425-M415-3A-313-PW0534-006	BCC M425-M415-3A-661-PW0534-006		BCC M414-M415-M415-U2027-006
BCC0AK7	**BCC0AKJ**	**BCC0C0P**		**BCC0AK3**
BCC M415-M415-3A-313-PW0534-010	BCC M425-M415-3A-313-PW0534-010	BCC M425-M415-3A-661-PW0534-010		BCC M414-M415-M415-U2027-010
BCC0C0M		**BCC0C0R**		
BCC M415-M415-3A-313-PW0534-015		BCC M425-M415-3A-661-PW0534-015		
BCC0AK8	**BCC0AKK**	**BCC0C0T**		**BCC0C27**
BCC M415-M415-3A-313-PW0534-020	BCC M425-M415-3A-313-PW0534-020	BCC M425-M415-3A-661-PW0534-020		BCC M414-M415-M415-U2027-020
BCC0AK9	**BCC0AKL**	**BCC0C0U**		
BCC M415-M415-3A-313-PW0534-030	BCC M425-M415-3A-313-PW0534-030	BCC M425-M415-3A-661-PW0534-030		
BCC0AKA	**BCC0AKM**	**BCC0C0W**		
BCC M415-M415-3A-313-PW0534-050	BCC M425-M415-3A-313-PW0534-050	BCC M425-M415-3A-661-PW0534-050		



Weld splatter-resistant PUR lines

PUR lines for especially tough conditions
Standard PUR lines have numerous advantages. They are resilient, wear-resistant, impact-resistant and resistant against solvents. With the new weld splatter-resistant versions to ISO 14001, you can easily 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
- Degree of protection IP 67 and IP 68
- ISO 14001 compliant – not hazardous waste
- Replacement for crosslinked lines
- Jacket color: Orange
- Torsional stress 180 °C
- Fulfill all requirements of the automotive industry

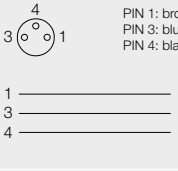
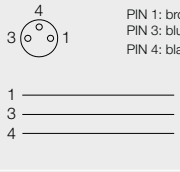
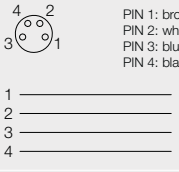
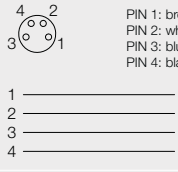
Connector diagram and wiring		
Max. supply voltage AC U_B		
Max. supply voltage DC U_B		
Cable		
Number of conductors x conductor cross-section		
Degree of protection as per IEC 60529		
Ambient temperature T_a	Static	
	Tensioned	
Use		

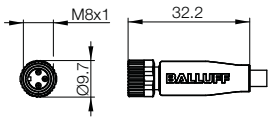
Cable material	Color	Length
PUR	Orange	5 m

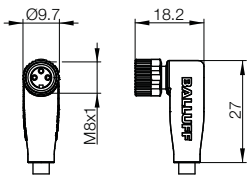
Other cable lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.

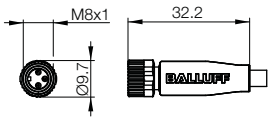
Weld splatter-resistant PUR lines M8 female straight and right-angle, 3- and 4-pin, without LED

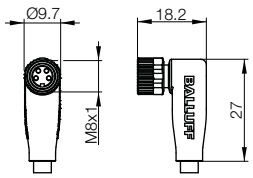


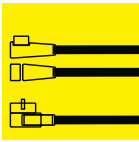

	 PIN 1: brown PIN 3: blue PIN 4: black	 PIN 1: brown PIN 3: blue PIN 4: black	 PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black	 PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black
	60 V AC 60 V DC	60 V AC 60 V DC	30 V AC 30 V DC	30 V AC 30 V DC
	Molded	Molded	Molded	
	3×0.34 mm²	3×0.34 mm²	4×0.34 mm²	4×0.34 mm²
	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
	Normally open (NO)	Normally open (NO)	Complementary (NO/NC)	Complementary (NO/NC)
Ordering code				
Part number				
	BCC0C3A	**BCC0C24**	**BCC0C21**	**BCC0C20**
	BCC M313-0000-10-001-PW3334-050	BCC M323-0000-10-001-PW3334-050	BCC M314-0000-10-003-PW3434-050	BCC M324-0000-10-003-PW3434-050





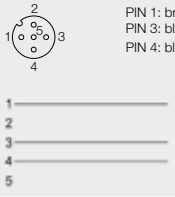
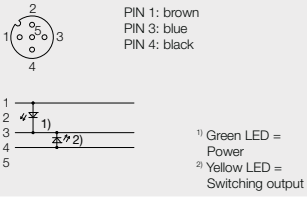
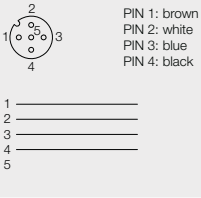






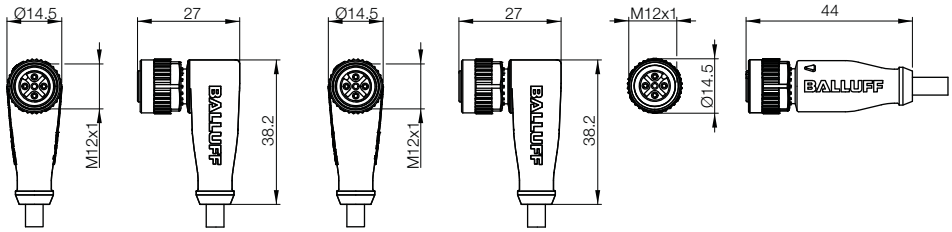
Connectors and cables
Special properties
High-temperature resistant
IP69 K–ECOLAB
Weld splatter-resistant PUR lines
Y-connectors, weld splatter-resistant
Pottable connectors

Weld splatter-resistant PUR lines
M12 female straight and right-angle, 3- and 4-pin, with and without LED

Connector diagram and wiring		 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	 PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black
Max. supply voltage AC U_B		250 V AC		250 V AC
Max. supply voltage DC U_B		250 V DC	30 V DC	250 V DC
Cable		Molded	Molded	Molded
Number of conductors x conductor cross-section		3×0.34 mm²	3×0.34 mm²	4×0.34 mm²
Degree of protection as per IEC 60529		IP 68	IP 68	IP 68
Ambient temperature T_a	Static	–40...+80 °C	–40...+80 °C	–40...+80 °C
	Tensioned	–25...+80 °C	–25...+80 °C	–25...+80 °C
Use		Normally open (NO) ⏜-	Normally open (NO) ⏜-	Complementary (NO/NC) ⏜-/-⏜
LED, transparent head			Green/yellow	

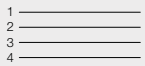
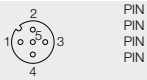
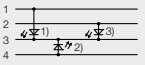
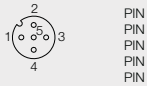
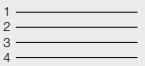
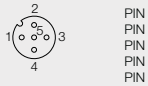
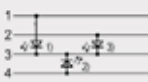
Cable material	Color	Length	Ordering code Part number		
PUR UL	Orange	1.5 m			
PUR UL	Orange	2 m	**BCC086T** BCC M425-0000-1A-001-PW3334-020	**BCC09J8** BCC M425-0000-1A-004-PW3334-020	**BCC09J6** BCC M415-0000-1A-003-PW3434-020
PUR UL	Orange	5 m	**BCC086U** BCC M425-0000-1A-001-PW3334-050	**BCC08MZ** BCC M425-0000-1A-004-PW3334-030	**BCC0C23** BCC M415-0000-1A-003-PW3434-050
PUR UL	Orange	7.5 m			
PUR UL	Orange	10 m	**BCC086W** BCC M425-0000-1A-001-PW3334-100	**BCC08LE** BCC M425-0000-1A-004-PW3334-100	**BCC0C7W** BCC M415-0000-1A-003-PW3434-100

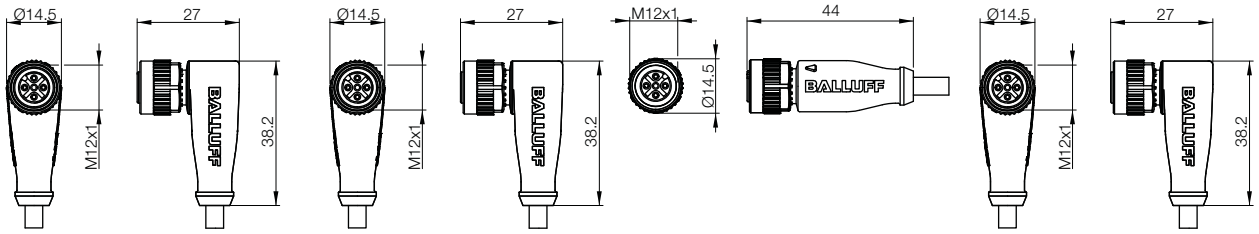
Other cable lengths on request. Connectors without LED are suitable for PNP and NPN switching functions. NPN versions with LED on request.



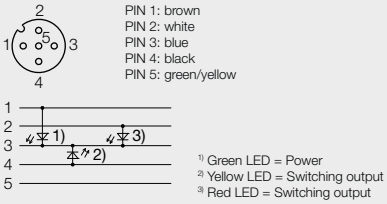
Weld splatter-resistant PUR lines M12 female straight and right-angle, 4 and 5-pin, with and without LED




 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) White LED = Switching output	 PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black PIN 5: green/yellow 	 PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black PIN 5: green/yellow  1) Green LED = Power 2) Yellow LED = Switching output 3) White LED = Switching output
250 V AC		125 V AC	
250 V DC	30 V DC	125 V DC	30 V DC
Molded	Molded	Molded	Molded
4×0.34 mm²	4×0.34 mm²	5×0.34 mm²	5×0.34 mm²
IP 68	IP 68	IP 68	IP 68
–40...+80 °C	–40...+80 °C	–40...+80 °C	–40...+80 °C
–25...+80 °C	–25...+80 °C	–25...+80 °C	–25...+80 °C
Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC)
	Green/yellow/white		Green/yellow/white
Ordering code			
Part number			
		BCC087F	**BCC087L**
		BCC M415-0000-1A-034-PW3534-015	BCC M425-0000-1A-040-PW3534-015
	BCC0C3Z		
	BCC M425-0000-1A-099-PW3434-020		
BCC0C22	**BCC0C41**	**BCC087H**	**BCC087M**
BCC M425-0000-1A-003-PW3434-050	BCC M425-0000-1A-099-PW3434-050	BCC M415-0000-1A-034-PW3534-050	BCC M425-0000-1A-040-PW3534-050
		BCC087J	**BCC087N**
		BCC M415-0000-1A-034-PW3534-075	BCC M425-0000-1A-040-PW3534-075
	BCC0C42	**BCC087K**	**BCC087P**
	BCC M425-0000-1A-099-PW3434-100	BCC M415-0000-1A-034-PW3534-100	BCC M425-0000-1A-040-PW3534-100

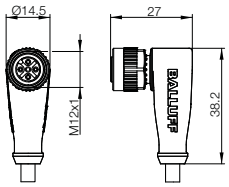


Weld splatter-resistant PUR lines
M12 female right-angle, 5-pin, with LED

Connector diagram and wiring				
Max. supply voltage AC U_B				
Max. supply voltage DC U_B		30 V DC		
Cable		Molded		
Number of conductors × conductor cross-section		5×0.34 mm²		
Degree of protection as per IEC 60529		IP 68		
Ambient temperature T_a	PUR	–40...+80 °C		
static/moving	PVC	–25...+80 °C		
Use		Complementary (NO/NC) ⌐/-/⌐		
LED		green/yellow/red		

Cable material	Color	Length	Ordering code Part number
PUR	Orange	0.3 m	
PUR	Orange	0.6 m	
PUR	Orange	1 m	
PUR	Orange	1.5 m	
PUR	Orange	2 m	**BCC0C7U** BCC M425-0000-1A-100-PW3534-020
PUR	Orange	3 m	
PUR	Orange	5 m	**BCC0C7T** BCC M425-0000-1A-100-PW3534-050
PUR	Orange	10 m	**BCC0C7U** BCC M425-0000-1A-100-PW3534-100

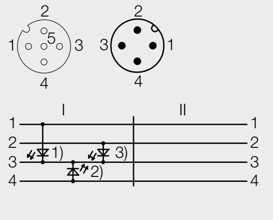
Other cable materials, colors, and lengths on request.
Connectors without LED are suitable for PNP and NPN switching functions.
NPN versions on request.



Connection Cables

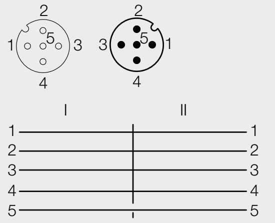
Weld splatter-resistant PUR cables
M12 female straight or right-angle ↔ M12 male straight, 4 or 5-pin, with and without LED





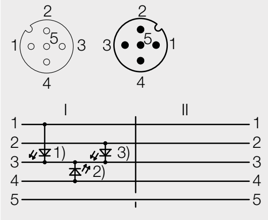
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: green/yellow

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



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

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

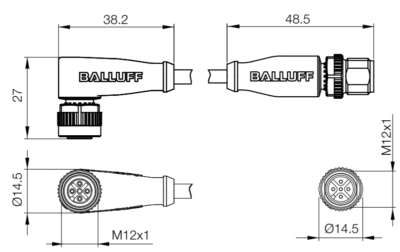


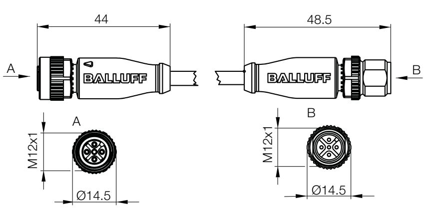
PIN 1: brown
PIN 2: white
PIN 3: blue
PIN 4: black
PIN 5: green/yellow

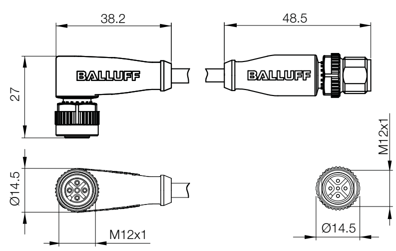
1) Green LED = Power
2) Yellow LED = Switching output
3) Red LED = Switching output

30 V DC	30 V DC	30 V DC
Molded	Molded	Molded
4×0.34 mm²	5×0.34 mm²	5×0.34 mm²
IP 68	IP 68	IP 68
–40...+80 °C	–40...+80 °C	–40...+80 °C
–25...+80 °C	–25...+80 °C	–25...+80 °C
Complementary (NO/NC)	Complementary (NO/NC)	Complementary (NO/NC)
green/yellow/red		green/yellow/red

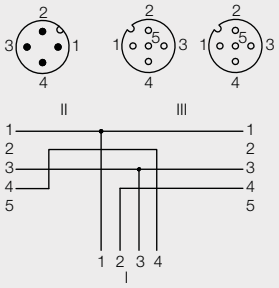
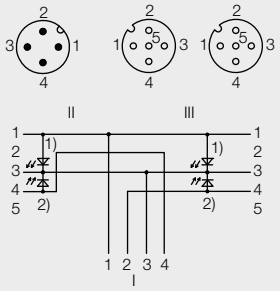
Ordering code Part number		
BCC0C4K BCC M425-M414-3A-691-PW3434-003		**BCC0C4T** BCC M425-M415-3A-692-PW3534-003
BCC0C52 BCC M425-M414-3A-691-PW3434-006	**BCC087R** BCC M415-M415-3A-313-PW3534-006	**BCC0C4U** BCC M425-M415-3A-692-PW3534-006
BCC0C4L BCC M425-M414-3A-691-PW3434-010	**BCC087T** BCC M415-M415-3A-313-PW3534-010	**BCC0C4W** BCC M425-M415-3A-692-PW3534-010
BCC0C4M BCC M425-M414-3A-691-PW3434-015	**BCC087U** BCC M415-M415-3A-313-PW3534-015	**BCC0C4Y** BCC M425-M415-3A-692-PW3534-015
BCC0C4N BCC M425-M414-3A-691-PW3434-020	**BCC087W** BCC M415-M415-3A-313-PW3534-020	**BCC0C4Z** BCC M425-M415-3A-692-PW3534-020
BCC0C4P BCC M425-M414-3A-691-PW3434-030	**BCC09M2** BCC M415-M415-3A-313-PW3534-030	**BCC0C50** BCC M425-M415-3A-692-PW3534-030
BCC0C4R BCC M425-M414-3A-691-PW3434-050	**BCC09M1** BCC M415-M415-3A-313-PW3534-050	**BCC0C51** BCC M425-M415-3A-692-PW3534-050





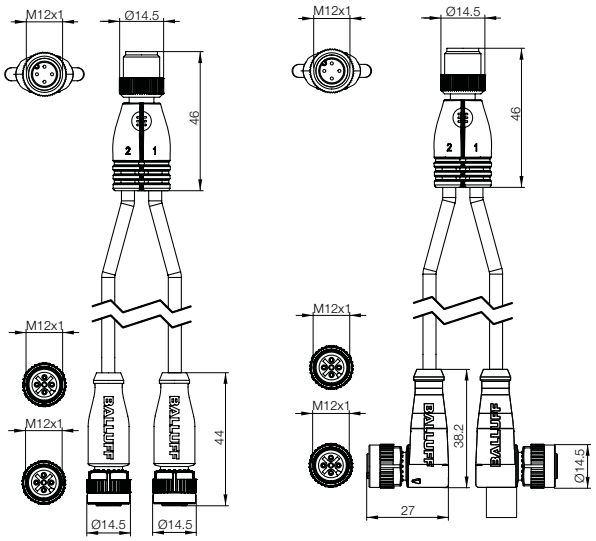


Weld splatter-resistant PUR lines
Y-connector

Connector diagram and wiring			
Max. supply voltage AC U_B	250 V AC		
Max. supply voltage DC U_B	250 V DC	30 V DC	
Cable	Molded	Molded	
Number of conductors x conductor cross-section	3×0.34 mm²	3×0.34 mm²	
Degree of protection as per IEC 60529	IP 67	IP 67	
Ambient temperature T_a Static	–40...+80 °C	–40...+80 °C	
Ambient temperature T_a Tensioned	–25...+80 °C	–25...+80 °C	
LED, transparent head		Green/yellow	

Cable material	Color	Length	Ordering code		
			Part number		
PUR	Orange	0.3 m	**BCC0C7A**	**BCC0CA2**	
			BCC M414-M415-M415-U2032-003	BCC M414-M425-M425-U2035-003	
PUR	Orange	0.6 m	**BCC0C7C**	**BCC0CA3**	
			BCC M414-M415-M415-U2032-006	BCC M414-M425-M425-U2035-006	
PUR	Orange	1 m	**BCC0C7E**	**BCC0CA4**	
			BCC M414-M415-M415-U2032-010	BCC M414-M425-M425-U2035-010	
PUR	Orange	2 m		**BCC0CA5**	
				BCC M414-M425-M425-U2035-020	
PUR	Orange	3 m		**BCC0CA6**	
				BCC M414-M425-M425-U2035-030	

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



M12 female right-angle, user-fabricated and pottable

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 an adjustable plug, if you need flexible cable length.

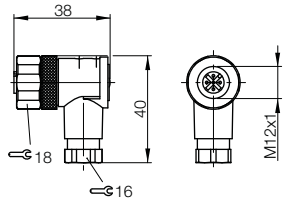
This either/or is now over. Because the adjustable and castable BCC0CAA plug provides both: higher leakproofness and flexible cable length. The cable is shortened, connected and the plug is easily molded (see drawing). With the BCC0CAA, you increase the reliability of your installation and simultaneously decide the cable length yourself.

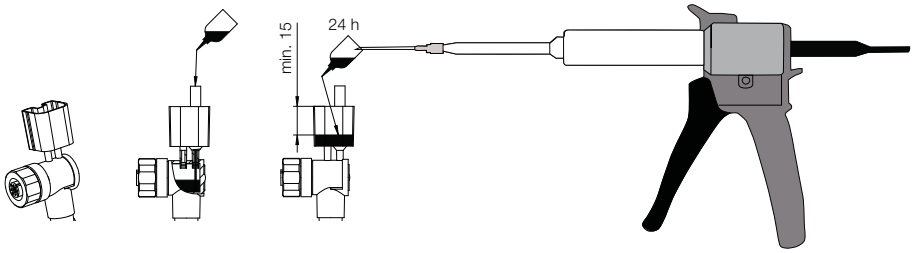
In harsh environments and extensive systems, the plug is therefore outstandingly well suited.

Features

- Higher leakproofness
- Flexible cable length
- Reliable
- For harsh environments
- For extensive systems

Connector diagram and wiring		
Connector		M12
Version		Can be fabricated
Use		Female
Ordering code		**BCC0CAA**
Part number		BCC S445-0000-1A-000-51X475-000-C024
Max. supply voltage AC U_B		125 V AC
Max. supply voltage DC U_B		125 V DC
Wire cross-section		0.14...0.75 mm²
Cable diameter		6...8 mm
Degree of protection as per IEC 60529		IP 67
Ambient temperature T_a		–25...+85 °C
Material	Grip body	PBT, transparent
	Contact	CuZn
	Contact holder	PA





Connectors and Valve Connectors

Contents

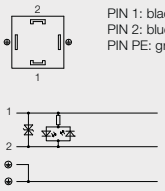
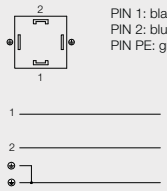
Valve Connectors

From sensors to cables, Balluff offers extensive, well-engineered system technology that leaves nothing to be desired outside of the switching cabinet.

Balluff valve connectors have an outstanding record in harsh industrial use and adverse conditions. They withstand large temperature differences as well as heavy contamination and their integrated protective circuit effectively prevents voltage peaks. In addition, the drag-chain compatible PUR and PVC valve connectors are available only from Balluff.

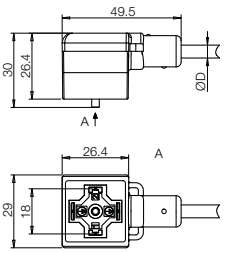
Choose the EN 175301-compliant valve connectors for extra flexibility

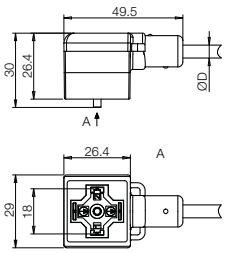
- With or without protective circuit
- With 100% on-time at –25...+80 °C
- Various styles in accordance with DIN and industry standard
- Drag chain-compatible connections with PUR and PVC cable

Connector diagram and wiring			
Cable outlet		**0°/180°**	**0°/180°**
Max. supply voltage AC U_B		24 V AC	230 V AC
Max. supply voltage DC U_B		24 V DC	230 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	No
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as 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		Yellow	without

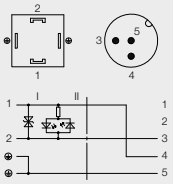
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC04W0**	**BCC04W6**
			BCC VA04-0000-10-053-PX0350-020	BCC VA04-0000-10-054-PX0350-020
PUR	Black	5 m	**BCC04W1**	**BCC04W7**
			BCC VA04-0000-10-053-PX0350-050	BCC VA04-0000-10-054-PX0350-050
PUR	Black	10 m	**BCC04W2**	**BCC04W8**
			BCC VA04-0000-10-053-PX0350-100	BCC VA04-0000-10-054-PX0350-100
PVC	Gray	2 m	**BCC04W3**	**BCC04W9**
			BCC VA04-0000-10-053-VX8350-020	BCC VA04-0000-10-054-VX8350-020
PVC	Gray	5 m	**BCC04W4**	**BCC04WA**
			BCC VA04-0000-10-053-VX8350-050	BCC VA04-0000-10-054-VX8350-050
PVC	Gray	10 m	**BCC04W5**	**BCC04WC**
			BCC VA04-0000-10-053-VX8350-100	BCC VA04-0000-10-054-VX8350-100

Other cable materials, colors, and lengths on request.



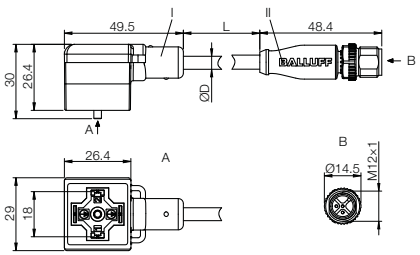


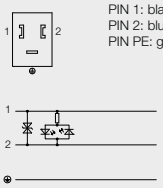
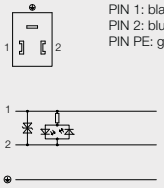
Valve Connectors
Style A, DIN, 18 mm, 4-pin
M12 male, straight

Connector diagram and wiring		
Cable outlet	**0°/180°**	
Max. supply voltage AC U_B	24 V AC	
Max. supply voltage DC U_B	24 V DC	
Cable	Molded/molded	
Current rating	4.0 A	
Suppressor	Suppressor diode	
Number of conductors × conductor cross-section	3×0.5mm²	
Degree of protection as per IEC 60529	IP 67/IP 68	
Ambient temperature T_a Static	–25...+90 °C	
Ambient temperature T_a Tensioned	–25...+80 °C	
LED	Yellow	

Cable material	Color	Length	Ordering code Part number
PUR	Black	0.3 m	**BCC04WF** BCC VA04-M413-3E-664-PX0350-003
PUR	Black	0.6 m	**BCC04WH** BCC VA04-M413-3E-664-PX0350-006
PUR	Black	1 m	**BCC0502** BCC VA04-M413-3E-664-PX0350-010
PUR	Black	1.5 m	**BCC04WJ** BCC VA04-M413-3E-664-PX0350-015
PUR	Black	2 m	**BCC04WK** BCC VA04-M413-3E-664-PX0350-020
PUR	Black	3 m	**BCC04WL** BCC VA04-M413-3E-664-PX0350-030
PUR	Black	5 m	**BCC04WM** BCC VA04-M413-3E-664-PX0350-050

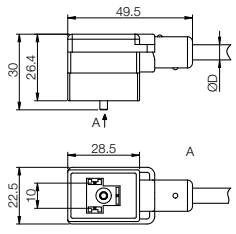
Other cable materials, colors, and lengths on request.

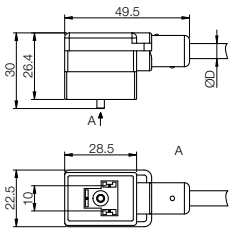


Connector diagram and wiring		 PIN 1: black PIN 2: blue PIN PE: green/yellow	 PIN 1: black PIN 2: blue PIN PE: green/yellow
Cable outlet		**0°**	**180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as 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		Yellow	Yellow

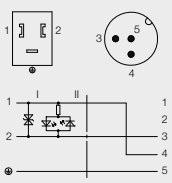
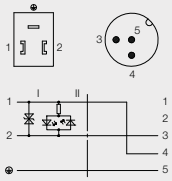
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC03YC**	**BCC03YH**
			BCC VB03-0000-10-055-PX0350-020	BCC VB23-0000-10-055-PX0350-020
PUR	Black	5 m	**BCC03YE**	**BCC03YJ**
			BCC VB03-0000-10-055-PX0350-050	BCC VB23-0000-10-055-PX0350-050
PUR	Black	10 m	**BCC03YF**	**BCC03YK**
			BCC VB03-0000-10-055-PX0350-100	BCC VB23-0000-10-055-PX0350-100
PVC	Gray	2 m	**BCC03ZZ**	**BCC0402**
			BCC VB03-0000-10-055-VX8350-020	BCC VB23-0000-10-055-VX8350-020
PVC	Gray	5 m	**BCC0400**	**BCC0403**
			BCC VB03-0000-10-055-VX8350-050	BCC VB23-0000-10-055-VX8350-050
PVC	Gray	10 m	**BCC0401**	**BCC0404**
			BCC VB03-0000-10-055-VX8350-100	BCC VB23-0000-10-055-VX8350-100

Other cable materials, colors, and lengths on request.



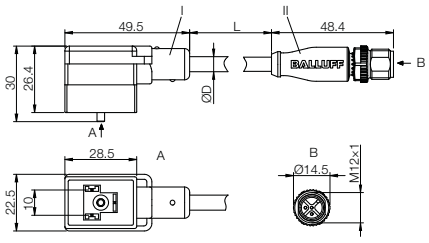


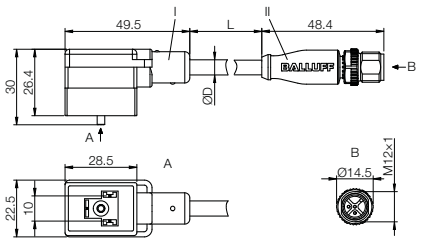
Valve Connectors
Style B, DIN, 10 mm, 3-pin
M12 male, straight

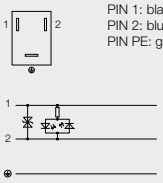
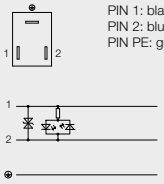
Connector diagram and wiring			
Cable outlet		**0°**	**180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded/molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T_a	Static	–25...+90 °C	–25...+90 °C
	Tensioned	–25...+80 °C	–25...+80 °C
LED		Yellow	Yellow

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m	**BCC064E**	**BCC064N**
			BCC VB03-M413-3E-666-PX0350-003	BCC VB23-M413-3E-666-PX0350-003
PUR	Black	0.6 m	**BCC064F**	**BCC064P**
			BCC VB03-M413-3E-666-PX0350-006	BCC VB23-M413-3E-666-PX0350-006
PUR	Black	1 m	**BCC064H**	**BCC064R**
			BCC VB03-M413-3E-666-PX0350-010	BCC VB23-M413-3E-666-PX0350-010
PUR	Black	1.5 m	**BCC064J**	**BCC064T**
			BCC VB03-M413-3E-666-PX0350-015	BCC VB23-M413-3E-666-PX0350-015
PUR	Black	2 m	**BCC064K**	**BCC064U**
			BCC VB03-M413-3E-666-PX0350-020	BCC VB23-M413-3E-666-PX0350-020
PUR	Black	3 m	**BCC064L**	**BCC064W**
			BCC VB03-M413-3E-666-PX0350-030	BCC VB23-M413-3E-666-PX0350-030
PUR	Black	5 m	**BCC064M**	**BCC064Y**
			BCC VB03-M413-3E-666-PX0350-050	BCC VB23-M413-3E-666-PX0350-050

Other cable materials, colors, and lengths on request.

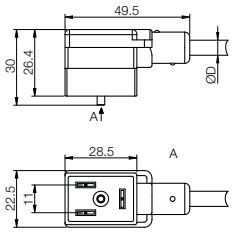


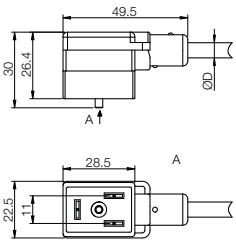


Connector diagram and wiring			
Cable outlet		**0°**	**180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded	Molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as 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		Yellow	Yellow

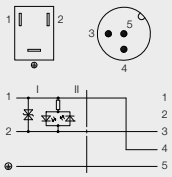
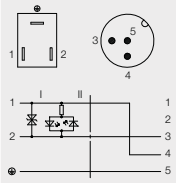
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC03YL**	**BCC03YP**
			BCC VB43-0000-10-055-PX0350-020	BCC VB63-0000-10-055-PX0350-020
PUR	Black	5 m	**BCC03YM**	**BCC03YR**
			BCC VB43-0000-10-055-PX0350-050	BCC VB63-0000-10-055-PX0350-050
PUR	Black	10 m	**BCC03YN**	**BCC03YT**
			BCC VB43-0000-10-055-PX0350-100	BCC VB63-0000-10-055-PX0350-100
PVC	Gray	2 m	**BCC0405**	**BCC0408**
			BCC VB43-0000-10-055-VX8350-020	BCC VB63-0000-10-055-VX8350-020
PVC	Gray	5 m	**BCC0406**	**BCC0409**
			BCC VB43-0000-10-055-VX8350-050	BCC VB63-0000-10-055-VX8350-050
PVC	Gray	10 m	**BCC0407**	**BCC040A**
			BCC VB43-0000-10-055-VX8350-100	BCC VB63-0000-10-055-VX8350-100

Other cable materials, colors, and lengths on request.



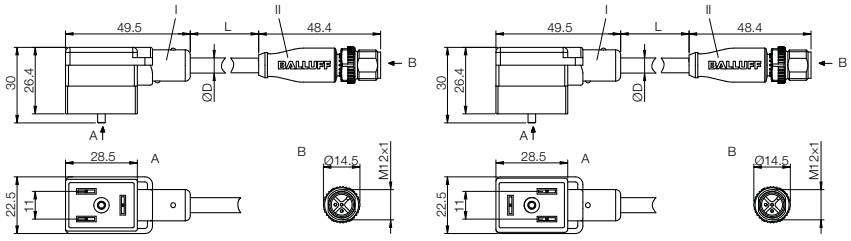


Valve Connectors
Style B, Industry, 11 mm, 3-pin
M12 male, straight

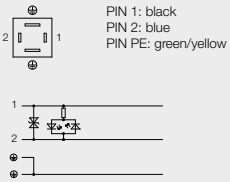
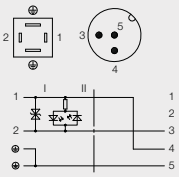
Connector diagram and wiring			
Cable outlet		**0°**	**180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded/molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as per IEC 60529		IP 67/IP 68	IP 67/IP 68
Ambient temperature T_a	Static	–25...+90 °C	–25...+90 °C
	Tensioned	–25...+80 °C	–25...+80 °C
LED		Yellow	Yellow

Cable material	Color	Length	Ordering code Part number	
PUR	Black	0.3 m	**BCC064Z** BCC VB43-M413-3E-666-PX0350-003	**BCC0656** BCC VB63-M413-3E-666-PX0350-003
PUR	Black	0.6 m	**BCC0650** BCC VB43-M413-3E-666-PX0350-006	**BCC0657** BCC VB63-M413-3E-666-PX0350-006
PUR	Black	1 m	**BCC0651** BCC VB43-M413-3E-666-PX0350-010	**BCC0658** BCC VB63-M413-3E-666-PX0350-010
PUR	Black	1.5 m	**BCC0652** BCC VB43-M413-3E-666-PX0350-015	**BCC0659** BCC VB63-M413-3E-666-PX0350-015
PUR	Black	2 m	**BCC0653** BCC VB43-M413-3E-666-PX0350-020	**BCC065A** BCC VB63-M413-3E-666-PX0350-020
PUR	Black	3 m	**BCC0654** BCC VB43-M413-3E-666-PX0350-030	**BCC065C** BCC VB63-M413-3E-666-PX0350-030
PUR	Black	5 m	**BCC0655** BCC VB43-M413-3E-666-PX0350-050	**BCC065E** BCC VB63-M413-3E-666-PX0350-050

Other cable materials, colors, and lengths on request.

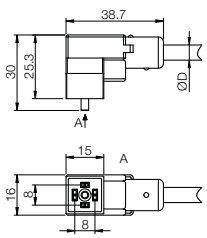


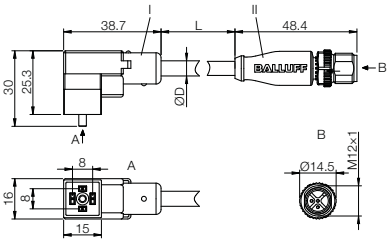
Style C, DIN, 8 mm, 4-pin
Style C, DIN, 8 mm, 4-pin, male M12, straight

Connector diagram and wiring			
Cable outlet		**0°/180°**	**0°/180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as 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	–25...+105 °C/–25...+105 °C
LED		Yellow	Yellow

Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m		**BCC04NC**
				BCC VC04-M413-3E-664-PX0350-003
PUR	Black	0.6 m		**BCC04NE**
				BCC VC04-M413-3E-664-PX0350-006
PUR	Black	1 m		**BCC04NF**
				BCC VC04-M413-3E-664-PX0350-010
PUR	Black	1.5 m		**BCC04NH**
				BCC VC04-M413-3E-664-PX0350-015
PUR	Black	2 m	**BCC04MZ**	**BCC04NJ**
			BCC VC04-0000-10-053-PX0350-020	BCC VC04-M413-3E-664-PX0350-020
PUR	Black	3 m		**BCC04NK**
				BCC VC04-M413-3E-664-PX0350-030
PUR	Black	5 m	**BCC04N0**	**BCC04NL**
			BCC VC04-0000-10-053-PX0350-050	BCC VC04-M413-3E-664-PX0350-050
PUR	Black	10 m	**BCC04N1**	
			BCC VC04-0000-10-053-PX0350-100	
PVC	Gray	2 m	**BCC04N2**	
			BCC VC04-0000-10-053-VX8350-020	
PVC	Gray	5 m	**BCC04N3**	
			BCC VC04-0000-10-053-VX8350-050	
PVC	Gray	10 m	**BCC04N4**	
			BCC VC04-0000-10-053-VX8350-100	

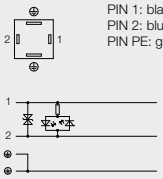
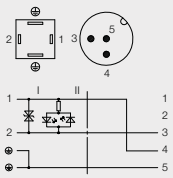
Other cable materials, colors, and lengths on request.





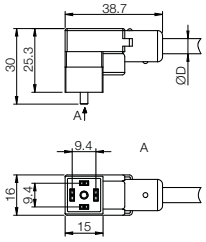
Valve Connectors

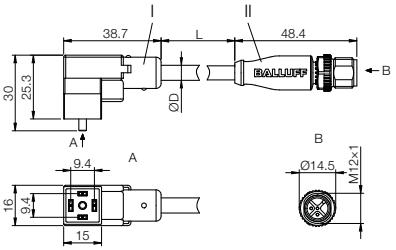
Style C, Industry, 9.4 mm, 4-pin
Style C, Industry, 9.4 mm, 4-pin, male M12, straight

Connector diagram and wiring			
Cable outlet		**0°/180°**	**0°/180°**
Max. supply voltage AC U_B		24 V AC	24 V AC
Max. supply voltage DC U_B		24 V DC	24 V DC
Cable		Molded	Molded/molded
Current rating		4.0 A	4.0 A
Suppressor		Suppressor diode	Suppressor diode
Number of conductors × conductor cross-section		3×0.5mm²	3×0.5mm²
Degree of protection as 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	–25...+105 °C/–25...+105 °C
LED		Yellow	Yellow

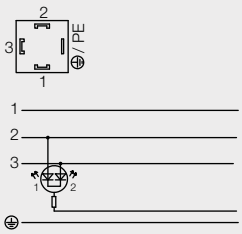
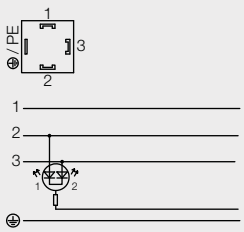
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	0.3 m		**BCC04RY**
				BCC VC44-M413-3E-664-PX0350-003
PUR	Black	0.6 m		**BCC04RZ**
				BCC VC44-M413-3E-664-PX0350-006
PUR	Black	1 m		**BCC04T0**
				BCC VC44-M413-3E-664-PX0350-010
PUR	Black	1.5 m		**BCC04T1**
				BCC VC44-M413-3E-664-PX0350-015
PUR	Black	2 m	**BCC04RF**	**BCC04T2**
			BCC VC44-0000-10-053-PX0350-020	BCC VC44-M413-3E-664-PX0350-020
PUR	Black	3 m		**BCC04T3**
				BCC VC44-M413-3E-664-PX0350-030
PUR	Black	5 m	**BCC04RH**	**BCC04T4**
			BCC VC44-0000-10-053-PX0350-050	BCC VC44-M413-3E-664-PX0350-050
PUR	Black	10 m	**BCC04RJ**	
			BCC VC44-0000-10-053-PX0350-100	
PVC	Gray	2 m	**BCC04RK**	
			BCC VC44-0000-10-053-VX8350-020	
PVC	Gray	5 m	**BCC04RL**	
			BCC VC44-0000-10-053-VX8350-050	
PVC	Gray	10 m	**BCC04RM**	
			BCC VC44-0000-10-053-VX8350-100	

Other cable materials, colors, and lengths on request.



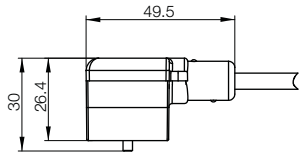


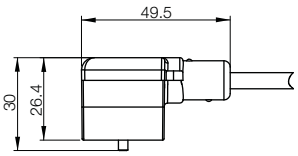
Connectors for pressure switches, 4-pin

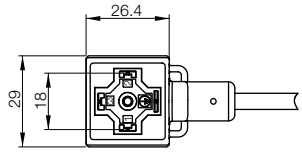
Connector diagram and wiring	 PIN 1: brown PIN 2: white PIN 3: black No PIN: blue PE PIN: green/yellow 1) Yellow LED = Function 2) Green LED = Function	 PIN 1: brown PIN 2: white PIN 3: black No PIN: blue PE PIN: green/yellow 1) Yellow LED = Function 2) Green LED = Function
Cable outlet	**0°**	**180°**
Max. supply voltage AC U_B	24 V AC	24 V AC
Max. supply voltage DC U_B	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 mm²	5×0.5 mm²
Degree of protection as per IEC 60529	IP 67	IP 67
Ambient temperature T_a — Static	–30...+90 °C	–30...+90 °C
Ambient temperature T_a — Tensioned	–5...+80 °C	–5...+80 °C
LED	Yellow/Green	Yellow/Green

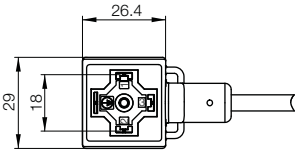
Cable material	Color	Length	Ordering code	
			Part number	
PUR	Black	2 m	**BCC071A**	**BCC071F**
			BCC PA04-0000-10-070-PX0550-020	BCC PA24-0000-10-070-PX0550-020
PUR	Black	5 m	**BCC071C**	**BCC071H**
			BCC PA04-0000-10-070-PX0550-050	BCC PA24-0000-10-070-PX0550-050
PUR	Black	10 m	**BCC071E**	**BCC071J**
			BCC PA04-0000-10-070-PX0550-100	BCC PA24-0000-10-070-PX0550-100

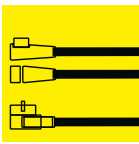
Other cable materials, colors, and lengths on request.











Power Supplies

Power Supplies

Industrial automation is becoming ever more demanding and the complexity of its tasks is constantly increasing. Efficient operation of equipment and machines demands reliable power sources more than ever. Balluff power supplies are the powerful solution for fault-free system operation.

Take advantage of the special benefits of Balluff power supplies

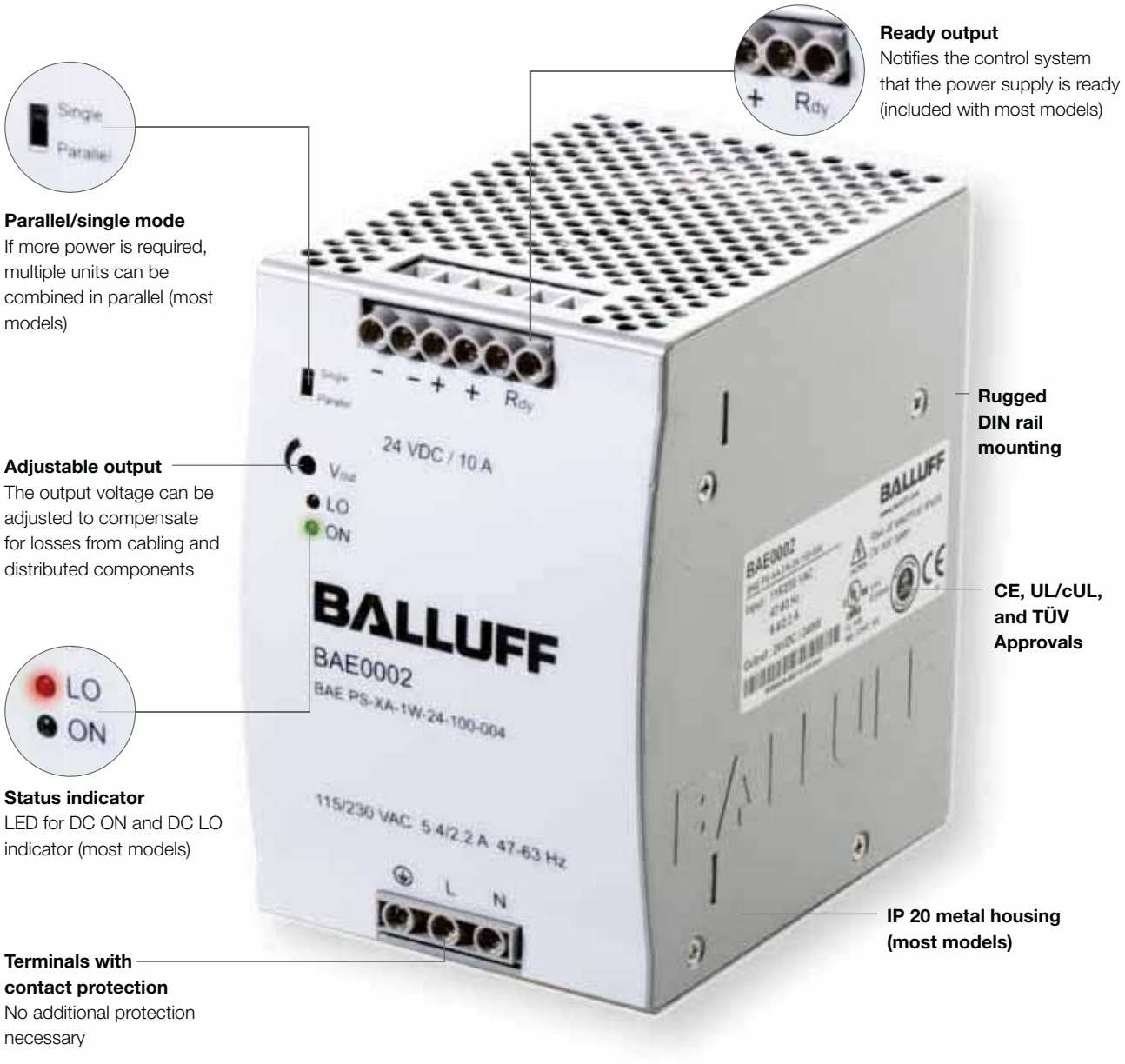
- Full product line – choose just what you need
- Short-circuit and overload protection in industrial environments
- High availability of all devices
- Unlimited, precise power for increased demands
- Long service life for reliable operation
- Worldwide approvals for use anywhere

Power Supplies
Contents

Power Supplies
Reliable performance for high requirements

Every industrial automation system needs a reliable, clean, and controlled source of power without spikes. Only then can these systems deliver the expected performance.
Balluff power supplies ensure reliable power even under demanding conditions and deliver reliable, high-quality performance.

- **Ultra-reliable power supplies**
  for protecting sensitive control electronics
- **Protection against unforeseen events**
  Integrated overload and overvoltage protection
- **Wide selection of models**
  Individual devices or individually combinations of different models available
- **Clean, precise power supply for particularly demanding systems**
  Load regulation ± 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



Version	Output voltage	Output power																Input voltage	Features			Product information		Page
		0.75 mA/18 W	1.25 A/30 W	1.5 A/18 W	2.5 A/30 W	2.5 A/60 W	2.5 A/120 W	3.8 A/91.20 W	5 A/60 W	5 A/120 W	5 A/240 W	8 A/200 W	10 A/120 W	10 A/240 W	10 A/480 W	20 A/480 W	40 A/960 W		Housing material	Parallel mode	Ready output	**Ordering code**	Part number	
Standard IP 20	12 V			■														Single-phase[1]	Plastic			**BAE0036**	BAE-PS-XA-1W-12-015-001	**370**
					■													Single-phase[1]	Plastic		■	**BAE0039**	BAE-PS-XA-1W-12-025-002	**371**
						■												Single-phase[1]	Metal		■	**BAE003E**	BAE-PS-XA-1W-12-050-002	**373**
													■					Single-phase[2]	Metal	■	■	**BAE003H**	BAE-PS-XA-1W-12-100-003	**375**
	24 V	■																Single-phase[1]	Plastic			**BAE0001**	BAE-PS-XA-1W-24-007-001	**370**
			■															Single-phase[1]	Plastic		■	**BAE0004**	BAE-PS-XA-1W-24-012-002	**371**
						■												Single-phase[1]	Plastic		■	**BAE0005**	BAE-PS-XA-1W-24-025-002	**372**
								■										Single-phase[2]	Metal	■	■	**BAE003J**	BAE-PS-XA-1W-24-038-003	**374**
										■								Single-phase[2]	Metal	■	■	**BAE0006**	BAE-PS-XA-1W-24-050-003	**375**
														■				Single-phase[2]	Metal	■	■	**BAE0002**	BAE-PS-XA-1W-24-100-004	**376**
																■		Single-phase[2]	Metal	■	■	**BAE0003**	BAE-PS-XA-1W-24-200-005	**377**
										■								3-phase[3]	Metal		■	**BAE0007**	BAE-PS-XA-3Y-24-050-009	**378**
														■				3-phase[3]	Metal	■	■	**BAE0008**	BAE-PS-XA-3Y-24-100-006	**379**
																■		3-phase[3]	Metal	■	■	**BAE0009**	BAE-PS-XA-3Y-24-200-007	**379**
																	■	3-phase[3]	Metal	■	■	**BAE003R**	BAE-PS-XA-3Y-24-400-010	**380**
	48 V						■											Single-phase[2]	Plastic	■	■	**BAE003K**	BAE-PS-XA-1W-48-025-003	**374**
											■							Single-phase[2]	Metal	■	■	**BAE003L**	BAE-PS-XA-1W-48-050-004	**376**
															■			Single-phase[2]	Metal	■	■	**BAE003M**	BAE-PS-XA-1W-48-100-005	**377**
Intelligent devices IP 20	24 V									■								Single-phase[1]	Metal		■	**BAE00EK**	BAE-PS-XA-1W-24-050-013	**365**
														■				Single-phase[1]	Metal		■	**BAE00EU**	BAE-PS-XA-1W-24-100-014	**365**
Intelligent devices IP 67								■										Single-phase[1]	Metal			**BAE00EN**	BAE-PS-XA-1W-24-038-601	**366**
								■										Single-phase[1]	Metal			**BAE00EP**	BAE-PS-XA-1W-24-038-602	**366**
								■										Single-phase[1]	Metal			**BAE00ER**	BAE-PS-XA-1W-24-038-603	**367**
								■										Single-phase[1]	Metal			**BAE00FW**	BAE-PS-XA-1W-24-038-607	**367**
												■						Single-phase[1]	Metal			**BAE00ET**	BAE-PS-XA-1W-24-080-604	**367**
												■						Single-phase[1]	Metal			**BAE00FL**	BAE-PS-XA-1W-24-080-605	**368**
												■						Single-phase[1]	Metal			**BAE00FY**	BAE-PS-XA-1W-24-080-606	**368**

[1] = 100...240 V AC
[2] = 115/230 V AC (Auto-Select)
[3] = 340...575 V AC

Power for controllers and networks
Specially developed for controller units, Balluff power supplies can be perfectly integrated into control packages.

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 to 960 W, they truly leave nothing to be desired. Several power supplies can be connected for even more power (parallel mode).

If you need other voltage levels, simply contact us.

Power Supplies
Intelligent power supply units
Single-phase power supplies
Three-phase power supplies
Technical data

Power Supplies

Reliable performance for the high requirements in industrial automation

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. They provide a complete picture of their environment wherever they are installed, allowing you to monitor the environment continuously.

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.

The benefits to you
- 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 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

Reliable performance for the high requirements of industrial automation

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 indicates the remaining service life of the device based on the sum of all loads.

All indicators are multi-colored – green, yellow, or red – and show the status of the device.

Intelligent devices for the demanding requirements of industrial automation

Intelligent power supply units

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 remedy this situation. They have visual displays that indicate their status – with load level, stress level and lifetime.
This enables operation under continuously high load and eliminates the need for typical reserves of 30 to 50%.

Ideal areas of application for these intelligent power supply units include local installations in the automobile industry, machine construction, wind turbines, etc.

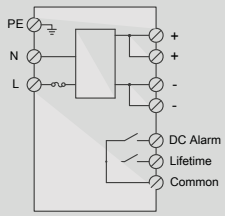
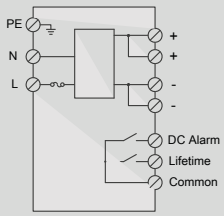
IP 20

General key information about the IP 20 and IP 67 power supply units

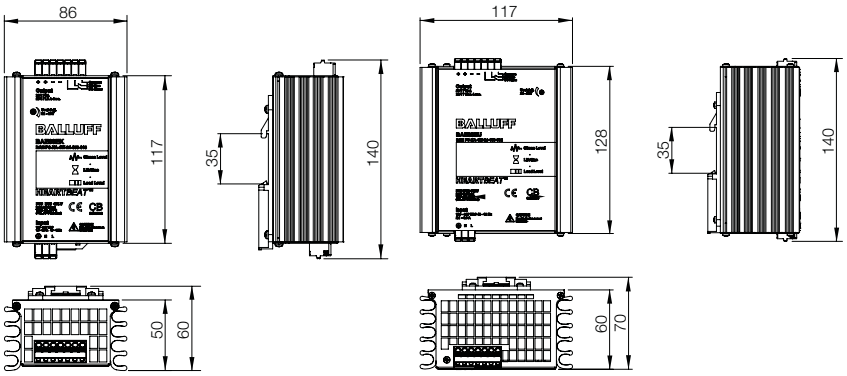
- High efficiency of up to 92%
- Minimal heat loss and generation
- Increasing efficiency of the systems
- 3-stage status indication
- Power boost (150% for 4 sec.)
- Extremely compact
- More efficient utilization of the power supply units
- Planned reserves are not wasted
- Prevention of failures since there is no 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)
- Enclosed housing guarantees high degree of resistance to vibration and shock loads
- With IP 20, also with floating alarm contacts

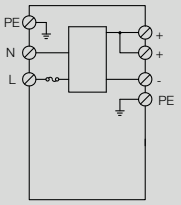
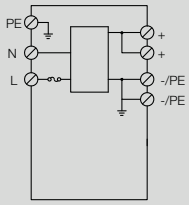
IP 67

Power Supplies
Intelligent devices
5 A, 10 A

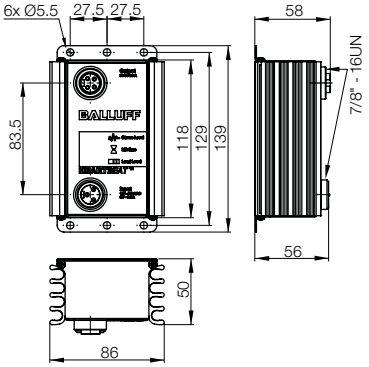
Output current	5 A	10 A
Output power	120 W	240 W
Output voltage	24 V DC (SELV)	24 V DC (SELV)
Input voltage	100...240 V AC Single phase	100...240 V AC single-phase
Ordering code	**BAE00EK**	**BAE00EU**
Part number	BAE PS-XA-1W-24-050-013	BAE PS-XA-1W-24-100-014
Input voltage range	90...264 V AC/135...340 V DC	90...264 V AC/135...340 V DC
Inrush current	1.14 at 230 VAC/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 range	–25...+70 °C	–25...+70 °C
Storage temperature	–40...+80 °C	–40...+80 °C
Fastener	DIN rail mounting	DIN rail mounting
Parallel mode	Yes (with external diodes)	Yes (with external diodes)
Degree of protection as 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		

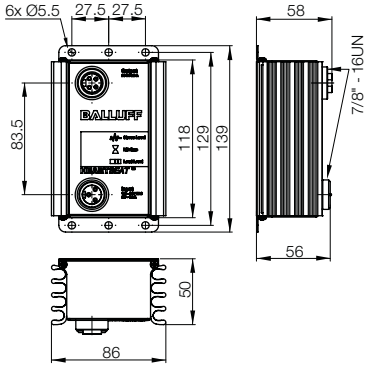
*SELV = Safety Extra Low Voltage

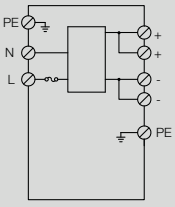
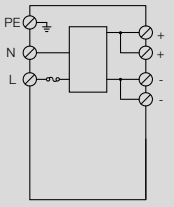
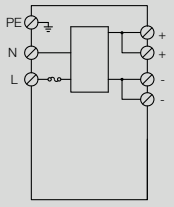


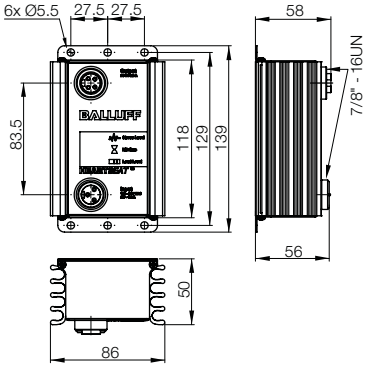
Output current	3.8 A	3.8 A	
Output power	91.2 W	91.2 W	
Output voltage	24 V DC (SELV)	24 V DC (PELV)	
Input voltage	100...240 V AC Single phase	100...240 V AC single-phase	
Ordering code	**BAE00EN**	**BAE00EP**	
Part number	BAE PS-XA-1W-24-038-601	BAE PS-XA-1W-24-038-602	
Input voltage range	90...264 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 range	–25...+70 °C	–25...+70 °C	
Storage temperature	–40...+80 °C	–40...+80 °C	
Fastener	Panel, wall, and field mounting	Panel, wall, and field mounting	
Degree of protection as 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			

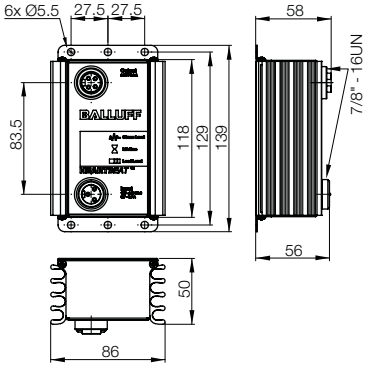
*SELV = Safety Extra Low Voltage

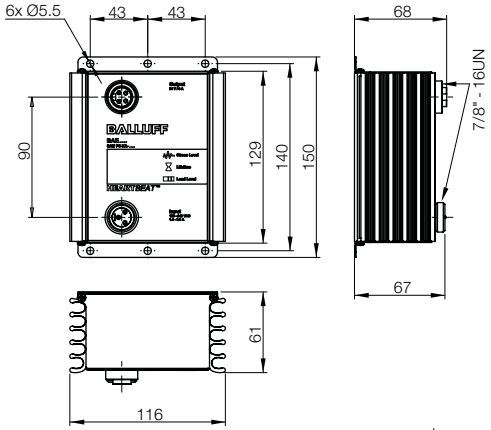


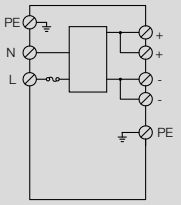
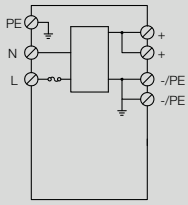


	3.8 A	3.8 A	8 A
	91.2 W	91.2 W	192 W
	24 V DC (SELV)	24 V DC (SELV)	24 V DC (SELV)
	100...240 V AC	100...240 V AC	100...240 V AC
	single-phase	single-phase	single-phase
	BAE00ER	**BAE00FW**	**BAE00ET**
	BAE PS-XA-1W-24-038-603	BAE PS-XA-1W-24-038-607	BAE PS-XA-1W-24-080-604
	90...264 V AC/ 135...340 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
			

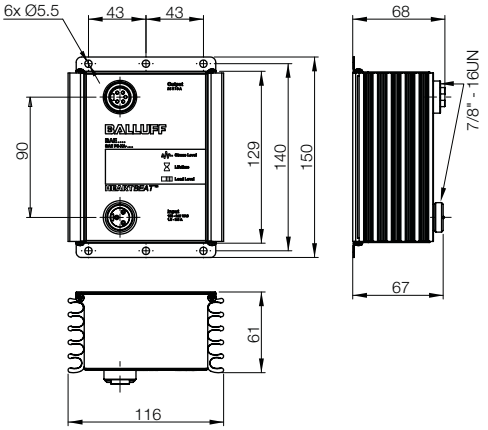


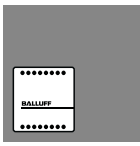




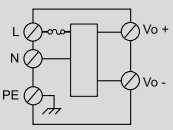
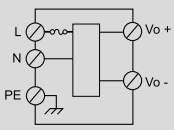
Output current	8 A	8 A
Output power	192 W	192 W
Output voltage	24 V DC (SELV)	24 V DC (PELV)
Input voltage	100...240 V AC Single phase	100...240 V AC single-phase
Ordering code	**BAE00FL**	**BAE00FY**
Part number	BAE PS-XA-1W-24-080-605	BAE PS-XA-1W-24-080-606
Input voltage range	90...264 V AC/135...340 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 range	–25...+70 °C	–25...+70 °C
Storage temperature	–40...+80 °C	–40...+80 °C
Fastener	Panel, wall, and field mounting	Panel, wall, and field mounting
Degree of protection as 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



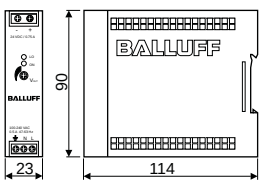


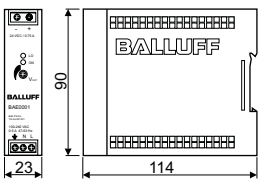
Power Supplies
Single-phase input voltage
0.75 A, 1.5 A

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
Ordering code	**BAE0001**	**BAE0036**
Part number	BAE PS-XA-1W-24-007-001	BAE PS-XA-1W-12-015-001
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
Insulation resistance	100 MΩ	100 MΩ
Turn-on delay	< 1 s	< 1 s
Ambient temperature range	–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)
Degree of protection as 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		

L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +

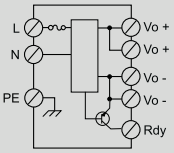
*SELV = Safety Extra Low Voltage



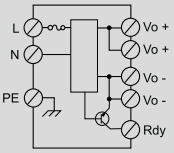


Power Supplies
Single-phase input voltage
1.25 A, 2.5 A

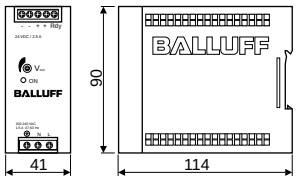
1.25 A	2.5 A
30 W	30 W
24 V DC (SELV)	12 V DC (SELV)
100...240 V AC	100...240 V AC
BAE0004	**BAE0039**
BAE PS-XA-1W-24-012-002	BAE PS-XA-1W-12-025-002
85...264 V AC/90...375 V DC	85...264 V AC/90...375 V DC
115 V AC < 20 A/230 V AC < 40 A	115 V AC < 20 A/230 V AC < 40 A
47...63 Hz	47...63 Hz
T2 A/250 V AC internal	T2 A/250 V AC internal
22.5...28.5 V DC	11...14 V DC
±0.03%/°C	±0.03%/°C
50 mV	50 mV
115 V AC > 20 ms/230 V AC > 30 ms	115 V AC > 20 ms/230 V AC > 30 ms
Green LED	Green LED
86%	84%
Forward characteristic	Forward characteristic
> 80 kHz	> 80 kHz
3000 V AC	3000 V AC
100 MΩ	100 MΩ
< 1 s	< 1 s
–40...+70 °C	–40...+70 °C
–2.5%/°C of +61 °C	–2.5%/°C of +61 °C
Yes (with external diodes)	Yes (with external diodes)
IP 20	IP 20
DC OK output	DC OK output
Free convection	Free convection
Plastic	Plastic
0.29 kg	0.29 kg
CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

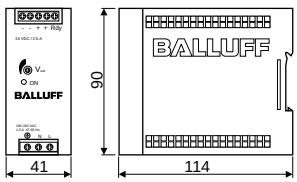


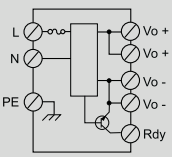
L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output



L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

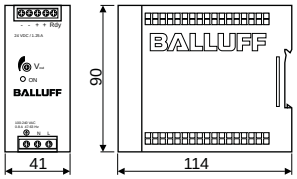




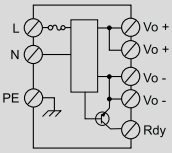
Output current	2.5 A
Output power	60 W
Output voltage	24 V DC (SELV)
Input voltage	100...240 V AC
Ordering code	**BAE0005**
Part number	BAE PS-XA-1W-24-025-002
Input voltage range	85...264 V AC/90...375 V DC
Inrush current	115 V AC < 30 A/230 V AC < 60 A
Frequency range	47...63 Hz
Input fuse	T2 A/250 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
Status indicator DC LOW	
Efficiency	89%
Response	Forward characteristic
Switching frequency	> 55 kHz
Input/output isolation voltage	3000 V AC
Insulation resistance	100 MΩ
Turn-on delay	< 1 s
Ambient temperature range	–40...+70 °C
Derating	–2.5%/°C of +61 °C
Parallel mode	Yes (with external diodes)
Degree of protection as 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

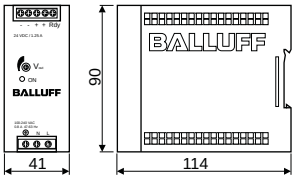
*SELV = Safety Extra Low Voltage



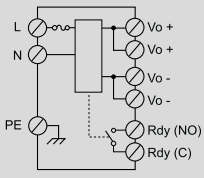
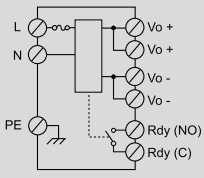
	5 A
	60 W
	12 V DC (SELV)
	100...240 V AC
	BAE003E
	BAE PS-XA-1W-12-050-002
	85...264 V AC/90...375 V DC
	115 V AC < 30 A/230 V AC < 60 A
	47...63 Hz
	T2 A/250 V AC internal
	11...14 V DC
	±0.03%/°C
	50 mV
	115 V AC > 20 ms/230 V AC > 30 ms
	Green LED
	86%
	Forward characteristic
	> 55 kHz
	3000 V AC
	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

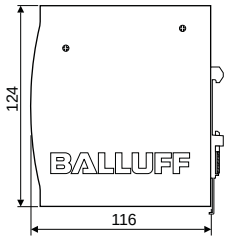


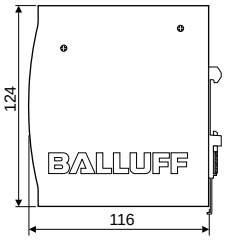
Single-phase input voltage
2.5 A, 3.8 A

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)
Ordering code	**BAE003J**	**BAE003K**
Part number	BAE PS-XA-1W-24-038-003	BAE PS-XA-1W-48-025-003
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
Insulation resistance	100 MΩ	100 MΩ
Turn-on delay	< 1 s	< 1 s
Ambient temperature range	–35...+70 °C	–35...+70 °C
Derating	–2.5%/°C of +61 °C	–2.5%/°C of +61 °C
Parallel mode	No	Yes
Degree of protection as 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		

L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

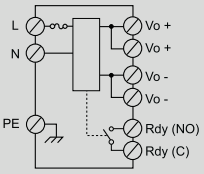
*SELV = Safety Extra Low Voltage



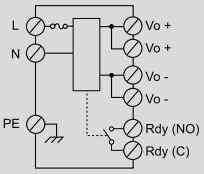


Single-phase input voltage
5 A, 10 A

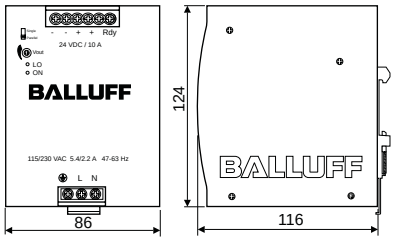
5 A	10 A
120 W	120 W
24 V DC (SELV)	12 V DC (SELV)
115/230 V AC (Auto-Select)	115/230 V AC (Auto-Select)
BAE0006	**BAE003H**
BAE PS-XA-1W-24-050-003	BAE PS-XA-1W-12-100-003
90...132 V AC; 180...264 V AC/210...375 V DC	90...132 V AC; 180...264 V AC/210...375 V DC
115 V AC < 24 A/230 V AC < 48 A	115 V AC < 24 A/230 V AC < 48 A
47...63 Hz	47...63 Hz
T3.15 A/250 V AC internal	T3.15 A/250 V AC internal
22.5...28.5 V DC	11...14 V DC
±0.03%/°C	±0.03%/°C
50 mV	50 mV
115 V AC > 25 ms/230 V AC > 30 ms	115 V AC > 25 ms/230 V AC > 30 ms
Green LED	Green LED
Red LED	Red LED
86%	84%
Forward characteristic	Forward characteristic
> 55 kHz (typically)	> 55 kHz (typically)
3000 V AC	3000 V AC
100 MΩ	100 MΩ
< 1 s	< 1 s
–35...+70 °C	–35...+70 °C
–2.5%/°C of +61 °C	–2.5%/°C of +61 °C
Yes	Yes
IP 20	IP 20
DC OK output relay	DC OK output relay
Free convection	Free convection
Metal	Metal
0.92 kg	0.92 kg
CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

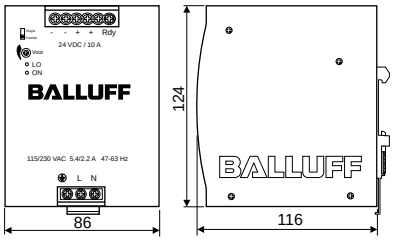


L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

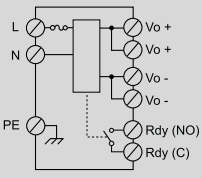
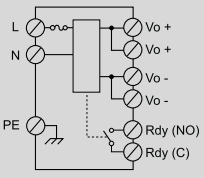


L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output



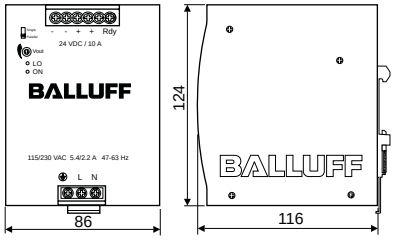


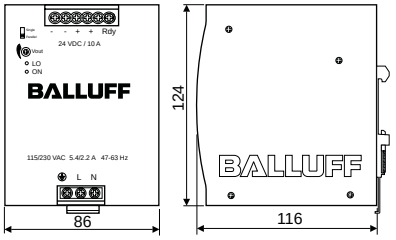
Single-phase input voltage
5 A, 10 A

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)
Ordering code	**BAE003L**	**BAE0002**
Part number	BAE PS-XA-1W-48-050-004	BAE PS-XA-1W-24-100-004
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
Insulation resistance	100 MΩ	100 MΩ
Turn-on delay	< 1 s	< 1 s
Ambient temperature range	–40...+70 °C	–40...+70 °C
Derating	–2.5%/°C of +61 °C	–2.5%/°C of +61 °C
Parallel mode	Yes	Yes
Degree of protection as 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		

L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

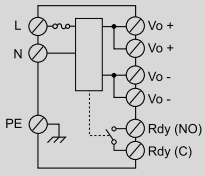
*SELV = Safety Extra Low Voltage



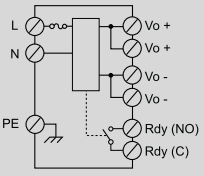


Power Supplies
Single-phase input voltage
10 A, 20 A

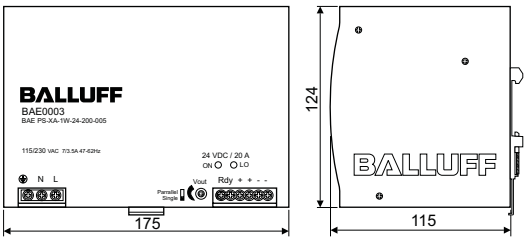
10 A	20 A
480 W	480 W
48 V DC (SELV)	24 V DC (SELV)
115/230 V AC (Auto-Select)	115/230 V AC (Auto-Select)
BAE003M	**BAE0003**
BAE PS-XA-1W-48-100-005	BAE PS-XA-1W-24-200-005
90...264 V AC/120...370 V DC	90...264 V AC/120...370 V DC
115 V AC < 25 A/230 V AC < 50 A	115 V AC < 25 A/230 V AC < 50 A
47...63 Hz	47...63 Hz
T10 A/250 V AC internal	T10 A/250 V AC internal
47...55 V DC	22.5...28.5 V DC
±0.03%/°C	±0.03%/°C
100 mV	100 mV
115 V AC > 25 ms/230 V AC > 30 ms	115 V AC > 25 ms/230 V AC > 30 ms
Green LED	Green LED
Red LED	Red LED
90%	89%
Forward characteristic	Forward characteristic
> 65 kHz (typically)	> 65 kHz (typically)
3000 V AC	3000 V AC
100 MΩ	100 MΩ
< 1 s	< 1 s
–40...+70 °C	–40...+70 °C
–2.5%/°C of +56 °C	–2.5%/°C of +56 °C
Yes	Yes
IP 20	IP 20
DC OK output relay	DC OK output relay
Free convection	Free convection
Metal	Metal
1.92 kg	1.92 kg
CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

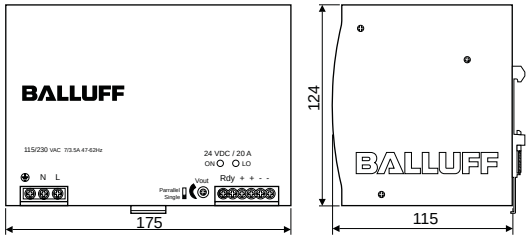


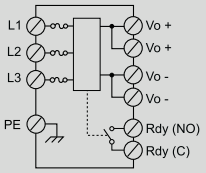
L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output



L, N	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

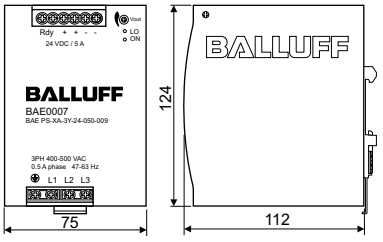




Output current	5 A
Output power	120 W
Output voltage	24 V DC (SELV)
Input voltage	3× 400...500 V AC
Ordering code	**BAE0007**
Part number	BAE PS-XA-3Y-24-050-009
Input voltage range	340...575 V AC/480...820 V DC
Inrush current	< 10 A
Frequency range	47...63 Hz
Input fuse	2 A/600 V AC internal/phase
Voltage 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
Insulation resistance	100 MΩ
Turn-on delay	< 1 s
Ambient temperature range	–40...+70 °C
Derating	–2.5%/°C of +61 °C
Parallel mode	Yes (with external diodes)
Degree of protection as 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	

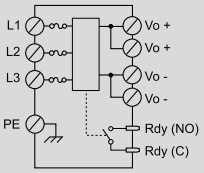
L	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output

*SELV = Safety Extra Low Voltage

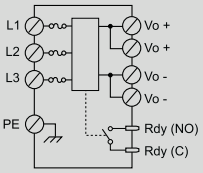


Power Supplies
3-phase input voltage
10 A, 20 A

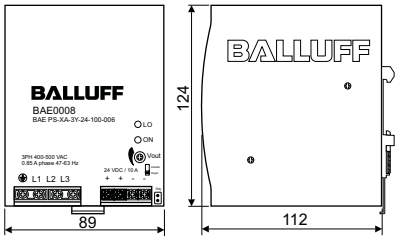
	10 A	20 A
	240 W	480 W
	24 V DC (SELV)	24 V DC (SELV)
	3× 400...500 V AC	3× 400...500 V AC
	BAE0008	**BAE0009**
	BAE PS-XA-3Y-24-100-006	BAE PS-XA-3Y-24-200-007
	340...575 V AC/480...820 V DC	340...575 V AC/480...820 V DC
	< 20 A	< 20 A
	47...63 Hz	47...63 Hz
	T2 A/600 V AC internal/phase	3.15 A/500 V AC internal/phase
	22.5...28.5 V DC	22.5...28.5 V DC
	±0.03%/°C	±0.03%/°C
	100 mV	100 mV
	> 20 ms	> 20 ms
	Green LED	Green LED
	Red LED	Red LED
	90%	90%
	Hiccup mode	Forward characteristic (C), restart after 30 s (D), Shutoff within 3 s, (C)/(D) togglable
	> 30 kHz (typically)	> 75 kHz (typically)
	3000 V AC	3000 V AC
	100 MΩ	100 MΩ
	< 1 s	< 1 s
	–40...+70 °C	–30...+70 °C
	–2.5%/°C of +61 °C	–2.5%/°C of +61 °C
	Yes	Yes
	IP 20	IP 20
	DC OK output relay	DC OK output relay
	Free convection	Free convection
	Metal	Metal
	1.1 kg	1.75 kg
	CE, UL/cUL, TÜV	CE, UL/cUL, TÜV

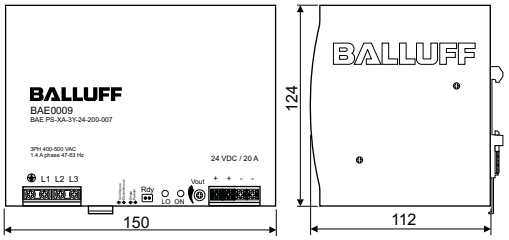


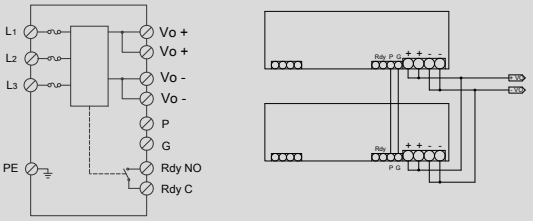
L	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output



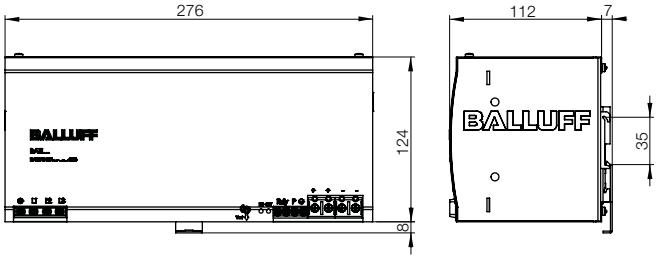
L	Input terminals
PE	PE connection
Vo –	Output terminal –
Vo +	Output terminal +
Rdy	Ready output





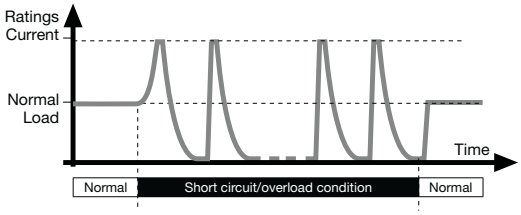
Output current	40 A
Output power	960 W
Output voltage	24 V DC (SELV)
Input voltage	3× 400...500 V AC
Ordering code	**BAE003R**
Part number	BAE PS-XA-3Y-24-400-010
Input voltage range	340...575 V AC/480...820 V DC
Inrush current	< 30 A
Frequency range	47...63 Hz
Input fuse	T5 A/500 V AC internal/phase
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
Insulation resistance	100 MΩ
Turn-on delay	< 1 s
Ambient temperature range	–40...+70 °C
Derating	–3.5%/°C above +61 °C
Parallel mode	Yes
Degree of protection as 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

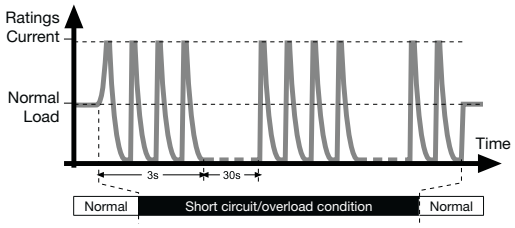


Output short circuit protection

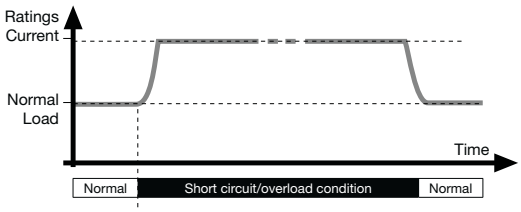
Hiccup mode overload protection*



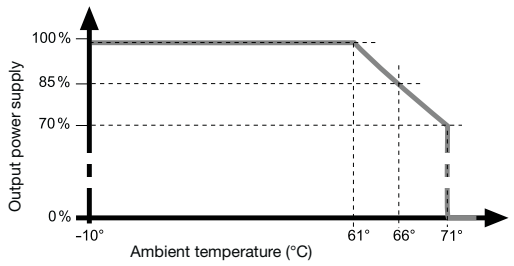
Hiccup mode with turn-off overload protection*



Current limiter and forward characteristic*



Temperature under-load



LED definition

DC ON	DC LO	Possible situation
○ off	○ off	AC supply off, internal fuse burned out, short circuit
● on	○ off	Normal operation
○ off	● on	Output voltage < 19.2 V
● on	● on	Power supply failure
Green	Red	

Approvals and standards

UL/cUL
UL 508 listed/UL 60950-1, UL 1310 Class 2

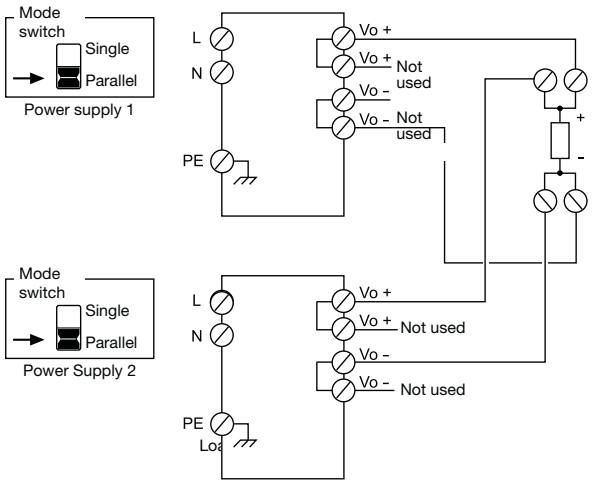
TÜV
EN 60950-1

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

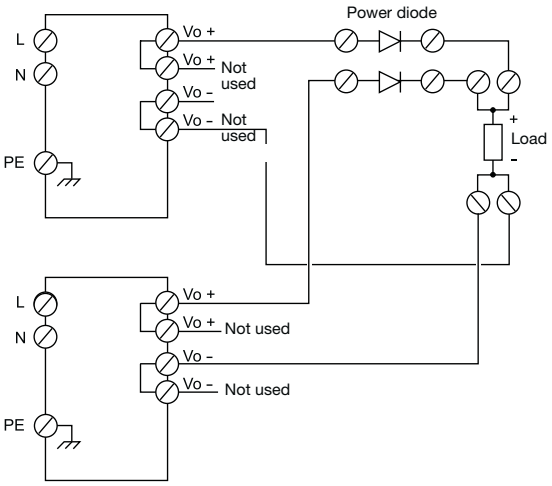
*Note: Diagrams are for illustration only. They do not reflect the actual waveforms.

Parallel mode**

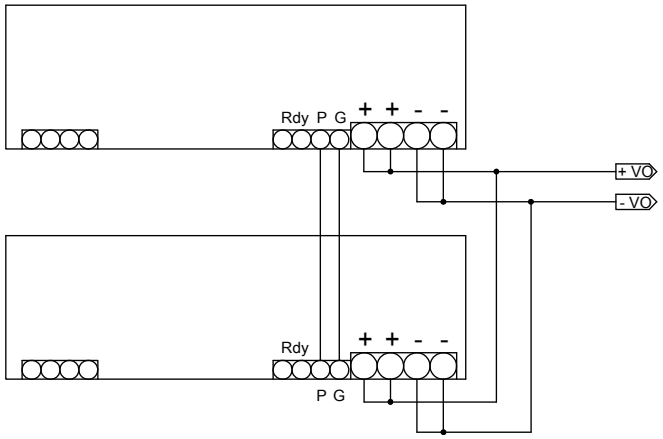
BAE0002, BAE0003, BAE0006,
BAE0008, BAE0009



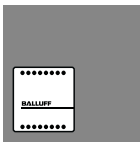
For all without
parallel switching mode

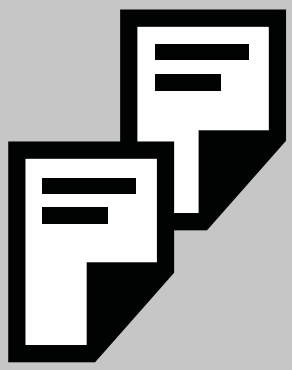


BAE003R



**Note: When wiring power supplies in parallel, the cable lengths should be the same for all DC connections on the load.





Basic Information and Definitions

Contents

Cable properties

Cable types

PUR cable, PUR insulated

Number of conductors × conductor cross-section	Outside diameter typical
3×0.14 mm²	2.5...3.5 mm
3×0.25 mm²	3.5...4.5 mm
3×0.34 mm²	4...5.5 mm
4×0.14 mm²	3...4 mm
4×0.34 mm²	4...5.5 mm
8×0.25 mm²	6...8 mm
12×0.25 mm²	6...8 mm
5×0.34 mm²	5...6.5 mm
3×1.5 mm²	7.8...8.2 mm
4×1.5 mm²	7.8...8.2 mm
5×1.5 mm²	8.5...8.9 mm

Number of conductors × conductor cross-section	Outside diameter typical
2×0.14 mm²	2.5...3.5 mm
2×0.34 mm²	4.5...5.5 mm
3×0.14 mm²	2.7...4.5 mm
3×0.25 mm²	4...5 mm
3×0.34 mm²	4.5...5.5 mm
4×0.34 mm²	4.6...5.5 mm
5×0.34 mm²	5.0...5.5 mm
8×0.25 mm²	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 splatter. A special connection 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

Braun, 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 as per DIN EN ISO 9001:2008

Balluff companies	
Balluff GmbH	Germany
Balluff SIE Sensorik GmbH	Germany
Balluff Controles Elétricos 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.	Spain
Balluff CZ, s.r.o	Czech Republic
Balluff Elektronika Kft.	Hungary
Balluff Inc.	USA

Reg.Nr.: 19279-03

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).

DAkkS Deutsche Akkreditierungsstelle D-PL-12017-01-01

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 ≥ 75 V DC/≥ 50 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
Degree of protection	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 inspection, 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.
	P 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)	Emissions, RF noise voltage and RF noise radiation from electrical equipment	EN 55011
	Static discharge immunity (ESD)	EN 61000-4-2/IEC 61000-4-2
	Radio frequency 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
	Interference immunity against conducted interference, induced by high-frequency fields	EN 61000-4-6/IEC 61000-4-6
	Immunity to voltage dips and voltage 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: Electrical equipment for gas explosive atmospheres, general requirements	EN 60079-0
	Electrical apparatus for explosive areas – intrinsic safety "i"	EN 50020

For conformity, see product marking.

Mounting torques

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

Degree of protection

The degrees of protection are given 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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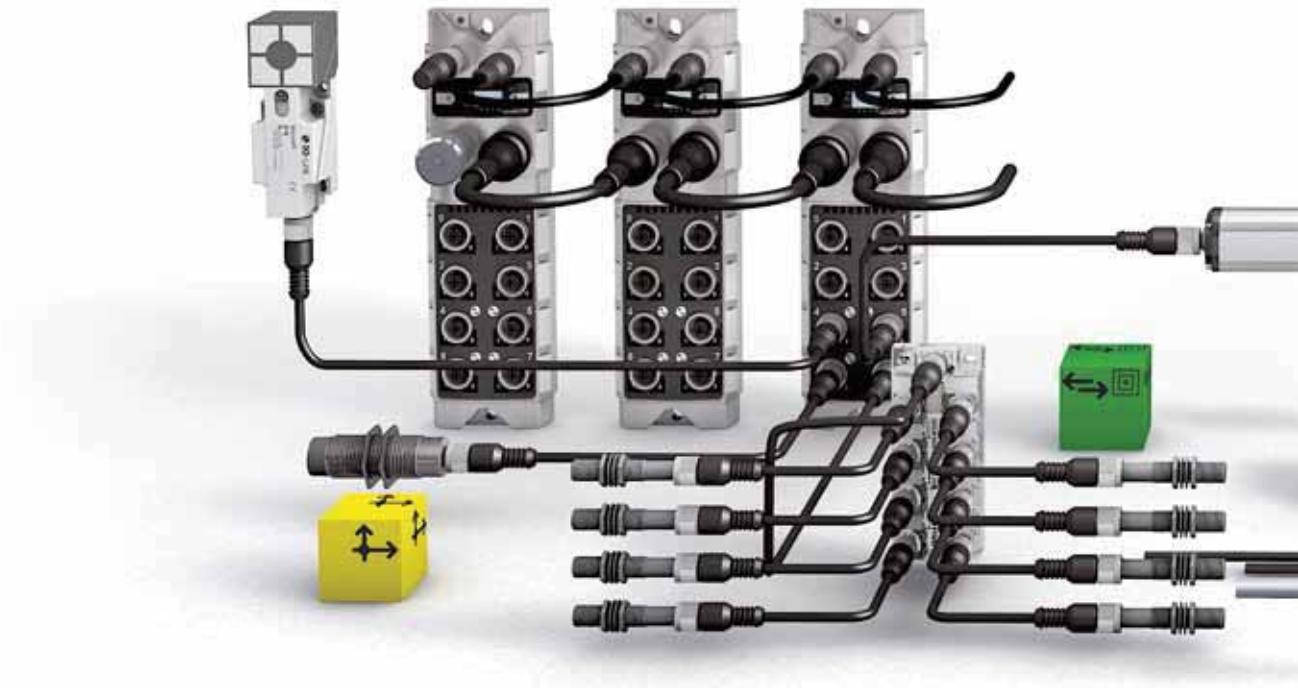

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Project support
Vision sensors
IO-Link
Industrial Networking and Connectivity
Product
System components
Decision help

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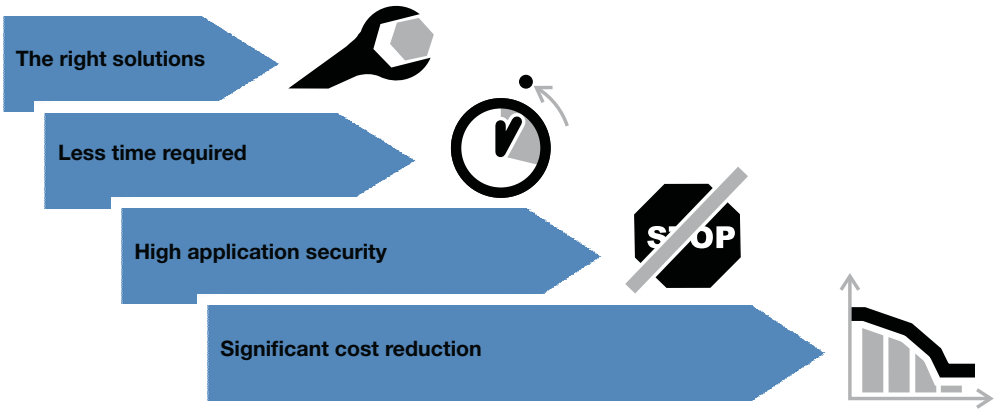
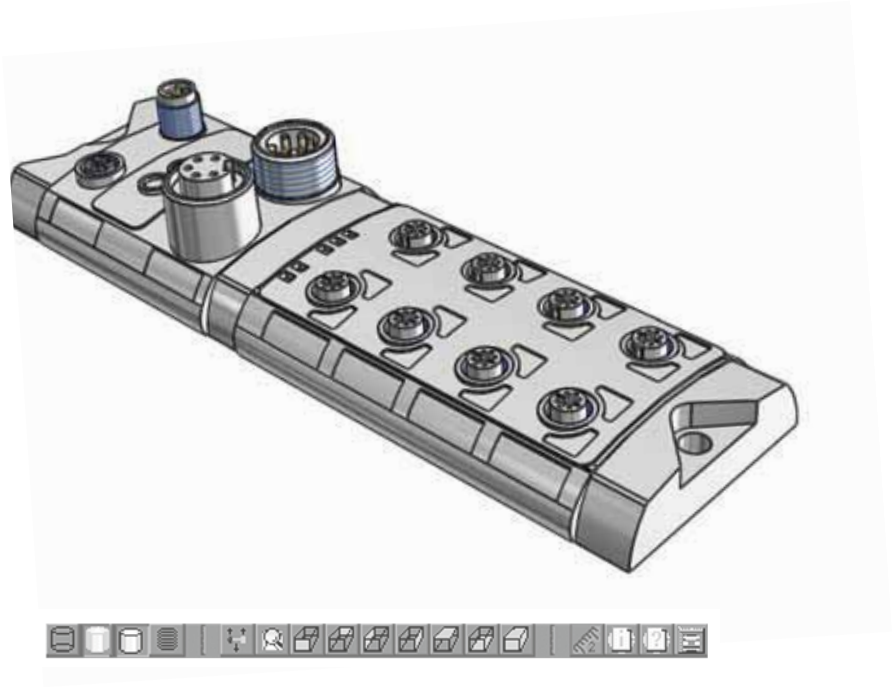
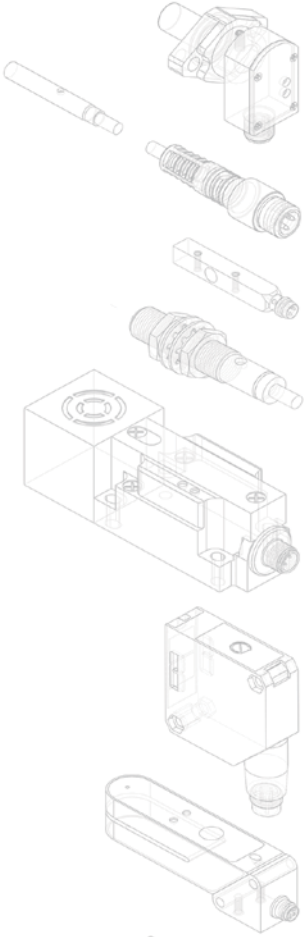
Application advice through our TecSupport: Discuss your technical requirements. And take advantage of our expertise.	Real-world examples: ■ Selection of the correct identification procedure for an assembly line ■ IO-Link concept as a cost-effective alternative to conventional wiring ■ System consulting for radio frequency identification (RFID): identification of large steel pipes in adverse environments ■ Recognizing multiple containers on a pallet in goods receiving
Commissioning: Order expert knowledge. And benefit from a quick start of production.	Real-world examples: ■ Setting up an optical checkpoint with the vision sensor BVS ■ Consulting and support during the programming of RFID systems BIS ■ Installation and commissioning of a color detection application with the color sensor BFS
Fully customized products: Order individual versions according to your requirements: from preassembly to engineering services. And take advantage of the optimum.	Real-world examples: ■ Extending the housing of a high-pressure resistant inductive sensor BHS ■ Extra threads for the housing cover of a micropulse transducer BTL ■ Customer-specific holder for an RFID data carrier ■ Adaptation of the characteristics for analog sensors BAW
Workshops: Make use of well-founded manufacturer expertise. And benefit from application security.	■ **Professional sensor use:** Select operating principles, install sensors professionally and ensure the reliable operation of your application. ■ **Position and Distance Measurement:** This is how you perform precise and wear-free measurements. ■ **RFID:** The right data at the right time at the right place. ■ **Vision sensor:** Using an image processing sensor, ensure manufacturing quality in three steps. ■ **Vision sensor identification:** Reliably identify data matrix codes with an image-processing sensor. ■ **Industrial networking with IO-Link:** Manage signals intelligently and cost-effectively.

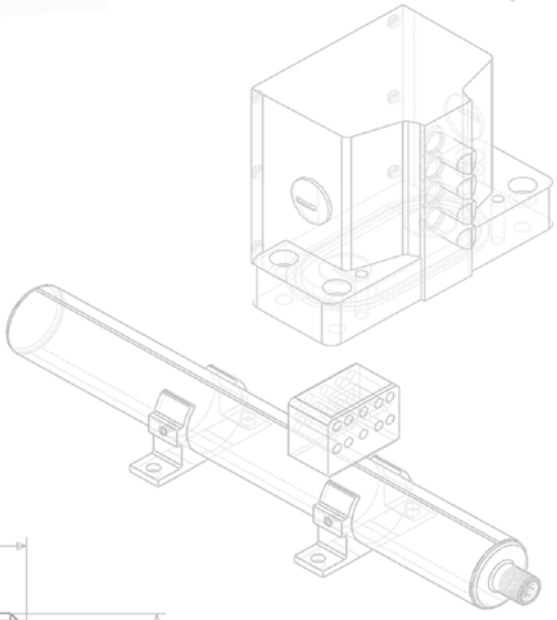


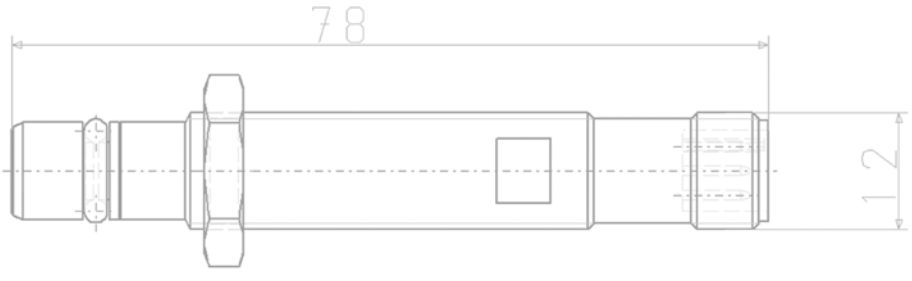
Balluff Products in 3D





- All catalog products are available: inductive sensors, photoelectric sensors, sensors for pneumatic cylinders, micropulse transducers, industrial RFID systems, vision sensors BVS, mechanical single and multiple position switches, industrial networking and connectivity, and so on.
- sizephics reduced to the essentials for optimized performance

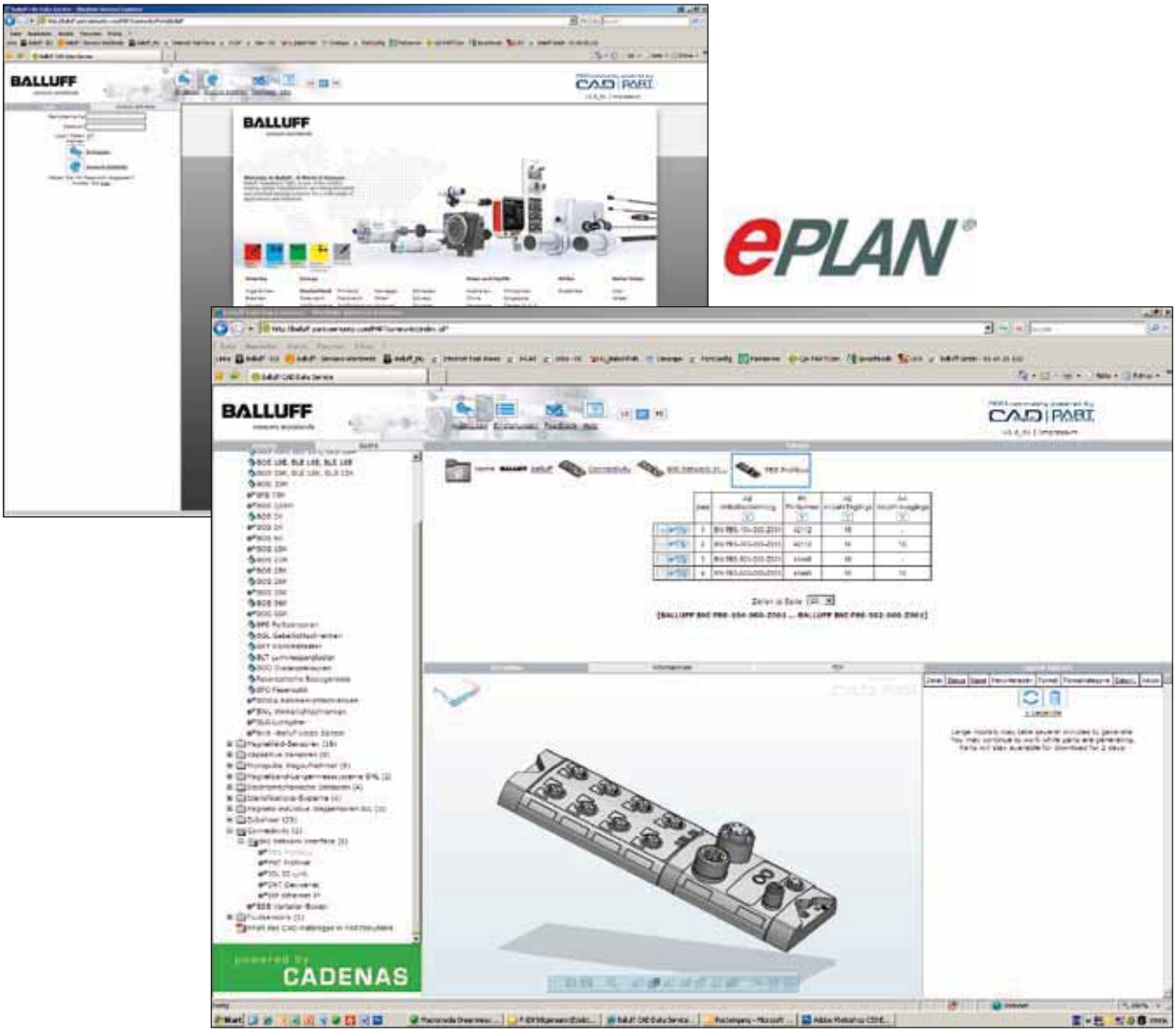




CAD formats on the Cadenas PARTserver

Retrieving Product Information Online

Various CAD and electronic diagram formats available



The benefits to you

- Faster and more efficient designing
- Free availability of all Balluff catalog products
- All common CAD formats
- Convenient preview in 3D
- Configurable products

And here is how it works

- Go to the 3D data at **www.balluff.com**
- You are redirected to the Cadenas PARTserver
- Select a sensor and perform an optional check via 3D preview
- Add it to the shopping cart
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