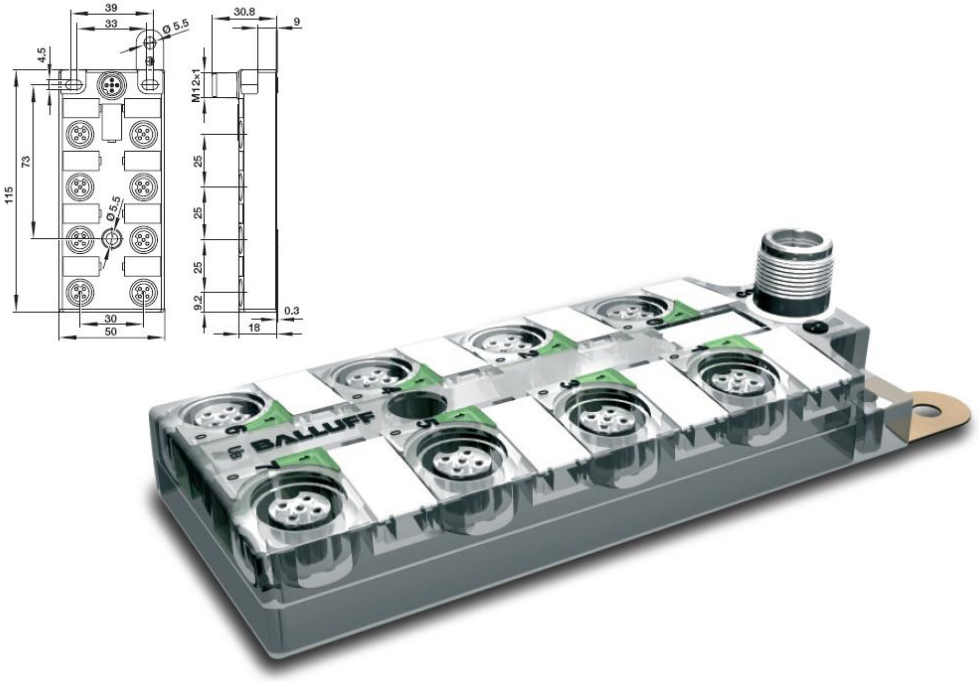
BALLUFF

sensors worldwide

BNI IOL-302-000-K006
BNI IOL-302-000-K006-C01
BNI IOL-302-S01-K006
BNI IOL-302-S01-K006-C01

IO-Link 1.1 Sensor-Hub / Actuator-Hub

User's Guide



Content

1 Notes to the user

1.1 About this guide

This guide describes the Balluff IO-Link sensor collector module, also called the Sensor Hub / Actor Hub.
Connection to the host interface master is made through the IO-Link protocol.
Functionally this compact, cost-effective module is comparable with a passive splitter box: It takes digital and analog sensor signals and passes them over the IO-Link interface.

1.2 Structure of the guide

The Guide is organized so that the sections build on one another.
Section 2 : Basic safety information.
…….

1.3 Typographical conventions

The following typographical conventions are used in this Guide.

Enumerations

Enumerations are shown in list form with bullet points.

- Entry 1,
- Entry 2.

Actions

Action instructions are indicated by a preceding triangle. The result of an action is indicated by an arrow.

➢ Action instruction 1.
↳ Action result.
➢ Action instruction 2.

Syntax

Numbers:
Decimal numbers are shown without additional indicators (e.g. 123),
Hexadecimal numbers are shown with the additional indicator $_{hex}$ (e.g. 00_{hex}).

Cross-references

Cross-references indicate where additional information on the topic can be found (see Section 5 -"Technical Data“).

1.4 Symbols

Note!
This symbol indicates a security notice which most be observed.

Note tip
This symbol indicates general notes.

1.5 Abbreviations

BNI	Balluff Network Interface
DPP	Direct Parameter Page
I/O-Port	Digital input/output port
EMC	Electromagnetic Compatibility
FE	Function ground
IOL	IO-Link
LSB	Least Significant Bit
MSB	Most Significant Bit
SPDU	Service Protocol Data Unit

2 Safety

2.1 Intended use

The BNI IOL-… is a decentralized sensor input module which is connected to a host IO-Link master over an IO-Link interface.

1.1. Installation and startup

Note
Installation and startup are to be performed only by trained specialists. Qualified personnel are persons who are familiar with the installation and operation of the product, and who fulfills the qualifications required for this activity. Any damage resulting from unauthorized manipulation or improper use voids the manufacturer's guarantee and warranty. The Operator is responsible for ensuring that applicable of safety and accident prevention regulations are complied with.

1.2. General safety notes

Commissioning and inspection
Before commissioning, carefully read the operating manual.
The system must not be used in applications in which the safety of persons is dependent on the function of the device.
Authorized Personnel
Installation and commissioning may only be performed by trained specialist personnel.
Intended use
Warranty and liability claims against the manufacturer are rendered void by:

- Unauthorized tampering
- Improper use
- Use, installation or handling contrary to the instructions provided in this operating manual

Obligations of the Operating Company
The device is a piece of equipment from EMC Class A. Such equipment may generate RF noise. The operator must take appropriate precautionary measures. The device may only be used with an approved power supply. Only approved cables may be used.
Malfunctions
In the event of defects and device malfunctions that cannot be rectified, the device must be taken out of operation and protected against unauthorized use.
Intended use is ensured only when the housing is fully installed.

1.3. Resistance to aggressive substances

Note
The BNI modules generally have a good chemical and oil resistance. When used in aggressive media (eg chemicals, oils, lubricants and coolants each in high concentration (ie, low water content)) must be checked prior application-related material compatibility. In the event of failure or damage to the BNI modules due to such aggressive media are no claims for defects.

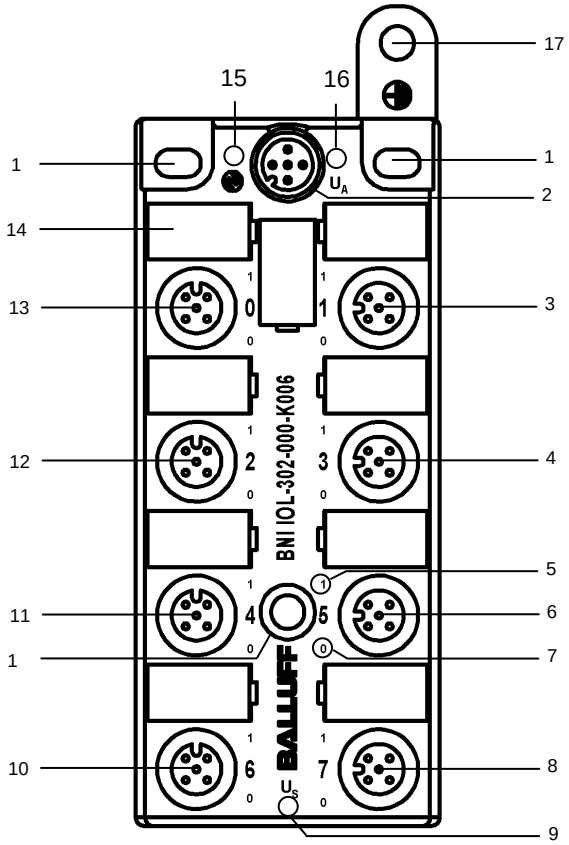
Hazardous voltage

Note
Disconnect all power before servicing equipment.

Note
In the interest of product improvement, the Balluff GmbH reserves the right to change the specifications of the product and the contents of this manual at any time without notice.

3 Getting Started

3.1 Connection overview



1 Mounting hole
2 IO-Link interface
3 Digital I/O Port 1
4 Digital I/O Port 3
5 Status-LED: Digital I/O Port 5 (pin 2)
6 Digital I/O Port 5
7 Status-LED: Digital I/O Port 5 (pin 4)
8 Digital I/O Port 7
9 Status LED “Power Supply”
10 Digital I/O Port 6
11 Digital I/O Port 4
12 Digital I/O Port 2
13 Digital I/O Port 0
14 Label
15 Status-LED IO-Link
16 Status LED actor power supply
17 Function ground connection

3 Getting Started

3.2 Mechanical connection

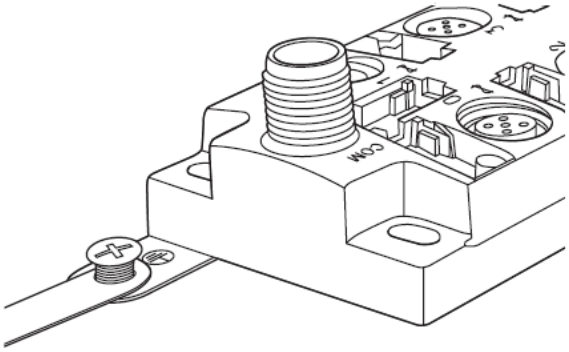
The BNI IOL modules are attached using 3 M4 screws.

3.3 Electrical connection

The BNI IOL-302-xxx-K006 modules require no separate supply voltage connection. Power is provided through the IO-Link interface by the host IO-Link Master.

3.4 Function ground

The modules are provided with a ground terminal.



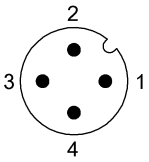
➢ Connect Sensor Hub module to the ground terminal.

Note!
The FE connection from the housing to the machine must be low-impedance and as short as possible.

3.5 IO-Link connection

The IO-Link connection is made using an M12 connector (A-coded, male).

IO-Link (M12, A-coded, male)



Pin	Function
1	Supply voltage Us, +24 V, max. 1.3 A
2	Actor power supply Ua, +24V, max 1.6A
3	GND, reference potential
4	C/Q, IO-Link data transmission channel

3 Getting Started

Sensor Hub connection

- Connection protection ground to FE terminal, if present.
- Connect the incoming IO-Link line to the Sensor Hub.

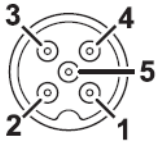
Note!
A standard sensor cable is used for connecting to the host IO-Link Master.

Module versions

Sensor Hub Version	Digital Port
BNI IOL-302-000-K006	16 Inputs / Outputs configurable
BNI IOL-302-S01-K006	16 Inputs / Outputs configurable, with single channel monitoring
BNI IOL-302-000-K006-C01	16 Inputs / Outputs configurable, with identification
BNI IOL-302-S01-K006-C01	16 Inputs / Outputs configurable, with single channel monitoring and identification

3.6 Digital Sensors

Digital Input- / Output port (M12, A-coded, female)



Pin	Function
1	+24 V, 200 mA
2	Standard Input 2 / Output 2
3	0 V, GND
4	Standard Input 1 / Output 1
5	FE

Note!
For the digital sensor inputs follow the input characteristic per EN 61131-2, Type 3.

Note!
Digital Outputs can be loaded with maximum 350 mA.
Total current of actuator supply is maximum 1.6 A

Note!
Unused I/O port sockets must be fitted with cover caps to ensure IP67 protection rating.

4 IO-Link Interface

4.1 IO-Link Data

BNI IOL-302-000-K006		
Data transmission rate	COM2 (38,4 kBaud)	
Minimal cycle time	3.5 ms	
Process data length	2 Byte Input, 2 Byte Output	
IO-Link Revision	**1.1**	**1.0**
Frame type	2.V	1
Process data cycle time*	3.5 ms	14 ms

BNI IOL-302-S01-K006		
Data transmission rate	COM2 (38,4 kBaud)	
Minimal cycle time	5 ms	
Process data length	8 Byte Input, 2 Byte Output	
IO-Link Revision	**1.1**	**1.0**
Frame type	2.V	1
Process data cycle time*	5 ms	50 ms

BNI IOL-302-000-K006-C01		
Data transmission rate	COM2 (38,4 kBaud)	
Minimal cycle time	4 ms	
Process data length	4 Byte Input, 2 Byte Output	
IO-Link Revision	**1.1**	**1.0**
Frame type	2.V	1
Process data cycle time*	4 ms	24 ms

BNI IOL-302-S01-K006-C01		
Data transmission rate	COM2 (38,4 kBaud)	
Minimal cycle time	5.5 ms	
Process data length	10 Byte Input, 2 Byte Output	
IO-Link Revision	**1.1**	**1.0**
Frame type	2.V	1
Process data cycle time*	5.5 ms	66 ms

* by min. cycle time

4.2 Process data inputs

BNI IOL-302-000-K006
Process data length 2 Byte:

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Input Port 7 Pin 4	Input Port 6 Pin 4	Input Port 5 Pin 4	Input Port 4 Pin 4	Input Port 3 Pin 4	Input Port 2 Pin 4	Input Port 1 Pin 4	Input Port 0 Pin 4	Input Port 7 Pin 2	Input Port 6 Pin 2	Input Port 5 Pin 2	Input Port 4 Pin 2	Input Port 3 Pin 2	Input Port 2 Pin 2	Input Port 1 Pin 2	Input Port 0 Pin 2

BNI IOL-302-S01-K006
Process data length 8 Byte:

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Input Port 7 Pin 4	Input Port 6 Pin 4	Input Port 5 Pin 4	Input Port 4 Pin 4	Input Port 3 Pin 4	Input Port 2 Pin 4	Input Port 1 Pin 4	Input Port 0 Pin 4	Input Port 7 Pin 2	Input Port 6 Pin 2	Input Port 5 Pin 2	Input Port 4 Pin 2	Input Port 3 Pin 2	Input Port 2 Pin 2	Input Port 1 Pin 2	Input Port 0 Pin 2

Byte	2								3							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Short Circuit Port 7	Short Circuit Port 6	Short Circuit Port 5	Short Circuit Port 4	Short Circuit Port 3	Short Circuit Port 2	Short Circuit Port 1	Short Circuit Port 0	-	-	-	-	-	Undervoltage Ua	-	Undervoltage Us

Byte	4								5							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Short Circuit Port 7 Pin 4	Short Circuit Port 6 Pin 4	Short Circuit Port 5 Pin 4	Short Circuit Port 4 Pin 4	Short Circuit Port 3 Pin 4	Short Circuit Port 2 Pin 4	Short Circuit Port 1 Pin 4	Short Circuit Port 0 Pin 4	Short Circuit Port 7 Pin 2	Short Circuit Port 6 Pin 2	Short Circuit Port 5 Pin 2	Short Circuit Port 4 Pin 2	Short Circuit Port 3 Pin 2	Short Circuit Port 2 Pin 2	Short Circuit Port 1 Pin 2	Short Circuit Port 0 Pin 2

Byte	6								7							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Warning Port 7 Pin 4	Warning Port 6 Pin 4	Warning Port 5 Pin 4	Warning Port 4 Pin 4	Warning Port 3 Pin 4	Warning Port 2 Pin 4	Warning Port 1 Pin 4	Warning Port 0 Pin 4	Warning Port 7 Pin 2	Warning Port 6 Pin 2	Warning Port 5 Pin 2	Warning Port 4 Pin 2	Warning Port 3 Pin 2	Warning Port 2 Pin 2	Warning Port 1 Pin 2	Warning Port 0 Pin 2

4 IO-Link Interface

BNI IOL-302-000-K006-C01
Process data length 4 Byte:

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Input Port 7 Pin 4	Input Port 6 Pin 4	Input Port 5 Pin 4	Input Port 4 Pin 4	Input Port 3 Pin 4	Input Port 2 Pin 4	Input Port 1 Pin 4	Input Port 0 Pin 4	Input Port 7 Pin 2	Input Port 6 Pin 2	Input Port 5 Pin 2	Input Port 4 Pin 2	Input Port 3 Pin 2	Input Port 2 Pin 2	Input Port 1 Pin 2	Input Port 0 Pin 2

Byte	2								3							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Identification byte 0								Identification byte 1							

BNI IOL-302-S01-K006-C01
Process data length 10 Byte:

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Input Port 7 Pin 4	Input Port 6 Pin 4	Input Port 5 Pin 4	Input Port 4 Pin 4	Input Port 3 Pin 4	Input Port 2 Pin 4	Input Port 1 Pin 4	Input Port 0 Pin 4	Input Port 7 Pin 2	Input Port 6 Pin 2	Input Port 5 Pin 2	Input Port 4 Pin 2	Input Port 3 Pin 2	Input Port 2 Pin 2	Input Port 1 Pin 2	Input Port 0 Pin 2

Byte	2								3							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Short Circuit Port 7	Short Circuit Port 6	Short Circuit Port 5	Short Circuit Port 4	Short Circuit Port 3	Short Circuit Port 2	Short Circuit Port 1	Short Circuit Port 0	-	-	-	-	-	Undervoltage Ua	-	Undervoltage Us

Byte	4								5							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Short Circuit Port 7 Pin 4	Short Circuit Port 6 Pin 4	Short Circuit Port 5 Pin 4	Short Circuit Port 4 Pin 4	Short Circuit Port 3 Pin 4	Short Circuit Port 2 Pin 4	Short Circuit Port 1 Pin 4	Short Circuit Port 0 Pin 4	Short Circuit Port 7 Pin 2	Short Circuit Port 6 Pin 2	Short Circuit Port 5 Pin 2	Short Circuit Port 4 Pin 2	Short Circuit Port 3 Pin 2	Short Circuit Port 2 Pin 2	Short Circuit Port 1 Pin 2	Short Circuit Port 0 Pin 2

Byte	6								7							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Warning Port 7 Pin 4	Warning Port 6 Pin 4	Warning Port 5 Pin 4	Warning Port 4 Pin 4	Warning Port 3 Pin 4	Warning Port 2 Pin 4	Warning Port 1 Pin 4	Warning Port 0 Pin 4	Warning Port 7 Pin 2	Warning Port 6 Pin 2	Warning Port 5 Pin 2	Warning Port 4 Pin 2	Warning Port 3 Pin 2	Warning Port 2 Pin 2	Warning Port 1 Pin 2	Warning Port 0 Pin 2

Byte	8								9							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Identification byte 0								Identification byte 1							

4 IO-Link Interface

4.3 Processdata / Output data

BNI IOL-302-…

Process data length 2 Byte

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Output Port 7 Pin 4	Output Port 6 Pin 4	Output Port 5 Pin 4	Output Port 4 Pin 4	Output Port 3 Pin 4	Output Port 2 Pin 4	Output Port 1 Pin 4	Output Port 0 Pin 4	Output Port 7 Pin 2	Output Port 6 Pin 2	Output Port 5 Pin 2	Output Port 4 Pin 2	Output Port 3 Pin 2	Output Port 2 Pin 2	Output Port 1 Pin 2	Output Port 0 Pin 2

4.4 Parameter data/ On-request data

	DPP	SPDU		Parameter	Data length	Range	Default value
	Index	Index	Sub-index				
Identification Data	07hex			Vendor ID	2 Byte	Read only	0378hex
	08hex						
	09hex			Device ID	3 Byte		05010Bhex(302-000-K006) 05010Chex(302-000-K006-C01) 05010Dhex(302-S01-K006) 05010Ehex(302-S01-K006-C01)
	0Ahex						
	0Bhex						
		10hex	0	Vendor Name	8 Byte		BALLUFF
		11hex	0	Vendor text	16 Byte		www.balluff.com
		12hex	0	Product Name	20/24 Byte		BNI IOL-302-000-K006
		13hex	0	Product ID	7 Byte		BNI005L (302-000-K006) BNI005U (302-000-K006-C01) BNI005T (302-S01-K006) BNI005W (302-S01-K006-C01)
		14hex	0	Product text	16 Byte		IO-Link Sensor/Actor Hub
		15hex	0	Serial number	16 Byte		0hex
		16hex		Hardware Revision	3 Byte		
		17hex	0	Firmware Revision	3 Byte		
		18hex	0	Application Specific Tag	32 Byte		0hex

	DPP	SPDU		Parameter	Data length	Range	Default value
	Index	Index	Sub-index				
Parameter Data		40hex 64	0 1-16	Inversion	2 Byte	0hex…FFFFhex	0hex
		41hex 65	0 1-16	Port Direction	2 Byte	0hex…FFFFhex	0hex
		42hex 66	0 1-8	Fault State Pin 4	2 Byte	0hex … FFFFhex	0hex
		43hex 67	0 1-8	Fault State Pin 2	2 Byte	0hex … FFFFhex	0hex
		44hex 68	0 1-16	Supply Monitoring	2 Byte	0hex … FF0Dhex	-
		45hex 69	0 1-16	Actuator short	2 Byte	0hex … FFFFhex	-
		46hex 70	0 1-16	Actuator warning	2 Byte	0hex … FFFFhex	-
		54hex 84	0	Serial number	16 Byte	0hex …… FFex	0hex
		60hex 96	0	Identification *	2 Byte	0hex … FFFFhex	0hex

* Only at BNI IOL-302-xxx-K006-C01

Note!
The Index 60, which includes the identification bytes, is not part of the parameter server list for the data storage.
If the parameter server of the IO-Link master port is activated, this Index will not be assigned during data storage, neither from the IO-Link Device to the master port, nor from the master port to the IO-Link device.

4 IO-Link Interface

Inversion 40hex

Inversion of the input signals:

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
Description	Inversion Port 7 Pin 4	Inversion Port 6 Pin 4	Inversion Port 5 Pin 4	Inversion Port 4 Pin 4	Inversion Port 3 Pin 4	Inversion Port 2 Pin 4	Inversion Port 1 Pin 4	Inversion Port 0 Pin 4	Inversion Port 7 Pin 2	Inversion Port 6 Pin 2	Inversion Port 5 Pin 2	Inversion Port 4 Pin 2	Inversion Port 3 Pin 2	Inversion Port 2 Pin 2	Inversion Port 1 Pin 2	Inversion Port 0 Pin 2

Inversion Port (x):
0 – Normal
1 - Inverted

Port Direction 41hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
Description	Direction Port 7 Pin 4	Direction Port 6 Pin 4	Direction Port 5 Pin 4	Direction Port 4 Pin 4	Direction Port 3 Pin 4	Direction Port 2 Pin 4	Direction Port 1 Pin 4	Direction Port 0 Pin 4	Direction Port 7 Pin 2	Direction Port 6 Pin 2	Direction Port 5 Pin 2	Direction Port 4 Pin 2	Direction Port 3 Pin 2	Direction Port 2 Pin 2	Direction Port 1 Pin 2	Direction Port 0 Pin 2

Direction Port (x)
0 – Input
1 – Output

Fault State Pin 4 / 42hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index		4		3		2		1		8		7		6		5
Description	Fault State Port 3 Pin 4		Fault State Port 2 Pin 4		Fault State Port 1 Pin 4		Fault State Port 0 Pin 4		Fault State Port 7 Pin 4		Fault State Port 6 Pin 4		Fault State Port 5 Pin 4		Fault State Port 4 Pin 4	

Fault State Pin 2 / 43hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	4		3		2		1		8		7		6		5	
Description	Fault State Port 3 Pin 2		Fault State Port 2 Pin 2		Fault State Port 1 Pin 2		Fault State Port 0 Pin 2		Fault State Port 7 Pin 2		Fault State Port 6 Pin 2		Fault State Port 5 Pin 2		Fault State Port 4 Pin 2	

Value		Output State
bin	dec	
00	0	Output 0V
01	1	Output 24V
10	2	Current state will be hold
11	3	Not defined

4 IO-Link Interface

Voltage Monitoring 44hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	8	7	6	5	4	3	2	1	16					11		9
Description	Short Circuit Port 7 Pin 1	Short Circuit Port 6 Pin 1	Short Circuit Port 5 Pin 1	Short Circuit Port 4 Pin 1	Short Circuit Port 3 Pin 1	Short Circuit Port 2 Pin 1	Short Circuit Port 1 Pin 1	Short Circuit Port 0 Pin 1	-	-	-	-	-	Undervoltage Ua	-	Undervoltage Us

Actuator short 45hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
Description	Short Circuit Port 7 Pin 4	Short Circuit Port 6 Pin 4	Short Circuit Port 5 Pin 4	Short Circuit Port 4 Pin 4	Short Circuit Port 3 Pin 4	Short Circuit Port 2 Pin 4	Short Circuit Port 1 Pin 4	Short Circuit Port 0 Pin 4	Short Circuit Port 7 Pin 2	Short Circuit Port 6 Pin 2	Short Circuit Port 5 Pin 2	Short Circuit Port 4 Pin 2	Short Circuit Port 3 Pin 2	Short Circuit Port 2 Pin 2	Short Circuit Port 1 Pin 2	Short Circuit Port 0 Pin 2

Actuator warning 46hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	8	7	6	5	4	3	2	1	16	15	14	13	12	11	10	9
Description	Warning Port 7 Pin 4	Warning Port 6 Pin 4	Warning Port 5 Pin 4	Warning Port 4 Pin 4	Warning Port 3 Pin 4	Warning Port 2 Pin 4	Warning Port 1 Pin 4	Warning Port 0 Pin 4	Warning Port 7 Pin 2	Warning Port 6 Pin 2	Warning Port 5 Pin 2	Warning Port 4 Pin 2	Warning Port 3 Pin 2	Warning Port 2 Pin 2	Warning Port 1 Pin 2	Warning Port 0 Pin 2

Serial number 54hex

The serial number has the default value 16x00hex. To use the master validation mode "Identity", with this Parameter are set a serial number. This prevents that a Device will be connected to a wrong master.

Identification 60hex

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Identificaton Byte 0								Identificaton Byte 1							

This parameter data will not be saved in data storage.

4 IO-Link Interface

4.5 Errors

Error Code	Description
0x8011	Index not available
0x8012	Subindex not available
0x8023	Access Denied
0x8033	Parameter length overrun
0x8034	Parameter length underrun
0x8035	Function not available

4.6 Events

IO-Link Revision 1.0	
Event Code	**Description**
0x5112	Low sensor voltage (US)
0x5114	Low actuator voltage (UA)
0x5410	Short circuit
IO-Link Revision 1.1	
Event Code	**Description**
0x5111	Low sensor voltage (US)
0x5112	Low actuator voltage (UA)
0x7710	Short circuit

5 IO-Link functions

5.1 IO-Link Version 1.0 / 1.1

This Device is compatible to IO-Link Master version 1.0 and 1.1 version specific functions like Data Storage will be supported only in combination with an IO-Link Master accordant to the IO-Link Version of the function.

5.2 Data Storage

Each IO-Link Master of the IO-Link Version 1.1 supports data storage. This can be used to save the device parameter in the IO-Link Master. In case of a device swap, the saved device parameter will be transferred to the new device.

5.3 Block parameter

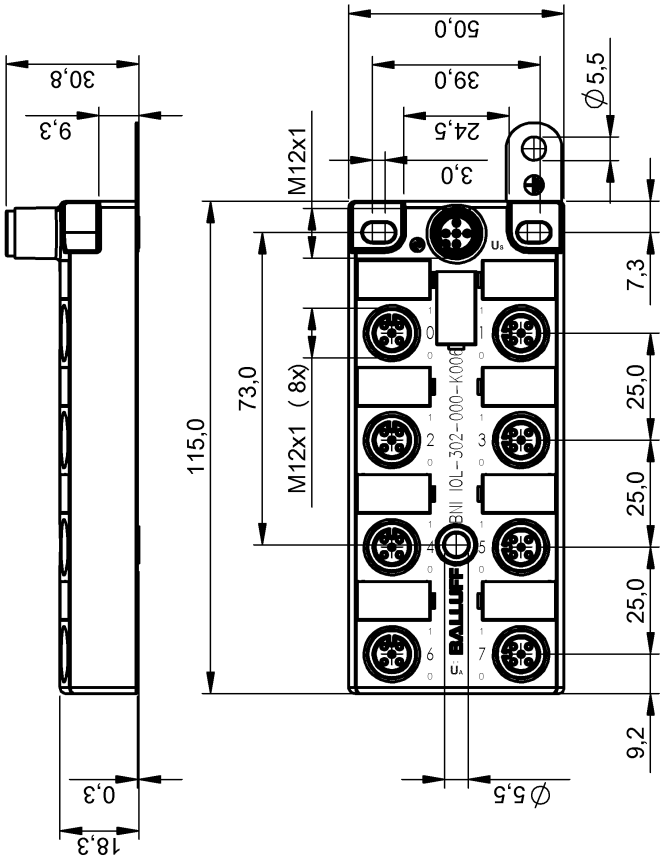
This feature allows writing parameters in one block. It´s necessary of one parameter depends on the other.

5.4 Reset factory setting

The System Command "reset factory settings", resets the device to factory settings. It can be executed by writing 0x82 to Index 2 subindex 0.

6 Technical Data

6.1 Dimensions



6.2 Mechanical data

Housing Material	Plastic, transparent
IO-Link-Port	M12, A-coded, male
Input-Ports	8x M12x1, A-coded, female
Enclosure rating	IP67 (only when plugged-in and threaded-in)
Weight	90 g
Dimensions (L × W × H, excluding connector)	115 × 50 × 30,8 mm

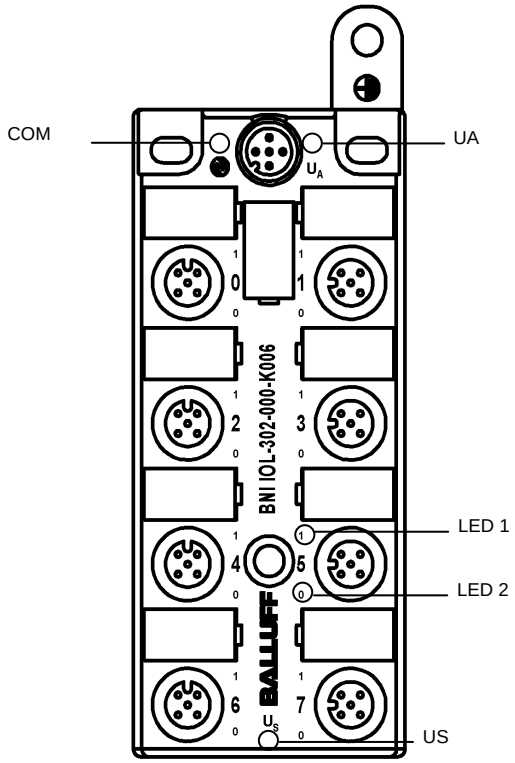
6.3 Electrical data

Operating voltage	18 ... 30,2 V DC, per EN 61131-2
Ripple	< 1 %
Current draw without load	≤ 65 mA

6.4 Operating conditions

Operating temperature	-5 °C … +55 °C
Storage temperature	-25 °C … +70 °C
EMC – EN 61000-4-2/3/4/5/6	Severity level 3A/3A/4A/2A/3A
Enclosure rating	IP67 (only when plugged-in and threaded-in)
Vibration/shock	EN 60068 Teil 2-6/27

6.5 Function indicators



Module LEDs

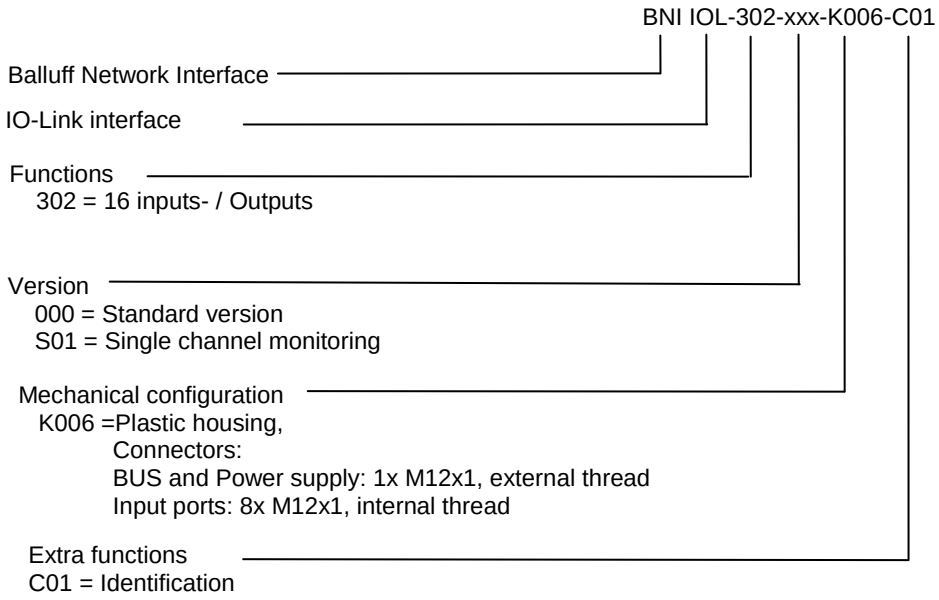
	Status	Function
IO-Link Communication	Green	No Communication
	Green negative pulsed	Communication OK
	Red	Communication line overload
	Off	Module unpowered
Us LED	Green	Module power is OK
	Green slowly flashing	Short Circuit Sensor supply
	Green rapidly flashing	Module power supply < 18 V
	Off	Module unpowered
Ua LED	Green	Actuator power supply OK
	Green slowly flashing	Actuator short circuit
	Green rapidly flashing	Undervoltage < 18 V
	Off	No Actuator power supply

Digital Input LEDs LED 2, Input Pin 4 and LED 1, Input Pin 2

Status	Function
Yellow	Input signal = 1
Red	Sensor power supply short circuit, Actuator short circuit Actuator warning
Off	Input- / Output signal = 0

7 Appendix

7.1 Type designation code



7.2 Order information

Type	Order Code
BNI IOL-302-000-K006	BNI005L
BNI IOL-302-S01-K006	BNI005T
BNI IOL-302-000-K006-C01	BNI005U
BNI IOL-302-S01-K006-C01	BNI005W

Notes

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