ibaPDA-Interface-ibaNet-E

Data interface for ibaNet-E

Manual

Issue 2.0

Measurement Systems for Industry and Energy

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The content of this publication has been checked for compliance with the described hardware and software. Nevertheless, discrepancies cannot be ruled out, and we do not provide guarantee for complete conformity. However, the information furnished in this publication is updated regularly. Required corrections are contained in the following regulations or can be downloaded on the Internet.

The current version is available for download on our web site www.iba-ag.com.

Version	Date	Revision	Author	Version SW
2.0	09-2023	New version ibaPDA v8	st	8.0.0

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Contents

1   About this documentation

This documentation describes the function and application of the software interface

ibaPDA-Interface-ibaNet-E.

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 addresses qualified professionals, who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as a professional if he/she is capable of assessing the work assigned to him/her and recognizing possible risks on the basis of his/her specialist training, knowledge and experience and knowledge of 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 of *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* v8.0.0 or higher

■ License for *ibaPDA-Interface-ibaNet-E*

■ With more than 2 connections you need additional *one-step-up-Interface-ibaNet-E* licenses for each additional 2 connections.

■ Standard network card

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

Note

i	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, 2 connections (modules)
31.101006	one-step-up-Interface-ibaNet-E	Extension license for an existing interface by 2 additional connections (modules) each. A maximum of 126 extensions permissible, in total maximum 254 connections (modules) possible.

Table 1: Available ibaNet-E interface licenses

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

3.1   General information

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. For further information, please refer to the ibaW-750 manual. No *ibaPDA-Interface-ibaNet-E* license is required to connect iba devices.

- 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.

- 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.

- 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.
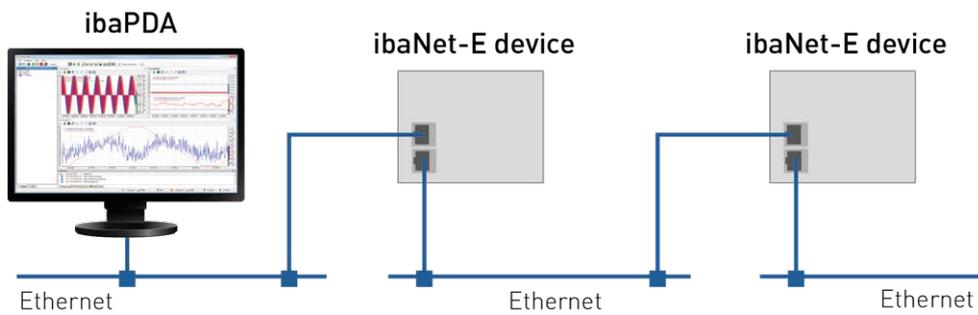
3.2   System topologies

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

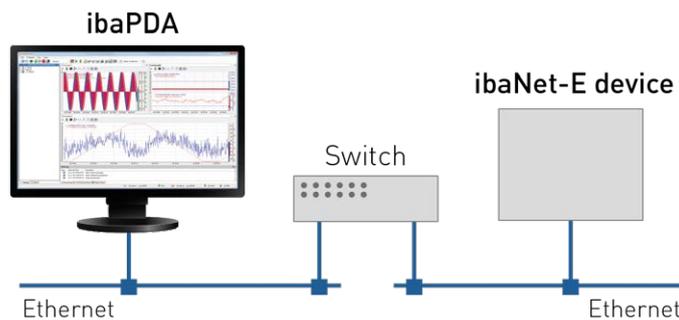Several connection examples are shown below.

Direct connection (P2P) of the device with the *ibaPDA* computer:
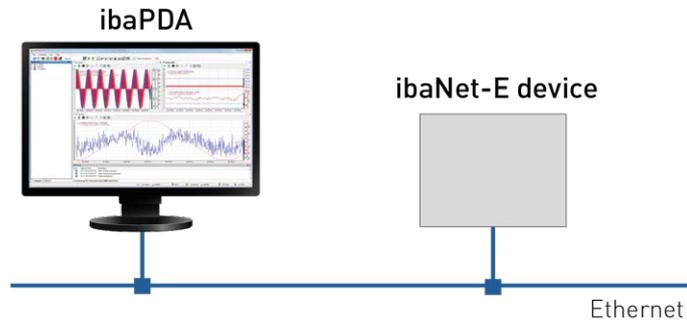
Connecting multiple devices in a daisy-chain topology:
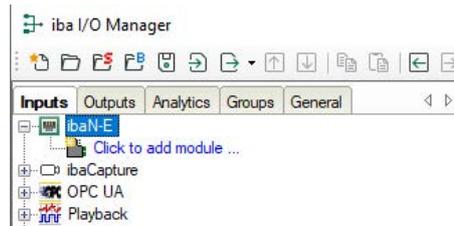

Connection via a switch or router:

3.3   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.

3.3.1   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.

3.3.1.1   Connections tab

General configurations for the ibaNet-E interface can be made in this tab:

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

Set signals to zero when no data is available
If the ibaNet-E connection is broken, all signals in the acquisition are set to zero. Otherwise, the signal values would show the last current value before the connection was lost.

All ibaNet-E connections are displayed in an overview. The connections to third-party devices are displayed only after they have been successfully configured.

Module
The name of the connected module or device.

Destination
Host name or IP-address of the destination device

If the device is connected via DHCP, the host name is displayed. Otherwise, its IP ad-dress is dis-played.

Type
Type of the ibaNet-E connection.

- ACQ: Typical connection type for a receive connection
  (Isochronous acquisition and telegram repetitions).

- PLC: Typical connection type for a send connection
  (always the most current value is sent, no repetition of sending in case of loss).

Direction
Input or output direction

- Input direction: Receiving data from the ibaNet-E device.

- Output direction: Send data to the ibaNet-E device

Messages
Number of telegrams for this connection

Ping time
Current ping time for this connection

A ping to the ibaNet-E device is performed cyclically during a valid ibaNet-E receive connection.

The measured time is displayed here and is a reference for the link quality of the Ethernet. The shorter this time is, the better the link quality and the more reliable the data transmission.

If the link quality is poor, the corresponding connection is highlighted in orange.
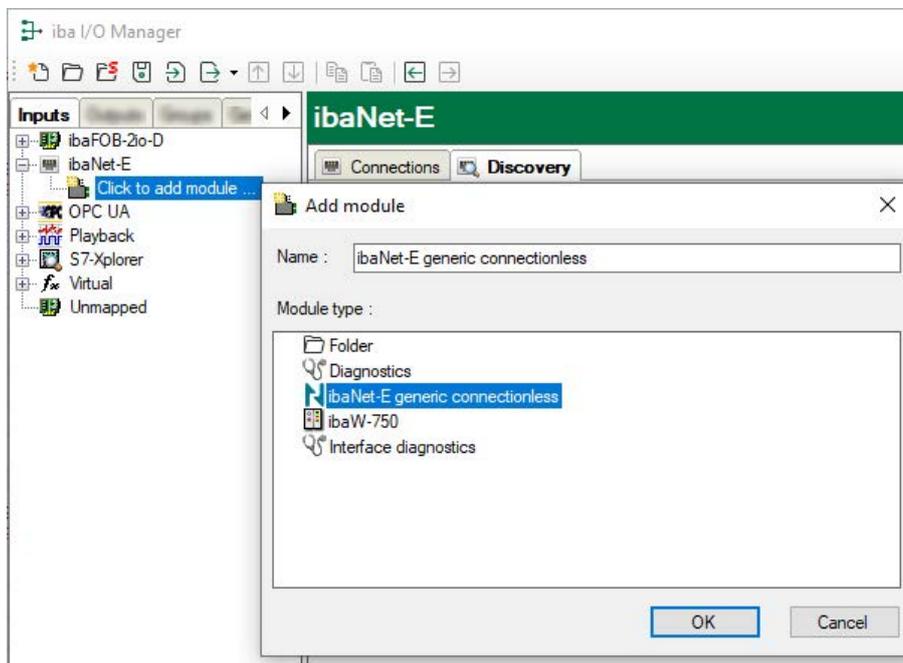
3.3.1.2   Discovery tab
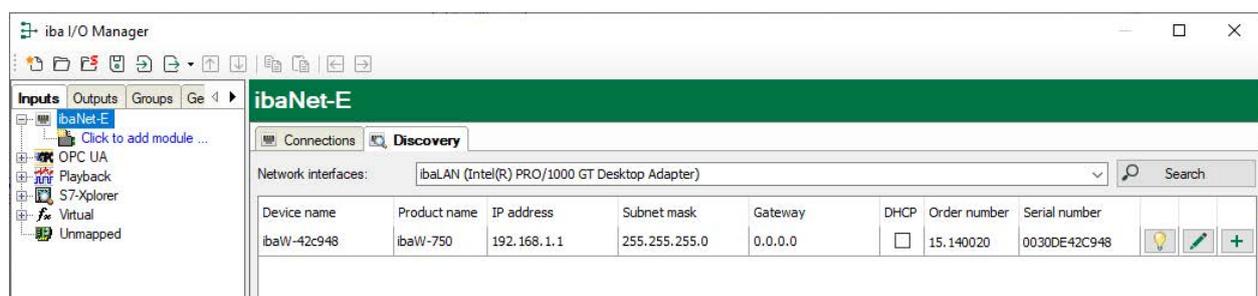
The search for ibaNet-E devices only works for iba devices. In order to configure third-party de-vices, you have to add the *ibaNet-E generic connectionless* module manually, see chapter ↗ *Ad-ding a module*, page 11

3.3.2   Adding a module

Mark the ibaNet-E interface in the I/O Manager, click on the link *Click to add module …* and se-lect *ibaNet-E generic connectionless*.

3.3.3 General module settings

The module has the following settings:

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.

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 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 10000-10255)

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

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

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 9

Module layout

No. analog signals
Defining the number of analog signals for this module

No. digital signals
Defining the number of digital signals for this module

Connection

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

- IPv4

- Raw

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*.

3.3.4   Signal configuration

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

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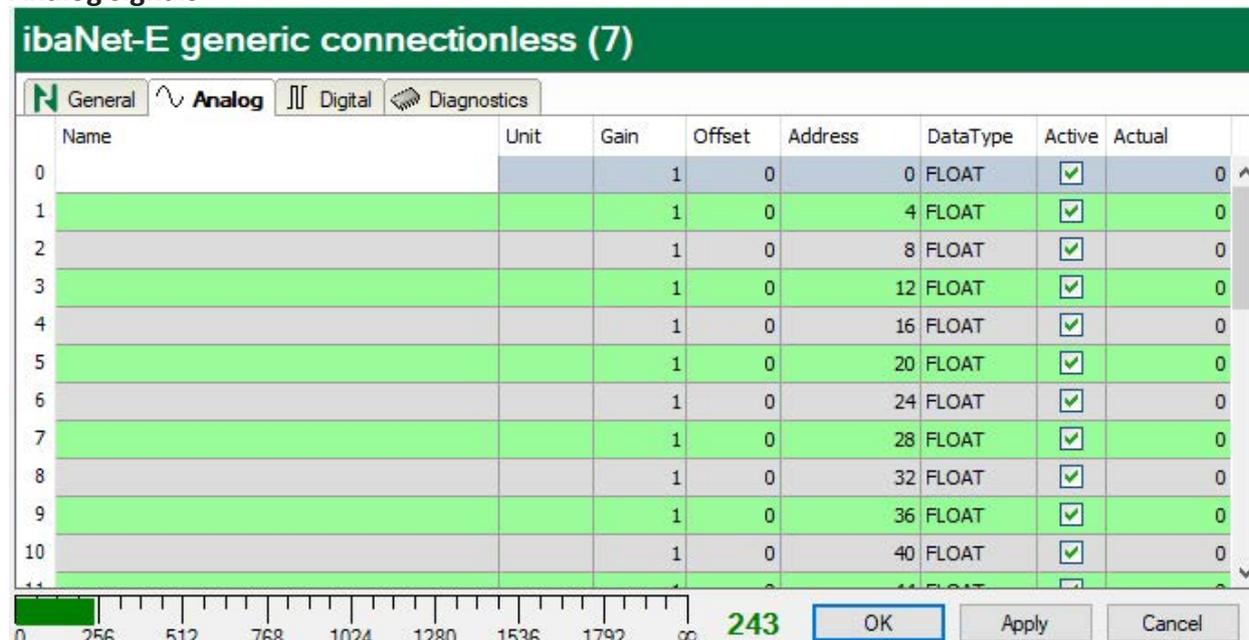
You can assign name, unit, scale factor, address and data type to the analog signals. Moreover, you can enable or disable the signals.

Note

i	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

Data Type	Description	Value range
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	$1{,}175 \cdot 10^{-38} \dots 3{,}403 \cdot 10^{38}$

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.
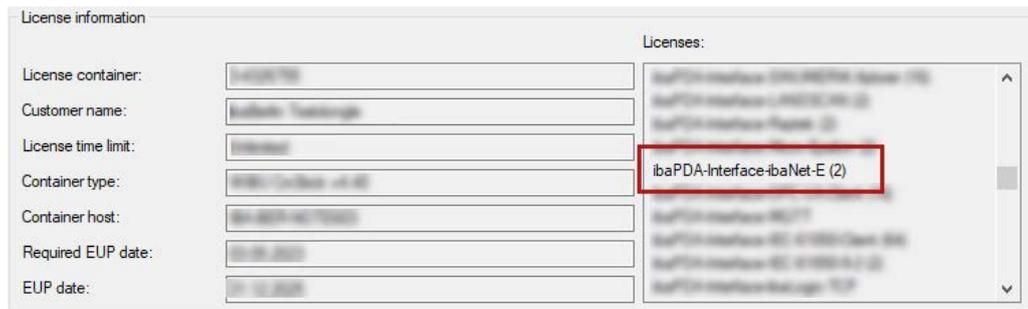
4.2   Log files

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:
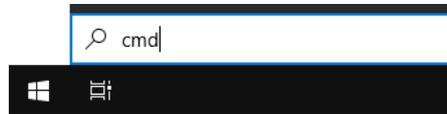
■ ethernetipLog.txt (log of EtherNet/IP connections)

■ AbEthLog.txt (log of Allen-Bradley Ethernet connections)

■ OpcUAServerLog.txt (log of OPC UA server connections)

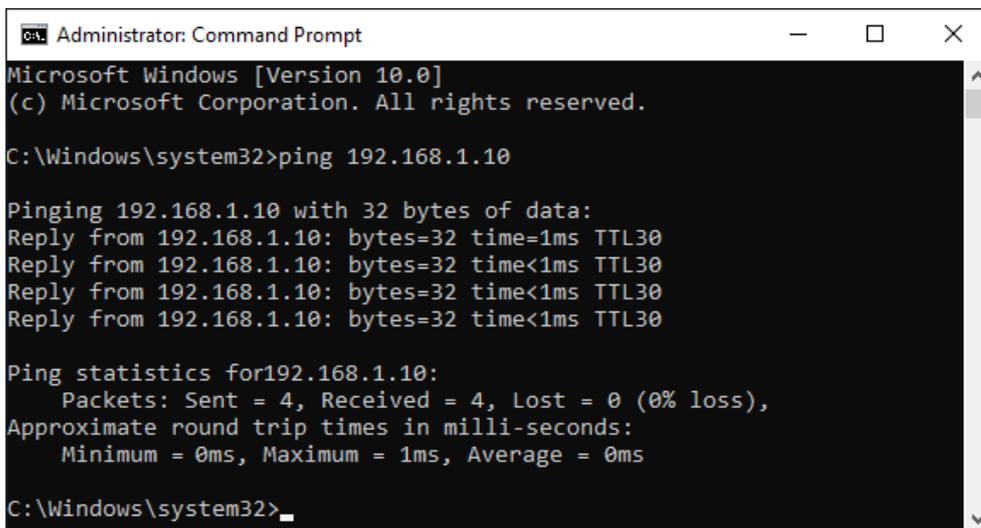## 4.3   Connection diagnostics with PING

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.

4.4   Checking the connection

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

	Module	Destination	Type	Direction	Messages	Ping time
0	ibaW-750-DHCP (0)	ibaW-750-DHCP	ACQ	IN	3139	3,296 ms
1	ibaW-750-DHCP (0)	ibaW-750-DHCP	PLC	OUT	233	2,044 ms
2	ibaW-750-WLAN (5)	192.168.41.201	ACQ	IN	2977	74,049 ms
3	ibaW-750-LAN (10)	192.168.1.50	ACQ	IN	3141	3,108 ms
4	ibaW-750-LAN (10)	192.168.1.50	PLC	OUT	233	1,782 ms
5	?	?	?	?	?	?
6	?	?	?	?	?	?

Description see chapter ⌝ *Connections tab*, page 9

5 Support and contact

Support

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Note

> **i** 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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