BVLLAL

BNI EIP-501-005-Z015 EtherNet/IP™ IP67 modules User's Guide



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1 Notes

1.1.	Structure of the guide	This guide is arranged so that one chapter builds upon the other. Chapter 2: Basic safety instructions Chapter 3: Main steps for installing the device	
1.2.	Typographical Conventions	The following typographical conventions are used in this manual.	
	Enumerations	Enumeration is shown in the form of bulleted lists. 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. & Result of action. Action instruction 2. Actions can also be indicated as numbers in parentheses. (1) Step 1 (2) Step 2	
	Syntax	Numbers: Decimal numbers are shown without additional information (e.g. 123), Hexadecimal numbers are shown with the additional indicator hex (e.g., 00 _{hex}) or the prefix "0x" (e.g., 0x00).	
	Cross-references	Cross-references indicate where additional information on the topic is located.	
1.3.	Symbols	Note This symbol indicates general notes.	
		Attention! This symbol indicates a security notice which most be observed.	
1.4.	Abbreviations	BNIBalluff Network InterfaceGNDElectrical Ground, 0VEMCElectromagnetic CompatibilityFEFunction earthIStandard input portOStandard output portI/OStandard Input/Output portIOLIO-LinkIODDIO-Link Device Descriptionn.anot availableEIPEtherNet/IP™UAActuator supplyUSSensor supply	
1.5.	Deviating views	Product views and illustrations in this manual may differ from the actual product. They are intended only as illustrative material.	

2 Safety

2.1.	Intended Use	The BN EtherNe	I EIP-501-005-Z015 is a decentralized IO-Link and inputmodule for connecting to the t/IP™ network.
2.2.	Installation and Startup	⚠	Attention! Installation and startup are to be performed by trained technical personnel only. Skilled specialists are people who are familiar with the work such as installation and the operation of the product and have the necessary qualifications for these tasks. Any damage resulting from unauthorized tampering or improper use shall void warranty and liability claims against the manufacturer. The operator is responsible for ensuring that the valid safety and accident prevention regulations are observed in specific individual cases.
2.3.	General Safety Notes	Commis Before of The sys function Intende Warrant from: ••••••••••••••••••••••••••••••••••••	ssioning and inspection commissioning, carefully read the User's Guide. tem must not be used in applications in which the safety of persons depends on the of the device. d use y and liability claims against the manufacturer shall be rendered void by damage Unauthorized tampering Improper use Use, installation or handling contrary to the instructions provided in this User's Guide. ions of the owner/operator rice is a piece of equipment in accordance with EMC Class A. This device can e RF noise. The owner/operator must take appropriate precautionary measures this for its use. The device may be used only with a power supply approved for this. proved cables may be connected. ctions went of defects and device malfunctions that cannot be rectified, the device must be ut of operation and protected against unauthorized use. d 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	\wedge	Attention!
	Voltage		Before working on the device, switch off its power supply.
		f	Note In the interest of continuous improvement of the product, Balluff GmbH reserves the right to change the technical data of the product and the content of these instructions at any time without notice.

3 **First Steps**

3.1. Module Overview



Figure - Overview: BNI EIP-501-005-Z015

- Mounting hole 1
- EtherNet/IP™ port 2 2
- 3 4
- Power supply, input Status LED: communication / module
- 5 Port 4
- 6 Pin/port LED: signal status
- 7 Port 5
- 8 Port 6

9	Port	7

- 10 Port 3
- Port 2 11
- Port 1 12
- 13 Port 0
- Power supply, output
 EtherNet/IP™ port 1
- 16 Ground connection

3 **First Steps**

- 3.2. Mechanical Connection
- 3.3. Electrical Connection

Power Supply

Grounding

IN 1 3	Pin	Function	Description
	1	+24 V	Actuator supply
24 7/8". male	2	+24 V	Module / sensor supply
OUT	3	0 V	GND module / sensor and actuator supply
1001	4		
			·
7/8" female			

The module is secured by means of two M6 screws and two washers.

Insulation support is available separately.

Note

i

Where possible, use a separate power source to supply the sensor/bus and actuator with power.

Total current < 9 A The total current of all modules must not exceed 9 A even in the case of series connection of the actuator supply.

Attention!

Do not separate supply voltages

Non-separate voltage supply circuits for sensor and actuator can result in undesired voltage drops in the sensor supply when switching actuators.



► Therefore always use separately protected voltage supplies for sensors and actuators.

Also be sure to sufficiently dimension the voltage supply of the device in order to cover startup and peak currents. Design the fusing concept accordingly.

Note i

The functional ground connection between housing and machine must have a low impedance and be as short as possible.

3 **First Steps**

Ethernet IP Interface

M12, D-coded, female

	Pin		Function
2	1	Tx+	Transmit Data +
്)3	2	Rx+	Receive Data +
	3	Tx-	Transmit Data -
	4	Rx-	Receive Data -

IO-Link Port

M12, A-coded, female

4

2	Pin	Function
20	1	+24 V, 1.6 A
$1\left(\begin{array}{c} 0 \\ 0 \\ 0 \end{array}\right)^{5} $	2	Input
10003	3	GND
0	4	IO-Link / Input
4	5	n.a.



Note For the digital sensor inputs, refer to guideline on inputs EN 61131-2, Type 2.



Note Unused I/O ports must be provided with cover caps to comply with degree of protection IP67.

4 Technical Data

4.1. Dimensions



4.2. Mechanical Data	Housing material	Die case zinc, matt nickel plated	
	Enclosure rating per IEC 60529	IP 67 (only when plugged-in and threaded-in)	
	Supply voltage	7/8" 4-pin, connector / female	
	IO-Link ports	M12, A-coded (8x female)	
	Dimensions (W x H x D in mm)	68 x 224 x 37.9	
	Type of mounting	Screw mounting with 2 mounting holes	
	Ground strap installation	M4	
	Weight	Approx. 670 g	
4.3. Operating Conditions	Ambient temperature Storage temperature	-5 °C 70 °C -25 °C 70 °C	
4.4. Electrical Data	Supply voltage	1830.2 V DC, in accordance with EN 61131-2	
	Ripple	< 1%	
	Input current at 24 V	130 mA	

4 Technical Data

4.5. Ethernet

Ethernet IP port	2 x 10Base/100Base Tx
Connection for Ethernet IP port	M12, D-coded, female
Cable types in accordance with IEEE 802.3	Shielded, twisted pair min. STP CAT 5/ STP CAT 5e
Data transmission rate	10/100 Mbps
Max. cable length	100 m
Flow control	Half-duplex/full-duplex (IEEE 802.33x pause)

4.6. Function Indicators

Status-LEDs BALLUFF

LED	Display	Description
110	Green	Input power OK
03	Red, flashing	Low Input power (< 18V)
	Green	Output power OK
UA	off	Low Output power (< 18V) or not output power (<11V)
	Green, flashing	Wrong or no configuration
	Green	No error
NOD	Red, flashing	Fixed bus clock is not possible
	Red-green, flashing	Initial sequence
	Off	No IP address
	Green, flashing	Module got IP, but no connection could be established
NET	Green	Connection established
	Red, flashing	Connection timeout
	Red-green, flashing	Initial sequence
100	Off	Bus clock: 10 Mbit/s
100	Yellow	Bus clock: 100 Mbit/s
LK1/2	Green, flashing	Data transfer

Module Status

4 Technical Data

PortMode

Each port has two bicolored LEDs for displaying the I/O statuses.

Standard mode

Status	Function	
off	State of the Input Pin is 0	
Yellow	State of the Input Pin is 1	

IO-Link mode

Status	Function			
Green	IO-Link – connection established			
Green, flashing	No active IO-Link communication			
Green, fast flashing	IO-Link pre-operate during data management			
Red, fast flashing	Wrong IO-Link data lenght, or validation failed or data storage failed			
Red	IO-Link short circuit, pin 4 against pin 3			

All modes

Status	Function			
both LEDs red flashing	Short circuit at sensor supply between pin 1 and pin 3			

5.1. Integration in Rockwell RS Logix 5000

Here you see an example of how the module can be integrated into a Rockwell RS Logix 5000:

First go offline



Right-click Ethernet (on the correct scanner card) Select a new module

ile Edit Viev	v Search	Logic (Communicatio	ons Tools	Window	Help
a 🚅 日	<u>6</u> 3		0	Baluff_B	IP_Device_	Connecting
ffline	0. I	RUN		LA	H	hd he
o Forces	۰.			9	1.1	a da sel
o E dits	2	E L/D			<u> </u>	
edundancy	8.J			0		Tevorite
🗄 🔂 1/0 Co	nfiguration	2				^
😑 😅 17	56 Backplar	ne, 1756-A	10			
10	[0] 1756-1	.61 EIP_Fi	rmware_Tes	t_1756		
e 🛙	[1] 1756-1	ONB Device	eNet_Scanne	er		
	केंक Device	eNet				
- B	[2] 1756-	ENBT/A Sc	anner_1			
	The Ether	net.				
		HERNET-P	MODULE Dev	ice_New_D	isplay	
		HERNET-P	MODULE Dev	10E_UId_DB	piay	100
	BL FT	HEDNET.	MODULE LIF.	104 Mod	ile Addres	e 1
	E ET	HERNET-N	MODULE New	ice202_old	alo_Houros	
	E F	HERNET-N	MODULE Nev	305 Too	ile Test	
	- 🐱 E1	HERNET-N	MODULE Nev	/ 305 Mod	ule Addres	is 2
	1	56-ENBT/	A Scanner_1			
	- 🔥 E1	HERNET-N	MODULE EIP:	306_V1021	24	
	- 🔂 E1	THERNET-N	MODULE Nev	_305_Mod	ule_Addres	is_1
e- 1	[3] 1756-	EN2T Scan	ner_2_High_	Speed_Car	d	
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		R Paste		rd+V	_Card	
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	el en	HERNET-	MODULE New	/_200_Mod	ule_Addres	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	E FI	HERNET-N	MODULE Dev	ice202 old	l .	
	- 1 ET	HERNET-N	MODULE Nev	105 Mod	ule Addres	is 2
	- E	HERNET-N	MODULE Nev	302_Tog	le_Test	65
	- 🐻 E1	HERNET-N	MODULE Nev	_206_Tog	le_Test	
	ET	THERNET-N	MODULE Nev	_502_Mod	ule_Addres	is_170_Te
	- 🐘 E1	HERNET-M	MODULE Nev	/ 105 Mod	ule Toggle	Test 👱

Then select the general Ethernet module as the ETHERNET module in the communication path

Module	Description	Vendor
Communications		
-1734-AENT/A	1734 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
1738-AENT/A	1738 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
1756-EN2F	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley
1756-EN2T	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1756-ENBF/A	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley
1756-ENBT	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1756-ENET/A	1756 Ethernet Communication Interface	Allen-Bradley
1756-ENET/B	1756 Ethernet Communication Interface	Allen-Bradley
1756-EWEB/A	1756 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv	Allen-Bradley
1757-FFLD/A	1757 Foundation Fieldbus Linking Device	Allen-Bradley
1768-ENBT/A	1768 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1768-EWEB/A	1768 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv	Allen-Bradley
1769-L32E Etherne	10/100 Mbps Ethernet Port on CompactLogix5332E	Allen-Bradley
1769-L35E Etherne	10/100 Mbps Ethernet Port on CompactLogix5335E	Allen-Bradley
1783-EM504T	1783-EMS04T Ethernet Managed Switch	Allen-Bradley
1783-EM508T	1783-EMSOBT Ethernet Managed Switch	Allen-Bradley
1788-EN2DN/A	1788 Ethernet to DeviceNet Linking Device	Allen-Bradley
1788-ENBT/A	1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
- 1794-AENF/A	1794 10/100 Mbps Ethernet Adapter, Fiber Media	Allen-Bradley
1794-AENT	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
Checker 4G1	Checker 4G Series	Cognex Corp
Checker 4G7	Checker 4G Series	Cognex Corp
DataMan 200 Series	ID Reader	Cognex Corp
DataMan 500 Series	ID Reader	Cognex Corp
DataMan 8000 Ser	ID Reader	Cognex Corp
Drivelogix5730 Eth	. 10/100 Mbps Ethernet Port on DriveLogix5730	Allen-Bradley
E1 Plus	Electronic Overload Relay Communications Interface	Allen-Bradley
- ETHERNET-BRIDGE	Generic EtherNet/IP CIP Bridge	Allen-Bradley
ETHERNET-MODULE	Generic Ethernet Module	Allen-Bradley
EtherNet/IP	SoftLogix5800 EtherNet/IP	Allen-Bradley
4 To Clabs 1700 Card	Halan Cristian	
	Find	Add Favorit
By Category By Ve	endor Favorites	

Now enter a user-defined tag name to select the general format Data-SINT, to enter the IP address of the module and to enter the correct connection parameters.

Type: Vendor:	ETHERNET-MODULE Generic Etherne Allen-Bradley	t Module		
Parent	Scanner_2_High_Speed_Card	- Connection Par	amatare	
Vame:	BNI_EIP_508_105_2015	Comoculari da	Assembly	Size:
Jeschption.	<u>^</u>	Input:	100	392 ÷ (8-bit)
		Output:	101	262 <u>*</u> (8-bit)
Comm Forma	t Data - SINT	Configuration:	102	194 ÷ (8-bit)
 IP Add 	ress: 192 . 168 . 000 . 105	Status Input		
C Host N	ame:	Status Output		

) 		Balluff_EIP_Device_Connecting
Offline No Forces No Edits Redundancy	BAT BAT BAT	
	Comparing the second seco	2. High, Speed, Card I.New, Joh, Toggie, Test I.New, Job, Module, Address, 2 New, 306, Module, Address, 2 New, 306, Module, Address, 2 New, 306, Module, Address, 2 New, 300, Toggie, Test New, 300, Toggie, Test New, 300, Toggie, Test New, 300, Toggie, Test New, 300, Module, Address, 170, TF New, 300, Module, Address, 1 New,
- and the		

The new module and corresponding controller tags are generated automatically.

Then download the configuration

		Balluff_EIP_Device_Connecting
Iffline	🕽 🗸 🔲 RUN	
o Forces	Go Online	
o Edits		
edundancy	Download	B Favorit
- 	Drogram Mode	
	Erogram mode	h Speed Card
	Run Mode	104 Tonde Test
	Test Mode	FUNCTION MODULE
		206_Module_Address_2
	Clear Eaults	306_Module_Address_2
	Gg To Faults	202_old1
		105_Module_Address_2
	Controller Properties	302_Toggle_Test
	ETHERNET-MODULE New	_zu6_loggle_lest
	ETHERNET-MODULE New ETHERNET-MODULE New ETHERNET-MODULE New ETHERNET-MODULE New ETHERNET-MODULE New ETHERNET-MODULE New ETHERNET-MODULE New	508_Stephans_Modul 508_Module_Address_170_Te _306_Module_Toggle_Test EIP_508_105_2015 _202_Module_Address_2 _104_Module_Address_2
	ETHERNET-MODULE New	_zuz_module_loggie_lest
	ETHERNET-MODULE New	_module_storcy Module_308
	ETHERNET-MODULE New	302 Module Address 1
	ETHERNET-MODULE Test	modul 502
	ETHERNET-MODULE New	_302_Module_Address_2
	ETHERNET-MODULE New	_206_Module_Address_1
	ETHERNET-MODULE New	_105_Module_Address_1
	ETHERNET-MODULE Step	hans502Geheimmodul_Develop
	ETHERNET-MODULE New	_306_Module_Address_1
	PL ETHERNET MODIFE!	THE WARDER HOUSE
el rai	TTHERNET-MODULE New,	_coc_module_widiress_1
- 🔥 [4]	THERNET-MODULE New 1756-MODULE SST_PFB_CLX	_202_100006_4000655_1

When the download is done, you can observe and control the tags using the Controller Tags option. Make sure you select the correct tag name, which you configured beforehand.

The input, output and configuration data for this is described on the following pages.

You can use these tags for the programming, too.

File Edit View Search Logic Communications Tools Window Hi	ep	Test_Trans(controller)]		- 8 x
Baluff_EP_Device_Connec	ting 🖸 💰 🇞 🗞 📴 🕅 🖉 🔍 🔛	Path: AB_ETHIP:1\192.168.0.200\Backplane\0 🖌 🖁	5	
Rem Run Brun Mode Controller OK No Edits Do No Responding NO No Responding	Image: Art of the state of the sta	Input/Output & Compare & Compute/Math & Move&Logical &	FileMilsc. 🗶 File/Shift 🗶	Sequencer & Program Control & Fori
Controller EIP_Firmware_Test_1756	Scope: TelP_Firmware_T Shgw	Show All		
Controller Fault Handler	Name	△ Value	 Force Mask Sty 	le Data Type
Power-Up Handler	+ Balluff_EIP_Device_Status_Masked_II	245	6 De	cimal INT
😑 🛅 Tasks	+ Balluff_EIP_Device_Status_Masked_III	245	6 De	cimal INT
🖻 🤯 MainTask	+ Balluff_EIP_Device_Status_Masked_IV	245	6 De	cimal INT
🗄 🕞 MainProgram	Balluff_EIP_Device_Status_Masked_V	245	6 De	cimal INT
Unscheduled Programs	+ Balluff_EIP_Device_Status_Masked_VI	245	6 De	cimal INT
Motion Groups	+ Balluff EIP Device Status V	245	6 De	cimal INT
Add-On Instructions	+ Balluff EIP Device Status VI	245	16 De	cimal INT
E C Data Types	- BNI_EIP_508_105_2015:C	() ()	AB:ETHERNET MODUL
Giff User-Defined	+ BNI EIP 508 105 Z015 C.Data	() () He	sinti4001
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Trande	# BNI FIP 508 105 2015 0 Data	(1 () De	cimal SINT(262)
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[1] 1756-DNB DeviceNet_Scanner	H Device_New_Osplay.0	(, ()	
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El Scanner_1	Provide_Old_Display.1	(3 ()	ABETHERNET MODUL
ETHERNET-MODILLE Device New Display	The Device_Old_Display.0) ()	AB STUSPINET MODUL
ETHERNET-MODULE Device Old Display	H Device202_000	(} ()	ABETHERNET_MODUL
ETHERNET-MODULE EIP_105_Module	+ Device202_0id:1	(3 ()	ABETHERNET_MODUL
ETHERNET-MODULE New_104_Module_Address_1	+ Device202_old:U	(} {}	AB:ETHERNET_MUDUI
ETHERNET-MODULE Device202_old	+ Device2U2_old1:C	{	} ()	AB:ETHERNET_MUDUI
M ETHERNET-MODULE New 305 Toggle Test	+ Device202_old1:1	{	} {}	AB:ETHERNET_MODUL
	A D Monitor Tage (Edit Tage)			The start was in

5.2. Address These settings are factory-set. Specifications

IP-Adresse:	192.168.1.1
Subnetmaske:	255.255.255.0
Gatewayadresse:	192.168.1.1

5.3. Data Configuration Please enter the following values in the control system. They describe the data sizes of the input, output and configuration data.

	Instance-ID	Data lenght
EINGANG	100	390
AUSGANG	101	258
KONFIG	102	194

5.4. Configuration Data
The following tables show an allocation of the configuration data sequence. The standard values specified below describe a configuration with the IO-Link function at Pin 4 and standard I/O functions at Pin 2 and 4 of each port. The input functions of the configured standard I/O ports are set via the process data.

BNI EIP-501-005-Z015

Byte	Slot	Module part	Description
01	1	Module	General configuration for the entire module
225	2	IO-Link port 0	Configuration of IO-Link port 0
2649	3	IO-Link port 1	Configuration of IO-Link port 1
5073	4	IO-Link port 2	Configuration of IO-Link port 2
7497	5	IO-Link port 3	Configuration of IO-Link port 3
98121	6	IO-Link port 4	Configuration of IO-Link port 4
122145	7	IO-Link port 5	Configuration of IO-Link port 5
146169	8	IO-Link port 6	Configuration of IO-Link port 6
170193	9	IO-Link port 7	Configuration of IO-Link port 7

Module Configuration BNI EIP-501-005-Z015

yte	Bit					Description			
B	7	6	5	4	3	2	1	0	· ·
0	Р	3	Р	2	P1		F	° 0	Port function
1	Р	7	Р	6	F	P5 P4		24	0x01: IO-Link

IO-Link Port Configuration	yte	Bit Description										
eegu uueu	â	7	7 6 5 4 3 2 1 0									
	2	Ba	Basic Time				Cycle time					
	3				Validati	on type					Validation type 0 No validation 1 compatible (VID + DID) 2 Identical (VID + DID + SerNum)	
	4				Vendo	or ID 1					Vender ID	
	5				Vendo	or ID 2					vendor ID	
	6				Devic	e ID 1						
	7		Device ID 2 Device ID 3 Serial number 1 Serial number 16				Device ID					
	8											
	9											
							Serial number					
	24											
	25		Parameter server					Parameter server 0x8X Enable 0x0X Disable 0x40 Delete 0xX1 Enable upload 0xX2 Disable download				
		The c	lata of t	he othe	r IO-Lir	nk ports	is struc	ctured i	ideı	ntica	lly and described in the following.	

Cycle Settings This parameter can be used to influence the IO-Link communication speed. Calculated using the multiplier and the time base, the IO-Link cycle time can be increased. The time base is described in Table B3. The multiplier is entered in decimal form from 0...63.

Bit							Description	
7	6	5	4	3	2	1	0	
Tii ba	me ase			Mult	iplier			Bit 0 to 5: Multiplier These bits contain a 6-bit multiplier for the calculation of MasterCycleTime or MinCycle Time. Permissible values for the multiplier are 0 to 63. Bit 6 to 7: Time Base These bits specify the time base for the calculation of MasterCycleTime or MinCycleTime.

Possible values of MasterCycleTime and MiniCycleTime

Time base encoding	Time base value	Calculation	Cycle time
00	0.1 ms	Multiplier x time base	0.4 ms to 6.3 ms
01	0.4 ms	6.4 ms + multiplier x time base	6.4 ms to 31.6 ms
10	1.6 ms	32.0 ms + multiplier x time base	32.0 ms to 132.8 ms
11	Reserved	Reserved	Reserved
NOTE: The va	alue 0.4 results fr	om the minimum possible transmiss	ion time according to

chapter A.3.7 of the IO-Link Interface and system specification.

Validation Settings **No validation**: validation deactivated, every device will be accepted. **Compatibility**: manufacturer ID and device ID are compared to the IO-Link device data. **Identity**: manufacturer ID and device ID and serial number are compared to the IO-Link device data. The IO-Link communication is only started if there is a match.

Parameter Server	 Enable: data management functions enabled, parameter data and identification data of the IO-Link device are stored permanently. Disable: data management functions disabled, stored parameter data and identification data of the IO-Link device remain stored. Deleted: data management functions disabled, stored parameter data and identification data of the IO-Link device are deleted. Enable upload: If only the upload is enabled, the master always starts an upload of the parameter data. In this case, the upload is independent of the upload flag of the IO-Link device. If no data is stored in the Master Port, an upload likewise takes place. (e.g. after deleting the data or before the first data upload) Enable download: If only the download is enabled, the master always starts a download of the parameter data. In this case, the download is likewise independent of the upload flag of the IO-Link device. If no data is stored in the Master Port, however, an upload takes place first. (e.g. after deleting the data or before the first data upload) Enable upload and download: If the upload and download are enabled, different parameter sets are distinguished depending on the upload flag of the IO-Link device. If no parameter data is stored in the IO-Link device. If no parameter data is stored in the IO-Link master port, an initial upload takes place. (e.g. after deleting the data or before the first data upload) Enable upload and download are enabled, different parameter sets are distinguished depending on the upload flag of the IO-Link device. If no parameter data is stored in the IO-Link device. If no parameter data is stored in the IO-Link device. If no parameter data is stored in the IO-Link device. If no parameter data is stored in the IO-Link device, an upload of the parameter data always takes place. If no upload flag is set on the IO-Link device, an upload of the parameter data always tak
	Note After the upload of the parameter data, the vendor ID and device ID of the connected IO-Link device are also still saved until the data records are deleted. When the connected IO-Link device is started, a validation takes place. Thus, only an IO-Link device of the same type can be used for the data management. If an IO-Link device of a different type is to be used, the contents of the parameter server must be deleted. The data storage is supported only by IO-Link devices with IO-Link Revision 1.1.
Upload Flag on the IO-Link Device	The upload flag is needed to overwrite already saved data in the parameter server with new parameter data of the same IO-Link device. To enable the upload flag of an IO-Link device, the data value 0x05 must be entered in the index 0x02, subindex 0. (For information about configuration via IO-Link, refer to the "Web Server" chapter under "Device Properties" or the "Configuration via Explicit Messages" chapter under "IO-Link Device Parameterization")

QuickConnect The QuickConnect function makes it faster to boot up and integrate the BNI EIP-501-005-Z015 modules.

Enabling QuickConnect automatically takes over all necessary port properties on the module:

- Static IP address
- Ports at 100 Mbps full-duplex
- Auto-negotiation disabled
- Auto MDI-X disabled
- Prepared for linear topology

You can configure **QuickConnect** via the following class instance attribute of the explicit messages:

Class	Instance	Attribute	Value
245 (0xF5)	1 (0x01)	12 (0x0C)	0: disabled (default)
			1: enabled



For QuickConnect to be enabled, ACD (Address Conflict Detection) must also be enabled. This is switched on by default.

The **ACD** can be reviewed and changed using the following class instance attributes of the explicit messages:

Class	Instance	Attribute	Value
245 (0xF5)	1 (0x01)	10 (0x0A)	0: disabled
			1: enabled(default)

Rockwell Automation Products that are Compatible with QuickConnect

Component	Supported Rockwell Automation Products
Controller	ControlLogix® controllers: • 1756-L6x • 1756-L7x GuardLogix controllers: • 1756-L6xS • 1756-L7xS All controllers require firmware revision 20.001 or later.
EtherNet/IP managed switch on the controller side	Stratix 6000 switches: • 1783-EMS04T • 1783-EMS08T Stratix 8000 switches: • 1783-MS06T or 1783-MS10T • 1783-RMS06T or 1783-RMS10T • 1783-MX08T or 1783-MX08F
EtherNet/IP communication modules	ControlLogix communication modules: • 1756-EN2T with firmware revision 4.003 • 1756-ENBT with firmware revision 6.002
Application logic that uses generic CIP Messages to inhibit and uninhibit I/O modules	Studio 5000 Logix Designer application, version 21.00.00 or later or RSLogix 5000 software, version 20.01.02

Source:



Source:

Allen-Bradley Ethernet/IP QuickConnect Application Technique, Page 12

Please also note the following:

- Direct connection between PLC and QuickConnect slave with crossover cable
- Slave-to-slave connection using patch cable
- For setting up the topology, only the linear topology with a maximum of 20 modules on the tool side is permitted.
- If needed, only one managed switch may be used between the PLC and Ethernet/IP slave.
- To trigger the QuickConnect sequence, an electrical lock signal is required that reads in the supply voltage of the QuickConnect slaves via the controller.

PLC Program	Add Application Logic	Add ladder logic to in • Run this logic i • The logic exam Modify the coo modules.	nhibit and uninhibit QuickConnect I/O modules: in a periodic task with a recommended 10 ms update rate. mples shown configure two ArmorBlock I/O modules. ode as needed to configure as many as 20 ArmorBlock I/O		
		IMPORTANT	A connection time of 500 ms with supported with only a ControlLog 1756-EN2T communication modu number of modules, see <u>Average</u> <u>Products on page 50</u> .	20 QuickConnect modules is ix 1756-L7x controller and ile. For average connection times per Timing with Rockwell Automation	
		Inhibit and Power	Down		
		Add this logic to inhi	bit and power down the Quic	kConnect modules.	
		1. Rung 0: Inhibi	t the modules.		
		Before making ArmorBlock I/ Use a GSV (Me and one SSV (1	a tool change, you must unin O modules mounted to the to ode) instruction to monitor th Mode) instruction per module	hibit the QuickConnect ool before powering down. ne present state of the modules e to inhibit the modules.	
		The input cond external input. tool, this input changed, the m tool and modu	lition to start the inhibit proc For example, as the robot is tr condition must be enabled. F odules are inhibited and can p les.	cess must come from an aveling back to change out the By the time the tool is being proceed to powering down the	
	Request_to_inhibt_QC_Modules QC_BlockONS.0	GSV QC Get System Value Class Name Module Instance Name QC_ArmorBlock1 Attribute Name Mode Dest QC_ArmorBlock1Mode 4 +	_ArmorBlocktMode 2 GC_ArmorBlocktMode 2	SSV Set System Value Class None Module Instance Name OC_ArmorBook1 Attibute Name Mode Source GC_ArmorBook1Mde 4 •	
		GSV OC Get System Value Class Name Module Instance Name GC_ArmorElock2 Attribute Name Mode Dest GC_ArmorElock2Mode 4 +	_ArmorBlock2Mode 2 OC_ArmorBlock2Mode 2	SSV Set System Value Class Name Model Instance Name Oc_ArmorBoot2 Attribute Name Mode Source GC_ArmorBioot24de 4 +	
				Power_Down_Request	

Source:

2. Rung 1: Verify the modules are inhibited.

After the modules have been inhibited, verify that the modules have indeed been inhibited. Use one GSV (Entry Status) instruction per module. When the Entry Status value equals a decimal value of 24576, the module can be disconnected from the robotic arm and powered down.

wer_Down_Request	OSV	MVM .
	Get System Value	Masked Move
	Class Name Module	Source QC_ArmorBlock1CnonStatus
	Instance Name GC_AnnorBlock1	24576 +
	Doct OC Associations	KIGSK 1541000
	24578	Dest OC AmorElock1Status
		24576 €
	FOUL	GC Block1 inhibited
	Equal	
	Source A. GC_AnnorBlock1Status	
	24576 •	
	Source B QC_ArmorBlackInhibit	
	24576 +	
	GEV-	MIV/M
	Oct System Value	Masked Move
	Class Name Module	Source QC_ArmorBlock2Chbristelus
	Attribute Name EntryStatus	24576 Mark 18#000
	Dest GC AmerBlock2CremStatus	iteration in the second s
	24578 •	Dest GC_ArmorBlock2Status
		24576 🖬
	EQU-	QC_Block2_Inhibited
	Equal	
	Source A GC_AnnorBlock2Status	
	24576 €	
	Source B QC_ArmorBlackInhibit	
	24576	

3. Rung 2: Power down the modules.

This rung verifies that all the modules have been inhibited and powered down. The tool and modules can be physically disconnected from the robotic arm.

36	 	0
		Powerup_Request
		Request_to_inhibit_QC_Modules
		Power_Down_Request

Source:

Uninhibit and Power Up

Add this logic to uninhibit and power up the QuickConnect I/O modules.

1. Rung 3: Power up the modules.

Once the tool and module is connected, an external input module sends an electrical lock input signal. On receipt of the signal, start a timer to keep track of how long the tool and modules have been connected.

Every QuickConnect ArmorBlock I/O module has a delay time embedded in its electronic data sheet (EDS) file. This delay time is the amount of time the module takes to power up. The module takes about 300 ms to fully power up before establishing a connection to the controller.

Acom 0+	Bectrical Lock_Input	Powerup, Request	TON- Timer On Delay Timer GC_ArmarBlackPowerUpTimer Preset 40000 + Accum 0 +	-(EN)
---------	----------------------	------------------	--	-------

2. Rung 4: Uninhibit the modules.

When the Timer. Acc is greater then or equal to the module delay time (300 ms), use an SSV (Mode) instruction to uninhibit the module. Use a GSV (Mode) instruction to verify the mode of the module at powerup.

Ort: Then or Ext (No.00) OC OC OC Source A: OC_WindBoolPowerUpTime D D D Source B: OC_Block/PowerUpTime 300 e 300 e	Biodich6.2	6C_ArmsBickHMode 2 GC_ArmsBickHMode 2	SSY Set System Value Class Nens Module Instruct Name GC_ArmorElsckit Athibute Name GC_ArmorElsckitNude Source GC_ArmorElsckitNude 4 •
	DSV Cell System Value Caso Name Module Indiance Name OC_AnnotBook Additione Name OC_AnnotBookd Nade Doot OC_AnnotBookd Nade	6C_4/not(lact2Note 2 CC_4/not(lact2Note 2	SRV Set System Value Class None Visition Classe Visition Classe Although None Source Classe Provide Job Struct Provide Job Struct Classe Provide Job Struct Provide Job Struct Pr

Source:

3. (Optional) Rung 5: Verify the modules are uninhibited.

After the modules have been uninhibited, verify that the modules have indeed been uninhibited. Use one GSV (Entry Status) instruction per module. When the Entry Status value equals a decimal value of 16384, the module has been uninhibited.



Source:

Parameter

IO-Link Device Para- meterization	 There are two options for configuring an IO-Link device connected to the IO-Link port. Configuration via the web server refer to the "Web Server" chapter under "Device Properties" Configuration via explicit messages 									
The following example describes how Rockwell RSLogix 5000 devices can be use configure an IO-Link device via explicit messages. For this purpose, the "MSG" components in the PLC program are used.										
	Imput_function_moduLe1Dete(1).7 MSG (ER) 1 Imput_function_moduLe1Dete(1).7 MSG 1 Imput_function_moduLe1Dete(1).7 (ER)									

Read IO-Link Service Code Class Instance Attribute 0x32 0x96 1 - n 0x03 (Read Parameter)

n: Number of ports

Source Length must correspond to at least the read parameters, but a larger value can also be entered. (In this example, 100 bytes)

As the Source Element (Write) and as the Destination Element (Read), create one SINT[100] array each and select the first line[0].

dessage	: Type: CIP Generic	~		-MSG-	
Service Type:	Custom	Source Element:	ink_Param_Write[0]	Get_IO_Link_Parameterizin	
Gervice Code: nstance:	32 (Hex) Class: 96 (Hex) 1 Attribute: 3 (Hex)	Destination Li	10 (Bytes) nk_Param_Read(0)		
		Name		::::::::::::::::::::::::::::::::::::::	Description
) Interfac	e_Object_IO_Link_Param_Read[0]	SINT	
		I _Interfac	e_Object_IO_Link_Param_Read[1]	SINT	
		Interfac	e_Object_IO_Link_Param_Read[2]	SINT	
	🔷 🔾 Enable Waiting 🔷 Start		e_Object_IO_Link_Param_Read[3]	SINT	
Enable			:e_Object_IO_Link_Param_Read[4]	SINT	
Enable Error Co	nde: Extended Error Code:		e_object_io_Link_Parani_Reau[5]	SINT	
Enable Error Co r Path:	ode: Extended Error Code:		o Object IO Link Perem ReadIR1	CINIT	
Enable Error Co or Path: or Text:	ode: Extended Error Code:	j Interfac	e_Object_IO_Link_Param_Read[6]	SINT	

In the Source Element Array (Write), enter which index is to be read. In this example, this is index 0x4E.

cope: 🗒 Rockwell_V20_1 🛩 Show: All Tage	y, interfa	ce_Object_lo	۷
Name	;≡ A Value	+ 6	14
- INTERFACE_OBJECT_IO_LINK_WR		level	2
+ INTERFACE_OBJECT_IO_LINK_WR(0)		16#4e	rope
+ INTERFACE_OBJECT_IO_LINK_WR[1]		16#00	100
+ INTERFACE_OBJECT_IO_LINK_WR[2]		16#00	17
+ INTERFACE_OBJECT_IO_LINK_WR[3]		16#00	-
+ INTERFACE_OBJECT_IO_LINK_WR[4]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[5]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR(6)		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR(7)		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR(8)		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR(9)		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[10]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[11]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[12]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[13]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[14]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[15]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[16]		16#00	
+ INTERFACE_OBJECT_IO_LINK_WR[17]		16#00 🚽	
Monitor Tags (Edit Tags /	et al.	>	

Destination Array (Read) shows the read-out value. In case of a configuration error, the error code is likewise displayed there.

In the "Communication" window, you have to select the Ethernet module on which the configuration is to take place.

Configuration Communication Tag	¥**********
Path: BNI_EIP_508_105_2015 Browse	Message Path Browser
BN_EIP_508_105_2015 Broadcast: Communication Method © CIP OH+ Channet: CIP With Source ID Source Link: © © (Octal)	Peth: BNI_EIP_508_105_2015 BNI_EIP_508_105_2015 Image: State
✓ Connected ✓ Cache Connections ←	OK Cancel Help

Write IO-Link Parameter

Service Code	Class	Instance	Attribute				
0x32	0x96	1 - n	0x02				
			(Write				
			Parameter)				
ny Nymber of porto							

n: Number of ports

Source Element and Destination Element are to be selected so they are identical to the previous example, "Read IO-Link parameter".

The Source Length must be exactly the same length as the parameter data to be written.

In this example, index 0x4E, subindex 0, value 0x02 is written in Source Element Array (Write). In case of a configuration error, an error code appears in Destination Element Array (Read).



In the "Communication" window, you likewise have to select the Ethernet module on which the configuration is to take place.

Path: BNL_EIP_508_105_2015 Browse	
BNI_EIP_508_105_Z015	Message Path Browser
🔿 Broadcast.	Path: BNI_EIP_508_105_2015
Communication Method	BNI_EIP_508_105_Z015
OP ODH+ Channel: A Destination Link: 0 0	
CIP With Source Link: 0 Destination Node: 0 0 (Oct.	1) 1) 1756-EN2T EIP_Scannercard_1756_EN ETHERNET-MODULE BIN_EIP_502_10 ETHERNET-MODULE BN_EIP_502_10 ETHERNET-MODULE BN_EIP_302_10 ETHERNET-MODULE BN_EIP_104_10 ETHERNET-MODULE BN_EIP_104_10
Enable O Enable Waiting O Start O Dave Dave Length: 2	B ETHERNET-MODULE BNI EIP 202 10 D ETHERNET-MODULE BNI_EIP_508_10 B ETHERNET-MODULE ENI_EIP_508_10 B ETHERNET-MODULE FIPM 6



Note The explicit messages functions are implemented in accordance with the Volume 1: Common Industrial Protocol Specification and Volume 2: Ethernet/IP Adaption of CIP.

7 Process Data

7.1. Process Data Inputs

The input data size is 390 bytes. Take a look at the tables below for the allocation of the process data inputs.

Byte	Module part	Description
05	Standard I/O ports	Process data inputs at the standard inputs
653	IO-Link Port 0	Process data inputs at IO-Link port 0
54101	IO-Link port 1	Process data inputs at IO-Link port 1
102149	IO-Link port 2	Process data inputs at IO-Link port 2
150197	IO-Link port 3	Process data inputs at IO-Link port 3
198245	IO-Link port 4	Process data inputs at IO-Link port 4
246293	IO-Link port 5	Process data inputs at IO-Link port 5
294341	IO-Link port 6	Process data inputs at IO-Link port 6
342389	IO-Link port 7	Process data inputs at IO-Link port 7

Standard Input Data

/te				В	lit		Description				
B	7	6	5	4	3	2	1	0	Description		
0	132	134	122	124	l12	l14	102	104	Input data $104 \rightarrow Input at port 0, pin 4$		
1	172	174	162	l64	152	154	I42	144	The result is 0 only if the port is configured as an IO-Link port.		
2	S	3	S2		S1		S0		Short-circuit status		
3	S	7	S	6	S5		S4		S4		at the registered port
4	0	0	0	0	0	reserved	PS	reserved	Status of the power supply PS: Power supply for sensor		
5	0	0	0	0	0	0	0	0	Reserved		

7 Process Data

IO-Link Input Data

te				E	Bit			Description		
By	7	6	5	4	3	2	1	0	De	escription
6 37									IO-Link port 0 i	nput data
38	0	0	0	0	0	0	DC	IOL	IO-Link status IOL: Port in IO DC: Device co 0: Reserved	-Link mode nnected
39	SC	0	0	0	0	PDI	DF	VF	IO-Link error VF: Validation SC: IO-Link sh DF: Data stora PDI: Process o	failed ort-circuit ge validation failed lata invalid
40				Vend	or ID 1				Vendor ID	
41				Vend	or ID 2				Vollaor 12	
42				Devic	e ID 1					
43				Devic	e ID 2				Device ID	
44				Devic	e ID 3					1
45	N	lode		Туре			0			Mode:
46				Event c	ode hig	h			Event 1	0: Reserved
47				Event of	ode lov	N				1: Event single shot
48	N	lode		Туре			0			2: Event disappears
49				Event c	ode hiç	gh			Event 2	3: Event appears
50				Event of	ode lov	N				Type:
51	Ν	lode		Туре			0			U: Reserved
52				Event c	ode hig	lh			Event 3	1: Notification
53				Event o	ode lov	N				3: Error
	The	data of	the oth	er IO-L	ink port	s are s	tructure	d ident	ically and describ	ped in the following.

7 **Process Data**

The output data size is 258 bytes. Take a look at the tables below for the allocation of the 7.2. Process Data Outputs process data outputs.

	BNI EIP	-501-0	05-Z01	5							
	Byt	е	Module part Desc					cription			
	0	1	Standa	Proc	Process data outputs at the standard inputs						
	23	33	IO-Link Port 0				Process data output at IO-Link port 0				
	34	65	IO-Link port 1			Proc	Process data output at IO-Link port 1				
	66	97	IO-Lin	k port 2	2	Proc	ess da	ta outp	out at I	O-Link port 2	
	981	29	IO-Lin	Proc	Process data output at IO-Link port 3						
	130	161	IO-Lin	k port 4	4	Proc	ess da	ta outp	out at I	O-Link port 4	
	162	193	IO-Lin	k port {	5	Proc	ess da	ta outp	out at I	O-Link port 5	
	194	225	IO-Link port 6				Process data output at IO-Link port 6				
	226	257	IO-Lin	Process data output at IO-Link port 7							
										•	
Standard Output					В	it				Description	
Data	Byte	7	6	5	4	3	2	1	0		
	0	0	0	0	0	0	0	0	0	Reserved	
							σ	σ	σ		
		~	0			0	Š	Š	Š	Deserved	
	1	0	0	0	0	0	sei	sei	sei	Reserved	
							P	P	ē		
	L	1		1	1	1	1	1	1	1	
O-Link Output	Dute				В	it				Description	
Data	Буте	7	6	5	4	3	2	1	0	Description	

Puto				В	Description					
Буте	7	6	5	4	3	2	1	0	Description	
233									IO-Link port 0 output data	
	The d	The data of the other IO-Link ports are structured identically and described in the following								

8 Web Server

8.1. General The BNI fieldbus module contains an integrated web server for retrieving detailed device information and for configuring the device.

To use the web interface you must first ensure that the module has been correctly integrated into your network. In addition the IP subnet of the BNI module must be accessible from the PC on which the browser is running. For the supported web browsers, please refer to the corresponding data sheet.

For open a connection with the web server, enter the IP address of the module in the address line of the browser. The homepage then appears with the essential device information.



8.2. Navigation / Info The navigation bar is located in the upper area of the window, which allows you to switch between the various dialogs of the web interface. To do this click on the corresponding icon.

When the "Info" tab is selected the following overview appears:



The "BALLUFF" logo at upper right links to the international Balluff homepage.

8 Web Server

8.3. Login/Logout To make configuration settings on the fieldbus module using the web interface, you must first log in. Functionalities which cannot be used without logging in are indicated by the grayed out buttons.

The default password is:	
BNI PNT-XXX-XXX-XXXX	"BNIPNT"
BNI EIP-XXX-XXX-XXXX	"BNIEIP"
BNI ECT-XXX-XXX-XXXX	"BNIECT"

The password cannot be changed!



After successfully logging in the dialogs are shown as follows:



Use the "Logout" button to log out again. After 5 minutes of no interaction with the Webserver the user is automatically logged out.



For security reasons the fieldbus module shows only one login at a time with configuration access. Reading (without logging in) is however possible from multiple PCs at the same time on the fieldbus module.

8.4. "Home" dialog Under "Home" you are given the essential information about the fieldbus itself and its network activity. You are also shown whether the configuration block was enabled by the controller (PLC).

Information is also shown about the current process data and the status of the module via the corresponding LEDs. After selecting "LED Legend" a Help dialog appears which explains the meaning of the LEDs.

If an IO-Link device is connected to one of the configured IO-Link terminals, some of the device data will be displayed in addition to the module data in the form of a link. After selecting one of these links the corresponding device dialog is opened.



8 Web Server

PNT:



EIP:



8.5. "Ports" dialog

The "Ports" dialog displays information and process data for the connected IO-Link devices. Select the desired IO-Link Port in the image of the fieldbus module on the right side to see the device data.



Note The IO-Link device data are only displayed if the port is also configured as an IO-Link port!

No appropriate IODD uploaded It is possible to read and write the configuration parameters of the IO-Link device via the "Parameters" option. The parameter indexes and subindexes of the IO-Link device are described in the corresponding separate user's guide (and follow the IO-Link conventions).

Under "Events" you can see whether a diagnostic event from the IO-Link device exists.

Under "Parameter Server Content" you can view the content of the parameter server if parameter data is stored on the parameter server.

BALLUF	F	BNI P	NT-508-105-Z0	15 A	Ports	IODD	Logout	Config	E	i Info
IO-Link Device Prr Identification Data Vendor ID: Device ID: Vendor Name: Vendor Text: Product Name: Product ID: Product Text: Sarial Number:	oxo50D20 BALLUFF www.balluff.com BNI IOL-302-002-Z046 BNI00AU Sensor/Actor hub M8	C 55 51 54 5	B 56 64 60 75)**@)**@)**@	
Senal Number: Hardware Revision: Firmware Revision: Application specific tag: Process Data Inputs (hex): Outputs (hex):	20 00 00 00	24 R2920	B F6 64 6C 75							
Parameters Index: Subindex: Data (hex): Result:	Read Write	Apply	Clear							
Events Current Event: Parameter server o	Secondary supply volta	ge fault (Porl	: Class B) - Check tole	rance						
Vendor ID (hex): Device ID (hex): Checksum (hex): Content (hex):	00 00 00 00 00 00 00 00 (none)									

"Ports" dialog with direct parameter access

8 Web Server

Appropriate IODD If an IODD appropriate to the IO-Link device connected to the currently selected port has been uploaded (see "Dialog "IODD"), the normal dialog for "Process Data" and "Parameters" is not displayed, but rather an expanded dialog. Information from the IODD of the device is used so that the data can be better understood.

Thus in the following screenshot not only are the input data of the distance sensor displayed as a hex number, but also interpreted and labeled under "Input". Since the sensor has no parameters, none are displayed.

BALLUF	F	BNI PNT-508-105-Z015	h Home	Ports	Logout	Config	E	i Info
IO-Link Device Pr	operties (Port 2)							
Identification Data	l							
Vendor ID:	0x0378				(
Device ID:	0x020101							
Vendor Name:	BALLUFF				(۵ ا د		
Vendor Text:	www.balluff.com							
Product Name:	BAW M18MI-BLC50B-S04G	3			(••@	
Product ID:	153938							
Product Text:	Inductive distance sensor,	, 15mm			(
Serial Number:								
Hardware Revision:	1.00							
Firmware Revision:	1.01							
Application specific tag:							1	1
Process Data						-		,
Inputs (hex):	00 03 FF							
Outputs (hex):	no outputs				10.40 10-40 11:2			
Input								
Distance absolute					1023			
Reserved bits					0			
Events								
Current Event:	no Event							
Parameter server	content							
Vendor ID (hex):	00 00							
Device ID (hex):	00 00 00							
Checksum (hex):	00 00 00 00							
Content (hex):	(none)							

Dialog "Ports": IODD interpretation and device image

i

If the IODD of the IO-Link device on the currently selected port has parameters, these are shown in table format (see following screenshot). In this example the parameters for the Balluff Smart Light are shown.

The Smart Light is a signal light which can be used in three different modes. These modes can be set using an IO-Link parameter. The parameter values and associated texts are stored in the IODD.

This means "Operation Mode" can be read out and displayed ("Read" and "Read All" buttons) or written to the device ("Write" button).

If subindexes have no buttons they cannot be individually processed but rather only the entire index at once.

Note Each changed value must be individually written by clicking on the "Write" button!

Parame	eters			
				Read All
54 (0)	Operating mode (rw)	Segment mode 👻	Write	Read
55 (0)	Number of segments (rw)	One segment 🔻	Write	Read
6 (0)	Type of level indicator (rw)	Bottom-up 👻	Write	Read
57 (0)	Resolution of level indicator (rw)	8 bit •	Write	Read
68 (0)	Level mode, segment 1 (rw)	See child elements		
8 (1)	Level mode, segment 1 color	Off 🗸	Write	Read
8 (2)	Level mode, segment 1 dominance	$^{\odot}$ Color is not dominant $^{\odot}$ Color is dominant	Write	Read
9 (0)	Level mode, segment 2 (rw)	See child elements		
9 (1)	Level mode, segment 2 color	Off 👻	Write	Read
9 (2)	Level mode, segment 2 dominance	${igodot}$ Color is not dominant ${igodot}$ Color is dominant	Write	Read
0 (0)	Level mode, segment 3 (rw)	See child elements		
0 (1)	Level mode, segment 3 color	Off 👻	Write	Read
'0 (2)	Level mode, segment 3 dominance	$^{\odot}$ Color is not dominant $^{\odot}$ Color is dominant	Write	Read
1 (0)	Level mode, segment 4 (rw)	See child elements		
1 (1)	Level mode, segment 4 color	Off 👻	Write	Read
1 (2)	Level mode, segment 4 dominance	© Color is not dominant © Color is dominant	Write	Read

"Ports" dialog: Parameter list of an IO-Link device with uploaded IODD

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8.6. "IODD" dialog Using this dialog you can transfer IODDs (device description files for IO-Link devices) and the associated device images to the fieldbus module, so that a detailed representation of the connected IO-Link devices in the "Ports" dialog is possible.

When IO-Link devices are connected and IO-Link ports are activated, the dialog shows a table with information about the IO-Link devices.

The fieldbus module file system supports only device names in "8+3" format, i.e. with a restricted name length. Since IODD files are generally published with a long file name, these must be renamed and given a shorter naming scheme on the PC before uploading to the fieldbus module.

For this a help setting is provided in the dialog, with the associated required IODD file name for the currently connected IO-Link devices shown in the bottom section of the list (column IODD Filename).

Image files without IODD can also be uploaded; the images are still displayed in the "Ports" dialog.

BVLLA	IFF		BNI	PNT-508-	105-Z01	5 1	me	Ports	IODD	Logout	Config	E	i Info
Information Device Picture Dassoa01.xml X Delete Delete BA020101.xml X Delete This module has a FAT12 file system, which names in 8.3 convention. Please rename of the suggested filename in the table below the suggested filename is generated according BA020101.xml X Delete The suggested filename is generated according BA050D20.xml X Delete The suggested filename is the dashee characters or the file name the IODD to upload: Durchsuchen BA020101.png Note that the filename must contain the Device							which me aame you a below. ccording to ile name a device has device has device has device has device has device has encores.	eans it sup ir IODDs o following re the first s no vendo code the zeros if nec 0 that is in	ports onl ¹ accordin rule: two lette r name, t DeviceII essary). the IODD	y file g to ers of chose D in file!			
Currently con Vendor Name BALLUFF BALLUFF BALLUFF	BNI IOL- BNI IOL- BNI IOL- BAW M1	IO - Link Device Name 302-002-Z046 802-000-Z036 8MI-BLC50B-S04G	Product ID Vendor ID Device ID IODD Filename BNI00AU 0000 050D20 BA050D20.xml BNI0072 0378 050A01 BA050A01.xml 04G 153938 0378 020101 BA020101.xml										

Using the "Delete" button you can delete IODDs and device images from the fieldbus when needed.



Note Before selecting the IODD it must be renamed on the PC to the file name which is shown in the table in the "IODD Filename" column! **8.7. "Config" dialog** The configuration page enables configuration of the module. You can change both the module information texts and the port configuration. The "Set Ports" action is not permanently stored in the device and is lost after the next reboot or reset.

PNT / ECT:

BALLUFF	BNI PNT-508-105-Z015	h Home	Ports	IODD	Logout	Config	E i
Module Configuration	Port Configuration						
Balluff GmbH					100		
Location:	Pin					lin	
Schurwaldstraße 9	Mode	16	00		1		Mode
Contact:	IO Link -				4 1	IO Link	•
+49 (0) 7158 173	Digital Input		/		2	Digital Input	•
	IO Link • Digital Input • IO Link • Digital Input •)°°		4 1 2 5 4 2	IO Link Digital Input IO Link Digital Input	•
	IO Link •		00		7 4 1	IO Link	•
	Digital Input •					Digital Input	•
Save Configuration			10				
Reboot Factory Reset	Set Ports						

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EIP:

BALLUFF	BNI EIP-508-105-Z015	A Home	Ports	IODD	L. Logout	Config	E	i Info
Module Configuration Name: Balluff GmbH	Port Configuration							
Location:	Mode IO Link V Digital Input/Output V				4 2 2	'in Digital Input Digital Input	l t/Output t/Output	Mode V V
O DHCP Client Static IP IP Address:	Digital Input/Output V Digital Input/Output V)		4	IO Link Digital Input	t/Output	~
192 168 0 159 Subnet Mask: 255 255 255 0 Gateway Address:	Digital Input/Output				4	Digital Input Digital Input	t/Output t/Output	~
192 168 0 1 O Factory IP IP Address: 192.168.1.1 Subnet Mask: 255.255.255.0	Digital Input/Output ✓ Digital Input/Output ✓				4	IO Link Digital Input	t/Output	> >
Gateway Address: 192.168.1.1 In order to change the IP adress, it's necessary to reboot the module after saving the configuration.			10					
Save Configuration								
Reboot Factory Reset	Set Ports							

The parameter set "Module Configuration" on the left side is used by clicking "Save Configuration" and permanently stored in the device. The "Reboot" button reboots the device as if the power to the module had been turned off

and on again.

Clicking on "Factory Reset" deletes the configuration and log files saved in the device and then performs a reboot, so that the device is restored to the default factory configuration as on delivery.

8.8. "Log" dialog

This dialog provides general service information about the device as well as a logging function.

The upper table (see screenshot below) contains important information for all service inquiries.



If you have a detailed question about a specific situation, send us a screenshot of this Website or print the site as a PDF.

Logging shows events which have occurred in chronological order. This provides a tool for detailed troubleshooting in equipment.

BALLUFF				BNI PNT-508-105-Z015			5 1	h	€		1	₽	Ξ	i		
								He	ome	Ports	IODD	Logout	Config	Log	Info	
Inform	nation															
Produ	ict name:	BNI	PNT-508-105-Z015		Brow	wser time:	6-12-16 1	0:26:29	9.495							
Firmw	are revision:	3.2			Syst	tem uptime:	50 s	ecs 291 m	nsecs							
MAC a	address:	00::	19:31:3F:FF:02		Free	flash space:	172	0 KB								
IP add	dress:	192	.168.0.10		Web	version	2.0.	113								
Brows	ser version:	Firef	fox 50.0													
Log									5	Set mod	ule time	Clear	Log	Update	Log	
No.	Severity	/	Date			Origin					Messag	je				
0	Notice		2000-01-01 00:00:	00.404	1	SYS	5	System startup (Oct 6 2016, 11:54:01)								
1	Notice		2000-01-01 00:00:	00.437	37 SYS Set MA			Set MAC a	4AC address: 00:19:31:3F:FF:02							
2	Notice		2000-01-01 00:00:	00.493	.493 IOL_MASTER IO-Lin			IO-Link Ma	ink Master started							
3	Informatio	nal	2000-01-01 00:00:	00.501	.501 IOL_MASTER FW ve			FW version	ersion 1.2.8							
4	Notice		2000-01-01 00:00:	01.999	99 ETH Port 1			Port 1: Lin	1: Link Up (100 MBit/s, full duplex)							
5	Notice		2000-01-01 00:00:	37.926	5	WEB_IF	1	Login succ	gin successful, IP address: 192.168.0.50							
6	Error		2000-01-01 00:00:	41.902	2	IOL_MASTE	RI	Port 0: Device disconnected								
7	Error		2000-01-01 00:00:	42.272	2	IOL_MASTE	R I	Port 1: De	vice dis	connect	ted					
8	Error		2000-01-01 00:00:	42.981	L	IOL_MASTE	R I	Port 3: De	evice dis	connect	ted					
9	Notice		2000-01-01 00:00:	43.169	9	IOL_MASTE	RI	Port 2: ISI	DU read	error:	Error code	e 80 Additi	ional Cod	e 11		
10	Notice		2000-01-01 00:00:	43.347	7	IOL_MASTE	RI	Port 2: ISI	DU read	error:	Error code	80 Additi	ional Cod	e 11		
11	Warning		2000-01-01 00:00:	43.347	7	IOL_MASTE	RI	Port 2: BN	II IOL-1	01-501	-K018 cor	inected				
12	Notice		2000-01-01 00:00:	44.145	5	IOL_MASTE	RI	Port 4: ISI	DU read	error:	Error code	e 80 Addit	ional Cod	e 11		
13	Error		2000-01-01 00:00:	44.183	3	IOL_MASTE	RI	Port 5: De	evice dise	connect	ted					
14	Warning		2000-01-01 00:00:	44.499	Ð	IOL_MASTE	RI	Port 4: BNI IOL-801-000-Z036 connected								
15	Error		2000-01-01 00:00:	44.830)	IOL_MASTE	RI	Port 6: De	evice dise	connect	ted					
16	Error		2000-01-01 00:00:	45.200)	IOL_MASTE	RI	Port 7: De	vice dis	connect	ted					

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Events are classified using the "Severity" column:

Internal Error (Emergency, Alert, Critical)

→ The fieldbus module has detected a fault in itself (hardware or software) which should not occur during normal operation. If this happens, the module must be serviced or replaced.

External Error (Error, Warning)

→ The fieldbus module has detected what may be a non-permissible event which is affecting the module from the outside. The system may require troubleshooting.

Event (Informational, Notice)

The fieldbus module has detected an important normal operating event and reports it. These may include for example configuration actions over the web interface and other configuration interfaces which are also recorded.

Clicking on "Set Module Time" sends the current browser time to the fieldbus module but does not permanently store it. After a reset, reboot or loss of power the time begins to run again from the year 2000.

Clicking on "Update Log" refreshes the display, and "Clear Log" deletes all entries. The log entries are stored in a ring buffer.

9 Appendix

9.1.	Scope of Delivery	 The BNI EIP comprises the following element IO-Link block 4x M12 dummy plugs Ground strap M4x6 screw 20 informational signs 	is:
9.2.	Order Number	Balluff Network Interface Ethernet IP Functions 501 = IP 67 IO-Link master module, 8 IO-Li Versions 005 = no display, 2-port switch Mechanical version Z015 = Die cast zinc housing Data transmission: 2 x M12x1 interm Power supply: 7/8" external thread, Sensor connections: 8 x M12x1 inter	BNI EIP-501-005-Z015
9.3.	Ordering	Product order code	Order code
	information	BNI EIP-501-005-Z015	BNI00HK

Notes

www.balluff.com

Balluff GmbH Schurwaldstrasse 9 D-73765 Neuhausen a.d.F. Germany Phone +49 7158 173-0 Fax +49 7158 5010 balluff@balluff.de