

BNI IOL-75x-Vxx-K007

Valve Plug

User's Guide



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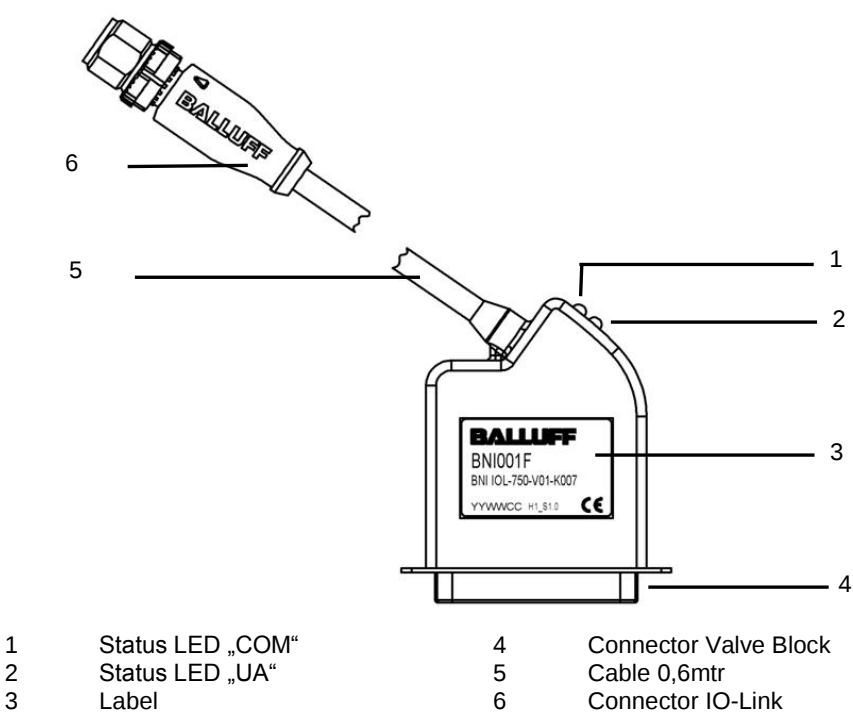
1 Notes to the User

1.1. Structure	The chapters in this guide build on one another. Section 2: Basic safety information. Section 3: The main steps for installing the device.	
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" (e.g. 00 _{hex}).	
Cross references	Cross references indicate where additional information on the topic can be found.	
1.3. Symbols	 Note This symbol indicates general notes.  Attention! This symbol indicates a security notice which must be observed.	
1.4. Abbreviations	BNI DPP EMC FE IOL LSB MSB SPDU	Balluff Network Interface Direct Parameter Page Electromagnetic Compatibility Function ground IO-Link Least Significant Bit Most Significant Bit Service Protocol Data Unit (see IO-Link Specification)
1.5. Divergent views	Product views and images can differ from the specified product in this manual. They serve only as an illustration.	

2.1. Intended use	This guide describes the Balluff IO-link valve block interface BNI IOL-75x-... to control valve block devices of different diverse manufacturers. Connection to the host interface IO-Link master is made through the IO-link protocol.
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 The operating company shall be responsible for observance of locally applicable safety instructions. 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.
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.
Hazardous 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



3.2. Mechanical
 connection

The module BNI IOL-75x-... is directly mounted at D-Sub 25 pin connector at the valve block unit. A additional mechanical fixation is not necessary.

3.3. Electrical
 connection

The valve block connector has no separate power supply connection. The supply of the power comes from the IO-Link master unit at pin 1 and pin 2 of the M12 male connector.

IO-Link interface

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

	Pin	BNI IOL 750-...	BNI IOL 751-...
	1	US,UA	US
	2	-	UA
	3	GND US, GND UA	GND US, GND UA
	4	C/Q	C/Q
	5	-	-

US	Power Supply Module, +24V, max.1,6 A
UA	Power Supply Actuators, +24V
GND US	Ground reference to Power Supply Module
GND UA	Ground reference to Power Supply Actuators
C/Q	IO Link communication line



Note
At cable extension:
For the BNI IOL 750-... just a 3 poles standard sensor cable is used. BNI IOL-751-... needs to have a 4 poles cable.

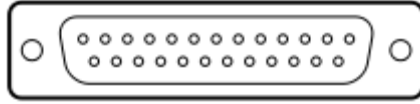


Note
The IO-Link cable must not be longer than 20 meters.

3 Getting Started

Interface Valve
Block Unit

D-Sub, 25-pole, female



Versions

Valve Plug	Valve Block
BNI IOL-75x-V01-K007	FESTO MPA, Bosch Rexroth, LSH 04, max 24 Valves
BNI IOL-75x-V02-K007	FESTO CPV, Bosch Rexroth, LSH 04, max 16 Valves
BNI IOL-75x-V03-K007	SMC VQC 1000/2000/4000, max. 24 Valves
BNI IOL-75x-V04-K007	SMC VQC 1000/2000/4000, max. 16 Valves

Pin assignment of
D-Sub 25

Pin	BNI IOL-75x-V01-K007	BNI IOL-75x-V02-K007	BNI IOL-75x-V03-K007	BNI IOL-75x-V04-K007
Pin 1	Valve 1 Coil A	Valve 1 Coil A	Valve 1 Coil A	Valve 1 Coil A
Pin 2	Valve 1 Coil B	Valve 1 Coil B	Valve 2 Coil A	Valve 2 Coil A
Pin 3	Valve 2 Coil A	Valve 2 Coil A	Valve 3 Coil A	Valve 3 Coil A
Pin 4	Valve 2 Coil B	Valve 2 Coil B	Valve 4 Coil A	Valve 4 Coil A
Pin 5	Valve 3 Coil A	Valve 3 Coil A	Valve 5 Coil A	Valve 5 Coil A
Pin 6	Valve 3 Coil B	Valve 3 Coil B	Valve 6 Coil A	Valve 6 Coil A
Pin 7	Valve 4 Coil A	Valve 4 Coil A	Valve 7 Coil A	Valve 7 Coil A
Pin 8	Valve 4 Coil B	Valve 4 Coil B	Valve 8 Coil A	Valve 8 Coil
Pin 9	Valve 5 Coil A	Valve 5 Coil A	Valve 9 Coil A	-
Pin 10	Valve 5 Coil B	Valve 5 Coil B	Valve 10 Coil A	-
Pin 11	Valve 6 Coil A	Valve 6 Coil A	Valve 11 Coil A	-
Pin 12	Valve 6 Coil B	Valve 6 Coil B	Valve 12 Coil A	-
Pin 13	Valve 7 Coil A	Valve 7 Coil A	GND	GND
Pin 14	Valve 7 Coil B	Valve 7 Coil B	Valve 1 Coil B	Valve 1 Coil B
Pin 15	Valve 8 Coil A	Valve 8 Coil A	Valve 2 Coil B	Valve 2 Coil B
Pin 16	Valve 8 Coil B	Valve 8 Coil B	Valve 3 Coil B	Valve 3 Coil B
Pin 17	Valve 9 Coil A	-	Valve 4 Coil B	Valve 4 Coil B
Pin 18	Valve 9 Coil B	-	Valve 5 Coil B	Valve 5 Coil B
Pin 19	Valve 10 Coil A	-	Valve 6 Coil B	Valve 6 Coil B
Pin 20	Valve 10 Coil B	-	Valve 7 Coil B	Valve 7 Coil B
Pin 21	Valve 11 Coil A	-	Valve 8 Coil B	Valve 8 Coil B
Pin 22	Valve 11 Coil B	-	Valve 9 Coil B	-
Pin 23	Valve 12 Coil A	-	Valve 10 Coil B	-
Pin 24	Valve 12 Coil B	-	Valve 11 Coil B	-
Pin 25	GND	GND	Valve 12 Coil B	-



Note

The exact coil / address assignment depends on the type of the valve block.

4 IO-Link interface

4.1. Communication parameters

	24 Bit Version	16 Bit Version
Transmission rate	COM2 (38,4 kBaud)	COM2 (38,4 kBaud)
Frame type	1	2.4
Minimum cycle time	3 ms	3 ms
Process data cycle *	12 ms	3 ms

*at min cycle time

4.2. Process data

All BNI IOL-75x-... are pure output modules and just have got output data. The direction of the data transmission for output data is IO-Link Master to IO Link device.

24-Bit Version

BNI IOL-75x-V01-K007 / BNI IOL-75x-V03-K007

Process data length 4 Bytes

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	-	-	-	-	Valve 12 – Coil A	Valve 11 – Coil A	Valve 10 – Coil A	Valve 09 – Coil A	Valve 08 – Coil A	Valve 07 – Coil A	Valve 06 – Coil A	Valve 05 – Coil A	Valve 04 – Coil A	Valve 03 – Coil A	Valve 02 – Coil A	Valve 01 – Coil A

Byte	2								3							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	-	-	-	-	Valve 12 – Coil B	Valve 11 – Coil B	Valve 10 – Coil B	Valve 09 – Coil B	Valve 08 – Coil B	Valve 07 – Coil B	Valve 06 – Coil B	Valve 05 – Coil B	Valve 04 – Coil B	Valve 03 – Coil B	Valve 02 – Coil B	Valve 01 – Coil B

16 Bit Version

BNI IOL-75x-V02-K007 / BNI IOL-75x-V04-K007

Process data length: 2 Bytes

Byte	0								1							
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Description	Valve 08 – Coil A	Valve 07 – Coil A	Valve 06 – Coil A	Valve 05 – Coil A	Valve 04 – Coil A	Valve 03 – Coil A	Valve 02 – Coil A	Valve 01 – Coil A	Valve 08 – Coil B	Valve 07 – Coil B	Valve 06 – Coil B	Valve 05 – Coil B	Valve 04 – Coil B	Valve 03 – Coil B	Valve 02 – Coil B	Valve 01 – Coil B

4.3. Parameter data /
On-request data

	DPP	SPDU		Object name	Range
	Index	Index	Sub-Index		
Identification Data	0x07			Vendor ID (0x378)	read only
	0x08			Device ID	
	0x09				
	0x0A				
	0x0B				
		0x10	0	Vendor name	
		0x11	0	Vendor text	
		0x12	0	Product name	
		0x13	0	Product ID	
		0x14	0	Product text	
		0x16	0	Hardware Revision	
		0x17	0	Firmware Revision	

4.4. Identification
data

BNI IOL-...	Device ID	Product ID	Product Name	Product text
750-V01	0x050401	BNI001F	BNI IOL-750-V01-K007	Valve Plug CG25 24 1-3
750-V02	0x050402	BNI001E	BNI IOL-750-V02-K007	Valve Plug CG25 16 1-3
750-V03	0x050403	BNI001H	BNI IOL-750-V03-K007	Valve Plug CG13 24 1-3
750-V04	0x050404	BNI001J	BNI IOL-750-V04-K007	Valve Plug CG13 16 1-3
751-V01	0x050405	BNI001K	BNI IOL-751-V01-K007	Valve Plug CG25 24 2-3
751-V02	0x050406	BNI001L	BNI IOL-751-V02-K007	Valve Plug CG25 16 2-3
751-V03	0x050407	BNI001M	BNI IOL-751-V03-K007	Valve Plug CG13 24 2-3
751-V04	0x050408	BNI001N	BNI IOL-751-V04-K007	Valve Plug CG13 16 2-3

4.5. Errors

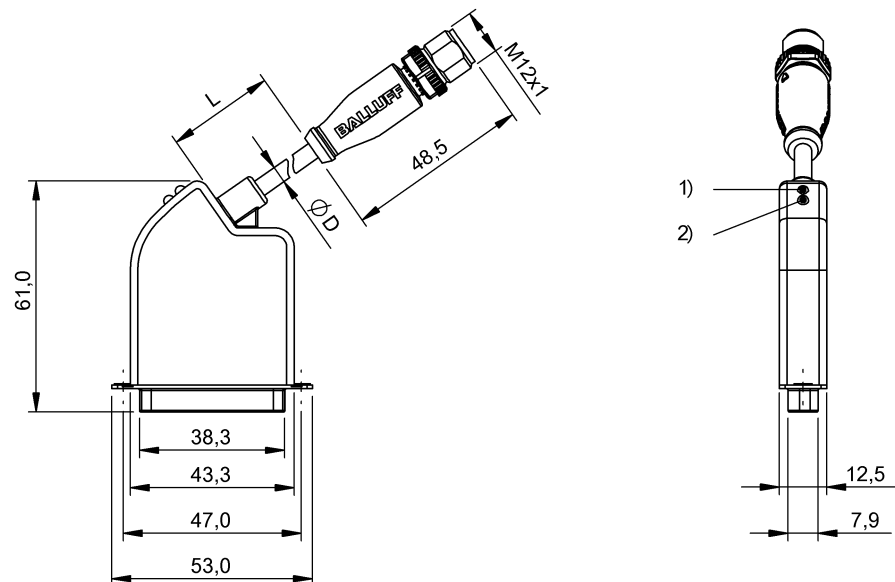
Error Code	Description
0x8011	Index not available
0x8012	Subindex not available

4.6. Events

Event Code	Description
0x5112	Low sensor voltage
0x5114	Low actor voltage
0x5151	Short circuit output stages

5 Technical Data

5.1. Dimensions



5.2. Mechanical data

Housing material	Plastic, Macromelt 6208
IO-Link port	M12, A-coded, male
Port valve block connector	D-Sub, 25-pole, female
Enclosure rating per IEC 60529	IP 40 (when plugged in)
Dimensions (W x H x D in mm)	53,0 x 61,0 x 12,5 without cable
Cable length	0,6 mtr.
Weight	69.5 gr

5.3. Elektrical data

Operating voltage	18...30.2 V DC, per EN 61131-2
Ripple	< 1%
Current draw without load	30 mA

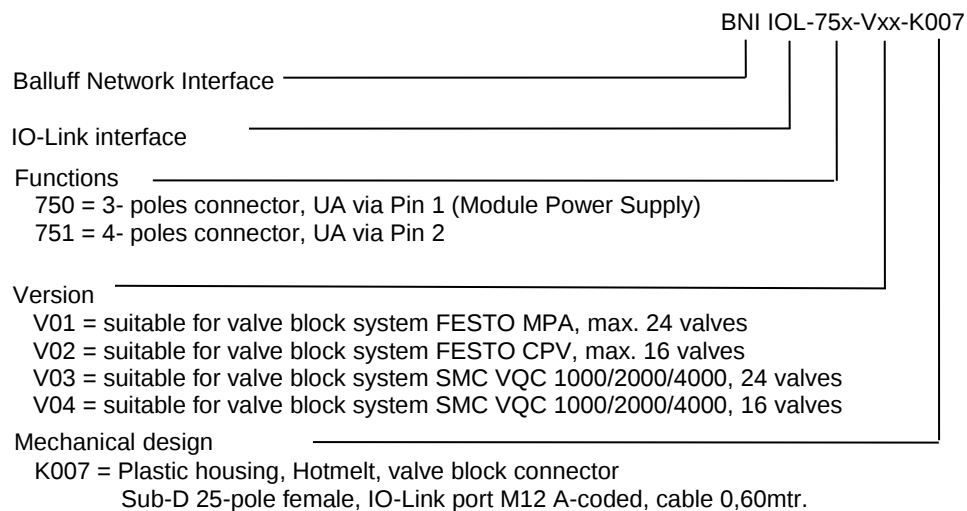
5.4. Operating conditions

Operating temperature	-5 °C ... 55 °C
Storage temperature	-25 C ... 70 °C
EMC - EN61000-4-2/3/4/5/6	Schärfegrad 4A/3A/4B/2A/3A
Vibration / Shock	EN 60068-2-6, EN 60068-2-27 EN 60068-2-29, EN 60068-2-64

5.5. Indicators / LEDs

LED 1 – Communication Status	
Green static	No communication
Green, negative pulsed	Communication OK
LED 2 – Status of Actuator Power Supply	
Green	Actuator Power Supply OK
Green flashing	Short Circuit on output
Off	Actuator power supply <18V

6.1. Type designation code



6.2. Order information

Type	Order code
BNI IOL-750-V01-K007	BNI001F
BNI IOL-750-V02-K007	BNI001E
BNI IOL-750-V03-K007	BNI001H
BNI IOL-750-V04-K007	BNI001J
BNI IOL-751-V01-K007	BNI001K
BNI IOL-751-V02-K007	BNI001L
BNI IOL-751-V03-K007	BNI001M
BNI IOL-751-V04-K007	BNI001N

Notes

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