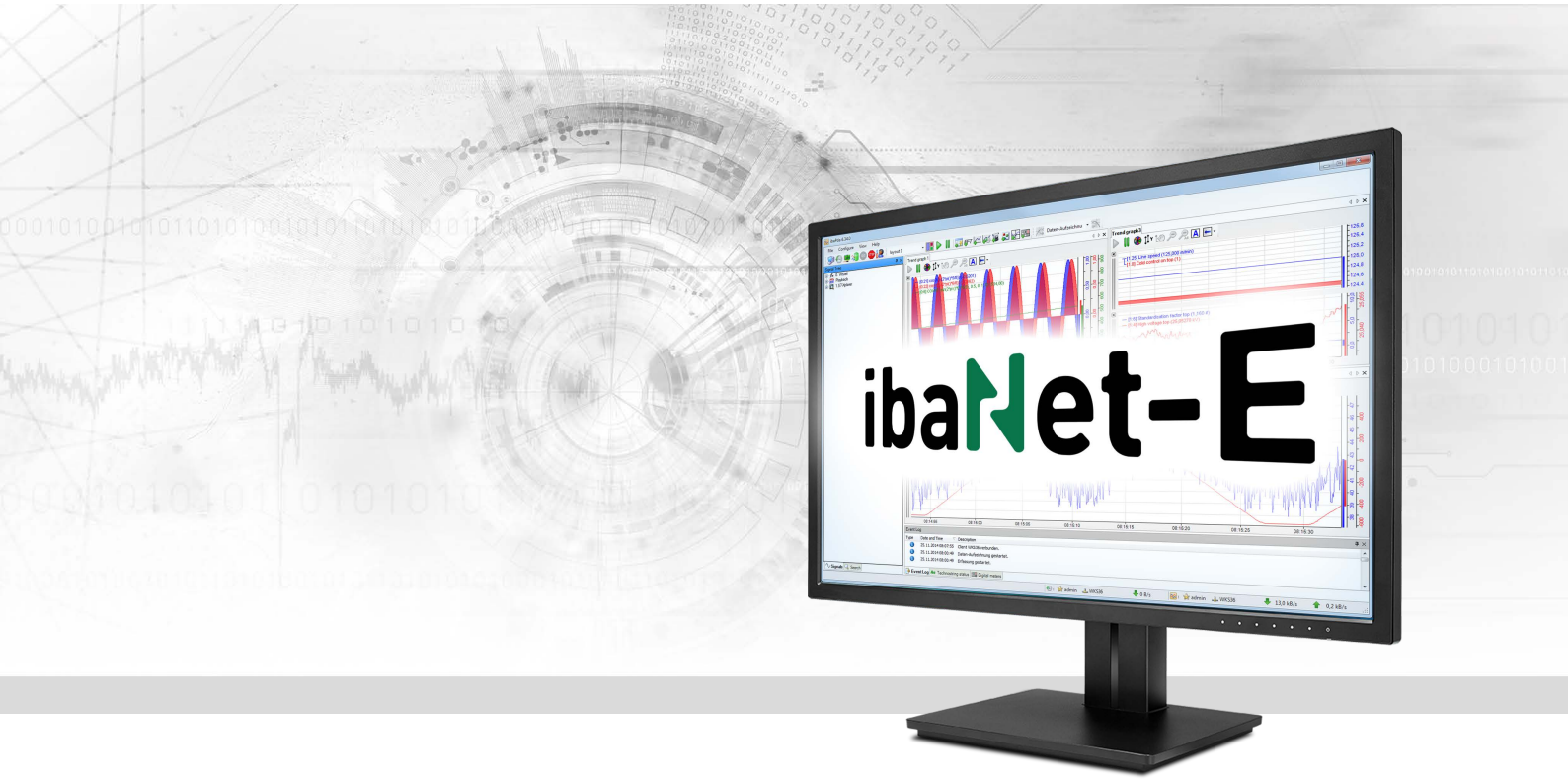

ibaPDA-Interface-ibaNet-E

Data interface for ibaNet-E

Manual

Issue 2.2

Measurement Systems for Industry and Energy

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Version	Date	Revision	Author	Version SW
2.2	07-2025	Connection settings	st	8.11.0

Contents

1 About this documentation

This documentation describes the function and application of the software interface *ibaPDA-Interface-ibaNet-E*.

Other documentation

This documentation is a supplement to the *ibaPDA* manual. Information about all the other characteristics and functions of *ibaPDA* can be found in the *ibaPDA* manual or in the online help.

1.1 Target group and previous knowledge

This documentation is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

This documentation in particular addresses persons who are concerned with the configuration, test, commissioning or maintenance of Programmable Logic Controllers of the supported products. For the handling *ibaPDA-Interface-ibaNet-E* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge of *ibaPDA*
- Knowledge of configuration and operation of the relevant measuring device/system

1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu *Logic diagram*
Calling the menu command	*Step 1 – Step 2 – Step 3 – Step x* Example: Select the menu *Logic diagram – Add – New function block*.
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
Filenames, paths	`Filename`, `Path` Example: `Test.docx`

1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

Danger!

The non-observance of this safety information may result in an imminent risk of death or severe injury:

- Observe the specified measures.

Warning!

The non-observance of this safety information may result in a potential risk of death or severe injury!

- Observe the specified measures.

Caution!

The non-observance of this safety information may result in a potential risk of injury or material damage!

- Observe the specified measures

Note

A note specifies special requirements or actions to be observed.

Tip

Tip or example as a helpful note or insider tip to make the work a little bit easier.

Other documentation

Reference to additional documentation or further reading.

2 System requirements

The following system requirements are necessary for the use of the data interface ibaNet-E:

- *ibaPDA* v8.11.0 or higher
- License for *ibaPDA-Interface-ibaNet-E*
- With more than 16 connections you need additional *one-step-up-Interface-ibaNet-E* licenses for each additional 16 connections.
- Standard network card

For more requirements on the PC hardware used and the supported operating systems, please refer to the *ibaPDA* documentation.

Note

It is highly recommended to operate the TCP/ IP communication on a separate network segment in order to exclude a mutual influence by other network components.

License information

Order no.	Product name	Description
31.001006	ibaPDA-Interface-ibaNet-E	Data acquisition from third-party devices via ibaNet-E, 16 connections (modules)
31.101006	one-step-up-Interface-ibaNet-E	Extension license for an existing interface by 16 additional connections (modules) each. A maximum of 15 extensions permissible, in total maximum 256 connections (modules) possible.

One connection is required per configured ibaNet-E third-party device. No license is required for connecting iba devices via ibaNet-E.

3 ibaNet-E interface

The ibaNet-E interface is used for data acquisition from iba or also third-party devices using the ibaNet-E transmission protocol in *ibaPDA*, in the following called ibaNet-E devices. ibaNet-E enables fast, efficient and deterministic communication between the acquisition computer and other involved components.

Standard Ethernet cabling and standard network infrastructure can be used for data communication.

With ibaNet-E, different applications, i.e. data acquisition from several data sources as well as controlling through outputs, can be realized. Not every ibaNet-E device supports the full ibaNet-E scope of functions. Therefore, some functions may not be available for all ibaNet-E devices.

Integration in ibaPDA
The configuration of the device is performed in the *ibaPDA* software. The ibaNet-E interface is available in the interface tree by default. Device-specific modules are added to the ibaNet-E interface to acquire data from iba devices. General modules can be added to the interface to acquire data from third-party devices. The following modules can be selected at the moment:

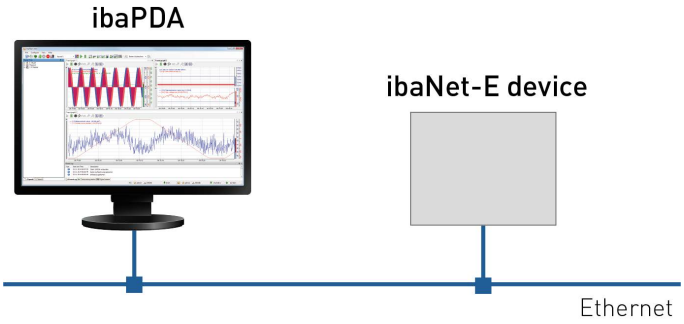
- ibaW-750
  The ibaW-750 module is used to acquire data from ibaW-750 devices. No *ibaPDA-Interface-ibaNet-E* license is required to connect iba devices. For more information please refer to the manual of the *ibaW-750* device.
- ibaNet-E generic connectionless
  This module is used to acquire data from third-party devices via ibaNet-E. The module *ibaNet-E generic connectionless* is only available if the license *ibaPDA-Interface-ibaNet-E* is present.
- ibaM-COM
  This module is used to acquire data from input modules of the ibaMAQ system. For more information please refer to the manual of the *ibaM-COM* device.
- S7 Request/S7 Request Decoder
  These two modules providing direct access on operands and symbols in a SIMATIC S7 PLC are also supported on the ibaNet-E interface. The modules are only available if the license *ibaPDA-Request-S7-DP/PN/ibaNet-E* is present. For more information please refer to the manual *ibaPDA-Request-S7-DP/PN/ibaNet-E*.
- HiPAC Request
  This module for direct access on data in a Danieli HiPAC PLC is only available if the license *ibaPDA-Request-HiPAC* is present.
- eLumina
  This module facilitates a connection to an eLumina CCU from GEVernova. The module is only available with an *ibaPDA-Interface-eLumina* license. One license allows up to 16 connections. For more information please refer to the manual of *ibaPDA-Interface-eLumina*.

3.1 System topologies

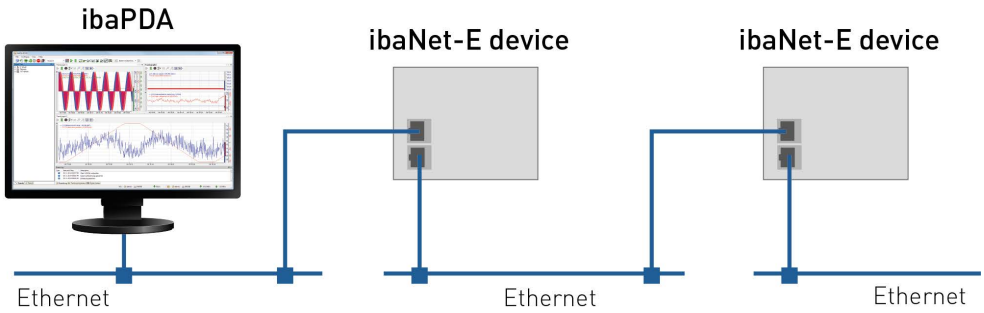
The ibaNet-E device is connected to the *ibaPDA* computer via a standard Ethernet network. The network topology is not important here.

Several connection examples are shown below.

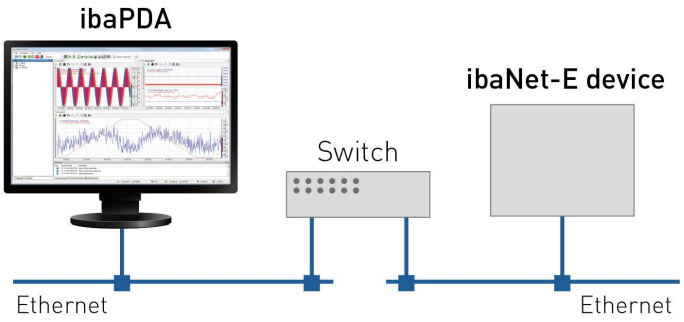
Direct connection (P2P) of the device with the *ibaPDA* computer:



Connecting multiple devices in a daisy-chain topology:



Connection via a switch or router:

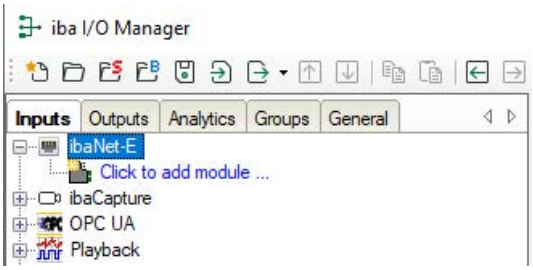


3.2 Configuration and engineering ibaPDA

Subsequently, the engineering for *ibaPDA* is described. If all system requirements are met, *ibaPDA* offers the *ibaNet-E* interface in the interface tree of the I/O Manager.

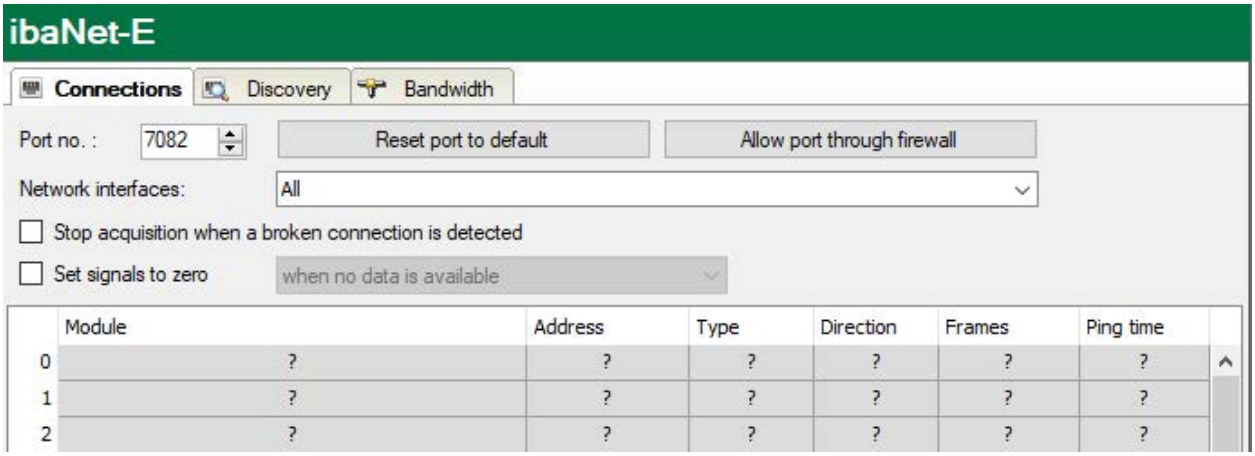
3.2.1 Settings of the ibaNet-E interface

The ibaNet-E device is connected via a standard Ethernet network card installed in the *ibaPDA* computer and the *ibaPDA* interface ibaNet-E.



3.2.1.1 Connections tab

General configuration settings for the ibaNet-E interface can be made on the *Connections* tab.



Port
Set the port for communication with the device here. Default setting: 7082

<Reset port to default>
If you have changed the port, you can reset it back to the default port.

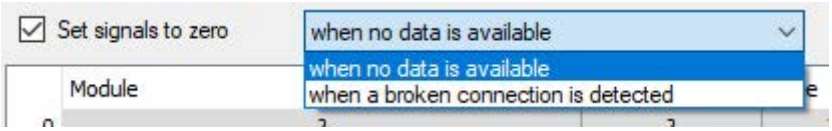
<Allow port through firewall>
When installing *ibaPDA*, the default port numbers of the protocols used are automatically entered in the firewall. If you change the port number here, you must allow this port through the firewall using this button.

Network interfaces
From the *Network interfaces* drop-down list select which network adapter on the computer you want to use for this interface. The communication ports are only opened on the selected network adapters. At least one network adapter must be selected for the interface configuration to be validated. If you select "None", an error message is displayed when validating the I/O configuration. All network adapters are selected by default.

Stop acquisition when a broken connection is detected
If a connection to an ibaNet-E device is broken, acquisition is stopped.

Set signals to zero
If the ibaNet-E connection is broken, all signals in the acquisition process are set to zero. Otherwise, the signal values would display the last current value before the connection was broken. You can choose when the signals are set to zero:

- when no data is available
- when a broken connection is detected.



All ibaNet-E connections are displayed in an overview:

Module
The name of the connected module or device.

Address
Address of the target device. If the device is connected via DHCP, the host name is displayed. Otherwise, its IP address is displayed.

Type
Type of the ibaNet-E connection.

- ACQ: Receive connection; isochronous acquisition of all values; with telegram repetitions
- PLC: Send connection; only the most recent value is sent without any repetitions if there are transmission errors

Direction
Input or output direction

- Input direction: Receiving data from the ibaNet-E device
- Output direction: Sending data to the ibaNet-E device

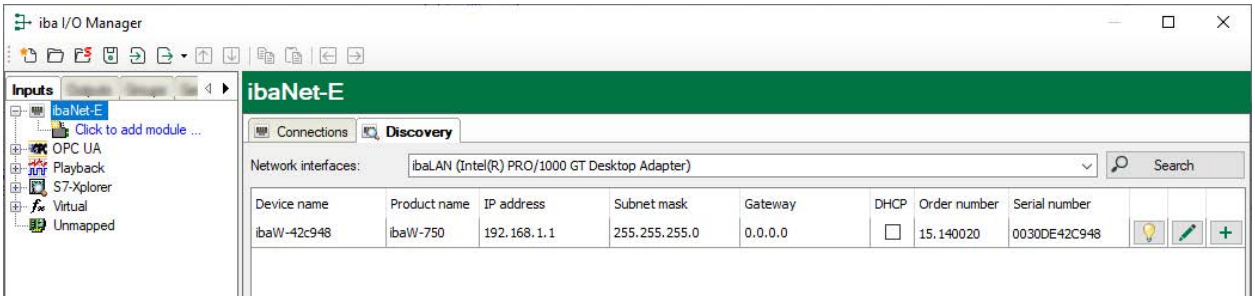
Frames
Number of telegrams for this connection.

Ping time
Current ping time for this connection.

While a valid ibaNet-E receive connection is live, a ping is sent cyclically to the ibaNet-E device. The measured time is displayed here, and indicates the connection quality of the Ethernet network. The shorter this time is, the better the connection quality, and the more secure the data transmission. If the connection quality is poor, the connection in question is highlighted in orange.

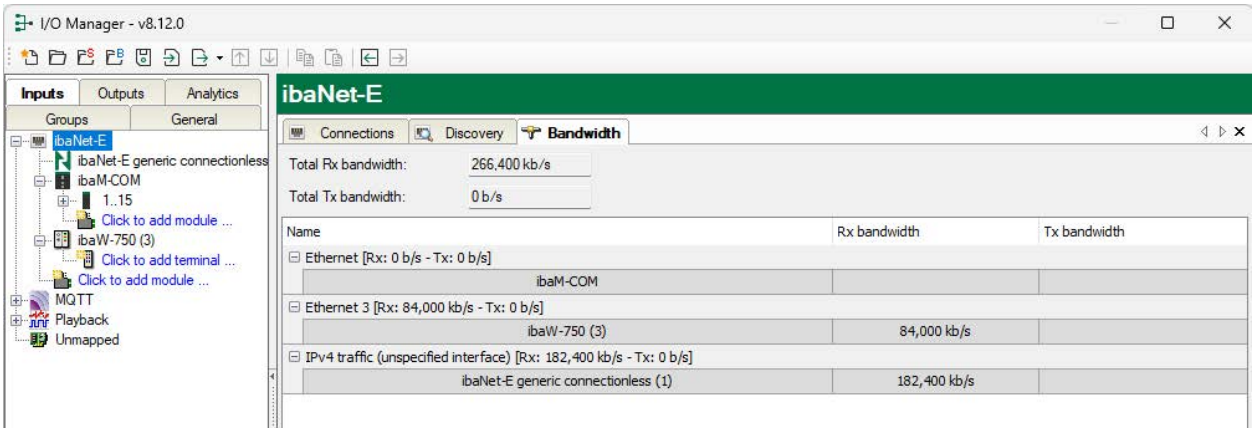
3.2.1.2 ibaNet-E – Discovery tab

The search for ibaNet-E devices only works for iba devices. In order to configure third-party devices, you have to add the *ibaNet-E generic connectionless* module manually, see chapter ↗ *Adding a module*, page 12



3.2.1.3 ibaNet-E – Bandwidth tab

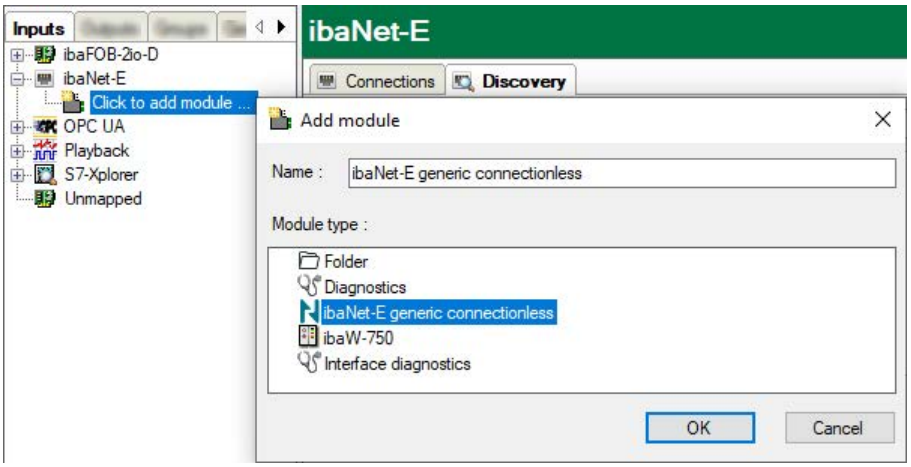
The *Bandwidth* tab provides information about network utilization. The estimated total network load in the send and receive directions is displayed, as well as the network load for the connections.



3.2.2 Adding a module

Procedure

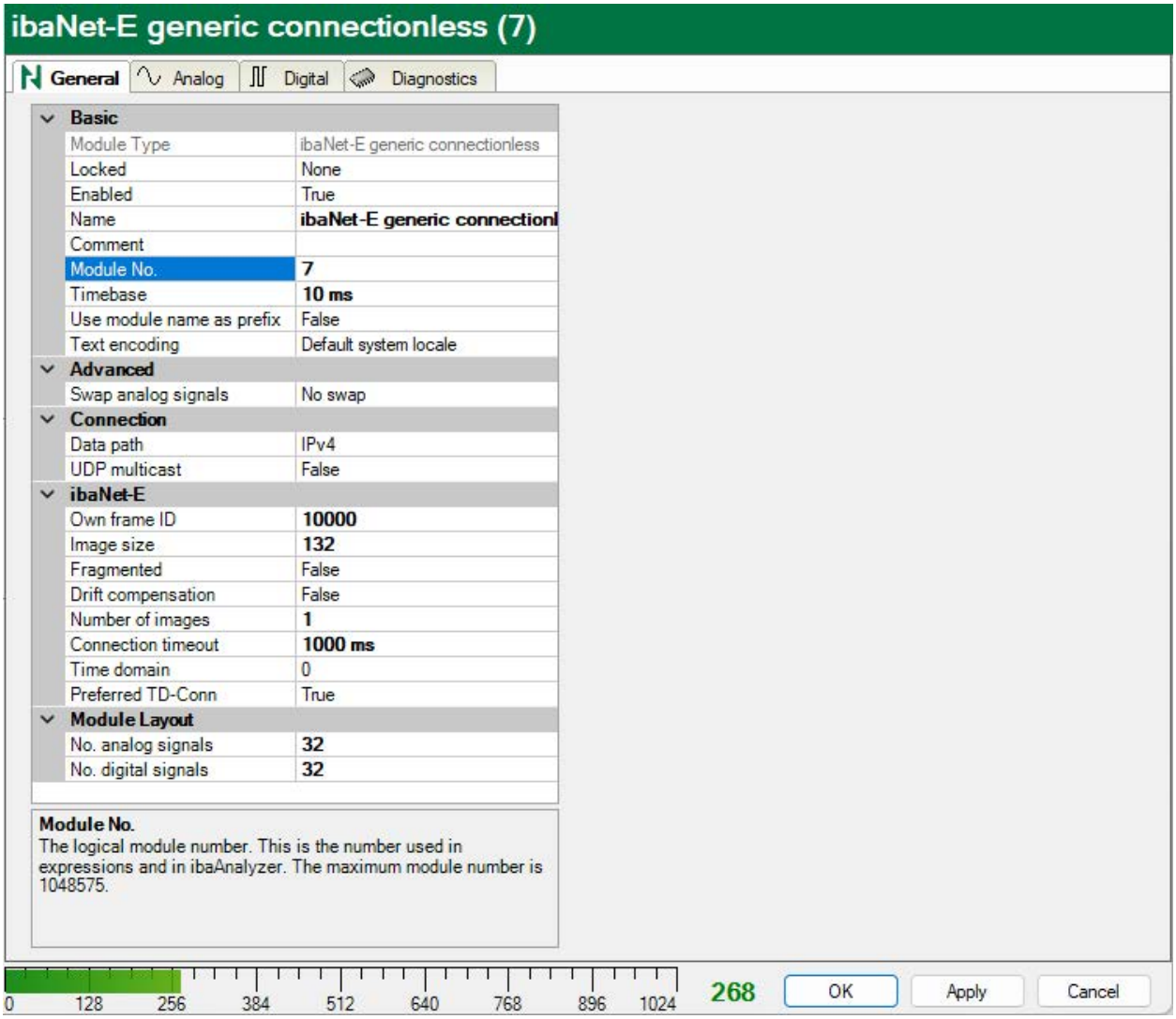
1. Mark the ibaNet-E interface in the I/O Manager.
2. Click on the blue link *Click to add module ...*
3. Select *ibaNet-E generic connectionless* and ssign a name in the input field if required.
4. Confirm the selection with <OK>.



3.2.3 General module settings

To configure a module, select it in the tree structure.

All modules have the following setting options.



Basic settings

Module Type (information only)
Indicates the type of the current module.

Locked
You can lock a module to avoid unintentional or unauthorized changing of the module settings.

Enabled
Enable the module to record signals.

Name
You can enter a name for the module here.

Comment
You can enter a comment or description of the module here. This will be displayed as a tooltip in the signal tree.

Module No.
This internal reference number of the module determines the order of the modules in the signal tree of *ibaPDA* client and *ibaAnalyzer*.

Timebase
All signals of the module are sampled on this timebase.

Use module name as prefix
This option puts the module name in front of the signal names.

Text encoding
You can select the type of text encoding or the code page here for a correct interpretation and display of the received text data for inputs as well as of the text data to be sent for outputs. Available for selection are, beside system locale according to the Windows system settings (default) and UTF-8 Unicode, all other encodings.

Advanced

Swap analog signals
Option to change the order of the byte evaluation.

ibaNet-E

Own frame ID
Own frame ID of *ibaNet-E* connection (value must be in the range 10000 to 10255)

Image size
Total number of bytes contained in one *ibaNet-E* image

Fragmented
Indicates whether one *ibaNet-E* image is fragmented or not

Drift compensation
Deactivate drift compensation if the data is sent slower than every 10 ms in order to improve the processing of the received data.

Number of images
Number of *ibaNet-E* images in one frame

Connection timeout
Time span after which the acquisition is stopped after disconnection, see ↗ *Connections tab*, page 10.

Time domain
ibaNet time domain from which the data is to be recorded

Enter the number of the ibaNet time domain here if the data belonging to this time domain is to be synchronized. When this property is set to zero (default), no time domain is used.

When using a time domain, drift compensation needs to be enabled (drift compensation = True).

Reference connection
The reference connection of a time domain is the connection to which the other connections of the same time domain are synchronized.

Module layout

No. of analog signals/digital signals
Define the number of configurable analog and digital signals in the signal tables. The default value is 32 for each. The maximum value is 65536. The signal tables are adjusted accordingly.

Connection

Data path
Protocol that will be used to transfer data between *ibaPDA* and the *ibaNet-E* device. Available are:

- IPv4 (max. telegram size 1446 bytes)
- Raw (max. telegram size 1474 bytes)

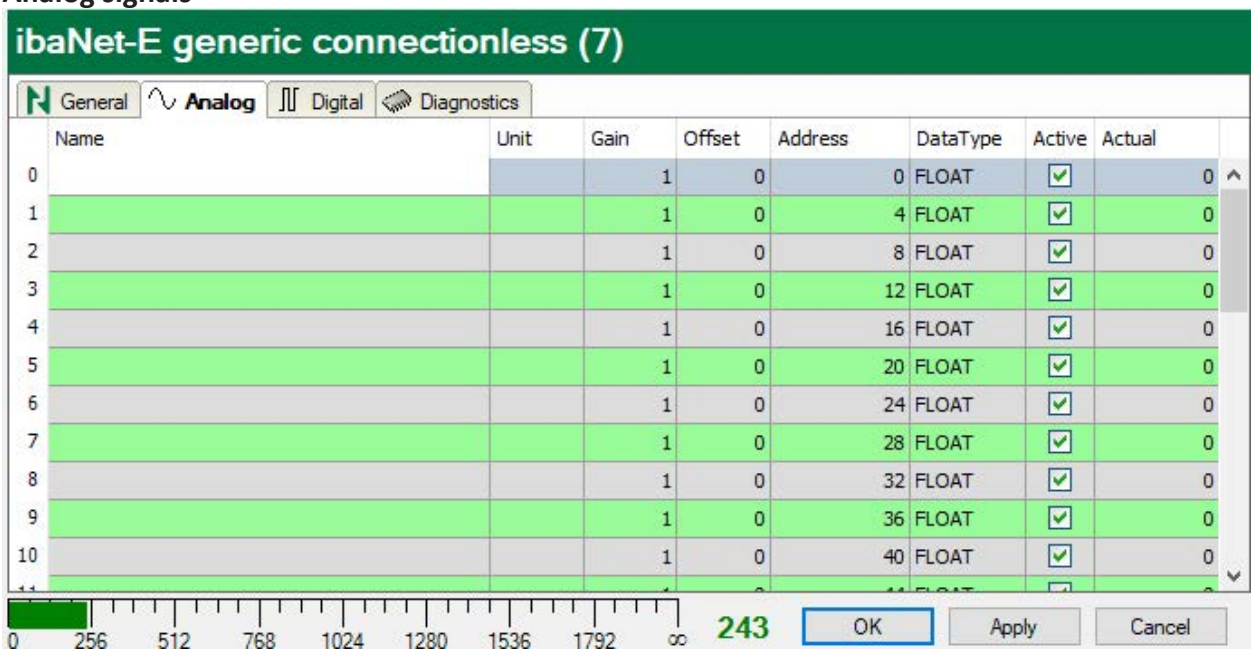
If *Raw* is selected, a network interface must be selected for *ibaPDA* to access the *ibaNet-E* device.

UDP multicast
When enabled, *ibaPDA* will subscribe to the specific multicast group to receive data. Enter the multicast IP address to which the data will be sent in the field *Multicast IP address*.

3.2.4 Signal configuration

The selection of the data to be measured is done on the side of the ibaNet-E device.

Analog signals



You can assign name, unit, scale factor, address and data type to the analog signals. Moreover, you can enable or disable the signals.

Note

For a description of the columns, please see the *ibaPDA* manual or the online help.

Specific columns for the *ibaNet-E generic connectionless* module:

Address
Address The address indicates the offset of the first byte of this value within the user data telegram. The offset can be entered as hexadecimal or decimal value by selecting the desired setting in the context menu.

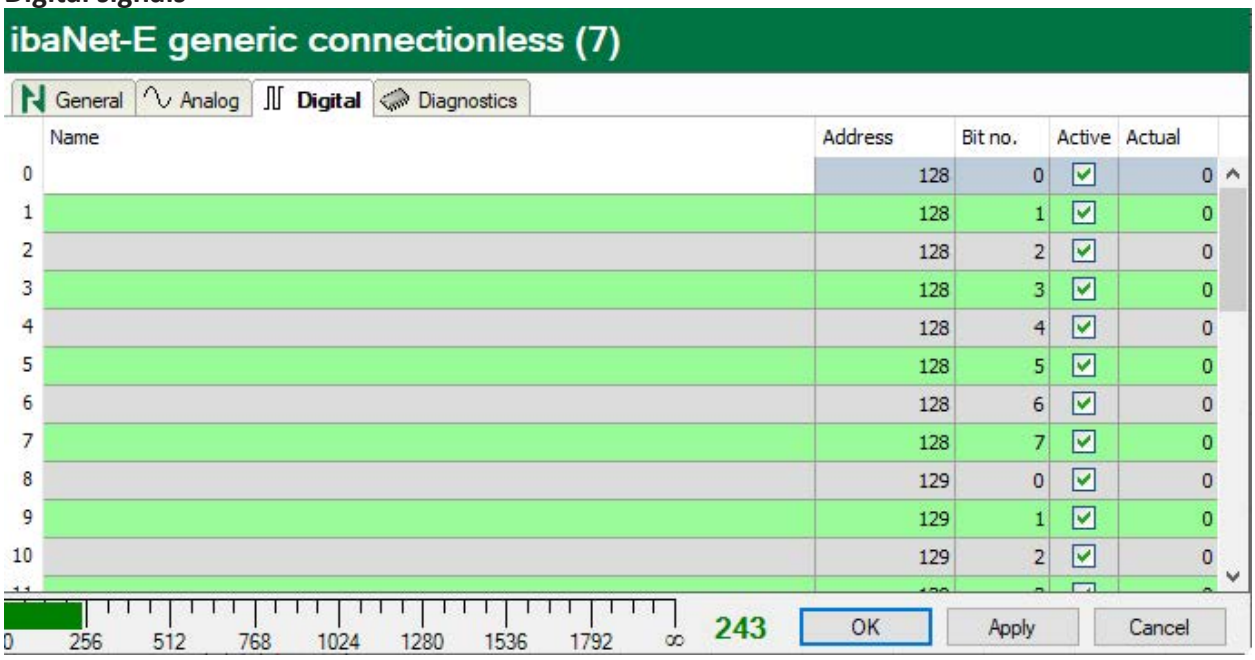
Data Type
In the fields of this column you can set the data type for each signal. Simply click in the desired field and select the data type from the drop-down list. The address range depends on the data type. This means that after a change of the data types it is necessary to adjust the address entries.

Data Type	Description	Value range
BYTE	8 bit without positive or negative sign	0 … 255
INT	16 bit with positive or negative sign	-32768 … 32767
WORD	16 bit without positive or negative sign	0 … 65535
DINT	32 bit with positive or negative sign	-2147483648 … 2147483647
DWORD	32 bit without positive or negative sign	0 … 4294967295
FLOAT	IEEE754; single precision; 32 bit floating point	$1{,}175 \cdot 10^{-38}$ …$3{,}403 \cdot 10^{38}$

Tip

If you enter the signals continuously, only the data types for all signals have to be set and then the byte addresses of the signals are calculated automatically. To do this, enter the correct byte address in the Address column for the first signal only and then click the column header. Starting from the first address (where the cursor is located) and considering the data types, the addresses of the further signals are entered automatically.

Digital signals



You can assign name and address to the digital signals. Moreover, you can enable or disable the signals.

The digital signals are addressed via the columns *Address* and *Bit no*.

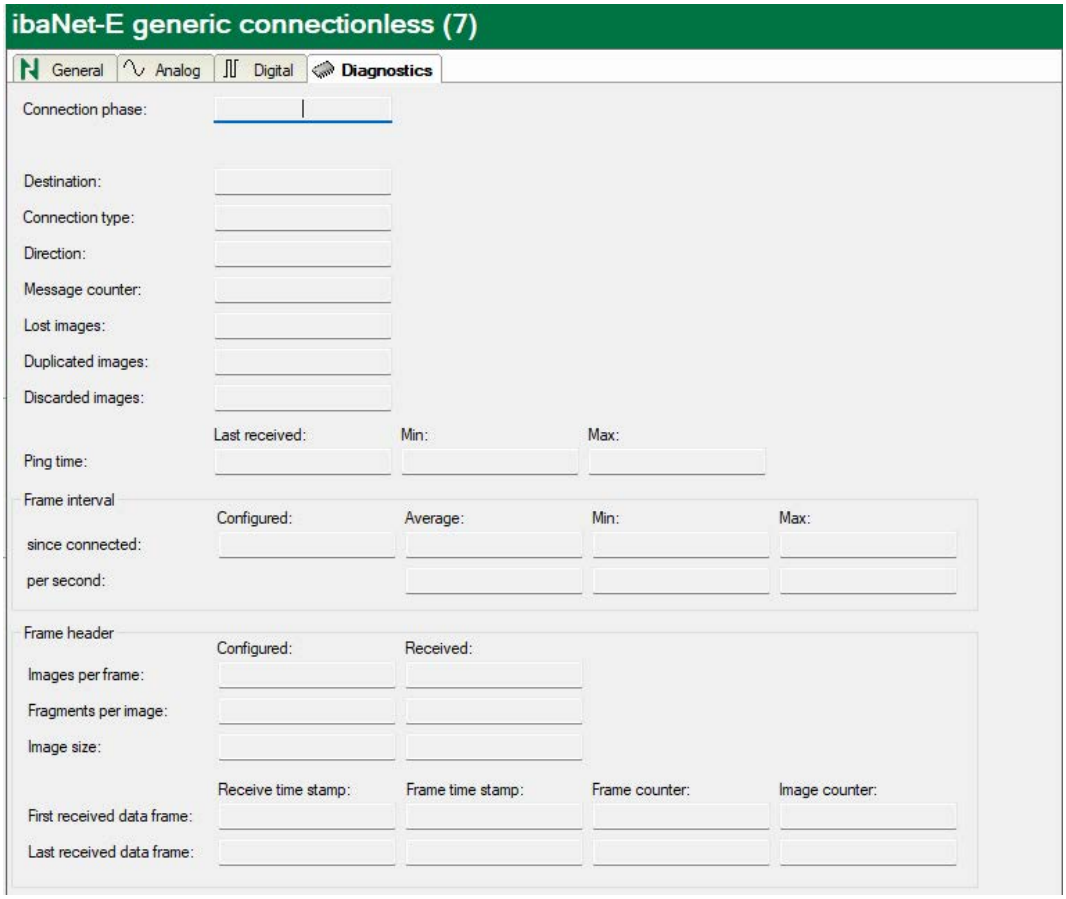
4 Diagnostics

4.1 License check

If the module "ibaNet-E generic connectionless" cannot be added to the ibaNet-E interface in the module tree, you can either check in *ibaPDA* in the I/O Manager under *General* - *Settings* or in the *ibaPDA* service status application, if your license "Interface ibaNet-E" is detected properly. The number of licensed connections is shown in brackets.

4.2 Diagnostics in the I/O Manager

The *Diagnostics* tab of the ibaNet-E generic connectionless module provides information about the ibaNet-E connection.



Connection phase
Each ibaNet e-connection can be in different connection phases.

ibaNet-E connection phase	Color	Meaning
ONLINE	green	Connection; connection quality is OK
	orange	Connection; connection quality is not optimal
STOP_WAIT	red	Connection timeout; waiting for reinitialization
SEND_TADJUST	red	Connection setup; time synchronization
WAIT	red	Connection setup
WAIT_SYNCRESP	red	Connection interruption

Destination
Communication partner (ANY: undefined)

Connection type
Type of the ibaNet-E connection.

- ACQ: Connection for receiving data; all values are received, acquired isochronously and also repeated if there are transmission errors.
- PLC: Connection for sending data; only the most recent value is sent without any repetitions if there are transmission errors.

Direction
Input or output direction

- IN: Receiving data from the ibaNet-E device.
- OUT: Sending data to the ibaNet-E device

Message counter
Number of messages for this connection

Lost/duplicated/discarded images
Number of the lost, duplicated and discarded images

Ping time
Current, maximum and minimum ping time for this connection

The ping time is a characteristic of the connection quality for the Ethernet network. The shorter this time is, the better the link quality and the more reliable the data transmission.

Frame interval
Time between two frames

The current, maximum, and minimum time between two frames is measured.

Frame header
Information in the frame header: Images per frame, fragments per image, image size

4.3 Log files

If connections to target platforms or clients have been established, all connection-specific actions are logged in a text file. You can open this (current) file and, e.g., scan it for indications of possible connection problems.

You can open the log file via the button <Open log file>. The button is available in the I/O Manager:

- for many interfaces in the respective interface overview
- for integrated servers (e.g. OPC UA server) in the *Diagnostics* tab.

In the file system on the hard drive, you can find the log files of the *ibaPDA* server (…\ProgramData\iba\ibaPDA\Log). The file names of the log files include the name or abbreviation of the interface type.

Files named `interface.txt` are always the current log files. Files named `Interface_yyyy_mm_dd_hh_mm_ss.txt` are archived log files.

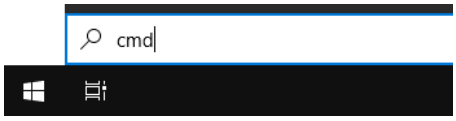
Examples:

- `ethernetipLog.txt` (log of EtherNet/IP connections)
- `AbEthLog.txt` (log of Allen-Bradley Ethernet connections)
- `OpcUAServerLog.txt` (log of OPC UA server connections)

4.4 Connection diagnostics with PING

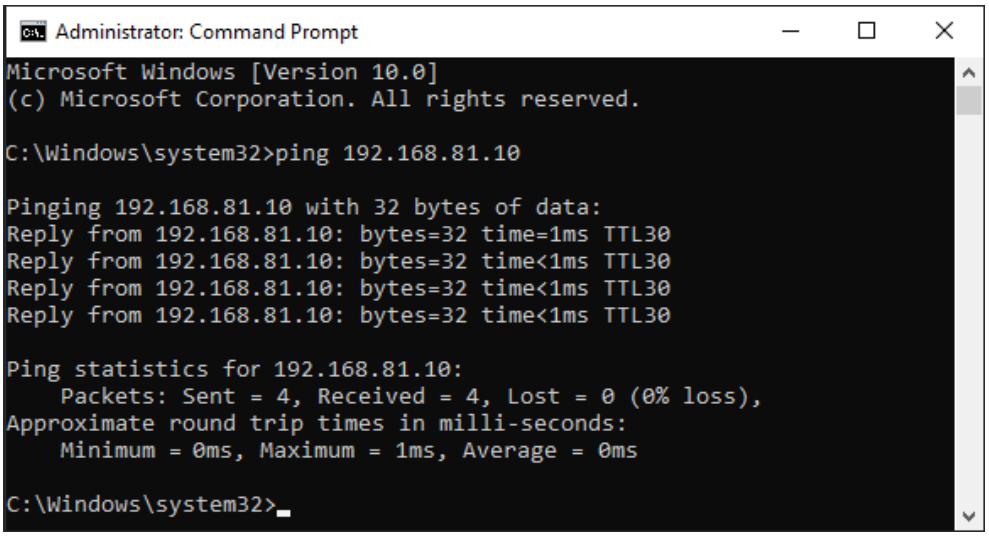
PING is a system command with which you can check if a certain communication partner can be reached in an IP network.

1. Open a Windows command prompt.

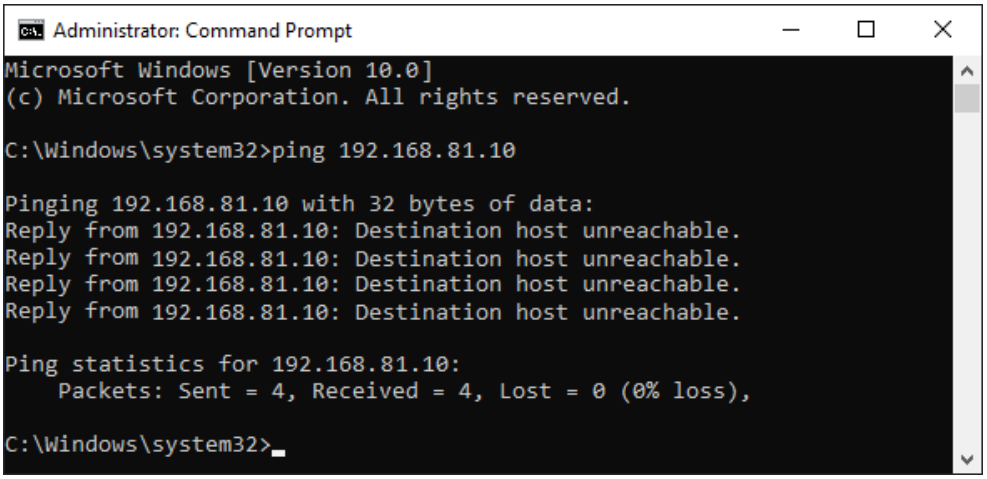


2. Enter the command "ping" followed by the IP address of the communication partner and press <ENTER>.

→ With an existing connection you receive several replies.

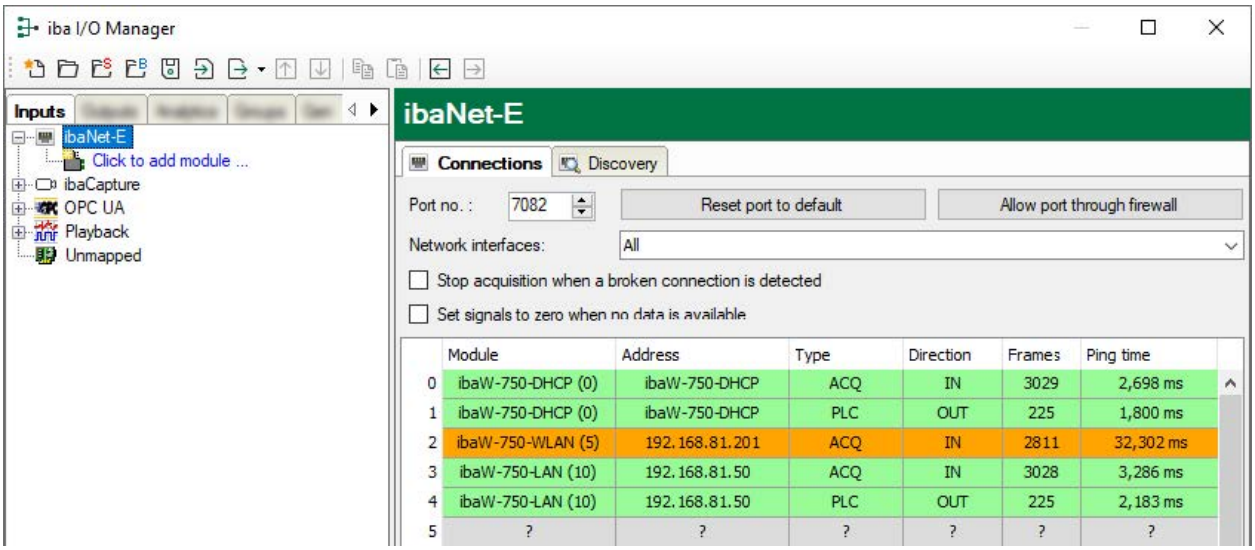


→ With no existing connection you receive error messages.



4.5 Checking the connection

After applying the configuration, the connection is displayed in the *Connection* tab:



Description see chapter ↗ *Connections tab*, page 10.

5 Support and contact

Support

Phone: +49 911 97282-14

Email: support@iba-ag.com

Note

If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

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