

**BNI EIP-508- \_05-Z015- \_ \_ \_**

Installation guide



EtherNet/IP™

IO-Link

english

## About this guide

This guide provides important information about the installation and connection of the following EtherNet/IP IO-Link master:

- **BNI-EIP-508-105-Z015**  
Order code: BNI006A  
With display
- **BNI-EIP-508-005-Z015-013**  
Order code: BNI00HM  
Without Display

## Intended use

The Ethernet/IP-IO-Link master serves as decentralized I/O and IO-Link Block for connection to an Ethernet/IP fieldbus and is intended for use in industrial applications.

The module may only be operated with an approved power supply. Only approved lines may be connected.

Proper function according to the specifications in the technical data is only assured when the product is used solely as described in the user's guide and the respective documents as well as in compliance with the technical specifications and requirements and only with suitable original Balluff accessories.

Otherwise, there is deemed to be unintended use. Unintended use is not permitted and will result in the loss of warranty and liability claims against the manufacturer.

## Reasonably foreseeable misuse

The product is not intended for the following applications and areas and may not be used there:

- In safety-oriented applications in which personal safety depends on the device function
- In explosive atmospheres
- In food applications

### Other applicable documents

A comprehensive user's guide and additional information about this product can be found at **[www.balluff.com](http://www.balluff.com)** on the product page.

## Safety notes

Activities such as **installation**, **connection** and **startup** may only be carried out by qualified personnel.

**Qualified personnel** are persons whose technical training, knowledge and experience as well as knowledge of the relevant regulations allows them to assess the work assigned to them, recognize possible hazards and take appropriate safety measures.

The **operator** is responsible for ensuring that local safety regulations are observed.

In particular, the operator must take steps to ensure that a defect in the product will not result in hazards to persons or equipment.

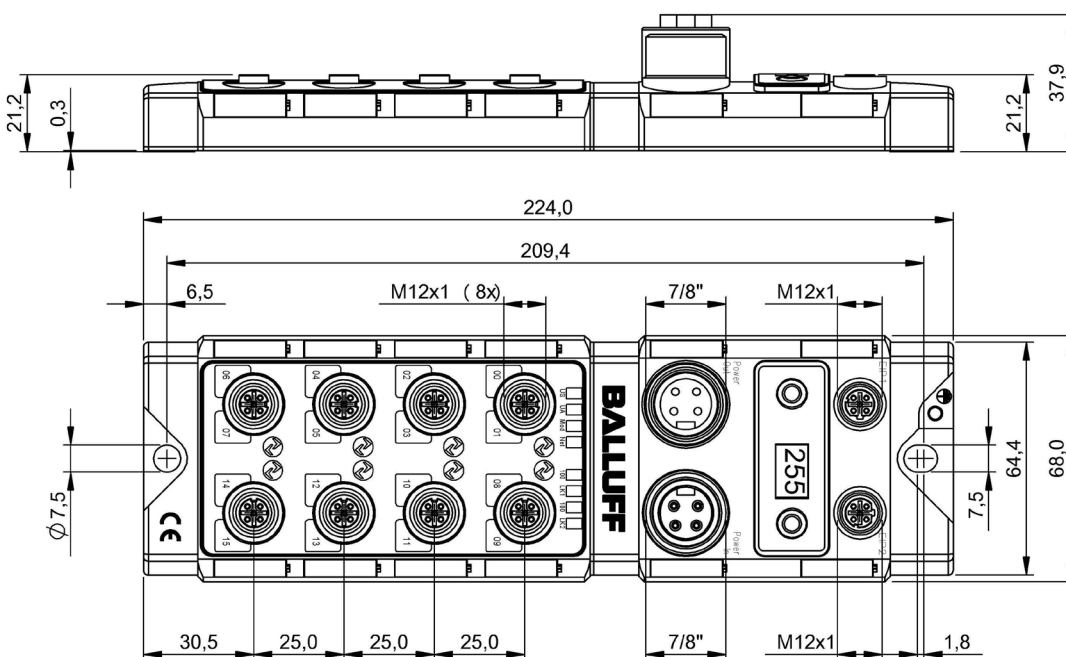
The product must not be opened, modified or changed. If defects and unresolvable faults occur in the product, take it out of service and secure against unauthorized use.

BNI modules generally have good chemical and oil resistance. When used in aggressive media (e.g. chemicals, oils, lubricants and coolants) in high concentrations (e.g. due to low water content), the material resistance must be checked in advance for the specific application. In the event of failure or damage to the BNI modules due to these kinds of aggressive media, claims for defects are ruled out.

## Hot surfaces

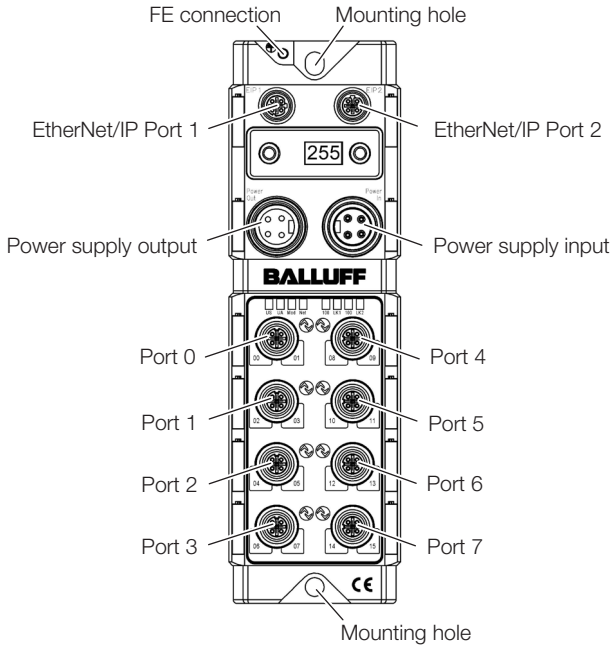
The housing heats up under normal operating conditions. There is a risk of burn injuries. Avoid direct skin contact with the surface.

## Dimensions



## Construction and function

### Construction



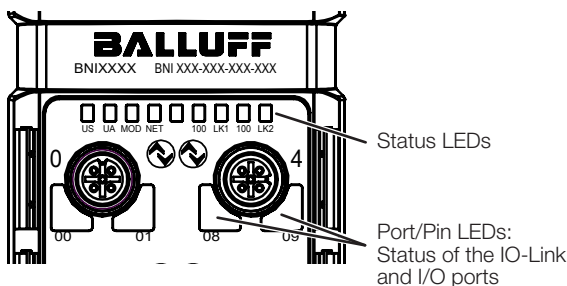
The Ethernet/IP-IO-Link master is a decentralized and configurable gateway that processes and evaluates the input and output signals of standard sensors and actuators as well as process data from connected IO-Link devices.

The data is transmitted via an existing fieldbus interface to a higher-level controller set up by the user for further processing.

A web server is available on the IO-Link master for configuration and diagnostics.

**i** For configuration information, see the configuration guide at [www.balluff.com](http://www.balluff.com) on the product page.

### Display elements



### Port/Pin LEDs

LED number	Assignment
Even	Pin 4
Odd	Pin 2

### Port/Pin LEDs Standard Port

Signal	Meaning
Off	State of input or output pins is 0
Yellow, static	State of input or output pins is 1
Both LEDs red flashing	Short circuit of sensor supply between pin 1 and pin 3
Red, static	Short circuit at output on pin 2/4 against pin 3
Red, static	No high signal at diagnostic input
Red, static	24 V input signal on configured output (actuator warning)

### Port/Pin LEDs IO-Link Port

Signal	Meaning
Green, static	IO-Link connection active
Green flashing	No IO-Link connection or incorrect IO-Link device
Green, fast flashing	IO-Link: Preoperate during data storage
Red, fast flashing	Validation failed / incorrect configuration of the IO-Link data length
Red, fast flashing	Data storage failed / incorrect device for data storage
Red, static	IO-Link: Short circuit of pin 4 against pin 3

### Status LEDs

LED	Signal	Meaning
US	Green, static	Input voltage OK
	Red flashing	Input voltage low (< 18 V)
UA	Green, static	Output voltage OK
	Red flashing	Output voltage low (< 18 V)
	Red, static	No output voltage present (< 11 V)
MOD	Green flashing	Incorrect or no module configuration
	Green, static	Module in progress.
	Red flashing	Fixed bus cycle not possible
	Red/Green flashing	Starting sequence
NET	Off	Module has no IP address.
	Green flashing	Module has an IP address, but no connection established.
	Green, static	Connection is established.
	Red flashing	Connection timeout
	Red/Green flashing	Starting sequence
100	Off	Transmission rate: 10 Mbit/s
	Yellow, static	Transmission rate: 100 Mbit/s
LK1/2	Green flashing	Data transfer

### Installation

Fasten the module with 2x M6 screws and to a maximum tightening torque of 3 Nm using the mounting holes.

### Electrical connection

#### Power supply

#### NOTICE

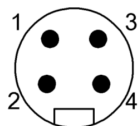
##### Unwanted voltage dips

Non-separated electric circuits of the power supplies for sensor and actuator can lead to unwanted voltage dips of the sensor supply when switching actuators.

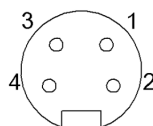
- Fuse the power supplies for sensors and actuators separately.
- Make sure that the power supply of the device is sufficiently dimensioned to cover start-up and peak currents and design the fuse protection concept accordingly.

- i** – Establish power supply of sensor/bus and actuator via a separate power source if possible.
- The total current for the sensor and actuator supply must not exceed 9 A each.
- For UL: Observe cable requirements and power supply requirements (see chapter UL requirements)!

7/8" connector



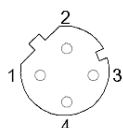
7/8" socket



Top view of 7/8" plug (left) and socket (right)

Pin	Signal	Description
1	UA	Actuator supply +24 V
2	US	Module/sensor supply +24 V
3	GND	Common ground
4		
5	FE	Functional earth

#### EtherNet/IP interface

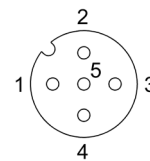


Top view of M12 socket, D-coded

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

### Electrical connection (continued)

#### I/O-Port



Top view of M12 socket

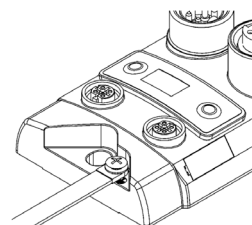
Pin	Signal	Description
1	US	+24 V, 2 A
2	I/O	Input / Output (2 A)
3	GND	Electrical ground 0 V
4	I/O, C/Q	Input / Output (2 A) / IO-Link
5	n. a.	Not available

- i** For the digital sensor inputs, see the directive on inputs EN 61131-2, type 3.

- i** Unused ports must be covered with caps to ensure IP67 protection.

- i** The IO-Link output is fed from the sensor supply.

#### Grounding



To counteract EMC interference, the functional earth connection must be used.

- Connect the earth terminal to the functional earth (FE) of the machine.

- i** The FE connection between the housing and the machine must have a low impedance and be as short as possible.

- Use the grounding strap included in the scope of delivery.

### Cable routing

#### Cable length

The Ethernet cable may be max. 100 meters long.

The IO-Link single-ended cordset may be max. 20 meters long.

## UL requirements



File	E319845
Classification	Type 1
Ambient temperature	+45 °C

### Power supply

The power supply has to be an isolated type or SELV type.

### Cleaning

Clean the product only with dry cloth or cloth dampened only with water!

### Performance data

Power input, nominal rated voltage 24 V DC	<ul style="list-style-type: none"> <li>– 130 mA maximum consumption</li> <li>– 9 A including all output loads</li> </ul>
Power output, nominal rated voltage 24 V DC	<ul style="list-style-type: none"> <li>– max. 8.8 A</li> </ul>
Digital input, nominal rated voltage 24 V DC	<ul style="list-style-type: none"> <li>– max. 30 mA/pin (point)</li> </ul>
Digital output, nominal rated voltage 24 V DC	<ul style="list-style-type: none"> <li>Class A IO-Link Port pin 1/3 <ul style="list-style-type: none"> <li>– 0.5 A/Port Pilot Duty</li> <li>– 1.6 A/port (point) Resistive / General use</li> </ul> </li> <li>Class A IO-Link Port pin 2/3 <ul style="list-style-type: none"> <li>– 0.5 A/Port Pilot Duty</li> <li>– 2 A/port (point) resistive/ general use (switchable)</li> </ul> </li> <li>Class A IO-Link Port pin 4/3 <ul style="list-style-type: none"> <li>– 0.5 A/Port Pilot Duty</li> <li>– 2 A/port (point) resistive/ general use (switchable) + IO-Link</li> </ul> </li> <li>– 8.8 A or less per device</li> </ul>

### Cable sizes

Power supply cable:

Listed or R/C cable (CYJV2) with 7/8" 4-pin threaded connector with minimum 24 V, minimum 9 A for all models. S, SJ, SO, ST, SV or R/C (AVLV2) cables identified or specified on the UL Style Page as suitable for external connections, rated 300 V or greater, 14 AWG or larger, unless identified with the maximum load current and overcurrent protection for the cable in accordance with the table below.

Mains connection cable:

Listed or R/C cable (CYJV2) with a 7/8", 4-pin female threaded connector and a rated voltage of at least 24 V and at least 9 A for all models. Listed S, SJ, SO, ST, SV or R/C cable (AVLV2) marked or specified on the UL Style Page as suitable for external connections, rated 300 V minimum and 14 AWG minimum, unless marked with the maximum load current and overcurrent protection for the cable in accordance with the table below.

Communication cable:

Listed or R/C cable (CYJV2) with A, B, or D-coded male or female threads, as applicable, for connection to Article 9, M12 plug rated 24 V minimum and 1 A minimum. R/C cable (AVLV2), identified or specified on the UL Style Page as suitable for external connections, with minimum 28 AWG and minimum 300 V.

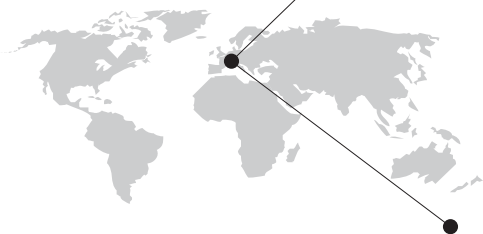
Input/output cable:

Listed or R/C cable (CYJV2) with A-coded M12 threaded connector, minimum 24 V, minimum 4 A. R/C cable (AVLV2), identified or specified on the UL Style Page as suitable for external connections, rated 300 V or greater, 20 AWG or larger, unless the maximum load current and overcurrent protection for the cable are specified in accordance with the table below.

Cable conductor size, AWG	14	16	18	20	22	24	26	28	30
Overcurrent protection maximum amperage [amps]	12	8	5.6	5	3	2	1	0.8	0.5
Maximum load [amps]	9	8	5.6	4	2.4	1.6	0.8	0.6	0.4







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