

Table of Contents

1	General	4
1.1.	Structure of the manual	4
1.2.	Typographical conventions	4
	Enumerations	4
	Actions	4
	Syntax	4
	Cross-references	4
1.3.	Symbols	4
1.4.	Abbreviations	4
1.5.	Divergent views	4
1.6.	EhterCat is a registered trademark	4
2	Safety	5
2.1.	Intended use	5
2.2.	Installation and startup	5
2.3.	General safety instructions	5
2.4.	Resistance to aggressive substances	5
	Hazardous voltage	5
3	First steps	6
3.1.	Module overview	6
3.2.	Mechanical connection	7
3.3.	Electrical connection	7
	Power supply	7
	Grounding	7
	EtherCAT interface	7
	IO-Link port	8
4	Technical data	9
4.1.	Dimensions	9
4.2.	Mechanical data	9
4.3.	Operating conditions	9
4.4.	Electrical data	9
4.5.	Ethernet	10
4.6.	Function indicators	10
	Module status	10
	Port	11
5	Integration	12
5.1.	EtherCAT	12
	Device data	12
	Input / output buffer	12
5.2.	Project administration	12
5.3.	Integration in project planning software	13
	Installing ESI files	13
	Automatic scanning	13
	Manually attach device	14
	Required setting on the device	15
	Station alias	16
	Configuring IO-Link module	17
5.4.	Bit mapping and function	19
	Inputs pin 4	19
	Inputs pin 2	19
	Outputs pin 4	19
	Outputs pin 2	19
	IO-Link modules	19
	Short circuit	19
	pin 4 / pin 2	19
	Restart pin 4 / pin2	19

IO-Link state	19
Sensor short circuit	20
Display LED	20
5.5. Startup	21
Configuration of the modules	21
Validation	22
Parameter server	22
Upload flag on the IO-Link device	23
Safe state	23
5.6. IO-Link parameterization	23
Control	23
Status	23
Example - CoE setting	24
Example - Read	24
Example - Write	25
5.7. Preparation for the webservice	26
EoE Setup	26
Network preparation	27
Beckhoff control settings	27
EOE and PC networks	27
6 Object list	28
6.1. Input Process Data (Pin 2) Ch. x (0x2000 – 0x2FFF)	28
6.2. Input Process Data (Pin 4) Ch. x (0x2000 – 0x2FFF)	28
6.3. Additional IO-Link Configuration Data (Pin 4) Ch. x (0x2000 – 0x2FFF)	28
6.4. Additional IO Configuration Data (Pin 2) Ch. x (0x2000 – 0x2FFF)	28
6.5. Display LEDs (0x2A01)	28
6.6. Module status (0x2A02)	28
6.7. Output Process Data Ch. x (0x3000 – 0x3FFF)	28
6.8. IO-Link Service Data Ch. x (0x4000 – 0x4FFF)	28
6.9. IO-Link Configuration Data Ch. x (0x8000 – 0x8FFF)	29
6.10. IO-Link Information Data Ch. x (0x9000 – 0x9FFF)	29
6.11. IO-Link Diagnosis Data Ch. x (0xA000 – 0xAFFF)	29
6.12. IO-Link Status Data Ch. x (0xF100)	29
6.13. Configuration without ESI	30
Master Control	30
Process data length	30
Example	30
Screenshot / Startup / Configuration	30
7 Display	31
7.1. General	31
7.2. Control and display	31
7.3. Design and symbols	31
7.4. Commissioning	31
7.5. Main Menu	32
7.6. Network Config	32
7.7. Module information	32
7.8. General information	32
8 Webservice	33
8.1. General Information	33
8.2. Navigation / Info	34
8.3. Login/Logout	35
8.4. "Home" dialog	36
8.5. "Ports" dialog	38
No appropriate IODD uploaded	38
Appropriate IODD uploaded	39
8.6. "IODD" dialog	41
8.7. "Config" dialog	42
8.8. "Log" dialog	44
9 Appendix	46
9.1. Included in the scope of delivery	46
9.2. Order number	46

1 General

1.1. Structure of the manual	This manual is structured such that one chapter builds on the other. Chapter 2: Basic safety instructions Chapter 3: Main steps for the installation of the device												
1.2. Typographical conventions	The following typographical conventions are used in this manual.												
Enumerations	Enumeration is shown in the form of lists with bullets. <ul style="list-style-type: none"> • Keyword 1 • Keyword 2 												
Actions	Action instructions are indicated by a preceding triangle. The result of an action is indicated by an arrow. <ul style="list-style-type: none"> ➤ Action instruction 1 ➤ Result of action ➤ Action instruction 2 Actions can also be indicated as numbers in parentheses. <ul style="list-style-type: none"> (1) Step 1 (2) Step 2 												
Syntax	Numbers: Decimal numbers are shown without additional information (e.g. 123), Hexadecimal numbers are shown with additional indicator hex (e.g. 00 _{hex}) or the prefix "0x" (e.g. 0x00).												
Cross-references	Cross references indicate where further information on the subject can be found.												
1.3. Symbols	<hr/> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div> <p>Note</p> <p>This symbol indicates general notes.</p> </div> </div> <hr/> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div> <p>Attention</p> <p>This symbol indicates a safety instruction that must be followed without exception.</p> </div> </div> <hr/>												
1.4. Abbreviations	<table border="0" style="width: 100%;"> <tr> <td style="padding-right: 10px;">BNI</td> <td>Balluff Network Interface</td> </tr> <tr> <td>I</td> <td>Standard input port</td> </tr> <tr> <td>ECT</td> <td>EtherCAT™</td> </tr> <tr> <td>EMC</td> <td>Electromagnetic compatibility</td> </tr> <tr> <td>FE</td> <td>Functional ground</td> </tr> <tr> <td>O</td> <td>Standard output port</td> </tr> </table>	BNI	Balluff Network Interface	I	Standard input port	ECT	EtherCAT™	EMC	Electromagnetic compatibility	FE	Functional ground	O	Standard output port
BNI	Balluff Network Interface												
I	Standard input port												
ECT	EtherCAT™												
EMC	Electromagnetic compatibility												
FE	Functional ground												
O	Standard output port												
1.5. Divergent views	Product views and images can differ from the specified product in this manual. They serve only as an illustration.												
1.6. EtherCat is a registered trademark	EtherCat® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.												

2.1. Intended use The BNI ECT-... is a decentralized IO-Link input and output module for connecting to the EtherCAT™ network.

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

Hazardous voltage



Attention

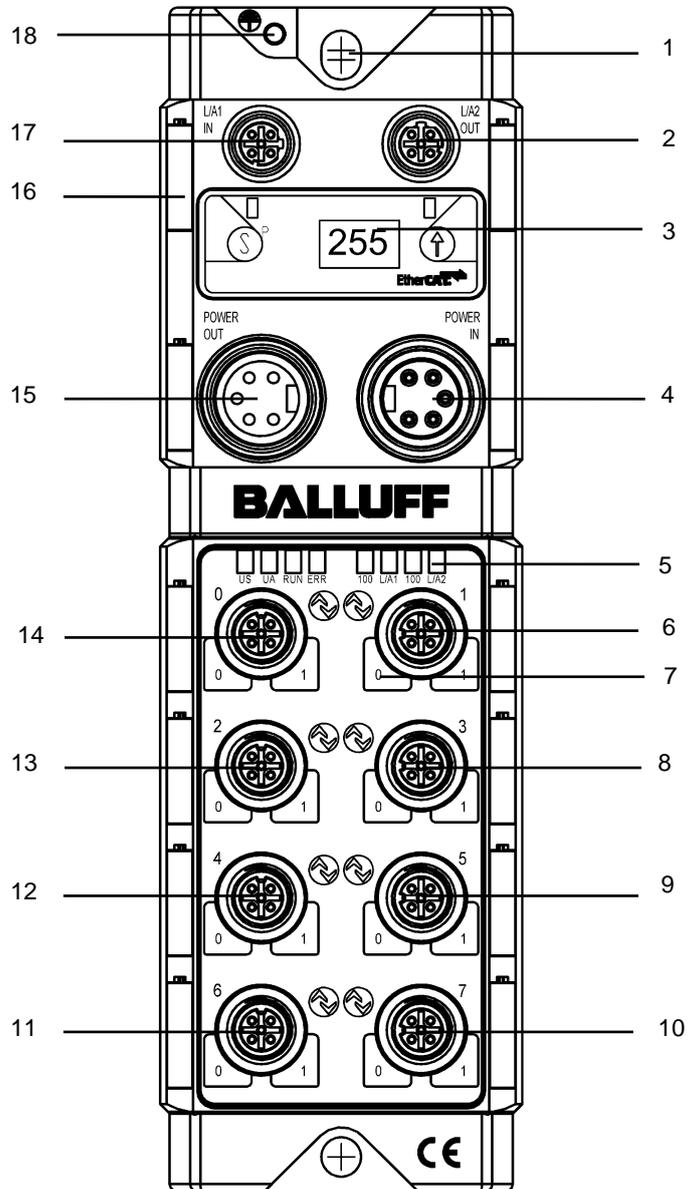
Disconnect all power before servicing equipment.



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.

3.1. Module overview



Overview BNI ECT-508-105-Z015

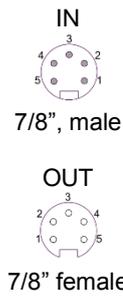
- | | | | |
|---|------------------------------------|----|--------------------------------|
| 1 | Mounting hole | 10 | Port 7 (IO-Link, standard I/O) |
| 2 | EtherCAT™-Port 2 OUT | 11 | Port 6 (IO-Link, standard I/O) |
| 3 | Display | 12 | Port 4 (IO-Link, standard I/O) |
| 4 | Power supply input | 13 | Port 2 (IO-Link, standard I/O) |
| 5 | Status LED: communication / module | 14 | Port 0 (IO-Link, standard I/O) |
| 6 | Port 1 (IO-Link, standard I/O) | 15 | Power supply output |
| 7 | Pin/port LED: Signal status | 16 | Information sign |
| 8 | Port 3 (IO-Link, standard I/O) | 17 | EtherCAT™-Port 1 IN |
| 9 | Port 5 (IO-Link, standard I/O) | 18 | Ground connection |

3.2. Mechanical connection

The module is secured by means of two M6 screws and two washers. Insulation support is available separately.

3.3. Electrical connection

Power supply



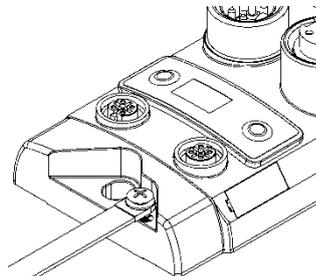
Pin	Function	Description
1	0 V	GND module / sensor and actuator supply
2		
3	FE	Functional ground
4	+24 V	Module / sensor supply
5	+24 V	Actuator supply

Note



Where possible, establish sensor/bus power supply and actuator power supply via a separate power supply. Total current < 9 A The total current of all modules must not exceed 9A even in the case of series connection of the actuator supply.

Grounding



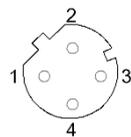
Note

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

EtherCAT interface

M12, D-coded, female

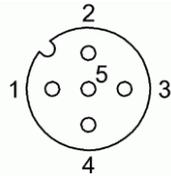
Pin	Function	Description
1	Tx+	Transmit Data +
2	Rx+	Receive Data +
3	Tx-	Transmit Data -
4	Rx-	Receive Data -



3 First steps

IO-Link port

M12, A-coded, female



Pin	Function
1	+24V, 1.6 A
2	Input/output
3	GND
4	IO-Link / input / output
5	n.a.



Note

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



Note

Each output receives a maximum current of 2 A. The total current of the module must not exceed 9 A per pin.



Note

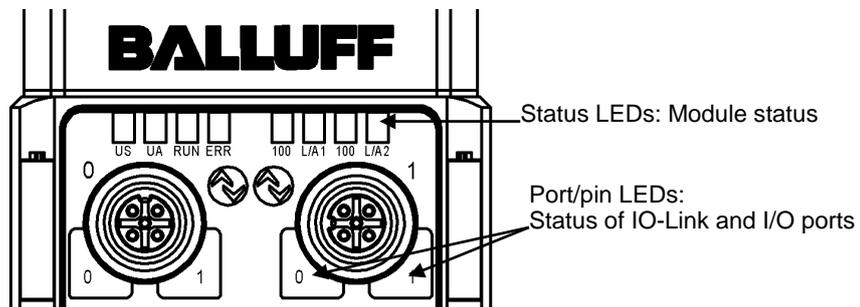
Unused I/O ports must be provided with cover caps to comply with protection type IP67.

4 Technical data

4.5. Ethernet

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

4.6. Function indicators



Module status

LED	Display	Function
US	Green	Sensor supply OK
	Red, flashing	Sensor supply less than < 18 V
UA	Green	Output voltage OK
	Red, flashing	Output voltage low (< 18 V)
	Red	No output voltage present (< 11V)
RUN	off	The device is in the INIT state
	Green, flashing	The device is in the PRE-OPERATIONAL state
	Green, single flashing	The device is in the SAFE OPERATIONAL state
	Green	The device is in the OPERATIONAL state
ERR	off	No error
	Red, flashing	Invalid configuration
	Red, single flashing	Local error
	Red double flashing	Application watchdog timeout
	Red	Error in the application
100	off	Transmission rate 10 Mbit/s
	Yellow	Transmission rate 100 Mbit/s
L/A	Green	Data transfer

Port

Standard port

Status	Function
off	Status of input or output pin is 0
Yellow	Status of input or output pin is 1
Both LEDs red flashing	Sensor power supply short circuit between pin 1 and pin 3
Red	Short circuit at the output on pin 2 / 4 to pin 3

IO-Link port

Status	Function
Green	IO-Link – connection active
Green, flashing	No IO-Link – connection
Green, rapid flashing	IO-Link preoperate during the data management
Red, rapid flashing	Validation failed / incorrect configuration of the IO-Link data length
Red, rapid flashing	Data management failed / incorrect device for data management
Red	IO-Link short circuit pin 4 to pin 3

- 5.1. EtherCAT
- The communication between the BNI ECT-508-105-Z015 and the controlling system is done via the EtherCAT.
The system consists of the following components:
- Bus master
 - Bus module/slaves (in this case the bus module BNI ECT-508-105-Z015)
- Device data
- To parameterize the bus master according to type, device data are available to the Bus module BNI ECT-508-105-Z015 in the form of three ESI files.
- Input / output buffer
- The data exchange with the controlling system occurs in the input and output buffers. The size of these buffers must be configured by the master.
- 5.2. Project administration
- In the project administration, the Bus module BNI ECT-508-105-Z015 is depicted as a modular device. The device data needed for the project planning are stored in the ESI files. The data modules of the inputs/outputs of the IO-Link port and possible additional modules are shown in the project administration software in relation to slots. The ESI files make the possible data modules (inputs/outputs, IO-Link ports of various data width and other additional modules) available. For the configuration of the BNI ECT-508-105-Z015 the appropriate data modules are assigned to a specific slot. Unused slots can easily be made available.

5.3. Integration in project planning software

For example, the connection of the BNI ECT-508-105-Z015 to a Beckhoff TwinCAT controller is shown with the TwinCAT System Manager. The exact procedure depends on the project planning software used.

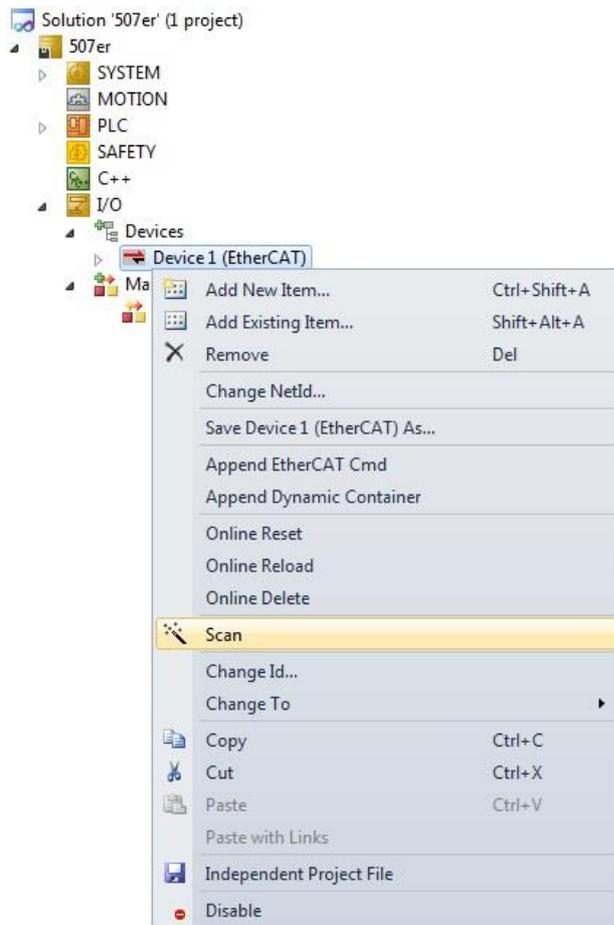
Installing ESI files

The device description has the following name: Balluff BNI ECT 508-105-Z015_xxxxxx.xml
Copy the file in the appropriate directory TwinCAT.
If during the installation of TwinCAT3, the default settings are used, this is
C:\TwinCat\3.1\Config\Io\EtherCAT.

At the next start of the TwinCAT System Manager, the installed devices are available.

Automatic scanning

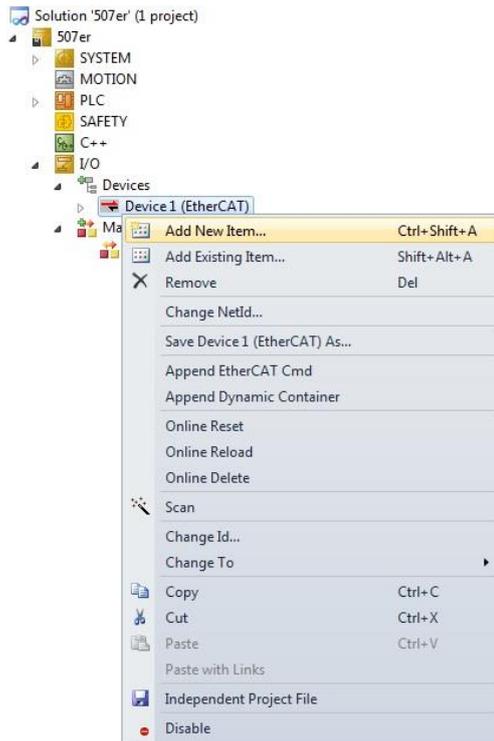
- Before connecting devices to the EtherCAT network, the EtherCAT system must be in a safe, de-energized state.
- Switch on the operating voltage and start the TwinCAT System Manager in Config mode.
- Scan BNI ECT-508-105-Z015 as a box



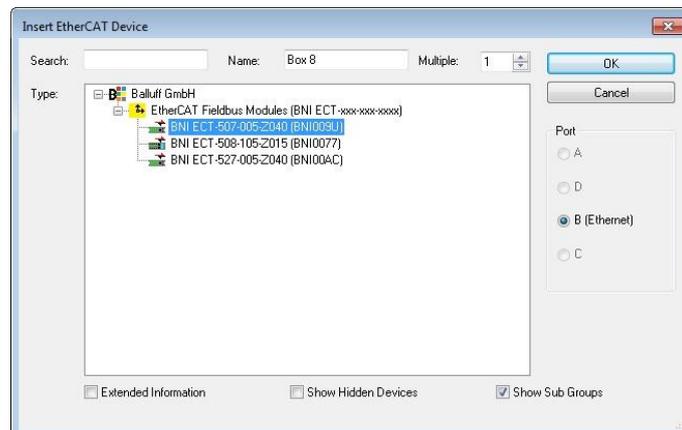
5 Integration

Manually attach device

- Before connecting devices to the EtherCAT network, the EtherCAT system must be in a safe, de-energized state.
- Switch on the operating voltage, and start the TwinCAT System Manager in Config mode.
- Attach the box

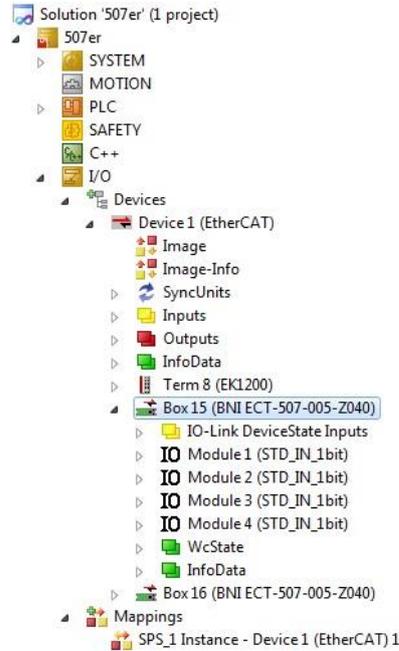


Select the appropriate box

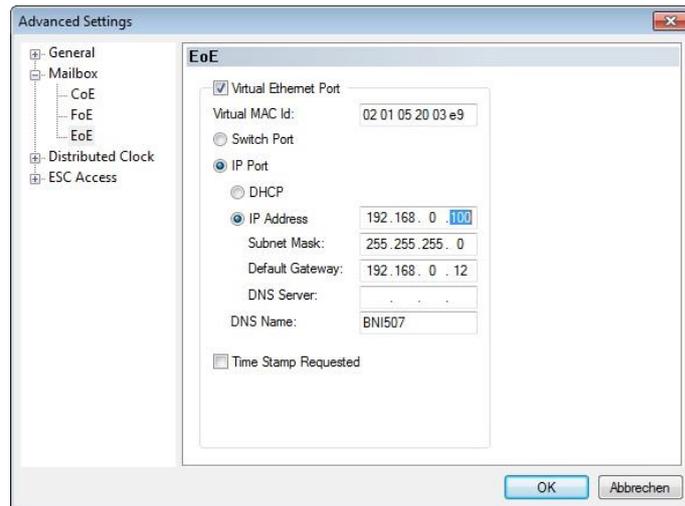


Required setting on the device

After the automatic scanning or manual addition, the device appears in the tree structure of TwinCAT

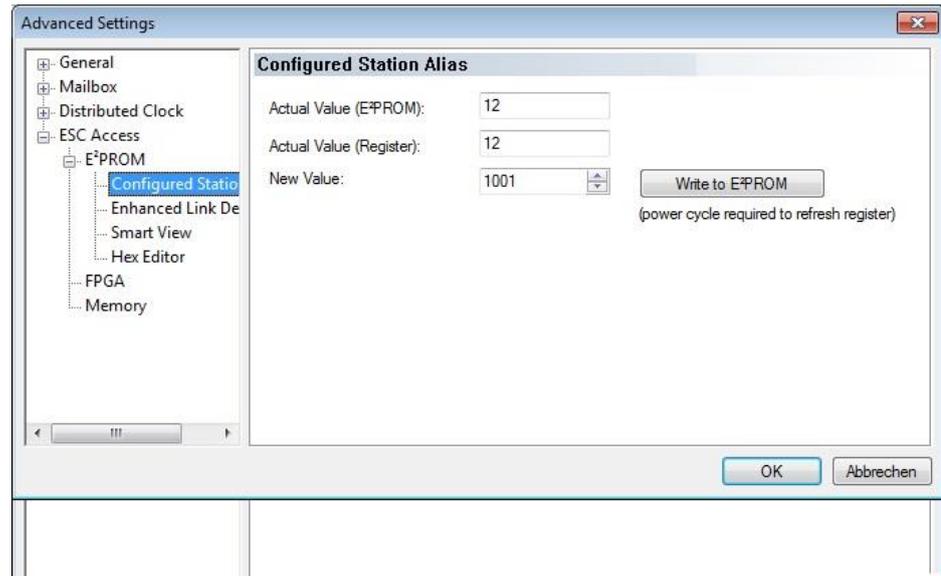


BNI ECT-508-105-Z015 supports EoE (Ethernet over Ethercat). To configure TwinCAT accordingly, select "Advanced Settings" in the EtherCAT tab. A valid DNS name must be entered first and then a valid IP address.



Station alias

The station alias can be entered under the following menu:
EtherCAT tab, select "Advanced settings".
Open ESC Access, open E²PROM and click on Configured Station.
The new value is valid only after a reset.



Configuring IO-Link module

BNI ECT-508-105-Z015 is a modular device. The following slot structure is present:

Slot number	Meaning
1-8	IO-Link ports
9-16	Unused slots, reserved for future expansions
17	Input pin 2
18	Short circuit pin 2
19	Short circuit pin 4
20	Sensor short circuit
21	Module status
22-32	Unused slots, reserved for future expansions
33	Output pin 2
34	Restart Pin 2
35	Restart Pin 4
36	Display LEDs



Note

The sum of the output data must not exceed 256 bytes.

IO-Link configuration

Slot	Module	ModuleIdent
IO IO-Link Ch.1	STD_IN_1bit	0x00001101
IO IO-Link Ch.2	STD_IN_1bit	0x00001101
IO IO-Link Ch.3	STD_IN_1bit	0x00001101
IO IO-Link Ch.4	STD_IN_1bit	0x00001101
IO IO-Link Ch.5	STD_IN_1bit	0x00001101
IO IO-Link Ch.6	STD_IN_1bit	0x00001101
IO IO-Link Ch.7	STD_IN_1bit	0x00001101
IO IO-Link Ch.8	STD_IN_1bit	0x00001101
IO-Link Ch (reserved)		
IO Input Pin 2		
Short Circuit Pin 2		
Short Circuit Pin 4		
Sensor Short Circuit		
i Module status		
IO Inputs (reserved)		
IO Output Pin 2		
IO Restart Pin 2		
IO Restart Pin 4		
Display LEDs		

In order to configure the IO-Link ports, a defined number of process data (buffer size) must be assigned to the EtherCAT slots. In the TwinCAT System Manager, this works as follows:

- The assignment of an IO-Link channel (or port) can be deleted with the [x] button.
- With the [<] button, the channel selected on the left side is populated with the module configuration selected on the right side.

This configuration must then be transferred to the EtherCAT slave (Shift F4 or with the button Restart TwinCAT in the Config mode).

5.4. Bit mapping and function Bit mapping and function of the configurable modules

Inputs pin 4
 Inputs pin 2
 Outputs pin 4
 Outputs pin 2

Signal from configured inputs or outputs are depicted in the modules
 STD_IN_1bit (input pin 4), input pin 2 as well as
 STD_OUT_1bit (output pin 4) and output pin 2.

IO-Link modules The IO-Link modules always have the same structure:

IOL_I/O_x/Bytes
 number of process data items used (should be equal to or greater than the process data length of the IO-Link device)
 I = input data
 O = output data
 I/O = both input and output data

Short circuit pin 4 / pin 2 Depicts a short circuit between a set output to ground at the respective port pin.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Restart pin 4 / pin 2 If this function is configured, after an actuator short-circuit there is no automatic restart, but rather the port must be activated by inserting the corresponding bit.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

IO-Link s tate In the IO-Link state, the momentary status of each port is displayed:

- 0x_0 = port disabled
- 0x_1 = port in std dig in
- 0x_2 = port in std dig out
- 0x_3 = port in communication OP
- 0x_4 = port in communication COMSTOP
- 0x1_ = watchdog detected
- 0x2_ = internal Error
- 0x3_ = invalid Device ID
- 0x4_ = invalid Vendor ID
- 0x5_ = invalid IO-Link version
- 0x6_ = invalid Frame Capability
- 0x7_ = invalid Cycle Time
- 0x8_ = invalid PD in length
- 0x9_ = invalid PD out length
- 0xA_ = no device detected

Sensor short circuit Feedback as to the port at which a sensor supply short circuit is pending.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Port 7	Port 6	Port 5	Port 4	Port 3	Port 2	Port 1	Port 0

Display LED Display functions

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
						Green LED	Red LED

5.5. Startup

In the startup, the IO-Link ports and outputs can be pre-configured. The configuration parameters are described in more detail in “Configuration without ESI”. The entries are transferred when the configuration is overwritten

Transition	Protocol	Index	Data	Comment
<PS>	CoE	0x1C12:00	0x00 (0)	clear sm pdos (0x1C12)
<PS>	CoE	0x1C13:00	0x00 (0)	clear sm pdos (0x1C13)
<PS>	CoE	0x1A00:00	0x00 (0)	clear pdo 0x1A00 entries
<PS>	CoE	0x1A00:01	0x60000108 (1610613000)	download pdo 0x1A00 entry
<PS>	CoE	0x1A00:00	0x01 (1)	download pdo 0x1A00 entry count
<PS>	CoE	0x1A01:00	0x00 (0)	clear pdo 0x1A01 entries
<PS>	CoE	0x1A01:01	0x60100108 (1611661576)	download pdo 0x1A01 entry
<PS>	CoE	0x1A01:00	0x01 (1)	download pdo 0x1A01 entry count
<PS>	CoE	0x1A02:00	0x00 (0)	clear pdo 0x1A02 entries
<PS>	CoE	0x1A02:01	0x60200108 (1612710152)	download pdo 0x1A02 entry
<PS>	CoE	0x1A02:00	0x01 (1)	download pdo 0x1A02 entry count
<PS>	CoE	0x1B02:00	0x00 (0)	clear pdo 0x1B02 entries
<PS>	CoE	0x1B02:01	0x00000008 (8)	download pdo 0x1B02 entry
<PS>	CoE	0x1B02:00	0x01 (1)	download pdo 0x1B02 entry count
<PS>	CoE	0x1C13:01	0x1A81 (6785)	download pdo 0x1C13:01 index
<PS>	CoE	0x1C13:02	0x1A00 (6656)	download pdo 0x1C13:02 index
<PS>	CoE	0x1C13:03	0x1A01 (6657)	download pdo 0x1C13:03 index
<PS>	CoE	0x1C13:04	0x1A02 (6658)	download pdo 0x1C13:04 index
<PS>	CoE	0x1C13:05	0x1B02 (6914)	download pdo 0x1C13:05 index
<PS>	CoE	0x1C13:00	0x05 (5)	download pdo 0x1C13 count
<IP, PS>	EoE		3F 00 00 00 02 01 05 20 0...	eoe init
PS	CoE	0x8010:24	0x01 (1)	Set Process Data In Length
PS	CoE	0x8010:25	0x00 (0)	Set Process Data Out Length
PS	CoE	0x8010:28	0x0001 (1)	Set Master Control
PS	CoE	0x8020:24	0x01 (1)	Set Process Data In Length
PS	CoE	0x8020:25	0x00 (0)	Set Process Data Out Length
PS	CoE	0x8020:28	0x0001 (1)	Set Master Control
PS	CoE	0x8000:24	0x01 (1)	Set Process Data In Length
PS	CoE	0x8000:25	0x00 (0)	Set Process Data Out Length
PS	CoE	0x8000:28	0x0001 (1)	Set Master Control

Configuration of the modules

Edit CANopen Startup Entry

Transition: I -> P P -> S S -> P S -> D D -> S

Index (hex): 8000 Sub-Index (dec): 40 Validate Complete Access

Data (hexbin): 01 00

Validate Mask:

Comment: Set Master Control

Index	Name	Flags	Value
1000			
1008			
1009			
100A			
1018:0			
10F3:0			
1600:0			
1601:0			
1602:0			
1A00:0			
1A01:0			
1A02:0			
1A81:0			

Set Value Dialog

Dec:

Hex:

Float:

Bool: 0 1

Binary:

Bit Size: 1 8 16 32 64 ?

Validation	<p>No validation: validation deactivated, every device will be accepted Compatibility: manufacturer ID and device ID are compared to the module data. The IO-Link communication is only started if there is a match. Identity: manufacturer ID and device ID and serial number are compared to the module data. The IO-Link communication is only started if there is a match.</p> <p>The following values are possible for the setting of the validation:</p> <ul style="list-style-type: none"> 0 no validation 1 compatible (VID + DID) 2 identical (VID + DID + serial number)
Parameter server	<p>Switched on: data management functions enabled, parameter data and identification data of the IO-Link devices are residually saved. Switched off: data management functions disabled, saved data are retained. Deleted: data management functions disabled, saved data is deleted.</p> <p>Enable upload: Select whether an upload of parameter data to the data management of the IO-Link master port is to be carried out or not. If the upload is enabled, the master starts a parameter data upload as soon as a device requests an upload (upload flag set) or if there is no data saved in the master port (e.g. after data has been deleted or before the first data upload)</p> <p>Block upload: If the upload is disabled, no data upload will be started. When there is an upload request from the IO-Link device, a download (if enabled) is started because no upload may be carried out if there are different parameter sets.</p> <p>Enable download: Select whether a download of parameter data to the IO-Link device is to be carried out or not. As soon as the saved parameter data in the parameter server of the port is differentiated from the connected IO-Link device and no upload request from the IO-Link device is present, a download is carried out.</p> <p>Block download: If the download is blocked, an upload (if enabled) of the parameter data occurs independent of the upload flag of the IO-Link device.</p> <p>Block upload and download: If upload and download are blocked, no parameter data exchange occurs. The IO-Link device then communicates anyway with the IO-Link port.</p> <p>The following values are possible for the settings:</p> <ul style="list-style-type: none"> 0x8X Switch on 0x0X Switch off 0x40 Delete 0xX1 Switch on upload 0xX2 Switch on download

Note



After the upload of the parameter data, the vendor ID and device ID of the connected IO-Link device is also still saved until the data record is 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. To use an IO-Link device of a different type, the contents of the parameter server must be deleted.

Upload flag on the IO-Link device

To enable the upload flag of an IO-Link device, the value 0x05 must be entered in the index 0x02, subindex 0. (Parameterization, see IO-Link Service Data on the next page)

The upload flag is needed to overwrite already saved data in the parameter server with new parameter data of the same IO-Link device

Safe state

This function is a supplement to an output configuration of the respective port pin. For each port pin, a safe status can be predefined which is to be assumed in the event of a loss of bus communication.

The following values are possible for the settings:

0x00: 0
0x01: 1
0x02: last state

5.6. IO-Link parameterization

Via object 0x4000 (IO-Link Service Data Ch. X), IO-Link ISDU parameters can be read or written from the IO-Link device. To do this, the corresponding index and subindex must be entered. In addition, the corresponding length and the data must still be entered when writing. Via the control object, the read or write task is then started. In the Object status, the result is then displayed.

Control

Values for the Control:

- 0x00: No action
- 0x02: Write
- 0x03: Read

Status

Values for the Status:

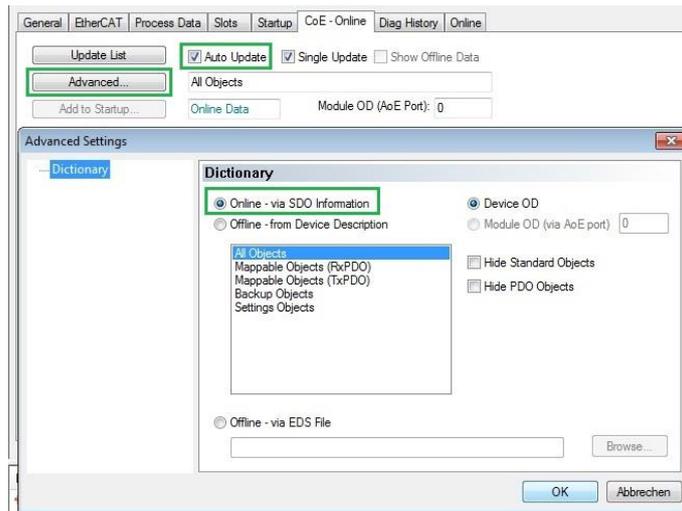
- 0x00: No activity
- 0x01: Active / Busy
- 0x02: Access
- 0x04: Error
- 0xFF: Failure

5 Integration

Example - CoE setting

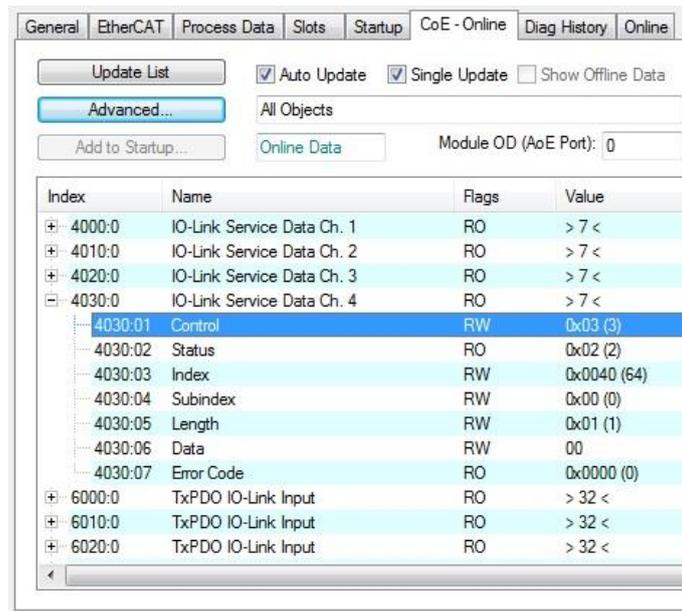
A short example shows how Index 0x40 for a SmartLight (Mode) is changed.

1. Select mode
2. CoE - Open Online
3. Set CoE
 - a. Under Advancedset to Online
 - b. Enable Auto Update



Example - Read

4. In Port select 4030:0 (here Channel 4)
5. First read the index, i.e. double-click 4030:03 and specify the respective index - 0x0040 (64)
6. Now in Control write command 0x03



7. Then the contents of the index is read and displayed in Data.

Example - Write

8. To write, change the data, specify the length and use the command 0x02.

The screenshot shows the 'CoE - Online' tab in the software interface. The 'Advanced...' button is highlighted in blue. Below it, the 'Online Data' section shows a table of parameters. The 'Control' parameter (Index: 4030:01) is selected, showing a value of 0x02 (2). Other parameters include Status (0x02), Index (0x0040), Subindex (0x00), Length (0x00), Data (02 00 00 00 00 00 00), and Error Code (0x0000).

Index	Name	Flags	Value
4000:0	IO-Link Service Data Ch. 1	RO	> 7 <
4010:0	IO-Link Service Data Ch. 2	RO	> 7 <
4020:0	IO-Link Service Data Ch. 3	RO	> 7 <
4030:0	IO-Link Service Data Ch. 4	RO	> 7 <
4030:01	Control	RW	0x02 (2)
4030:02	Status	RO	0x02 (2)
4030:03	Index	RW	0x0040 (64)
4030:04	Subindex	RW	0x00 (0)
4030:05	Length	RW	0x00 (0)
4030:06	Data	RW	02 00 00 00 00 00 00
4030:07	Error Code	RO	0x0000 (0)
6000:0	TxPDO IO-Link Input	RO	> 32 <
6010:0	TxPDO IO-Link Input	RO	> 32 <
6020:0	TxPDO IO-Link Input	RO	> 32 <

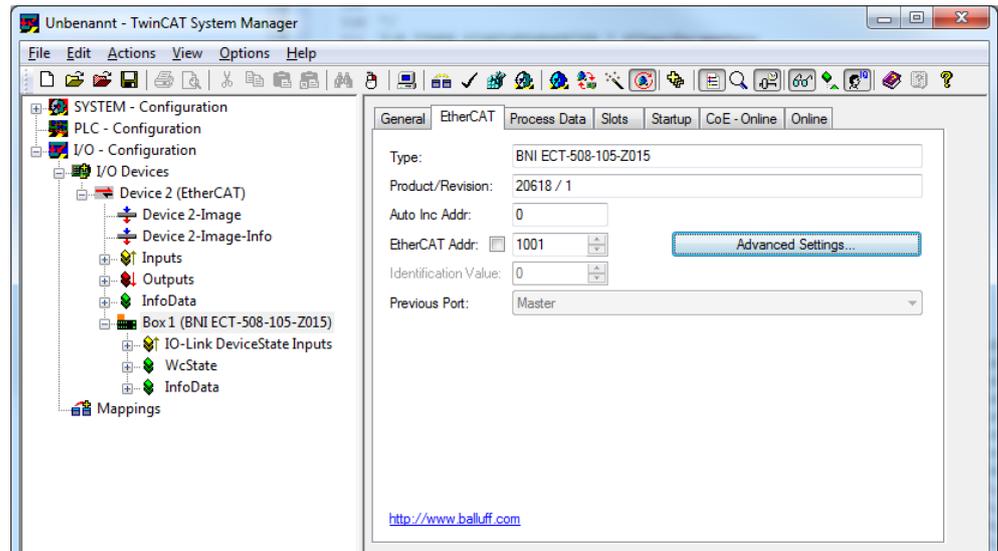
9. The data are written and the parameters changed in the device.

5.7. Preparation for the webserver

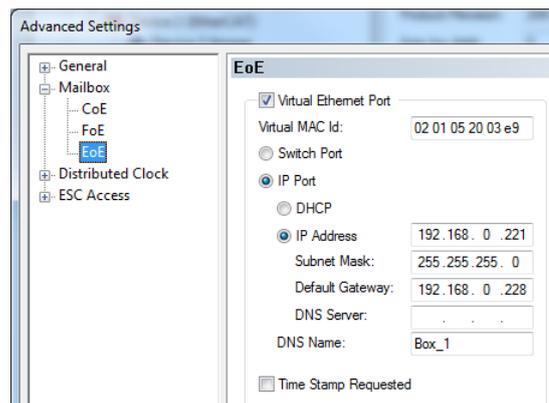
EoE Setup

To access the web server of the module BNI ECT-508, access via EoE (Ethernet over EtherCAT) must first be configured.

For this purpose, the "Advanced Settings" menu must be opened.



A valid DNS name must be entered first and then a valid IP address.

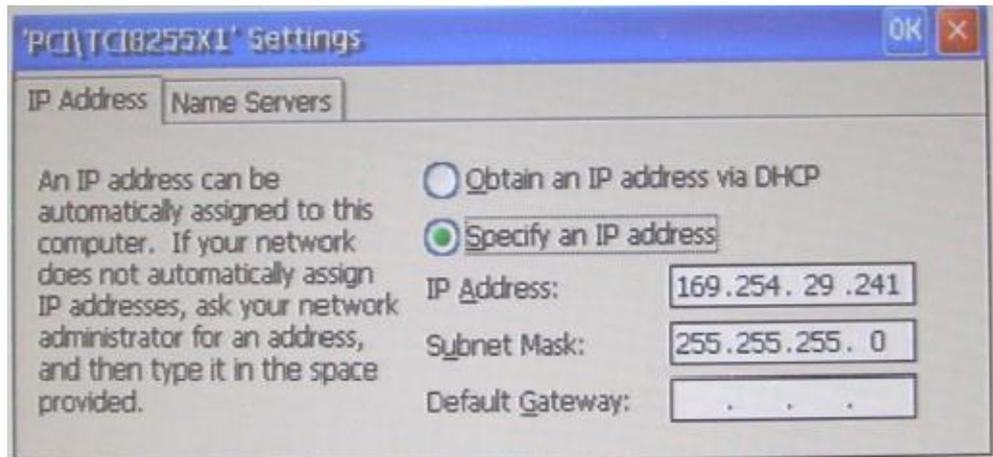


Network preparation

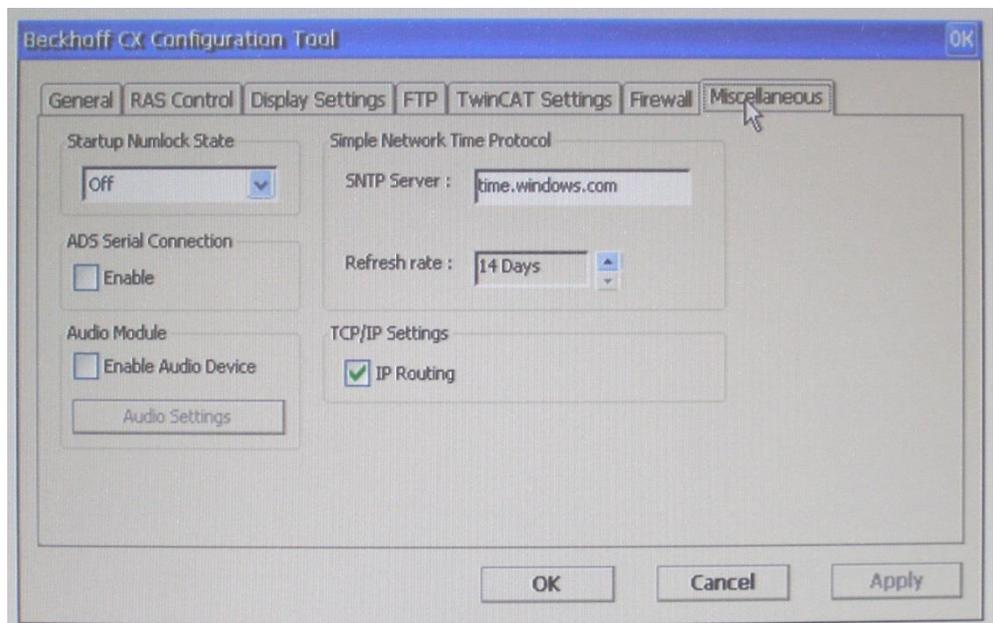
Before the web server can be reached via EoE, the network of the Beckhoff control must be properly configured.

Beckhoff control settings

Both network boards must be assigned a fixed IP address. The IP address can be set in Windows CE on the Beckhoff control under Start -> Control-panel -> Network and dial-up connections -> Making PCI...Settings



Next, the IP routing must be enabled under Start -> Control Panel -> Beckhoff CX Configuration Tool



EOE and PC networks

In the EOE settings in TwinCAT, the IP address of the second network board of the Beckhoff control must be entered as the default gateway. The IP address of the first network board of the Beckhoff control must be entered as the default gateway for the network configuration of the PC.

6 Object list

6.1. Input Process Data (Pin 2) Ch. x (0x2000 – 0x2FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x20n0 n = 0..7	0x01	Input pin 2	BOOLEAN	RO	
		0x02	Actor Short Circuit Pin 2	BOOLEAN	RO	
6.2. Input Process Data (Pin 4) Ch. x (0x2000 – 0x2FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x20n1 n = 0..7	0x01	Actor Short Circuit Pin 4	BOOLEAN	RO	
		0x02	Sensor supply short circuit	BOOLEAN	RO	
6.3. Additional IO-Link Configuration Data (Pin 4) Ch. x (0x2000 – 0x2FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x20n2 n = 0..7	0x01	Safe state	UINT8	RW	
		0x02	Validation Type	UINT8	RW	
		0x03	Parameter server	UINT8	RW	
6.4. Additional IO Configuration Data (Pin 2) Ch. x (0x2000 – 0x2FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x20n3 n = 0..7	0x01	Safe state	UINT8	RW	
6.5. Display LEDs (0x2A01)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x2A01	0x01	Led red	BOOLEAN	RO	
0x02		Led green	BOOLEAN	RO		
6.6. Module status (0x2A02)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x2A02	0x01	UA low	BOOLEAN	RO	
		0x02	US low	BOOLEAN	RO	
0x03		no UA	BOOLEAN	RO		
6.7. Output Process Data Ch. x (0x3000 – 0x3FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x30n0	0x01	Output pin 2	BOOLEAN	RO	
		0x02	Restart Pin 2	BOOLEAN	RO	
0x30n1 n = 0..7	0x01	Restart Pin 4	BOOLEAN	RO		
6.8. IO-Link Service Data Ch. x (0x4000 – 0x4FFF)	Index	Sub-index	Name	Data Type	Access	Description/Value
	0x40n0	0x01	Control	UINT8	RW	0: no control action 3: read 2: write
		0x02	Status	UINT8	RO	0: no activity 1: busy 2: success 4: error 0xFF: failure
	n = 0..7	0x03	Index	UINT16	RW	
		0x04	Subindex	UINT8	RW	
		0x05	Length	UINT8	RW	
		0x06	Data	UINT8	RW	
		0x07	Error code	UINT16	RO	

6.9. IO-Link
Configuration
Data Ch. x
(0x8000 –
0x8FFF)

Index	Sub-index	Name	Data Type	Access	Description/ Value
0x80n0	0x04	Device ID	UINT32	RW	
	0x05	Vendor ID	UINT32	RW	
	0x06	Product ID	UINT32	RW	
	0x08	Serial Number	UINT32	RW	
	0x20	IO-Link revision	UINT8	RW	
	0x21	Frame Capability	UINT8	RW	
	0x22	Min Cycle Time	UINT8	RW	
	0x24	Process data in length	UINT8	RW	
	0x25	Process data out length	UINT8	RW	
n = 0..7	0x28	Master Control	UINT16	RW	

6.10. IO-Link
Information
Data Ch. x
(0x9000 –
0x9FFF)

Index	Sub-index	Name	Data Type	Access	Description/ Value
0x90n0	0x04	Device ID	UINT32	RO	
	0x05	Vendor ID	UINT32	RO	
	0x06	Product ID	UINT32	RO	
	0x08	Serial Number	UINT32	RO	
	0x20	IO-Link revision	UINT8	RO	
	0x21	Frame Capability	UINT8	RO	
	0x22	Min Cycle Time	UINT8	RO	
	0x24	Process data in length	UINT8	RO	
	0x25	Process data out length	UINT8	RO	
n = 0..7	0x25	Process data out length	UINT8	RO	

6.11. IO-Link
Diagnosis
Data Ch. x
(0xA000 –
0xAFFF)

Index	Sub-index	Name	Data Type	Access	Description/ Value
0xA0n0 n = 0..7	0x01	IO-Link state	UINT8	RO	
	0x02	Lost Frames	UINT8	RO	

6.12. IO-Link
Status Data
Ch. x (0xF100)

Index	Sub-index	Name	Data Type	Access	Description/ Value
0xF100	0x01	Status of IO-Link Port 1	UINT8	RO	
	0x02	Status of IO-Link Port 2	UINT8	RO	
	0x03	Status of IO-Link Port 3	UINT8	RO	
	0x04	Status of IO-Link Port 4	UINT8	RO	
	0x05	Status of IO-Link Port 5	UINT8	RO	
	0x06	Status of IO-Link Port 6	UINT8	RO	
	0x07	Status of IO-Link Port 7	UINT8	RO	
	0x08	Status of IO-Link Port 8	UINT8	RO	

6 Object list

6.13. Configuration without ESI The ports can also be configured without incorporating an ESI. To do this, the object 0x8000 must be set in the Master Control and the respective length of the process data.

Master Control Values for the Master Control (80X0:28):

- 0x0003: Port in IO-Link Mode
- 0x0001: Port in Standard Input
- 0x0002: Port in Standard Output

Process data length Process data length for IO-Link ports:

- 1 byte: 0x08
- 2 bytes: 0x16
- 4 bytes: 0x83
- 6 bytes: 0x85
- 8 bytes: 0x87
- 10 bytes: 0x89
- 16 bytes: 0x8F
- 24 bytes: 0x97
- 32 bytes: 0x9F

Process data length for a standard input-/output port:

- 0x01

Example

MasterControl = 3 --> IO-Link				
IO-Link size	Process Data In Length		Process Data Out Length	
	hex	dez	hex	dez
IOL_I_1byte	0x08	8	0x00	0
IOL_I_2byte	0x16	22	0x00	0
IOL_I_4byte	0x83	131	0x00	0
IOL_I_6byte	0x85	133	0x00	0
IOL_I_8byte	0x87	135	0x00	0
IOL_I_10byte	0x89	137	0x00	0
IOL_I_16byte	0x8F	143	0x00	0
IOL_I_24byte	0x97	151	0x00	0
IOL_I_32byte	0x9F	159	0x00	0
IOL_I_1byte/O_1bytes	0x08	8	0x08	8
IOL_I_2byte/O_2bytes	0x16	22	0x16	22
IOL_I_2byte/O_4bytes	0x16	22	0x83	131
IOL_I_4byte/O_4bytes	0x83	131	0x83	131
IOL_I_4byte/O_2bytes	0x83	131	0x16	22
IOL_I_2byte/O_8bytes	0x16	22	0x87	135

Screenshot / Startup / Configuration

In the startup configuration, this means that for port 6 in the IO link mode with 32 byte process data length for input and output, for example, As follows:

 PS	CoE	0x8060:24	0x9F (159)	Set Process Data In Length
 PS	CoE	0x8060:25	0x9F (159)	Set Process Data Out Len...
 PS	CoE	0x8060:28	0x0003 (3)	Set Master Control

7 Display

7.1. General

With the built-in display, the station alias is output directly to the devices BNI ECT... The display also shows information about the version of the hardware and firmware.

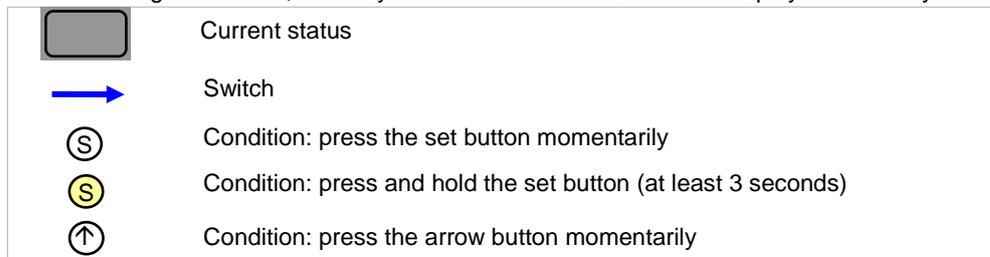
7.2. Control and display



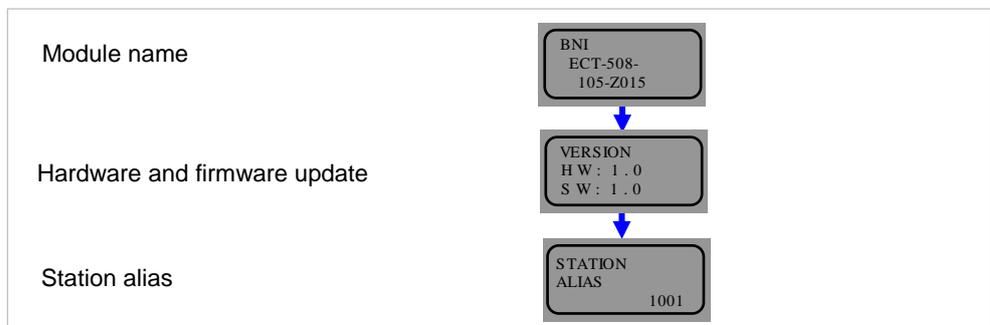
- | | | | |
|---|-----------|---|-----------|
| 1 | Display | 3 | "Set" key |
| 2 | Arrow key | 4 | LED |

7.3. Design and symbols

In the following flow charts, some symbols are used to describe the display functionality:

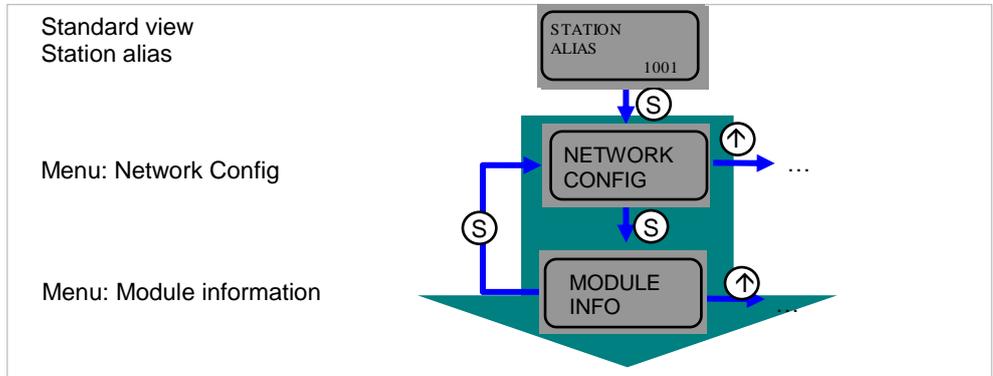


7.4. Commissioning



7 Display

7.5. Main Menu



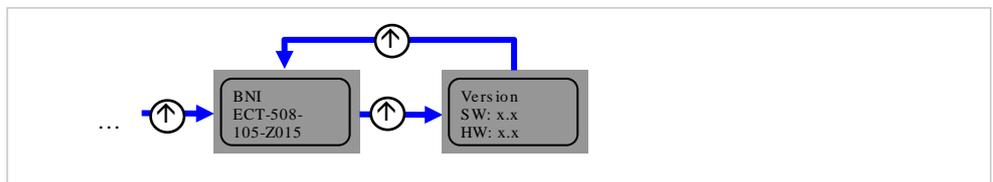
- Press the set key briefly to scroll through the main menu.
- Press the arrow key to open the menu.

7.6. Network Config



- In the Network Config menu, the station alias can be displayed

7.7. Module information



- Briefly pressing the arrow key allows scrolling via the "Module information" mention.
- The product name and the module version are displayed as information.

7.8. General information

- If no key is pressed for 10 seconds, the view reverts to the standard display (station alias).
- The LED function of the display LEDs can be set in a user-specific manner by setting several bits in the configurable display LED module.

8.1. General Information

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. Please use Internet Explorer 10 or newer as the browser; older versions may result in display problems.

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.

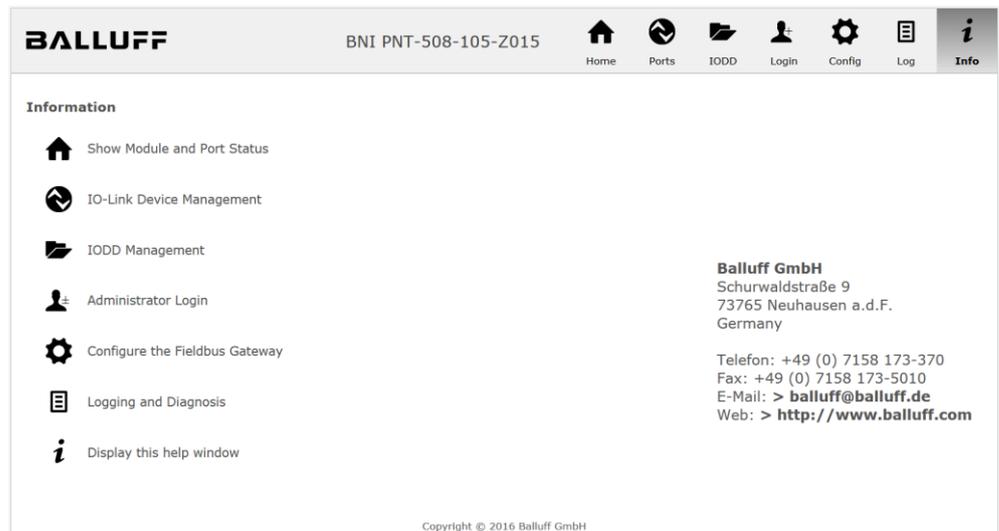
The screenshot displays the web interface for the BALLUFF BNI PNT-508-105-Z015 module. The interface includes a navigation bar with icons for Home, Ports, IODD, Login, Config, Log, and Info. The main content area is titled "Module Information" and lists the following details:

Product Name:	BNI PNT-508-105-Z015
Order Code:	BNI005H
Name:	unknown name
Location:	unknown location
Contact:	unknown contact
Firmware Revision:	3.2
Hardware Revision:	6
Station name:	mydevice
IP Address:	192.168.0.3
Subnet Mask:	255.255.255.0
Gateway Address:	0.0.0.0
MAC Address:	00:19:31:3F:FF:32
Link Speed Port 1:	100 Mbit/s FULL
Link Speed Port 2:	No Link
PLC Lock:	No

To the right of the information is a photograph of the physical module, which features eight RJ45 ports arranged in two columns of four. Below the photograph is a link labeled "> LED Legend".

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.

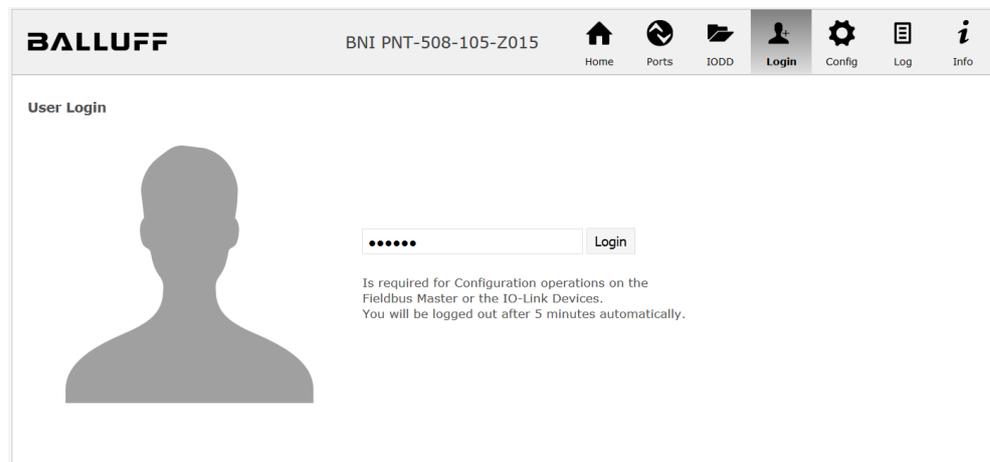
8.3. Login/Logout

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.

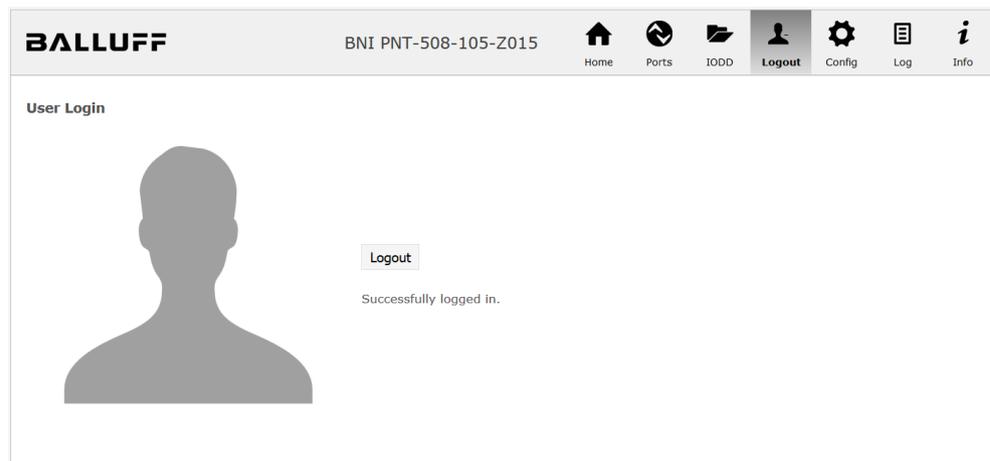
The default password is:

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 Websaver the user is automatically logged out.



Note

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.

The screenshot displays the Balluff web interface for the BNI PNT-508-105-Z015 module. The interface includes a navigation bar with icons for Home, Ports, IODD, Logout, Config, Log, and Info. The main content area is divided into two sections: Module Information and a terminal status diagram.

Module Information

Product Name:	BNI PNT-508-105-Z015
Order Code:	BNI005H
Name:	Balluff GmbH
Location:	Schurwaldstraße 9
Contact:	+49 (0) 7158 173
Firmware Revision:	3.2
Hardware Revision:	6
Station name:	mydevice
IP Address:	192.168.0.3
Subnet Mask:	255.255.255.0
Gateway Address:	0.0.0.0
MAC Address:	00:19:31:3F:FF:32
Link Speed Port 1:	100 Mbit/s FULL
Link Speed Port 2:	No Link
PLC Lock:	No

The terminal status diagram shows a vertical array of eight ports. The top two ports are labeled with callouts: "BALLUFF BNI IOL-302-002-Z046" and "BALLUFF BNI IOL-802-000-Z036". Below the diagram is a link labeled "> LED Legend".

PNT:

Module LED Functions

US	UA	SF	BF	100	LK1	100	LK2
OK	OK	Low	Low				
OK	OK	Low	Low				
No link activity	No link activity	No data exchange	No data exchange				
No Linking	No Linking	No data exchange	No data exchange				
100 Mbit/s	10 Mbit/s						
Link activity	No link activity						

Port LED Functions

IO	0	1
IO-Link	IO-Link	IO-Link
IO-Link	IO-Link	IO-Link
IO-Link	IO-Link	IO-Link

EIP:

Module LED Functions

US	UA	MODNET	100	LK1	100	LK2
OK	OK	Low				
OK	OK	Low	Error			
No error	No error	Config Error				
No config	No data exchange	Connected	Timeout			
100 Mbit/s	10 Mbit/s					
Link activity	No link activity					

Port LED Functions

IO	0	1
IO-Link	IO-Link	IO-Link
IO-Link	IO-Link	IO-Link
IO-Link	IO-Link	IO-Link

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.

BALLUFF BNI PNT-508-105-Z015 Home Ports IODD Logout Config Log Info

IO-Link Device Properties (Port 0)

Identification Data

Vendor ID:
Device ID: 0x050D20
Vendor Name: BALLUFF
Vendor Text: www.balluff.com
Product Name: BNI IOL-302-002-Z046
Product ID: BNI00AU
Product Text: Sensor/Actor hub M8
Serial Number: 7A 69 68 67 6A 68 73 6C 66 61 6A 6B F6 64 6C 75
Hardware Revision: 1
Firmware Revision: 1.0 2016/03/08 09:05:24 R2920
Application specific tag:

Process Data

Inputs (hex): 20 00
Outputs (hex): 00 00

Parameters

Index:
Subindex:
Data (hex):
Result:
 Read Write

Events

Current Event: Secondary supply voltage fault (Port Class B) - Check tolerance

Parameter server content

Vendor ID (hex): 00 00
Device ID (hex): 00 00 00
Checksum (hex): 00 00 00 00
Content (hex): (none)

"Ports" dialog with direct parameter access

Appropriate IODD uploaded

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.

BALLUFF BNI PNT-508-105-Z015

Home Ports IODD Logout Config Log Info

IO-Link Device Properties (Port 2)

Identification Data

Vendor ID: 0x0378
 Device ID: 0x020101
 Vendor Name: BALLUFF
 Vendor Text: www.balluff.com
 Product Name: BAW M18MI-BLC50B-S04G
 Product ID: 153938
 Product Text: Inductive distance sensor, 1...5mm
 Serial Number:
 Hardware Revision: 1.00
 Firmware Revision: 1.01
 Application specific tag:

Process Data

Inputs (hex): 00 03 FF
 Outputs (hex): no outputs

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

If 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 IO-Link.

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!

Parameters			Read All	
64 (0)	Operating mode (rw)	Segment mode ▾	Write	Read
65 (0)	Number of segments (rw)	One segment ▾	Write	Read
66 (0)	Type of level indicator (rw)	Bottom-up ▾	Write	Read
67 (0)	Resolution of level indicator (rw)	8 bit ▾	Write	Read
68 (0)	Level mode, segment 1 (rw)	See child elements		
68 (1)	Level mode, segment 1 color	Off ▾	Write	Read
68 (2)	Level mode, segment 1 dominance	<input type="radio"/> Color is not dominant <input checked="" type="radio"/> Color is dominant	Write	Read
69 (0)	Level mode, segment 2 (rw)	See child elements		
69 (1)	Level mode, segment 2 color	Off ▾	Write	Read
69 (2)	Level mode, segment 2 dominance	<input type="radio"/> Color is not dominant <input checked="" type="radio"/> Color is dominant	Write	Read
70 (0)	Level mode, segment 3 (rw)	See child elements		
70 (1)	Level mode, segment 3 color	Off ▾	Write	Read
70 (2)	Level mode, segment 3 dominance	<input type="radio"/> Color is not dominant <input checked="" type="radio"/> Color is dominant	Write	Read
71 (0)	Level mode, segment 4 (rw)	See child elements		
71 (1)	Level mode, segment 4 color	Off ▾	Write	Read
71 (2)	Level mode, segment 4 dominance	<input type="radio"/> Color is not dominant <input checked="" type="radio"/> Color is dominant	Write	Read

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

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.

IODD Management

Device	Picture	
BA050A01.xml	X	Delete
BA020101.xml	X	Delete
BA050D20.xml	X	Delete

Choose the IODD to upload:

Durchsuchen... BA020101.png

Upload

Information

This module has a FAT12 file system, which means it supports only file names in 8.3 convention. **Please rename your IODDs according to the suggested filename in the table below.**

The suggested filename is generated according to following rule:

- The first two characters of the file name are the first two letters of the IODD Vendor Name. If the device has no vendor name, those characters are substituted by underscores.
- The remaining 6 characters must encode the DeviceID in hexadecimal representation (padded with zeros if necessary).

Note that the filename must contain the DeviceID that is in the IODD file!

Currently connected IO - Link Devices:

Vendor Name	Product Name	Product ID	Vendor ID	Device ID	IODD Filename
BALLUFF	BNI IOL-302-002-Z046	BNI00AU	0000	050D20	BA050D20.xml
BALLUFF	BNI IOL-802-000-Z036	BNI0072	0378	050A01	BA050A01.xml
BALLUFF	BAW M18MI-BLC50B-S04G	153938	0378	020101	BA020101.xml

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

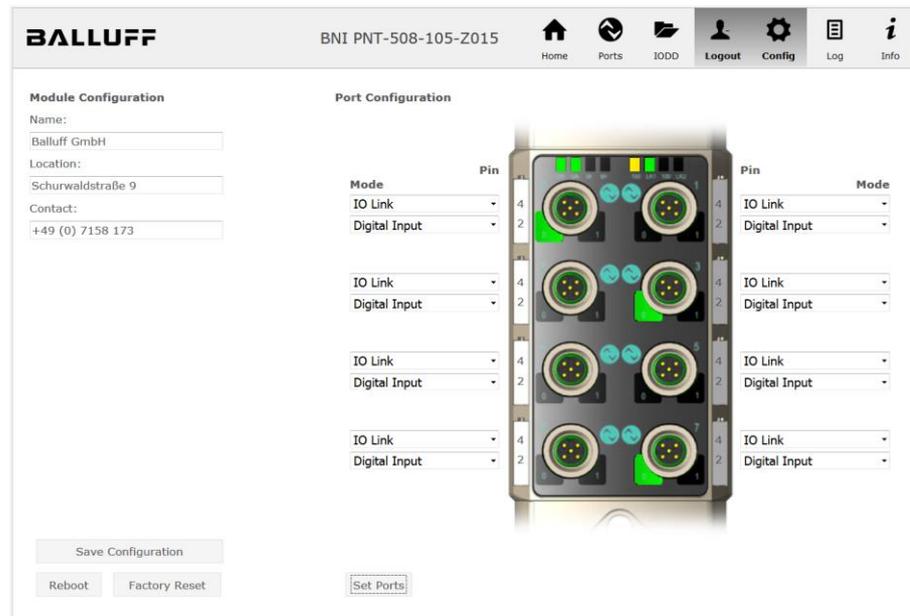
**Note**

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:



EIP:

BALLUFF BNI EIP-508-105-Z015

Home Ports IODD Logout **Config** Log Info

Module Configuration

Name: Balluff GmbH

Location: Schurwaldstraße 9

Contact: +49 (0) 7158 173

DHCP Client

Static IP

IP Address: 192 168 0 159

Subnet Mask: 255 255 255 0

Gateway Address: 192 168 0 1

Factory IP

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Gateway Address: 192.168.1.1

In order to change the IP address, it's necessary to reboot the module after saving the configuration.

Save Configuration

Reboot Factory Reset

Port Configuration

Mode Pin

IO Link 4

Digital Input/Output 2

Digital Input/Output 4

Digital Input/Output 2

Digital Input/Output 4

Digital Input/Output 2

IO Link 4

Digital Input/Output 2

IO Link 4

Digital Input/Output 2

IO Link 4

Digital Input/Output 2

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.



Note

If you have a detailed question about a specific situation, send us a screenshot of this Web site 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

Home
Ports
IODD
Logout
Config
Log
Info

Information

Product name:	BNI PNT-508-105-Z015	Browser time:	2016-12-16 10:26:29.495
Firmware revision:	3.2	System uptime:	50 secs 291 msecs
MAC address:	00:19:31:3F:FF:02	Free flash space:	1720 KB
IP address:	192.168.0.10	Web version:	2.0.113
Browser version:	Firefox 50.0		

Log

No.	Severity	Date	Origin	Message
0	Notice	2000-01-01 00:00:00.404	SYS	System startup (Oct 6 2016, 11:54:01)
1	Notice	2000-01-01 00:00:00.437	SYS	Set MAC address: 00:19:31:3F:FF:02
2	Notice	2000-01-01 00:00:00.493	IOL_MASTER	IO-Link Master started
3	Informational	2000-01-01 00:00:00.501	IOL_MASTER	FW version 1.2.8
4	Notice	2000-01-01 00:00:01.999	ETH	Port 1: Link Up (100 MBit/s, full duplex)
5	Notice	2000-01-01 00:00:37.926	WEB_IF	Login successful, IP address: 192.168.0.50
6	Error	2000-01-01 00:00:41.902	IOL_MASTER	Port 0: Device disconnected
7	Error	2000-01-01 00:00:42.272	IOL_MASTER	Port 1: Device disconnected
8	Error	2000-01-01 00:00:42.981	IOL_MASTER	Port 3: Device disconnected
9	Notice	2000-01-01 00:00:43.169	IOL_MASTER	Port 2: ISDU read error: Error code 80 Additional Code 11
10	Notice	2000-01-01 00:00:43.347	IOL_MASTER	Port 2: ISDU read error: Error code 80 Additional Code 11
11	Warning	2000-01-01 00:00:43.347	IOL_MASTER	Port 2: BNI IOL-101-S01-K018 connected
12	Notice	2000-01-01 00:00:44.145	IOL_MASTER	Port 4: ISDU read error: Error code 80 Additional Code 11
13	Error	2000-01-01 00:00:44.183	IOL_MASTER	Port 5: Device disconnected
14	Warning	2000-01-01 00:00:44.499	IOL_MASTER	Port 4: BNI IOL-801-000-Z036 connected
15	Error	2000-01-01 00:00:44.830	IOL_MASTER	Port 6: Device disconnected
16	Error	2000-01-01 00:00:45.200	IOL_MASTER	Port 7: Device disconnected

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.

9.1. Included in the scope of delivery

The BNI ECT comprises the following elements:

- IO-Link block
- 4x M12 dummy plugs
- Ground strap
- M4x6 screw
- 20 Information signs

9.2. Order number

BNI ECT-508-105-Z015

Balluff network interface

EtherCAT

Functions

508 = IP 67 IO-Link master module, 8 IO-Link ports

Versions

105 = display version, 2-port switch

Mechanical Version

Z015 = Housing made of zinc die-casting

Data transmission: 2 x M12x1 inner threads

Electrical connection: 7/8" outer threads

Sensor connections: 8 x M12x1 female thread

9.3. Ordering information

Product ordering code	Ordering code
BNI ECT-508-105-Z015	BNI0077

www.balluff.com

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

BALLUFF

No. 894449-726 E • 06.124819 • Edition H17 • Replaces Edition G17 • Subject to modifications