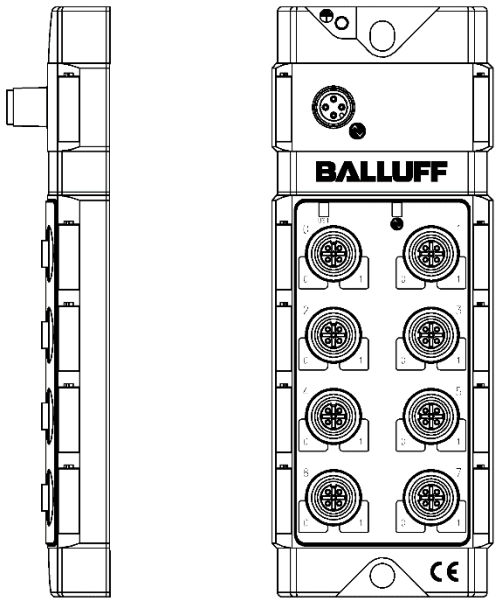
BALLUFF

BNI IOL-102-000-Z012
BNI IOL-104-000-Z012
BNI IOL-104-S01-Z012
BNI IOL-104-S01-Z012-C01
BNI IOL-104-S01-Z012-C02
BNI IOL-302-000-Z012
BNI IOL-302-S01-Z012
BNI IOL-302-000-Z042

User´s Guide



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1 Notes for the user

1.1. Structure of the guide

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

1.2. 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 (z. B. 00_{hex}).

Cross references

Cross references indicate where additional information on the topic can be found.

1.3. Symbols

Attention!
This symbol indicates a security notice which must be observed.

Note
This symbol indicates general notes

1.4. Abbreviations

BNI	Balluff Network Interface
DPP	Direct Parameter Page
EMV	Electromagnetic Compatibility
FE	Function earth
IOL	IO-Link
SPDU	Service Protocol Data Unit

1.5. Deviating views

Product views and illustrations in this manual may differ from the actual product. They are intended only as illustrative material.

1.6. Disposal

This product falls under the the current EU Directive for WEEE, waste of electrical and electronic equipment for protecting you and the environment from possible hazards and responsible handling of natural resources.

Dispose of the product properly and not as part of the normal waste stream. Observe the regulations of the respective country. Information can be obtained from the national authorities. Or return the product to us for disposal.

2 Safety

2.1. Intended use

This guide describes the Balluff Network Interface BNI IOL-…… for the application as peripheral output module to establish connection of binary actuators. Hereby it is about an IO-Link device which communicates by means of IO-Link protocol with the superordinate IO-Link master assembly.

2.2. Installation and startup

Attention!
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.

2.3. General safety instructions

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.

2.4. Resistance to Aggressive Substances

Attention!
The BNI modules always have good chemical and oil resistance. When used in aggressive media (such as chemicals, oils, lubricants and coolants, each in a high concentration (i.e. too little water content)), the material must first be checked for resistance in the particular application. No defect claims may be asserted in the event of a failure or damage to the BNI modules caused by such aggressive
media.

Dangerous Voltage

Attention!
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

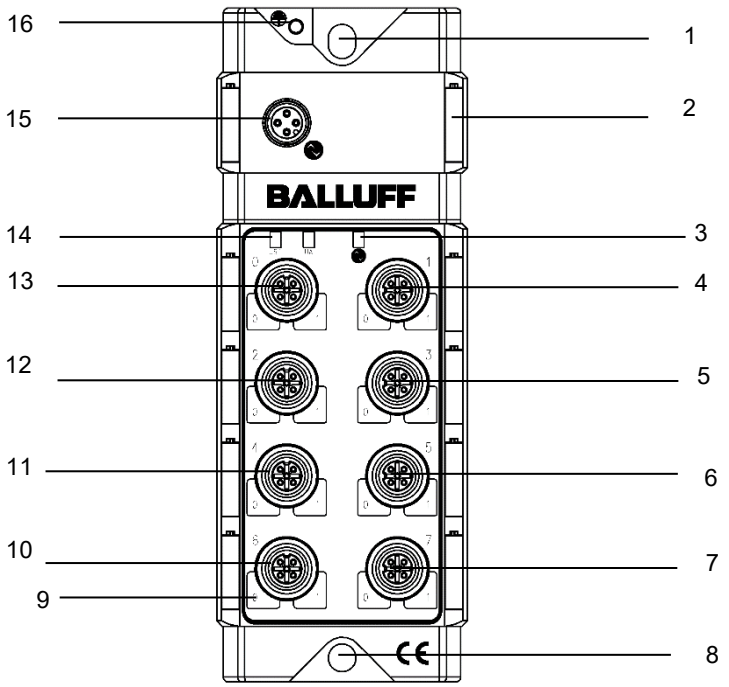


Fig. 3-1: BNI IOL-…..-Z0xx

1 Mounting hole
2 Label
3 Status LED:Communication / module
4 Standard I/O port 1
5 Standard I/O port 3
6 Standard I/O port 5
7 Standard I/O port 7
8 Mounting hole
9 Pin/Port LED: Signalstatus
10 Standard I/O port 6
11 Standard I/O port 4
12 Standard I/O port 2
13 Standard I/O port 0
14 Status LED: Module supply
15 IO-Link Interface
16 FE connection

3 Getting Started

3.2. Mechanical connection

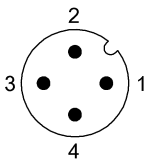
The BNI IOL-…..-Z0xx modules are attached by using 2 M6 screws and 2 spacers.

3.3. Electrical connection

The BNI IOL-…-Z0xx modules require no separate supply voltage connection. Power is provided through the IO-Link interface by the host IO-Link Master.

IO-Link Interface

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



Pin	Function
1	Power supply controller, +24V, max 1.1A
2	Power supply actuator, +24V, max 1.6A* (4A**)
3	GND, reference potential
4	C/Q, IO-Link Data transmission channel

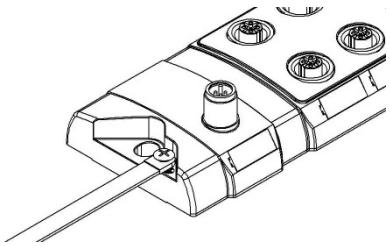
* Only for BNI IOL-302-xxx-Z012
** Only for BNI IOL-302-xxx-Z042

Connecting the sensor hub

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

Note
For BNI IOL-10x-xxx-Z012 a standard 3 wire sensor cable is used for connection to the host IO-Link master. For BNI IOL-302-xxx-Z0xx a 4 wire sensor cable is necesarry.

Function earth



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

Module versions

Sensor Hub Version	Digital Port
BNI IOL-102-000-Z012	8 Inputs
BNI IOL-104-000-Z012	16 Inputs
BNI IOL-104-S01-Z012	16 Inputs with single channel monitoring
BNI IOL-104-S01-Z012-C01	16 Inputs with single channel monitoring 2 Identification bytes
BNI IOL-104-S01-Z012-C02	16 Inputs with single channel monitoring 4 Identification bytes
BNI IOL-302-000-Z012	16 Inputs and Outputs configurable
BNI IOL-302-S01-Z012	16 Inputs and Outputs configurable, with single channel monitoring
BNI IOL-302-000-Z042	16 Inputs and Outputs configurable

3 Getting Started

3.4. Sensor Interface

Standard I/O port (M12, A-coded, female)

M12
A-coded
female

Pin	Function			
	Input pin4	Input pin4/pin2	Output	In / Out
1	+24V 0.1 A	+24V 0.1 A	n.c.	+24V 0.1 A
2	n. c.	Input	Output 500 mA / 2A**	In / Out 500 mA / 2A**
3	0V	0V	0V	0V
4	Input	Input	Ouput 500 mA / 2A**	In / Out 500 mA / 2A**
5	FE	FE*	FE	FE

*BNI IOL-106-xxx-Z012 not used
** For BNI IOL-302-xxx-Z042

Note
For the digital inputs follow the input guideline per EN 61131-2, Type.

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

Note
Outputs: Maximum 500mA per output (BNI IOL-302-000-Z042 2A).
Total current of actuator supply is maximum 1.6A

4 IO-Link Interface

4.1. IO-Link Data

BNI IOL-102-000-Z012	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	1 Byte input
IO-Link Revision	1.0
Process data cycle time	3 ms, minimal cycle time

BNI IOL-104-000-Z012	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	2 Byte input
IO-Link Revision	1.0
Process data cycle time	3 ms, minimal cycle time

BNI IOL-104-S01-Z012	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	4 Byte input
IO-Link Revision	1.0
Process data cycle time	12 ms, minimal cycle time

BNI IOL-104-S01-Z012-C01	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	6 Byte input
IO-Link Revision	1.0
Process data cycle time	18 ms, minimal cycle time

BNI IOL-104-S01-Z012-C02	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	8 Byte input
IO-Link Revision	1.0
Process data cycle time	24 ms, minimal cycle time

4 IO-Link Interface

BNI IOL-302-000-Z012	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	2 Byte input, 2 Byte output
IO-Link Revision	1.0
Process data cycle time	12 ms, minimal cycle time

BNI IOL-302-S01-Z012	
Übertragungsrate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	8 Byte input, 2 Byte output
IO-Link Revision	1.0
Process data cycle time	30 ms, minimal cycle time

BNI IOL-302-000-Z042	
Data transmission rate	COM2 (38,4 kBaud)
Minimal cycle time	3 ms
Process data length	2 Byte input, 2 Byte output
IO-Link Revision	1.0
Process data cycle time	12 ms, minimal cycle time

4.2. Prozess data/ Input data

BNI IOL-102-000-Z012

Byte	0							
Bit	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

BNI IOL-104-000-Z012

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

4 IO-Link Interface

BNI IOL-104-S01-Z012

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 US

BNI IOL-104-S01-Z012-C01
BNI IOL-104-S01-Z012-C02*

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 US

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

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

BNI IOL-302-000-Z0xx

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

4 IO-Link Interface

BNI IOL-302-S01-Z012

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 US1

Short Circuit at Port x between
Pin 1 and Pin 3
Short Circuit Port x = 1

Where x = 0…..7

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 1Pin 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 1Pin 2	Warning Port 0 Pin 2

Note
Actuator short circuit: overload or short circuit in the main against 0V
Actuator warning: short circuit of the output signal against +24V

4.3. Prozess data / Output data

BNI IOL-302-xxx-Z0xx

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

No output data for:
BNI IOL-104-xxx-Z012
BNI IOL-104-S01-Z012-C01
BNI IOL-104-S01-Z012-C02

4 IO-Link Interface

Parameter data / Request data

	DPP	SPDU		Object name	Length	Range	Default value
	Index	Index	Sub-index				
Identification Data	07hex			Vendor ID	2 Byte	Read only	0378hex
	08hex						
	09hex			Device ID	3 Byte		050702hex 050701hex 050704hex 050709hex 050711hex 050706hex 050707hex 050715hex
	0Ahex						
	0Bhex						
		10hex	0	Vendor Name	7 Byte		BALLUFF
		11hex	0	Vendor text	15 Byte		www.balluff.com
		12hex	0	Product name	20-24 Byte		BNI IOL-102-000-Z012 BNI IOL-104-000-Z012 BNI IOL-104-S01-Z012 BNI IOL-104-S01-Z012-C01 BNI IOL-104-S01-Z012-C02 BNI IOL-302-000-Z012 BNI IOL-302-S01-Z012 BNI IOL-302-000-Z042
		13hex	0	Product ID	7 Byte		BNI0031 BNI0032 BNI0039 BNI003T BNI005P BNI003U BNI003C BNI0080
		14hex	0	Product text	22-31 Byte		Sensor hub metal 8 inputs Sensor hub metal 16 inputs Sensor hub metal 16 inputs Sensor hub metal 16 inputs + ID Sensor hub metal 16 inputs + ID Sensor/Actor hub metal Sensor/Actor hub metal Sensor/Actor hub metal
		16hex	0	Hardware Revision	1 Byte		
		17hex	0	Firmware Revision	23 Byte		

	DPP	SPDU		Object name	Length	Range	Default value
	Index	Index	Sub-index				
Parameter Data		40hex	0 1-16	Inversion	2 Byte	0hex…FFFFhex	0000hex
		41hex	0 1-16	Port Direction*	2 Byte	0hex … FFFFhex	0000hex
		42hex	0 1-8	Fault State Pin4*	2 Byte	0hex … FFFFhex	0000hex
		43hex	0 1-8	Fault State Pin2*	2 Byte	0hex … FFFFhex	0000hex
		44hex	0 1-16	Sp. Monitoring	2 Byte	0hex … FFFFhex	-
		45hex	0 1-16	Actuator short*	2 Byte	0hex … FFFFhex	-
		46hex	0 1-16	Actuator warning***	2 Byte	0hex … FFFFhex	-
		60hex	-	Identification**	2 Byte	0hex … FFFFhex	0000hex
		60hex	-	Identification***	4 Byte	0hex … FFFFFFFFhex	00000000hex

* Only in case BNI IOL-302-xxx-Z0xx
** Only in case BNI IOL-104-S01-Z012-C01
*** Only in case BNI IOL-104-S01-Z012-C02

4 IO-Link Interface

Inversion of the inputs 40_{hex}

BNI IOL-10x-xxx-Z012
BNI IOL-104-S01-Z012-C0x
BNI IOL-302-xxx-Z0xx

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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 41_{hex}

BNI IOL-302-xxx-Z0xx

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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
0: Input
1: Output

Fault State of the outputs Pin 4, 42_{hex}

BNI IOL-302-xxx-Z0xx

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 Port (x)
00 - 0
01 - 1
10 - Last state
11 - Not defined

Fault State of the outputs Pin 2, 43_{hex}

BNI IOL-302-xxx-Z0xx

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	

Fault State Port (x)
00 - 0
01 - 1
10 - Last State
11 - Not defined

4 IO-Link Interface

Voltage Monitoring 44_{hex}

BNI IOL-x0x-xxx-Z012
BNI IOL-104-S01-Z012-C0x

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	16	15	14	13	12	11	10	9						3		1
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 US1

*only for "302".

Short circuit at Port x between Pin 1 and Pin 3
Short circuit port x = 1
Where x = 0…7

Actuator short 45_{hex}

BNI IOL-302-xxx-Z0xx

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Sub Index	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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 46_{hex}

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

Identification 60$_{hex}$

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

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

*Only in case of BNI IOL-104-S01-Z012-C01 and BNI IOL-104-S01-Z012-C02
**Only in case of BNI IOL-104-S01-Z012-C02

4.4. Errors

Error Code	Description
0x8011	Index not available
0x8012	Subindex not available
0x8030	Parameter Value out of Range

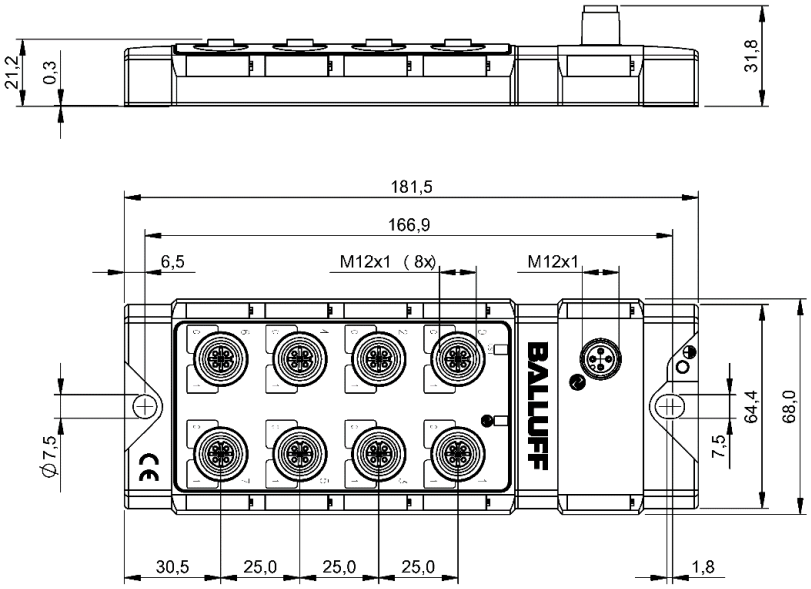
4.5. Events

IO-Link Revision 1.0	
Event Code	**Description**
0x5112	Low sensor voltage (US)
0x5114	Low actuator voltage
0x5160	Short circuit sensor supply
0x5410*	Short circuit actuator supply / actuator warning

*Only in case of BNI IOL-302-xxx-Z0xx

5 Technical Data

5.1. Dimensions



5.2. Mechanical Data

Housing material	Die-cast zinc housing
IO-Link-Port	M12, A-coded, male
I/O-Ports	M12, female, 5-poles
Enclosure rating per IEC 60529	IP67 (only when plugged in and threaded in)
Weight	ca. 500 g
Dimensions (B × H × T in mm)	68 x 181,5 x 31,8

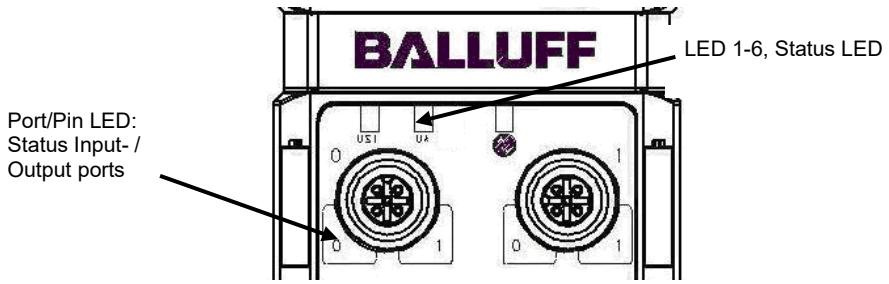
5.3. Electrical Data

Operating conditions	18 ... 30.2 V DC, per EN 61131-2
Ripple	< 1 %
Current draw without load	≤ 90 mA

5.4. Operating conditions

Ambient temperature	-5 °C … +70 °C
Storage temperature	-25 °C … +70 °C

5.5. LED indicators



Port-Pin LEDs

LED “0” – Port Pin 4
LED “1” – Port Pin 2

Status LEDs

BNI IOL-10x-xxx-Z012

LED	Indicator	Function
LED 1	Green / Red	Supply Sensors & Module ok / Undervoltage
LED 6	Green / Green flashing	Communication error / communication ok

BNI IOL-302-xxx-Z0xx

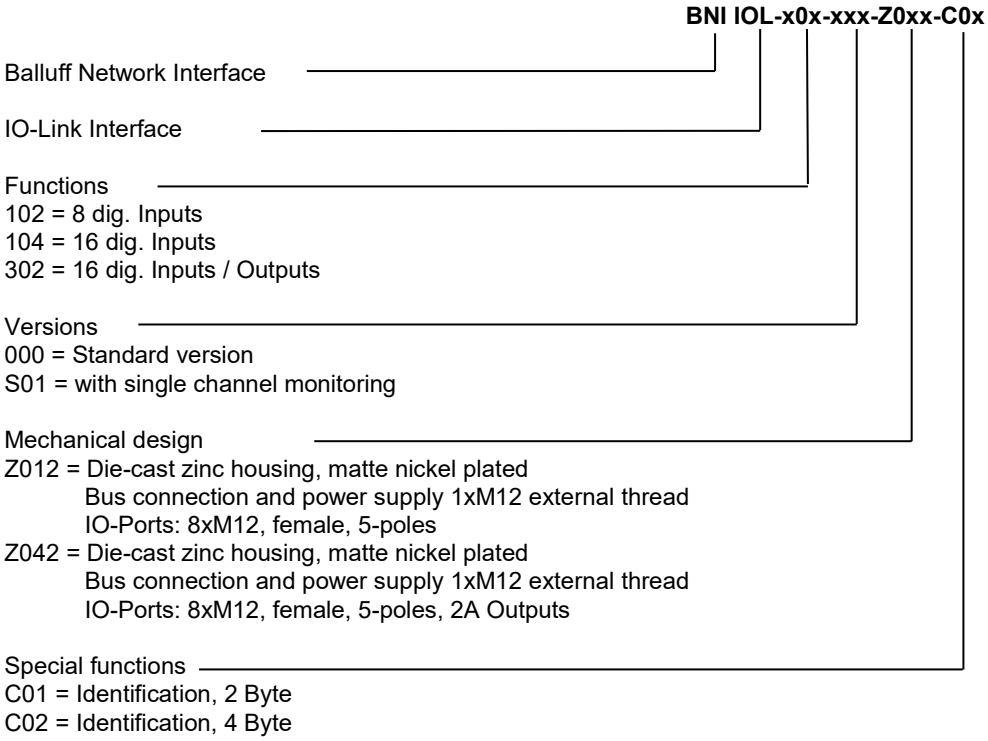
LED	Indicator	Function
LED 1	Green / Red	Supply Module ok / Undervoltage
LED 3	Green / Red	Supply actuators ok / Undervoltage
LED 6	Green / Green flashing	Communication error / communication ok

LED I/O-Ports

Indicator	Function LED Pin 2 / Pin 4
Off	Input signal / output signal = 0
Yellow static	Input signal / output signal = 1
Red	Input port : SC, short circuit Output port: Imax, over-current, short circuit, actuator warning

6 Appendix

6.1. Product ordering code



6.2. Order information

Product ordering code	Order code
BNI IOL-102-000-Z012	BNI0031
BNI IOL-104-000-Z012	BNI0032
BNI IOL-104-S01-Z012	BNI0039
BNI IOL-104-S01-Z012-C01	BNI003T
BNI IOL-104-S01-Z012-C02	BNI005P
BNI IOL-302-000-Z012	BNI003U
BNI IOL-302-S01-Z012	BNI003C
BNI IOL-302-000-Z042	BNI0080

Included material

BNI IOL… consists of the following components:

- IO-Modul
- 4 filler plugs M12
- Ground connection-band
- Screw M4x6
- 20 Labels

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