

IO-Link

System Components for Industrial Communication



What is IO-Link?

As the first standardized uniform, universally applicable interface in control technology, IO-Link transmits all sensor and actuator signals to the controller. Likewise, IO-Link passes control data down to the lowest sensor level. All this makes automation even more powerful than ever before. And it does it by simple means.

**Easy to get started,
time-saving installation**

With IO-Link you can uniformly wire various sensors and actuators together. You do not have to retrofit your system, nor replace the proven unshielded industrial cable. Special bus systems are also unnecessary, since IO-Link operates independent of any particular field bus. This makes installation child's play: Simply integrate IO-Link into your existing system – just the way you need to have it. Upward compatibility with conventional technology means expansion is possible at any time. Enjoy the profits from optimized data transmission.

**Automatic setting
on-the-fly**

Additional advantages for your process quality: Sensors and actuators can now be simply exchanged. The controller specifies the necessary settings. The parameters stored there are immediately sent. In many cases, no teach-in procedure is required. Timely configuration also takes place when there are changes in the production process, such as when product or size are changed or materials and recipes substituted. This means:

- Shortened setup times
- Longer machine runtimes
- Greatest possible reliability
- Increased efficiency

Continuous monitoring

Another plus: Continuous monitoring of data ensures reliable operation. Errors are centrally detected and the system constantly readjusted.

This means diagnostics is continuous – with positive effects on process quality:

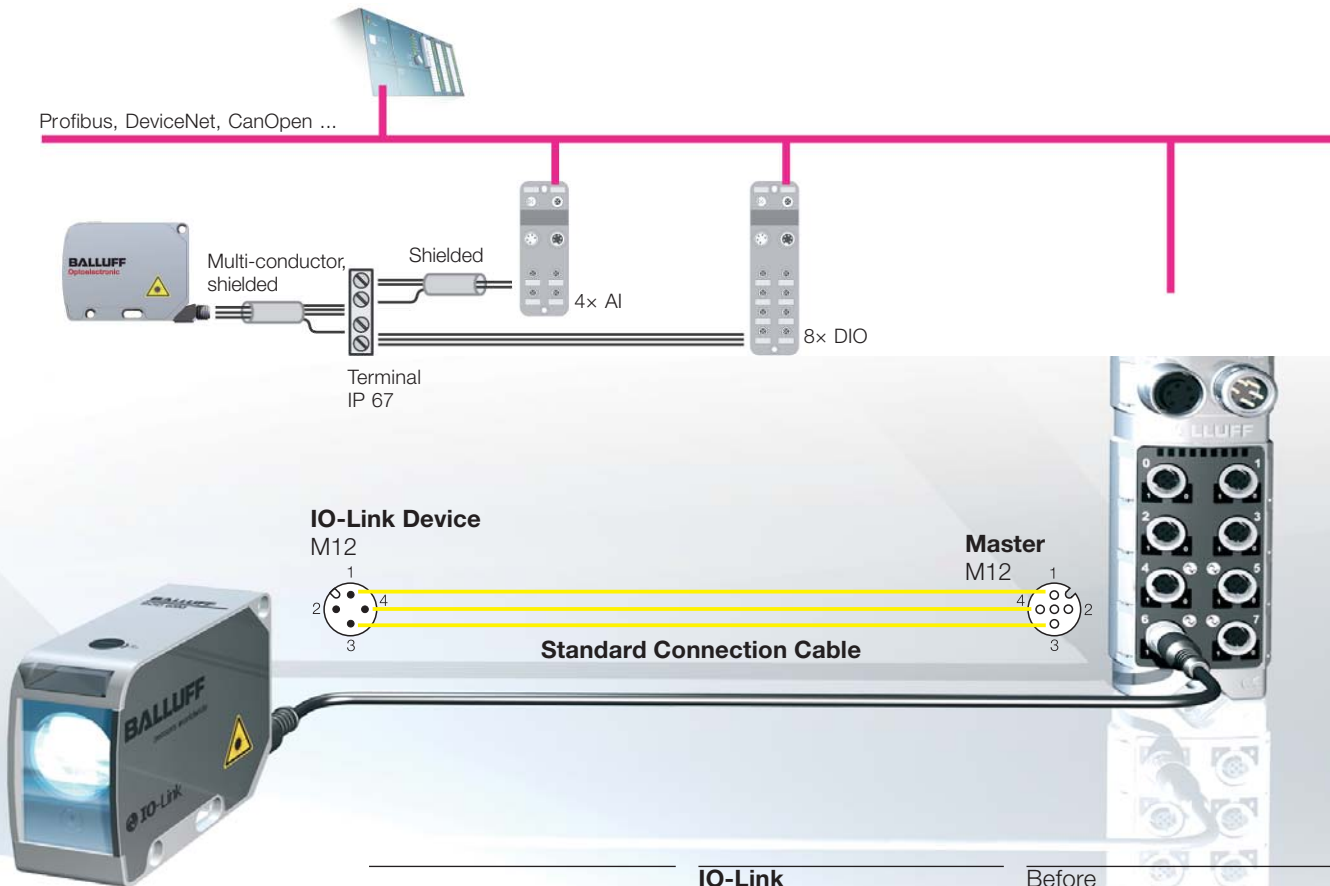
- Greater noise immunity compared with analog signals
- Simplified service
- Lower maintenance costs
- Increased system availability
- Higher productivity

**Simple installation:
Save 30 minutes of work
time – perfect IO-Link
wiring in 30 seconds.**

To be able to use all the functions of a laser distance sensor, conventional wiring requires considerable time. Roughly half an hour to connect four different cables: A shielded multi-conductor as well as three standard

cables, since the sensor has an analog measuring signal, two switching signals and one digital input. In addition, three ports for digital and one port for analog I/O are connected to the field bus interface. Compare this with

an IO-Link solution, which is ready to use in around 30 seconds. All you need is a standard cable and an IO-Link port on the Master.



	IO-Link	Before
Cable	1x Standard	1x multi-conductor shielded 1x analog shielded 3x standard for DIO
Ports	1x IO-Link	1x AI, 2x DI, 1x DO
Terminal		1x IP 67
Work time	30 seconds	30 minutes

IO-Link interface

- Serial point-to-point connection
- 3-/2-wire interface, based on IEC 60947-5-2
- Unshielded standard sensor cable, max. 20 m
- Current draw per sensor/actuator: 200 mA
- Serial UART protocol: Pulse modulation 24 V

Communication modes

- Process data (cyclical):
2 bytes input or
2 bytes output data,
max. 32 bytes
- Deterministic time behavior:
2 ms cycle time for 16 bits of process information
- Service data:
No mutual interference with the process data
- Integrity level: 2

Alternative: Switching mode (SIO)

- Switching signal on Pin 4
- Parameter setting through communication, then fall-back to SIO mode

IO-Link offers optimizing and cost-reducing potential in the following areas:



Lower costs



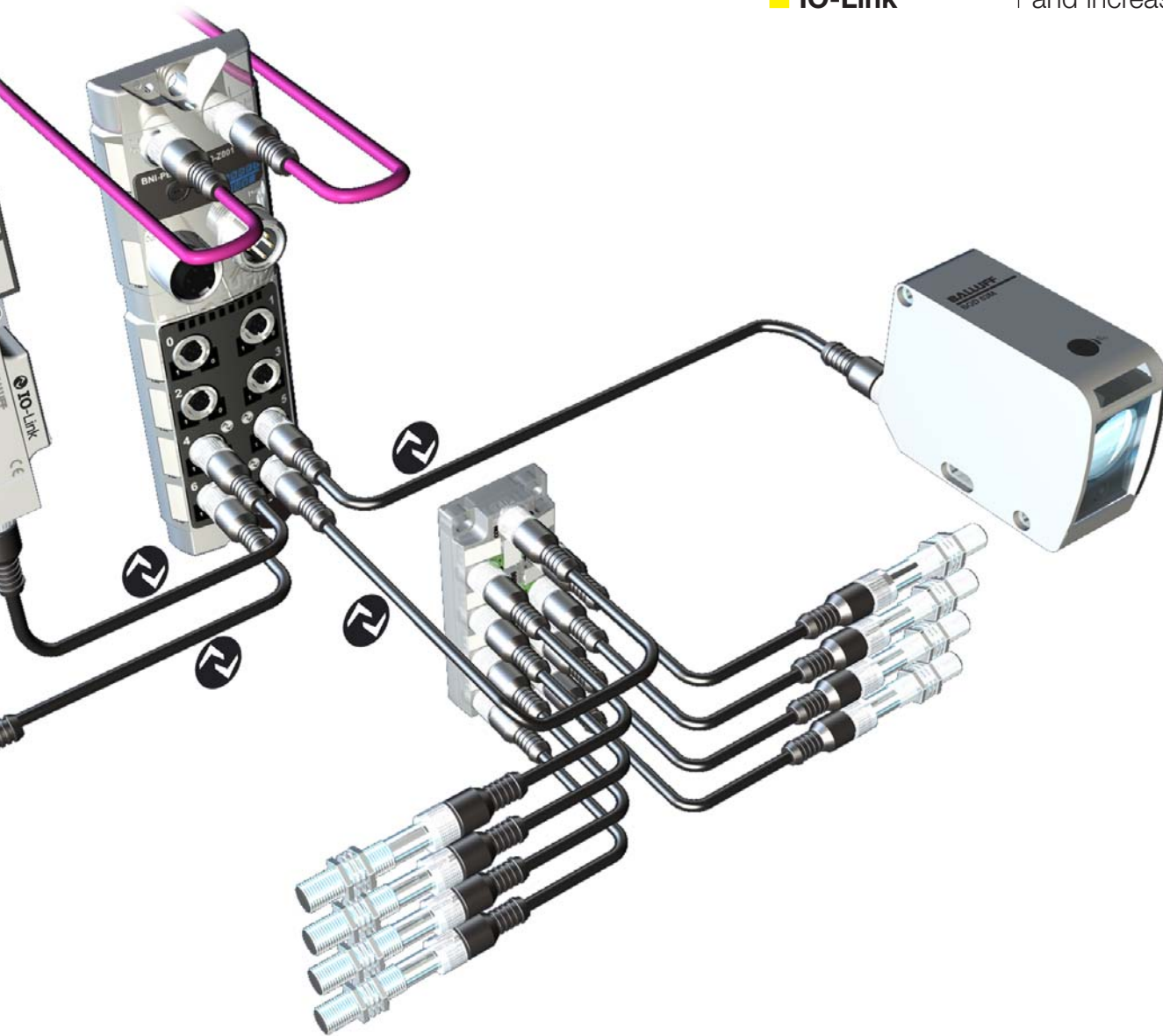
Less maintenance

Logistics and planning

- Simplified stocking thanks to uniform, universal interface for all variants
- Reduced planning and administration effort through reduced variant and interface variety
- Lower costs, since simple, unshielded industrial cables can be used
- Increased investment security due to a manufacturer-neutral, open standard
- Well equipped for future requirements due to the greatest possible flexibility in project planning

Service and maintenance

- Less oversight required due to automatic readjustment
- Reduced machine downtimes through reliable error detection and localization, fast sensor replacement and centralized data setting
- Less maintenance thanks to anticipatory error detection



Reduced time outlay

Installation and startup

- Simple integration into the field bus world through uniform interface and the use of traditional, unshielded industrial cables
- Reduced startup times, since the controller takes over parameter setting
- Incremental expansion through simultaneous use of binary and analog sensors/actuators

Shorter downtime

Runtime

- High automation precision through direct data transmission
- Centralized parameter setting by the controller – even over long distances
- Reliable readjustment, since data monitoring runs continuously (e.g. maintaining a specified level or a switching hysteresis)
- Fast sensor replacement, quick format changes thanks to centralized parameter setting
- Standard and IO-Link sensors/actuators can be used at the same time

With Balluff inductive distance sensors it's easy to position, sense distances or material variations.

Applications

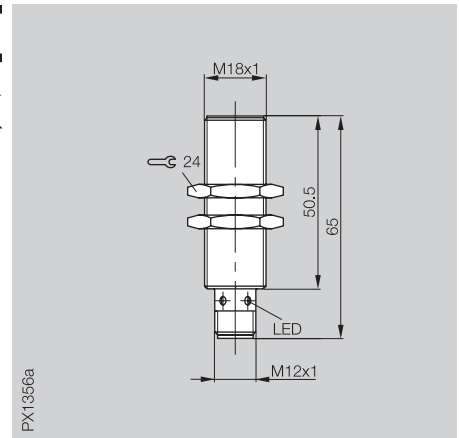
A few examples of the many possible uses:

- Distance sensing (even at high traverse speeds)
- Thickness measurement of films, sheet metal
- Belt center measurement
- Measuring the width of metal strips
- Detecting waviness
- Counting
- Positioning
- Position checking
- Clamping status detection
- Selection of various sizes and materials

Features

- Non-contacting, 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 restricting the working range
- Insensitive to contamination

Housing size	M18x1
Output signal	IO-Link
Installation type	flush
Linear range s_L	1...5 mm



Ordering code	BAW M18MI-BLC50B-S04G
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Supply voltage U_S	18...30 V DC
Ripple	$\leq 15\%$ of U_b
Rated insulation voltage U_i	250 V AC
Rated distance s_e	3 mm
Load resistance R_L	$\geq 2\text{ k}\Omega$
Load resistance R_T	
No-load current I_0 at U_b	$\leq 10\text{ mA}$
Polarity reversal protected	yes
Short circuit protected	yes

Ambient temperature range T_a	$-10...+70\text{ }^\circ\text{C}$
Repeat accuracy R_{EWN}	$\pm 8\text{ }\mu\text{m}$
Non-linearity	$\leq \pm 120\text{ }\mu\text{m}$
Measuring speed	$\leq 40\text{ m/s}$
Response time	2 ms
Temperature coefficient TC	typ.
in optimal range	min.
of $+10...+50\text{ }^\circ\text{C}$	max.
	$-2\text{ }\mu\text{m/K}$
	$+1\text{ }\mu\text{m/K}$
	$-8\text{ }\mu\text{m/K}$

Enclosure rating per IEC 60529	IP 67
Degree of protection	$\square$
Housing material	CuZn nickel plated
Material of sensing face	PBT
Connection type	Connector
Recommended connector	BKS- 19/BKS- 20
Display	Out of Range

IO-Link	
Mode	COM 2
Baud rate	38.4 Kbaud
Value range	0000 H...03FF H



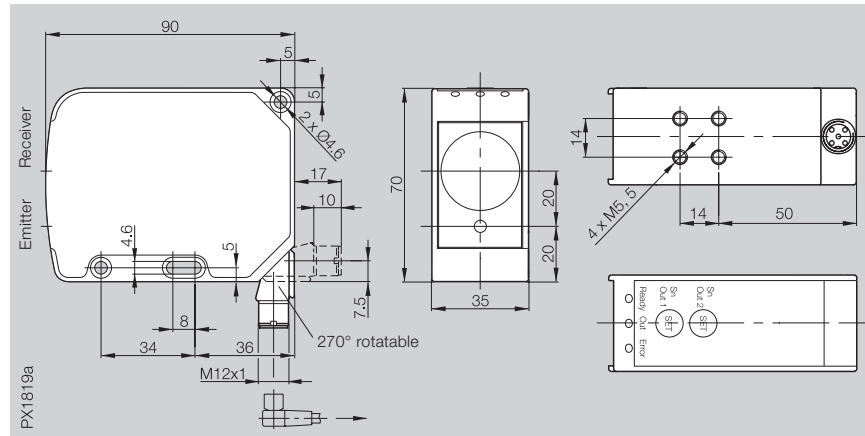
When traditional sensing methods reach their technological and economic limits, the **BOD 63M** steps in:

- for detecting small objects over long distances
- in difficult environments such as high temperatures
- in robot cells

The BOD 63M in its rugged metal housing has a working range of 200...6000 mm. Its data are sent in IO-Link mode. This makes setup and operation extremely easy: Two teach-in buttons are provided for initiating startup. Directly from the controller you set both switching points, turn the laser off and disable the buttons.



Series	BOD 63M
Output signal	IO-Link
Working range	200...6000 mm
Measuring range	5800 mm



Distance Sensor	PNP	BOD 63M-LI06-S4
Electrical		
Supply voltage U_s		18...30 V DC
No-load supply current I_0 max.		≤ 90 mA
Settings		Teach-in
Switch points		2
Optical		
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		≤ 2 mm
Gray value shift		≤ 1,5 %
Repeat accuracy		≤ ±4 mm
Temperature drift		≤ 2 mm/°C
Linearity		±1%
Switching hysteresis		≤ 15 mm
Time		
Turn-on/turn-off delay		≤ 3.4 ms
Ready delay		≤ 20 ms
Frequency of operating cycles f		≥ 150 Hz
Indicators		
Power indicator		LED green
Output function indicator		LED yellow
Stability indicator		LED red
Mechanical		
Dimensions		90×70×35 mm
Connection type		M12 connector, 4-pin
Housing material		Anodized aluminum
Optical surface		Glass
Weight		270 g
Ambient		
Enclosure rating per IEC 60529		IP 65
Polarity reversal protected		yes
Short circuit protected		yes
Ambient temperature range T_a		-10...+60 °C
Permissible ambient light		≤ 10 kLux
IO-Link		
Mode		COM 2
Baud rate		38.4 Kbaud
Value range		00C8 H...1770 H
Diagnostics		Stability indicator
Parameters		Switch points, laser on/off, button disable

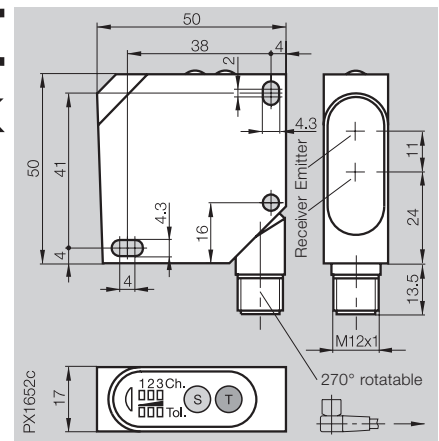


Robotics, automation, quality assurance and production processes are among the applications for color sensors. The

BFS 26 K color sensor is uniquely suited for

- quality assurance
- part selection
- discriminating cable conductors.

The BFS 26K uses white light, making it especially insensitive to ambient light. This provides you with reliable data in challenging applications. Making your setting is child's play, since the controller handles data configuration via IO-Link.



Color Sensor		BFS 26K	
Series		BFS 26K	
Output signal		IO-Link	
Working range in diffuse mode		12...32 mm	
Working range in reflector mode		50...200 mm	
Electrical		BFS 26K-IX-L01-S4	
Supply voltage U_s		12...28 V DC	
Ripple		10 %	
No-load supply current I_0 max.		≤ 40 mA	
Switching output		3× PNP transistors	
Output current		100 mA	
Output circuit		Light-on	
Voltage drop U_d at I_0		≤ 2.4 V	
Settings		Teach-in	
Optical			
Emitter, light type		pulsed white light	
Light spot geometry		round	
Light spot diameter		$\varnothing 4$ mm at 22 mm range	
Range tolerance		± 6 mm at Tol. 3	
Color resolution tolerance		adjustable in 5 levels	
Indicators			
Power indicator		LED green	
Output function indicator Ch. 1...Ch. 3		3× LED yellow	
Output function indicator Tol. 1...Tol. 5		3× LED red	
Time			
Ready delay		300 ms	
Response time		1 ms	
Frequency of operating cycles f		500 Hz	
Time functions		50 ms OFF delay selectable	
Mechanical			
Dimensions		50×50×17 mm	
Connection type		M12 connector, 4-pin	
Housing material		Impact-resistant ABS	
Optical surface		PMMA	
Weight		40 g	
Ambient			
Enclosure rating per IEC 60529		IP 67	
Polarity reversal protected		yes	
Short circuit protected		yes	
Ambient temperature range T_a		–10...+55 °C	
Ambient light rejection per		EN 60947-5-2	
IO-Link			
Mode		COM 2	
Baud rate		38.4 Kbaud	
Parameter		max. 5 colors, 5 tolerance ranges, N.O./N.C., button disable	



Connector orientation



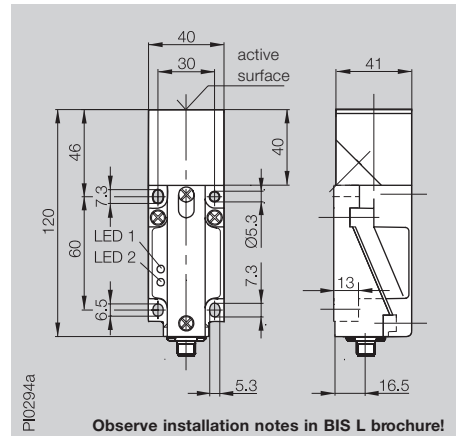
Description/dimensions	Module 40×40×120 mm
Output signal	IO-Link
Housing material	PBTP
Antenna type	round

The key areas of application for the non-contacting **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 acquiring safety-relevant data

Information pre-programmed into data carriers can be read and passed along using non-contacting data capture. These data are sent out serially over the IO-Link interface and made available to the IO-Link master.

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



Ordering code	BIS L-409-045-001-07-S4
Supply voltage	24 V DC $\pm 10\%$ / -20%
Ripple	$\leq 10\%$
Supply voltage	≤ 50 mA no load
Ambient operating temperature	0...+60 °C
Enclosure rating per IEC 60529	IP 67
Mounting in steel	non-flush
LED function indicator	yes
Connection type	4-pin round connector
Weight	170 g

IO-Link	
Mode	COM 3 (3-wire)
Baud rate	230.4 Kbaud



Specifications for data carriers and additional identification systems can be found in the Balluff main catalog, on the CD-ROM or DVD-ROM or online!

www.balluff.com





**Multiple position switches
per DIN 43697 for
standard applications**

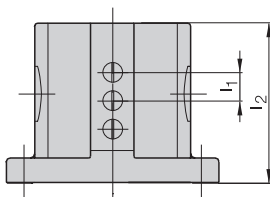
- Dual-chamber system with IP 67 protection: wear-free membrane with hermetic sealing from plunger mechanism and switch chamber
- Maintenance-free, self-lubricating plunger guide with slide bearing

**Multiple position switches
with anticrystallization
plungers**

- For use with aggressive, resinifying liquid media
- In dry areas with very fine chip presence

IO-Link

- Simple installation: Standard M12 connectors
- No cable gland needed, factory sealed to IP 67
- Can be connected in seconds
- High diagnostic capability: Parallel processing for normally open/normally closed signals



Available sizes

Number of plungers	2	3	4	5	6	8	10	12
Dimension $l_1 = 12$ mm	70	80	90	105	120	140	170	200
l_2 at $l_1 = 16$ mm	70	90	105	120	140	170	200	240

dimensions in mm

Ordering example:

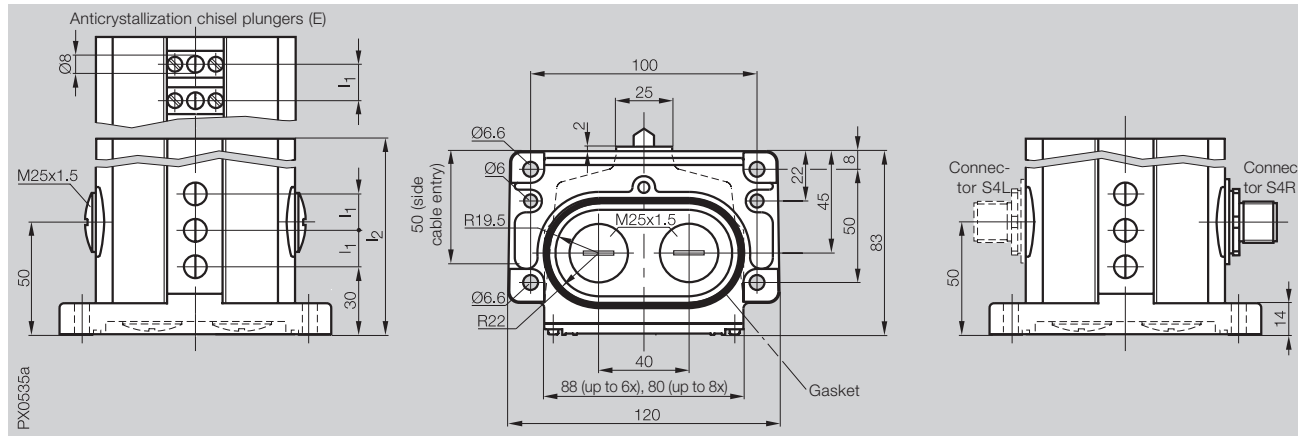
BNS 819-D02-D16-100-10-S4R-IO

BNS 819-D - -100-10- -IO

No. of plungers	Plunger type	Plunger spacing	Connector
02 2x	D Chisel	12 12 mm	S4R 5-pin, right side
03 3x	K Ball	16 16 mm	S4L 5-pin, left side
04 4x	R Roller		
...	L Roller bearing		
	E Anticrystallization chisel plunger		



Type	Multiple Position Switches Series 100
Output signal	IO-Link
Plunger spacing	12 mm or 16 mm
Mounting and function dimensions	per DIN 43697



Plunger style	Chisel (D), ball (K), Roller (R), roller bearing (L) or anticrystallization plungers (E)
Plunger material	Stainless steel, contact surfaces induction hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M12 connector
Ambient operating temperature	-5...+85 °C
Enclosure rating per IEC 60529	IP 67

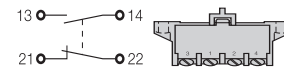
With switch element

BSE 30.0

Ordering code

BNS ...-100-10-...

Wiring diagram, style

**Switch element**

Contact material	Silver, gold plated
Switching principle	Snap switch
Contact system	Dual changeover, one NO and one normally-closed, galvanically isolated
Electrical data	see catalog "The Mechanical Line"

Mechanical data

Plunger point to reference surface	8 mm
Switchpoint 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 frequency	max. 300/min
Approach velocity	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	plunger D, E, K ±0.002 mm
	plunger R, L ±0.01 mm

IO-Link

Mode	COM 2
Baud rate	38.4 Kbaud
Parameter	N.O./N.C.



Multiple position switches for standard applications

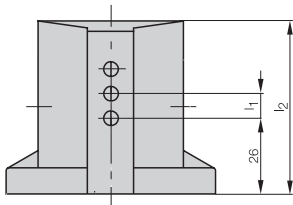
- Smallest plunger spacing for electromechanical multiple position switches (8 mm or 10 mm)
- Dual-chamber system with IP 67 protection: wear-free membrane with hermetic sealing from plunger mechanism and switch chamber
- Maintenance-free, self-lubricating plunger guide with slide bearing

Multiple position switches with anticrystallization plungers

- For use with aggressive, resinifying liquid media
- In dry areas with very fine chip presence

IO-Link

- Simple installation: Standard M12 connectors
- No cable gland needed, factory sealed to IP 67
- Can be connected in seconds
- High diagnostic capability: Parallel processing for normally open/normally closed signals



Available sizes

Number of plungers	2	3	4	5	6	8	10
Dimension l_2 at $l_1 = 8 \text{ mm}$	49	59	64	72	80	96	112
$l_1 = 10 \text{ mm}$	49	59	72	80	89	112	129

dimensions in mm

Ordering example:

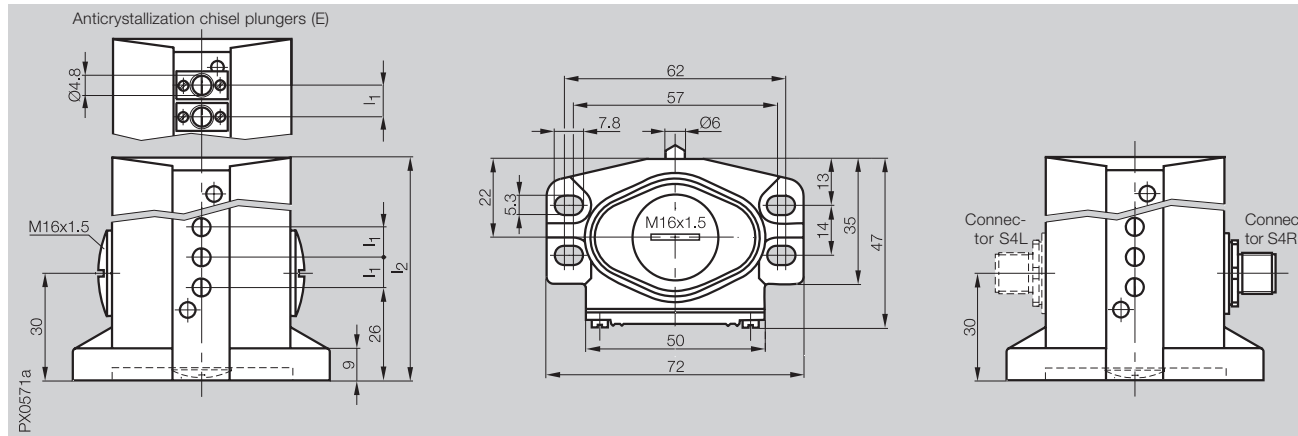
BNS 819-B04-D08-46-12-S4R-IO

BNS 819-B - -46-12- -IO

No. of plungers	Plunger type	Plunger spacing	Connector
02 2×	D Chisel	08 8 mm	S4R 5-pin, right side
03 3×	K Ball	10 10 mm	S4L 5-pin, left side
04 4×	R Roller		
...	E Anticrystallization chisel plunger		

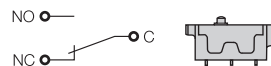


Type	Multiple Position Switches Series 46
Output signal	IO-Link
Plunger spacing	8 mm or 10 mm



Plunger style	Chisel (D), ball (K), roller (R) or anticrystallization plungers (E)
Plunger material	Stainless steel, contact surfaces induction hardened
Housing material	Cast aluminum, corrosion-resistant, anodized finish
Connection type	M12 connector
Ambient operating temperature	-5...+80 °C
Enclosure rating per IEC 60529	IP 67

With switch element	BSE 73
Ordering code	BNS ...-46-12-...
Wiring diagram, style	



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

Mechanical data	
Plunger point to reference surface	4 mm
Switchpoint to reference surface	3.5 mm
Maximum plunger travel	3.5 mm
Switching actuating force on plunger	min. 8 N
Switching frequency	max. 200/min
Approach velocity	plunger D, E: 20 m/min (D), 10 m/min (E) plunger K: 9 m/min plunger R: 60 m/min
Repeatability	Plunger D, E: ±0.02 mm Plunger K: ±0.03 mm Plunger R: ±0.05 mm

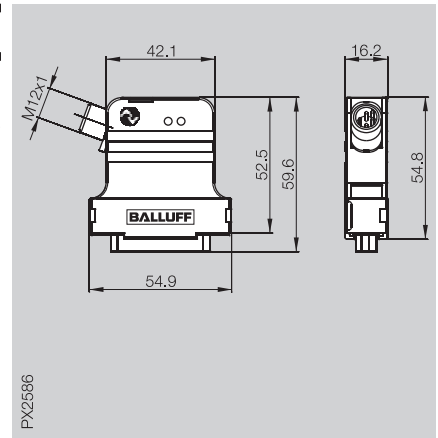
IO-Link	
Mode	COM 2
Baud rate	38.4 Kbaud
Parameter	N.O./N.C.

Using proven IO-Link manner the valve connectors **BNI IOL-750** and **-751** make connecting decentralized valve terminals to the control level incredibly easy.

Additional benefits to you:

- **Compact adapter housing**
Direct plugging into the valve terminal using minimal space
- **Flexibility**
Compatible with pin configurations of many valve terminals
- **Optimized cabling**
Connects to the control level using standard 3-conductor sensor cable
- **Modularity**
Control up to 16 solenoids (larger expansion level in development)

Series	Valve Connector BNI IOL-75_
Output signal	IO-Link



Ordering code	BNI IOL-75_-000-K007*
Operating temperature	–5...+55 °C
Storage temperature	–25...+85 °C
Housing material	Plastic
Dimensions	60×53.5×17 mm
Enclosure rating	IP 20
Approvals	UL, CSA
Error indicator	LED red
Communication indicator	LED green
Short circuit monitoring for each output	Yes
Supply voltage	18...30.2 V DC
IO-Link port pin assignments (M12, A-coded, male)	Pin 1: Supply voltage +24 V Pin 2: – Pin 3: GND, reference potential Pin 4: Q/C, IO-Link data transmission channel Pin 5: Function ground
Signal assignments D-SUB 25-pin	compliant with the various pin configurations of leading manufacturers of valve terminals

IO-Link	
Mode	COM 2
Baud rate	38.4 Kbaud

*Detailed ordering code on request!



IO-Link pressure sensor

with reliable 10-bit digital data transmission. This sensor also offers a freely programmable switching point in the 16-bit IO-Link signal.

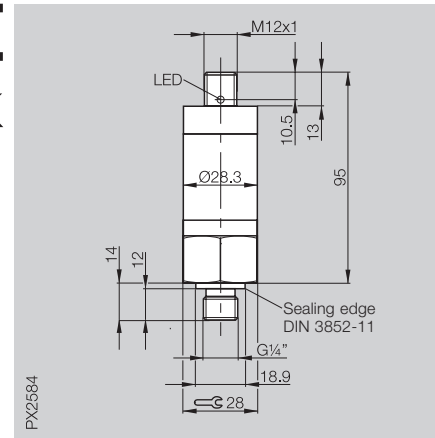
The specific benefits include:

- **Measured value acquisition** with a long-term stable ceramic cell
- **Simple parameter setting** via a central man-machine interface for the system
- **Free selection of the installation location** in the system saves costs
- **Expanded diagnostic capability** compared with traditional pressure sensors
- **High reliability** of the data values

Series
Output signal
Pressure ranges

Pressure Sensors BPM**IO-Link**

10...600 bar



Ordering code	0...10 bar	BPM B010-DV001-I00A0A-S4
	0...50 bar	BPM B050-DV001-I00A0A-S4
	0...100 bar	BPM B100-DV001-I00A0A-S4
	0...200 bar	BPM B200-DV001-I00A0A-S4
	0...400 bar	BPM B400-DV001-I00A0A-S4
	0...600 bar	BPM B600-DV001-I00A0A-S4

Enclosure rating per IEC 60529	IP 67
Process connection	G1/4 AG
Dimensions	32x95 mm
Weight	approx. 200 g
Measuring range	0...10 bar
	0...50 bar
	0...100 bar
	0...200 bar
	0...400 bar
	0...600 bar
Resolution	10 Bit
Sampling rate	2 ms
Connection	M12x1 connector, 4-pin
Media-contacting materials	Stainless 1.4301, AL302, FKM
Electronics housing materials	Stainless 1.4301
Seal materials	FKM
Medium temperature range	-25...+100 °C
Electronics temperature range	-25...+70 °C
Supply voltage	15...32 V DC
Overload	1.5x measuring range

IO-Link

Mode	COM 2
Baud rate	38.4 Kbaud



The Balluff PROFIBUS interface provides for optimum operation of IO-Link modules, thereby assuring acyclical operation of PROFIBUS-DP V1 as well.

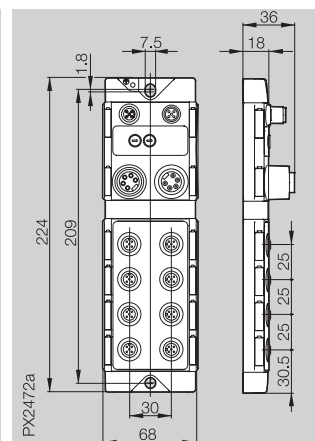
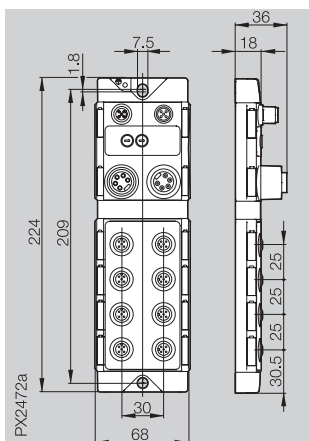
The module includes four IO-Link Master ports which can be parameterized and used fully independently of each other.

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 in-/output on Pin 2. This means that SIO mode also enables connecting of complementary NO/NC and DESINA sensors.

You get four additional standard IO ports with eight inputs or eight freely configurable in-/outputs for standard sensors and actuators up to 1.6 A.

Fieldbus	PROFIBUS	PROFIBUS
IO-Link	Master	Master
Version	4x IO-Link, 12x I	4x IO-Link, 12x I/O



Ordering code	BNI-PBS-501-000-Z001	BNI-PBS-502-000-Z001
Supply voltage U_s	18...30 V DC	18...30 V DC
Function indicator	BUS RUN	BUS RUN
Power indicator	U_A , U_s , under-voltage	U_A , U_s , under-voltage
Connection: Fieldbus	M12, B-coded	M12, B-coded
Connection: Supply voltage	7/8"	7/8"
Connection: I/O ports	M12, A-coded	M12, A-coded
No. of I/O ports	8	8
No. of inputs	12	12
No. of outputs	12	12
Configurable	no	yes
max. load current sensors/channel	200 mA	200 mA
max. output load current		1.6 A
Port status indicator	LED yellow	LED yellow
Port diagnostic indicator	Short circuit/overload: LED red	Short circuit/overload: LED red
Total current $U_{Actuator}$	< 9 A	< 9 A
Total current U_{Sensor}	< 9 A	< 9 A
Enclosure rating per IEC 60529	IP 67 (when attached)	IP 67 (when attached)
Operating temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+85 °C	-25...+85 °C
Weight	approx. 580 g	approx. 580 g
Attachment	2 mounting holes	2 mounting holes
Dimensions	225x68x37 mm	225x68x37 mm
Housing material	Nickel-plated GdZn	Nickel-plated GdZn
IO-Link		
No. of IO-Link Master Ports	4x Master	4x Master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3	SIO, COM 1, COM 2, COM 3
Indicators Communication	LED green	LED green
Error	LED red	LED red
max. load current for IO-Link device	1.6 A	1.6 A



Fieldbus
IO-Link
Version

PROFINET
Master
4x IO-Link, 12x I

PROFINET
Master
4x IO-Link, 12x I/O

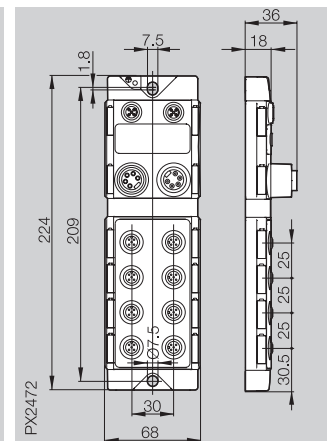
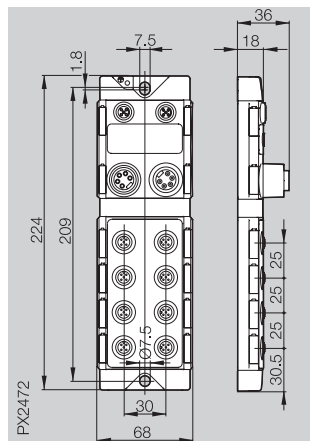
For high-performance applications consider the PROFINET IO-Link Master interface, which also supports isochronal real-time (IRT) using ERTEC 200.

The module includes four IO-Link Master ports which can be parameterized and used fully independently of each other.

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 in-/output on Pin 2. This means that SIO mode also enables connecting of complementary NO/NC and DESINA sensors.

You get four additional standard IO ports with eight inputs or eight freely configurable in-/outputs for standard sensors and actuators up to 1.6 A.



Ordering code	BNI-PNT-501-000-Z002	BNI-PNT-502-000-Z002
Supply voltage U_s	18...30 V DC	18...30 V DC
Function indicator	BUS RUN	BUS RUN
Power indicator	U_A , U_s , under-voltage	U_A , U_s , under-voltage
Connection: Fieldbus	M12, B-coded	M12, B-coded
Connection: Supply voltage	7/8"	7/8"
Connection: I/O ports	M12, D-coded	M12, D-coded
No. of I/O ports	8	8
No. of inputs	12	12
No. of outputs	12	12
Configurable	no	yes
max. load current sensors/channel	200 mA	200 mA
max. output load current		1.6 A
Port status indicator	LED yellow	LED yellow
Port diagnostic indicator	Short circuit/overload: LED red	Short circuit/overload: LED red
Total current U_O	< 9 A	< 9 A
Total current U_s	< 9 A	< 9 A
Enclosure rating per IEC 60529	IP 67 (when attached)	IP 67 (when attached)
Operating temperature T_a	-5...+55 °C	-5...+55 °C
Storage temperature	-25...+85 °C	-25...+85 °C
Weight	approx. 580 g	approx. 580 g
Attachment	2 mounting holes	2 mounting holes
Dimensions	225x68x37 mm	225x68x37 mm
Housing material	Nickel-plated GdZn	Nickel-plated GdZn

IO-Link

No. of IO-Link Master Ports	4x Master	4x Master
Operating modes (3-wire)	SIO, COM 1, COM 2, COM 3	SIO, COM 1, COM 2, COM 3
Indicators	Communication	LED green
Error	LED red	LED red
max. load current for IO-Link device	1.6 A	1.6 A



The Sensor Hub is an efficient way to complete your machine installation. You can conveniently connect standard sensors using 8 or 16 standard inputs.

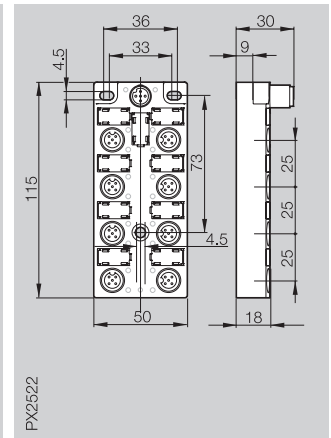
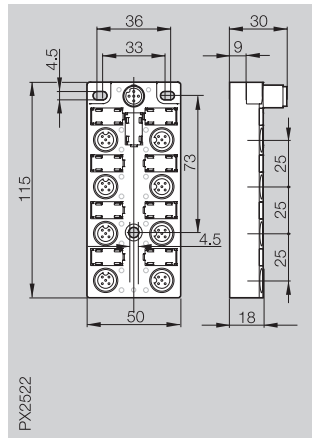
Each input can be programmed as normally open or normally closed using a parameter set. This adds significant flexibility to your installation.

complementary DESINA sensors can be easily connected to the DI16 Sensor Hub.

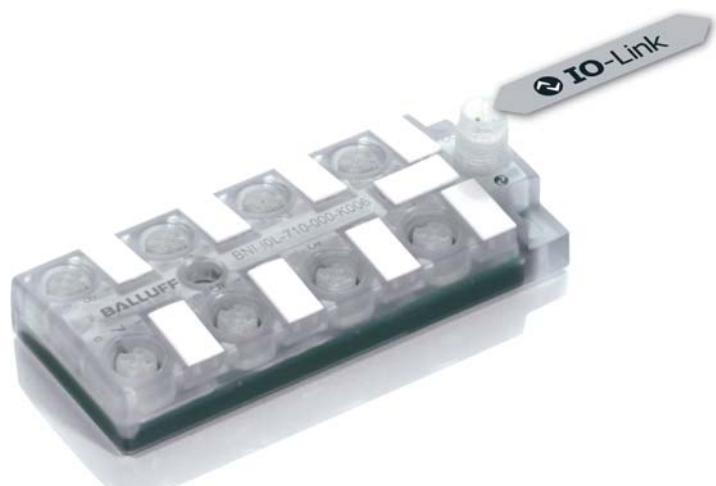
Communication with the IO-Link Master takes place in COM2 mode (38.4 kbaud) on the standard 3-conductor cable. This gives you a complete process representation in as little as 2 ms.



IO-Link	Device	Device
Version	8x I	16x I



Ordering code	BNI IOL-102-000-K006	BNI IOL-104-000-K006
Supply voltage U _s	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	LED green	LED green
Power indicator	LED green	LED green
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
No. of inputs	8	16
Configurable	N.O./N.C.	N.O./N.C.
max. load current sensors/channel	200 mA	200 mA
Port status indicator	LED yellow	LED yellow
Total current U _s	< 1.2 A	< 1.2 A
Enclosure rating per IEC 60529	IP 67 (when attached)	IP 67 (when attached)
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
Attachment	3 mounting holes	3 mounting holes
Dimensions (L×W×H)	115×50×31 mm	115×50×31 mm
Housing material	PC	PC
IO-Link		
No. of IO-Link Ports	1× Device	1× Device
Operating mode	COM 2	COM 2
Communication indicator	LED green	LED green
Error indicator	LED red	LED red
max. load current	< 1.2 A	< 1.2 A
Parameter	N.O./N.C. per input	N.O./N.C. per input



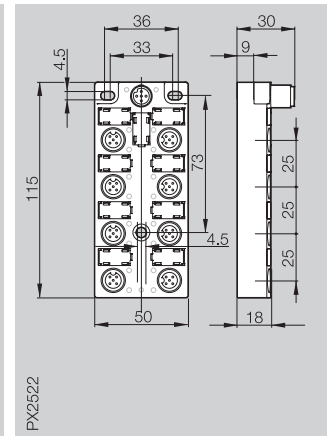
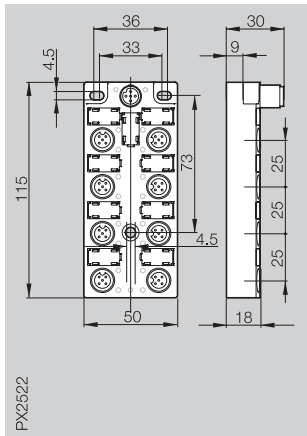
IO-Link
Version

Device
4 AI-I, 8× I

Device
4 AI-U, 8× I

With the analog Sensor Hub you can select from between two additional variants with current and voltage interface. This allows you to reliably connect non-IO-Link capable sensors.

Four analog channels are usable which can be supplemented with four additional dual-use standard input ports per IEC 61131. The analog channels have a resolution of 10 bits.



Ordering code	BNI IOL-709-000-K006	BNI IOL-710-000-K006
Supply voltage U_s	18...30 V DC	18...30 V DC
Function indicator IO-Link RUN	LED green	LED green
Power indicator	LED green	LED green
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
No. of inputs	8	8
Configurable	N.O./N.C.	N.O./N.C.
max. load current sensors/channel	200 mA	200 mA
Port status indicator	LED yellow	LED yellow
Total current U_s	< 1.2 A	< 1.2 A
Enclosure rating per IEC 60529	IP 67 (when attached)	IP 67 (when attached)
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
Attachment	3 mounting holes	3 mounting holes
Dimensions (L×W×H)	115×50×31 mm	115×50×31 mm
Housing material	PC	PC
Analog ports		
Number of analog ports	4	4
Interface	4...20 mm	0...10 V DC
Resolution	10 bits	10 bits
Analog signal indicator	LED green	LED green
IO-Link		
No. of IO-Link ports	1× Device	1× Device
Operating mode	COM 3 (3-wire)	COM 3 (3-wire)
Communication indicator	LED green	LED green
Error indicator	LED red	LED red
max. load current	< 1.2 A	< 1.2 A
Parameter	N.O./N.C. per input, 1 switch point per analog channel	N.O./N.C. per input, 1 switch point per analog channel



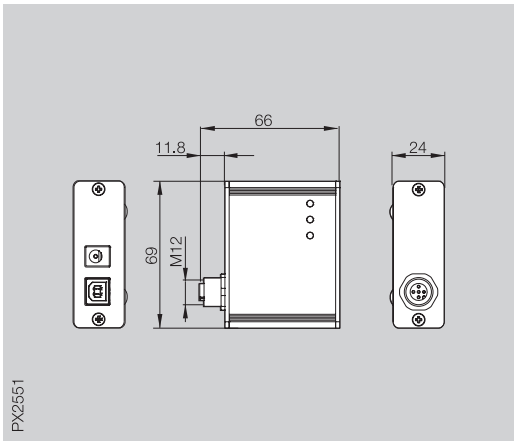
Test and configure IO-Link devices using the **IO-Link Master Tool**.

Released from the controller, you can now place an IO-Link device in service, call up the process parameters and load all the service parameters. The USB port makes it simple to connect to a laptop, and software makes operation easy.

Supply voltage for the IO-Link devices is provided directly through the USB port. If additional power is required, an external power supply provides this energy.

Network
IO-Link

USB
1× Master



Ordering code

BNI USB-901-000-A301

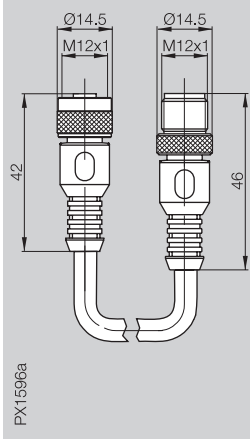
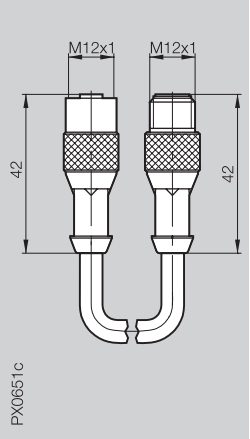
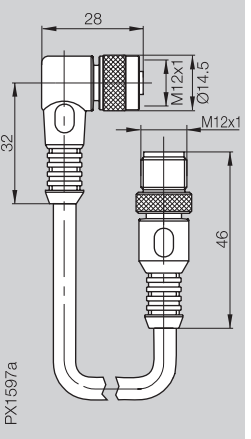
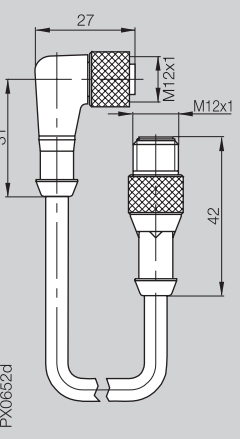
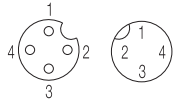
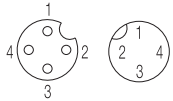
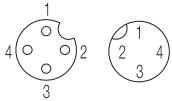
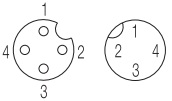
Power indicator
Connection: Network
Connection: Supply voltage
Connection: IO-Link Port
No. of IO-Link Ports
max. load current for IO-Link port
USB status indicator
Error indicator
Enclosure rating per IEC 60529
Operating temperature T _a
Storage temperature
Weight
Attachment
Dimensions (L×W×H)
Housing material

LED green
USB B-female
DC-9, 2.1 mm
M12, A-coded
1
50 mA using USB/1.6 A using external power supply
LED green
LED red
IP 40 (when attached)
-5...+55 °C
-25...+70 °C
approx. 96 g
None
70×55×25 mm
AL

IO-Link
IO-Link
Operating mode
Communication indicator

Master
SIO, COM 1, COM 2, COM 3
LED green



Connector/cable	BKS-B 19- /GS4	BKS-S 19- /GS4	BKS-B 20- /GS4	BKS-S 20- /GS4
Version	Straight female/ straight male	Straight female/ straight male	Right angle female/ straight male	Right angle female/ straight male
Use	Connector type sensors S 4	Connector type sensors S 4	Connector type sensors S 4	Connector type sensors S 4
				
No LED, N.O.	BKS-B 19-1/GS4-PU-__	BKS-S 19-1/GS4-PU-__	BKS-B 20-3/GS4-PU-__	BKS-S 20-3/GS4-PU-__
No LED, complementary	BKS-B 19-3/GS4-PU-__	BKS-S 19-3/GS4-PU-__	BKS-B 20-4/GS4-PU-__	BKS-S 20-4/GS4-PU-__
With LED, N.O. PNP				
Manufacturer	Balluff	Lumberg	Balluff	Lumberg
Supply voltage U_s	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
Cable	molded-on PUR	molded-on PUR	molded-on PUR	molded-on PUR
No. of wires x conductor cross section	3x0.34 mm ² /4x0.25 mm ²	3x0.34 mm ² /4x0.25 mm ²	3x0.34 mm ² /4x0.25 mm ²	3x0.34 mm ² /4x0.25 mm ²
Enclosure rating per IEC 60529	IP 67	IP 68 per BWN Pr. 20	IP 67	IP 68 per BWN Pr. 20
Ambient temperature range T_a	-25...+85 °C	-25...+90 °C	-25...+85 °C	-25...+90 °C
View of female/male side				

Please append cable length to ordering code!
 PUR, standard lengths 0.6 m, 1 m, 2 m = 00.6, 01, 02
 Other cable properties or lengths on request.

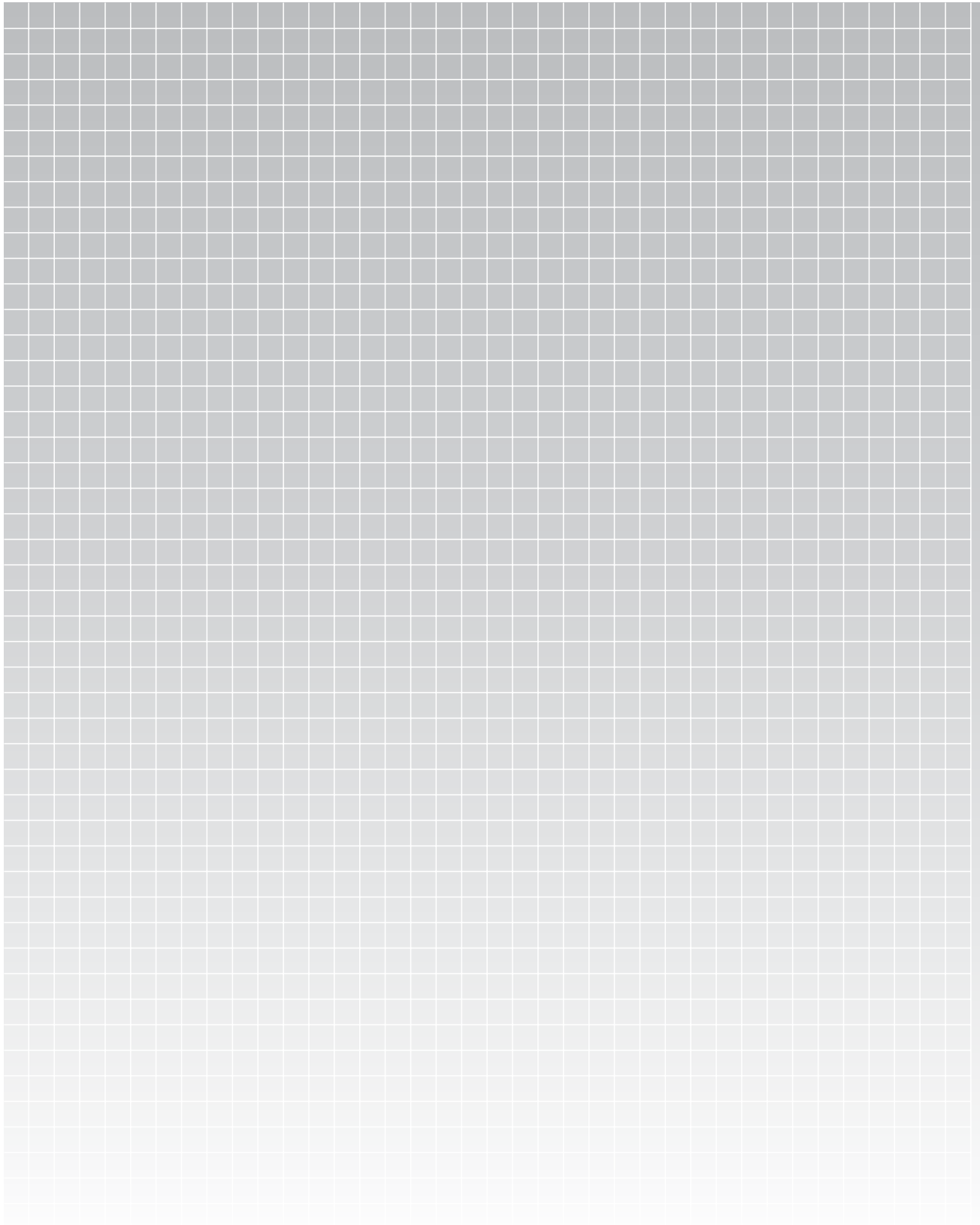
Ordering example

PUR, length 1 m =
 BKS-S 20-1/GS4-PU-01



See additional connectors in the accessories catalog, on CD-ROM, DVD-ROM or online!

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Object Detection



Sensor Line

Inductive Sensors DC 3-/4-wire
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Inductive Sensors AC/DC
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Sensors for Pneumatic Cylinders
Magnetic Field Sensors
Capacitive Sensors



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Retro-reflective Sensors
Through-beam Sensors (emitter/receiver)
Fiberoptic Systems
Slot Sensors
Optical Window Sensors
Light Grids
Contrast Sensor
Luminescence Sensors
Color Sensors
Photoelectric Distance Sensors



Mechanical Line

Mechanical Multiple and Single Position Switches
Mechanical Multiple and Single Position Switches with safety switch positions per DIN EN 60204-1 /VDE 0113
Mechanical Multiple and Single Position Switches with forced opening
Mechanical Multiple Position Switches with quick-change plunger block
Inductive Multiple and Single Position Switches
Inductive Multiple and Single Position Switches with extended switching distance
Mechanical Wireless Single Position Switches
Mixed Assembly Multiple Position Switches

Linear Position Sensing



Linear Position Sensing

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Micropulse® Transducer BTL rod series
Micropulse® Transducer BTL compact rod series
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Magnetic Linear Encoder Systems BML
Incremental and Absolute Encoders BDG/BRG
Micropulse Transducer BIW
Inductive Distance Sensors BAW
Magneto-Inductive Distance Sensors BIL
Photoelectric Distance Sensors BOD

Industrial Identification



Industrial Identification

Industrial RFID Systems BIS C
Industrial RFID systems BIS L
Industrial RFID Systems BIS M
Industrial RFID Systems BIS S
Vision Sensor BVS

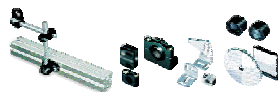
Industrial Networking and Connectivity



Industrial Networking and Connectivity

Connectors BKS
Splitter Boxes BSB
Valve Connectors BNI
IO-Link
Remote Inductive Transmission Systems
BUS Systems
Wireless
Electronic Devices

Mechanical Accessories



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Attachments
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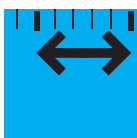
Phone

BALLUFF

sensors worldwide



Object detection



Linear Position Sensing



Industrial Identification



Industrial networking and connectivity



Mechanical accessories

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