ibaM-COM

Communication module for the ibaMAQS modular system

Manual

Issue1.2

Measurement Systems for Industry and Energy

www.iba-ag.com

Manufacturer

iba AG

Koenigswarterstraße 44

90762 Fuerth

Germany

Contacts

Headquarters	+49 911 97282-0
Support	+49 911 97282-14
Engineering	+49 911 97282-13
E-Mail	iba@iba-ag.com
Web	www.iba-ag.com

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1.2	10-2025	Miscellaneous supplements, system status module	ms-st	1.05.001

Certification

The product is certified according to the European standards and directives. This product meets the general safety and health requirements.

Other international and national standards were observed.

Contents

1 About this documentation

This documentation describes the design, application and operation of the device *ibaM-COM*.

1.1 Target group

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.

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 About ibaM-COM

The *ibaM-COM* communication module is part of the ibaMAQS Modular Acquisition System. *ibaM-COM* can be used as an alternative to the *ibaM-DAQ* processor module to build a module series. In contrast to the *ibaM-DAQ* processor module, *ibaM-COM* does not offer an integrated *ibaPDA* system.

This module is designed for applications that do not require local measured value processing and recording as with *ibaM-DAQ*. *ibaM-COM* allows the transmission of decentrally acquired measured values via Ethernet to a central *ibaPDA* system.

ibaPDA systems with widely branched I/O peripherals can be built up in this way. In addition to measurement data acquisition, *ibaM-COM* is also used for outgoing communication, as well as for configuration of the individual modules in *ibaPDA*.

Thanks to the two ibaNet connections, the iba network can be extended from module node to module node. Since the communication via ibaNet-E can also use a computer's standard network interface, I/O, bus and technological modules can also be connected to a virtual *ibaPDA* server. ibaNet-E capable devices can also be integrated via the ibaNet interfaces.

Use of additional iba devices via fiber optics

The *ibaM-FO-2IO* interface module offers the functionality of the proven ibaFOB-io board, and supports the 32Mbit Flex and 32Mbit ibaNet protocols. If corresponding iba devices are already available, or if no suitable ibaMAQS modules are available for certain tasks, then devices like the ibaPADU family, iba bus monitors or system interfaces can be connected to the ibaMAQS system via *ibaM-FO-2IO*.

The *ibaBM-COL-8i-o* data concentrator can also be used to connect iba devices with the 3Mbit ibaNet protocol.

Up to two *ibaM-FO-2IO* modules are supported on the *ibaM-COM* communication module.

At a glance

- max. 15 modules can be mounted
- Data throughput typ. 512 Mbit/s
  - depending on the number of modules installed, the time base of the modules set in *ibaPDA*, and the signal selection or number of signals in the *ibaPDA* configuration, among other factors
  - display of utilization in *ibaPDA*
- ibaNet-E HP (High Performance) capable in combination with an *ibaN-2E* card (PCI Express card for ibaNet-E connections)

3 Scope of delivery

After having unpacked the delivery, please check it for completeness and possible damage. The scope of delivery comprises:

- *ibaM-COM* device
- Covering caps for Ethernet
- 3-pin connector, push-in (power supply)
- ibaM-CoverPlate end cover
- "iba Software & Manuals" data medium

4 Safety and other instructions

Note

Work on the system, as well as mounting and dismounting, must only be carried out by trained and qualified specialists.

Careful working methods and compliance with safety measures when working with electrical devices of all types must be observed.

Note

Observe this danger sign:

In all cases where this danger sign is displayed, refer to the manual to find out more about the nature of the potential hazards and the measures that must be taken to avoid them.

4.1 Intended Use

The device is an electrical operating resource. It must only be used for the following applications:

- Measurement data acquisition and analysis
- Applications of software products (*ibaPDA*, *ibaLogic* etc.) and hardware products from iba AG

The device must only be used as specified in the *Technical data* chapter, and is designed and approved for continuous operation.

Danger!

Electric shock

If the device is used or operated in a manner other than specified in the *Technical data* chapter, the protection supported by the device may be impaired.

4.2 Special safety instructions

Danger!

Operation

- The system must only be operated permanently connected and not touchable, only in a building (in-door) and only in a fire protection housing in accordance with IEC 61010-1.
- The system must only be operated with a mounted end cover.
- The external power supply/power supply unit for supplying the central unit and thus for the complete system must be tested for use with this system in accordance with IEC 61010-1.
- Modules from this system must only be operated with a central processing unit from this system.
- The supply voltage for this system must only be fed from this system via a central unit.
- The supply may only be provided via an energy-limited circuit in accordance with IEC 61010-1 and must either include a fuse that trips after 120 s at the latest in the event of an overcurrent greater than 4 A or limit the total current of the system to 4 A.
- In addition to their own current consumption from the supply voltage via the module-module interface, the central units and the modules also pass on the supply voltage for other connected modules, so that the module-module interfaces may have to carry the maximum specified total current of the system.
- Only a maximum of 15 modules may be installed next to the central unit.

Danger!

Duty of care

Take care when working on the system and always check that the system and the modules themselves are in perfect condition, as well as ensuring that they are properly installed and correctly attached to the DIN rail.

If damage to cables, devices, supplies or enclosures is detected before commissioning or during operation, the system must not be put into operation or must be taken out of operation immediately.

Warning!

Compliance with the supply voltage range

A higher supply voltage may destroy the device!

Never supply the device with a voltage other than 24 V DC!

Warning!

This is a class A device. This equipment can cause harmful interference in a residential area. In this case, the operator will be required to take appropriate measures.

Warning!

Mounting and dismounting / Disconnection from the grid

Work on the device or system may only be carried out when the power is switched off!

Due to the modular concept of this system, modules connected in series with this module can also carry dangerous voltages.

All energized components of all modules in the system must therefore be disconnected from the grid before mounting and dismounting.

In addition to disconnecting the power supply at the system's central unit, the signal plugs and connections of all modules in the system must also be de-energized or disconnected from the grid.

Caution!

A suitable disconnecting device for this system must be available and disconnect all energized components of this system.

This disconnecting device must include a switch or circuit breaker that is easily accessible at a suitable location in the vicinity and is also clearly marked as a disconnecting device for this system.

Note

Do not switch off the device in an uncontrolled way, such as by disconnecting the supply voltage. This can lead to data loss. So always shut down the device properly.

Note

A power supply unit with safety extra-low voltage and corresponding power limitation must be provided.

Protect the device against uncontrolled voltage dips/drops of the power supply unit with an uninterruptible power supply (UPS) or at least with an external buffer module.

Note

Do not open the device! Opening the device results in a loss of warranty!

Note

The device does not require any special cleaning or maintenance!

However, if you want to carry out an inspection, return the device to iba.

5 System requirements

Hardware

For operation

- Power supply 24 V DC SELV

For device parameterization and operation

- *ibaPDA* client via network connection

Software

- *ibaPDA* version 8.12.0 or higher for device configuration and for measuring and recording data

Firmware

- ibaMAQS version 01.05.001 or higher

6 Mounting and dismounting

Danger!

Operation

- The system must only be operated permanently connected and not touchable, only in a building (in-door) and only in a fire protection housing in accordance with IEC 61010-1.
- The system must only be operated with a mounted end cover.
- The external power supply/power supply unit for supplying the central unit and thus for the complete system must be tested for use with this system in accordance with IEC 61010-1.
- Modules from this system must only be operated with a central processing unit from this system.
- The supply voltage for this system must only be fed from this system via a central unit.
- The supply may only be provided via an energy-limited circuit in accordance with IEC 61010-1 and must either include a fuse that trips after 120 s at the latest in the event of an overcurrent greater than 4 A or limit the total current of the system to 4 A.
- In addition to their own current consumption from the supply voltage via the module-module interface, the central units and the modules also pass on the supply voltage for other connected modules, so that the module-module interfaces may have to carry the maximum specified total current of the system.
- Only a maximum of 15 modules may be installed next to the central unit.

The modular system is designed as follows and is to be mounted on the DIN rail:

- Central unit on the far left
- Up to 15 modules to the right of the central unit
- End cover on the far right to protect the contacts

Make sure that the modules

- are properly secured to the DIN rail and
- are correctly positioned in the side guide rails.

Check the correct fitting of the modules after mounting by a visual inspection.

Note

An end cover is included in the scope of delivery of the central unit.

The end cover is also available as an accessory or spare part from iba.

Installation clearances

Ensure a minimum clearance of the entire system of 30 mm upwards and downwards and 10 mm to the right and left for sufficient ventilation of the device.

6.1 Disconnection from the grid

To enable safe, hazard-free work on the system, all live components in the system must be disconnected from the grid.

Warning!

Mounting and dismounting / Disconnection from the grid

Work on the device or system may only be carried out when the power is switched off!

Due to the modular concept of this system, modules connected in series with this module can also carry dangerous voltages.

All energized components of all modules in the system must therefore be disconnected from the grid before mounting and dismounting.

In addition to disconnecting the power supply at the system's central unit, the signal plugs and connections of all modules in the system must also be de-energized or disconnected from the grid.

Caution!

A suitable disconnecting device for this system must be available and disconnect all energized components of this system.

This disconnecting device must include a switch or circuit breaker that is easily accessible at a suitable location in the vicinity and is also clearly marked as a disconnecting device for this system.

6.2 Central unit

Mounting

- Lift the green lever upwards and place the device onto the rail.
- Hold the device firmly and push the lever down again to lock the device onto the rail.
- If no further modules are mounted, mount the end cover.

Connecting

- Connect the Ethernet cable(s) to one of the network interfaces X2 or X3.
- Connect the 24 V DC power supply with the correct polarity and switch on the device.

Dismounting

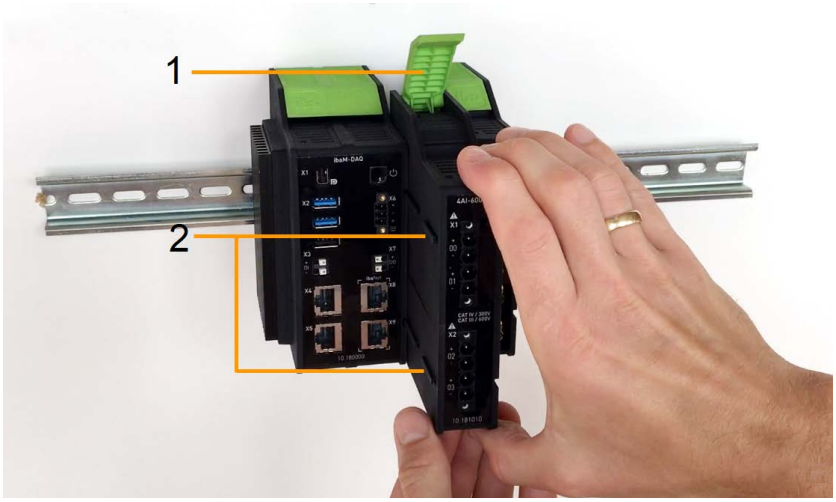
- Shut down the processor module and switch off the power supply.
- Remove all connections from the processor module.
- Grasp the module at the top and bottom with one hand and lift the green lever upwards to release the lock on the DIN rail.
- Pull the module forward.
- Push down the green lever.

6.3 Modules

Mounting

- Shut down the system and/or switch off the power supply.
- Disconnect the power supply and the entire system from the mains as instructed in chapter ↗ *Disconnection from the grid*, page 15.

- Remove the end cover, if present.
- Lift the green lever of the module upwards.
- Push the module backwards along the guide rails onto the DIN rail.
- Push down on the green lever.
- To protect the side contacts from dirt and damage, install the end cover on the last module.
- Switch on the power supply.
- Start the system.



1 Green lever for locking and releasing the modules

2 Guide rails

Dismounting

- Shut down the system and/or switch off the power supply.
- Disconnect the power supply and the entire system from the mains as instructed in chapter ↗ *Disconnection from the grid*, page 15.
- Remove all connections from the module that is to be dismounted.
- If you want to dismount the module on the far right, first remove the end cover. This is mounted again on the last module on the right after the module has been dismounted.
- Grasp the module at the top and bottom with one hand and lift the green lever upwards to release the lock on the DIN rail.
- Pull the module forward along the guide rails.
- Push down on the lever.

6.4 End cover

The rightmost module is terminated on the right side with the end cover ibaM-CoverPlate.

Mounting

- Push this end cover along the guide rail until the cover snaps into place.

Dismounting

- Push this end cover forward along the guide rail.

Note

An end cover is included in the scope of delivery of the central unit.

The end cover is also available as an accessory or spare part from iba.

6.5 Connection technology connector

Caution!

You must only connect one conductor to each terminal connection.

Several individual conductors, whether single-wired or fine-wired, are not permitted.

Only connectors classified by iba may be used for connecting conductors.

Connection technology power supply connector

Connection technology	Push-in			
Clamping range	0.14 - 1.5 mm^2			
Cable cross-sections				
Single wired	0.14 - 1.5 mm^2			
Fine wired	0.14 - 1.5 mm^2			
With wire end ferrule	0.25 - 1.5 mm^2			
With wire end ferrule/ collar	0.25 - 1.0 mm^2			
Stripping length				
Cross-section	0.5 mm^2	0.75 mm^2	1.0 mm^2	1.5 mm^2
Single wired	9 mm			
Fine wired				
With wire end ferrule	10 mm			
With wire end ferrule/ collar	12 mm			-
Recommended cables				
Single wired	H05V-U; H07V-U			
Fine wired	H05V-K; H07V-K			
Screwdriver blade	0.4 mm x 2.5 mm			
Tightening torque connector	0.3 Nm			

Caution!

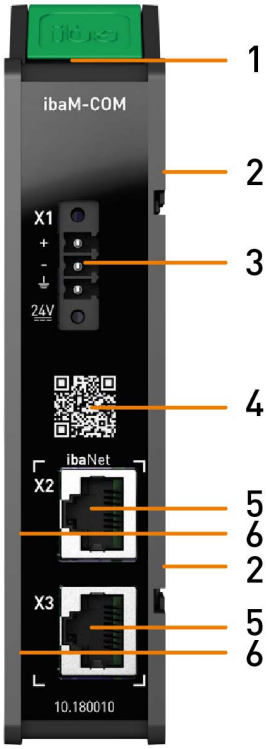
Supply and measuring cables

- Do not use damaged supply and measuring cables.
- Do not connect or disconnect supply and measuring cables when the device is connected to the power.
- Supply and measuring cables must be suitable for the corresponding voltages.

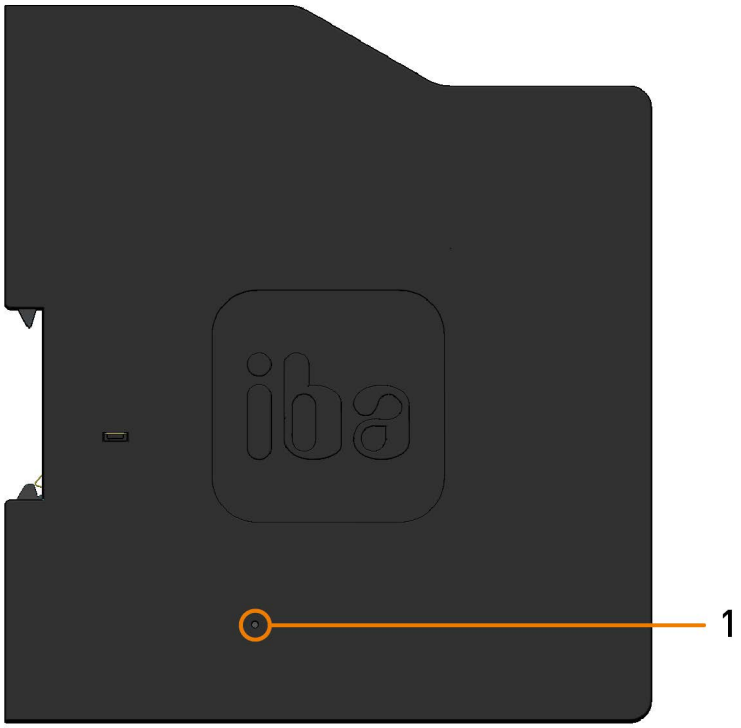
7 Device description

Here you will find views and descriptions of the *ibaM-COM* device.

7.1 View



1	Operating status indicator	4	QR code for installation notes
2	Contacts module-module interface	5	Connectors ibaNet interfaces X2, X3
3	Connector 24 V power supply X1	6	ibaNet interface indicator



1 Reset button

7.2 Indicating elements

Colored LEDs on the device indicate the operating status of the device.

7.2.1 Operating status

Color	Status	Description
--	off	down, no power supply
Green	on	ready for operation
	flashing slowly	device is booting
	flashing quickly	update is running
Red	on	error, reset

7.2.2 ibaNet interface

LED	Status	Description
ibaNet X2, X3	green on	connectivity OK
--	off	no connectivity

7.3 Operating elements

Below you will find further information on the operating elements of the device *ibaM-COM*.

7.3.1 Reset button

You can use the reset button to reset the device to the factory settings. For further information see chapter ↗ *Reset to factory settings*, page 25.

7.4 Connectors

You will find the following connections and interfaces on the device *ibaM-COM*.

7.4.1 Power supply X1

The external power supply is provided via a 3-pin plug.

Caution!

Power supply

Only connect the device to an external 24 V DC power supply!

Ensure correct polarity!

Note

ibaM-COM is not grounded when mounted on a grounded DIN rail.

ibaM-COM can only be grounded via the ground terminal of the 3-pin power supply plug X1.

7.4.2 ibaNet connections X2, X3

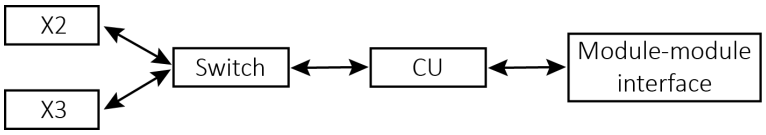
The ibaNet X2 and X3 connections are intended for dedicated use with high-performance ibaNet-E connections, which can record data with an accuracy of up to 1 µs.

The two 1GbE interfaces are **with switch function** and support:

- Autonegotiation (100/1000 Mbit, full duplex)
- Auto-MDI(X)

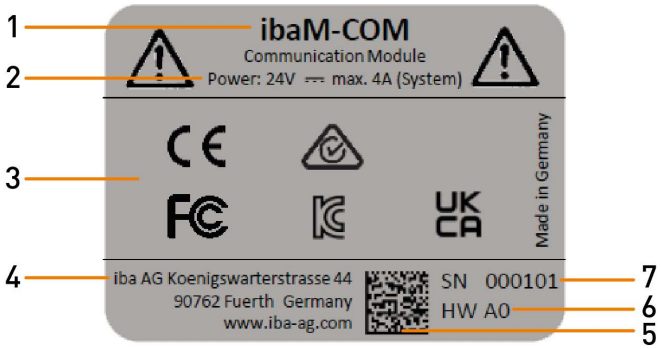
7.5 Flow chart

The following block diagram visualizes the internal communication of the device.



7.6 Type label

The type label provides the following information:

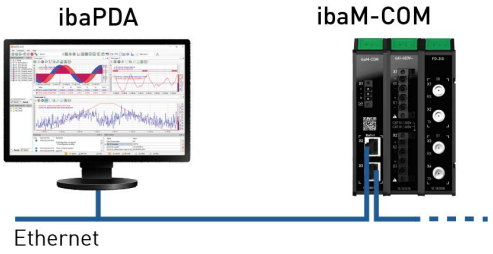


1	Product name	5	DataMatrix code (iba internal)
2	Power supply	6	Hardware version
3	Certificates, standards	7	Serial number
4	Manufacturer		

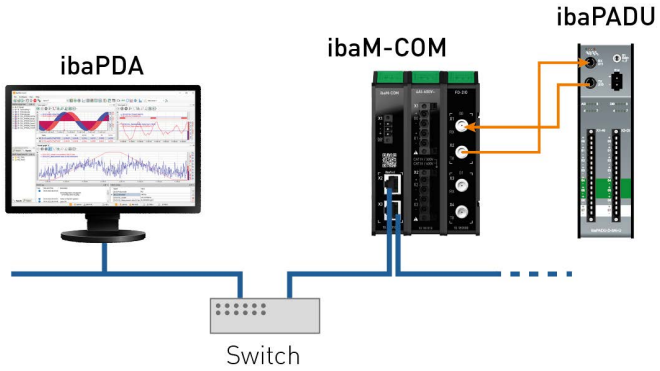
8 System integration

8.1 System integration examples

ibaM-COM is connected to the *ibaPDA* computer via a standard Ethernet network. It does not matter which of the two Ethernet interfaces is used. The device works with the ibaNet-E protocol to transfer configuration and measurement data.

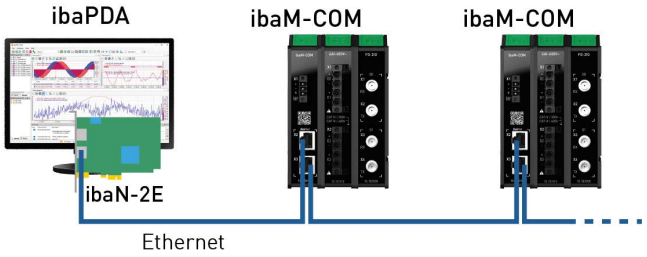


Any network topology can be used to do this. The device can either be connected to the *ibaPDA* computer directly (P2P), as shown above, or via a switch or router, as shown below. The modules connected to *ibaM-COM* are only examples.



If the *ibaPDA* computer is connected to the network via a standard network adapter card, synchronous data sampling between multiple network devices at 1 ms is possible.

If an *ibaN-2E* card is used in the *ibaPDA* computer, synchronous data sampling at up to 1 µs is possible. To do this, the *ibaPDA* computer and *ibaM-COM* must be in the same LAN (without switch).



8.2 Default settings

Below you will find the factory settings of the device and how to reset the device to the factory settings.

8.2.1 Default settings of the device

Owner	none
Settings locked	no
Device name	MCOM-xxxxxx xxxxxx = 6-digit serial number, e.g. MCOM-000036
IP settings	disabled
IP address	0.0.0.0
Subnet mask	0.0.0.0
Gateway	0.0.0.0
DHCP	no

Note

By default, the device settings are not locked and no IP settings are enabled or configured.

No IP settings are normally required for operation in undivided local networks. They are required for network routing however.

8.2.2 Reset to factory settings

The device can only be reset by a hardware reset on the device itself. The reset button is located on the side of the device; see chapter ↗ *View*, page 20.

Note

When resetting to the factory settings,

- the device settings are reset, and
- the module configuration, including its owner, is deleted.

1. With the device switched off, press and hold down the reset button using a suitable object (such as a paper clip; maximum diameter 1.2 mm).
2. Switch the device on.
3. When the operating status indicator LED starts blinking rapidly, you can release the reset button.

→ When the rapid blinking stops, the device has been reset to its factory settings.

The device is ready for operation again when the operating status indicator is statically on.

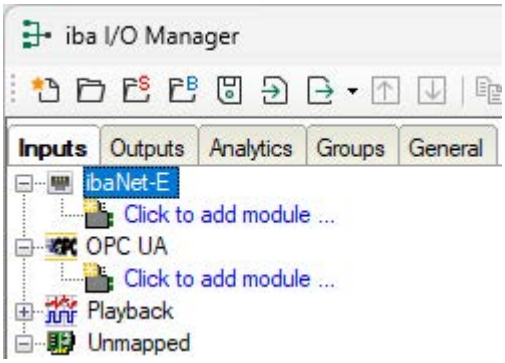
9 Configuration in ibaPDA

With *ibaPDA*, the devices can be found and configured for operation in the network. The analog and digital signals to be acquired and recorded are also configured in *ibaPDA*.

Set up an Ethernet connection to the *ibaPDA* computer first. Start ibaPDA and open the I/O Manager.

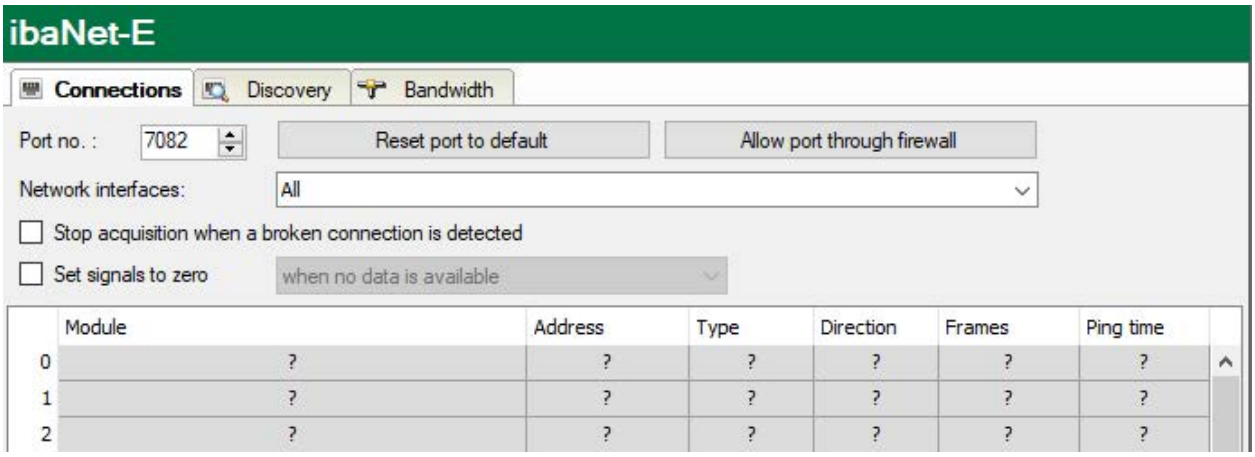
9.1 ibaNet-E interface

ibaM-COM is connected via a standard Ethernet network card installed in the *ibaPDA* computer, and the *ibaPDA* ibaNet-E interface. Standard Ethernet infrastructure components can be used.



9.1.1 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.

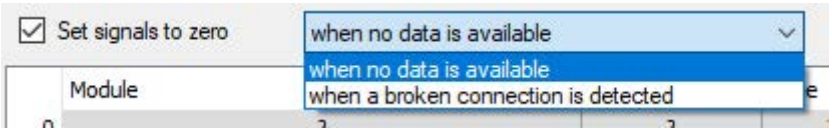
<Allow port through firewall>
When installing *ibaPDA*, the default port numbers of the protocols used are automatically entered in the firewall. If you change the port number here, you must allow this port through the firewall using this button.

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.

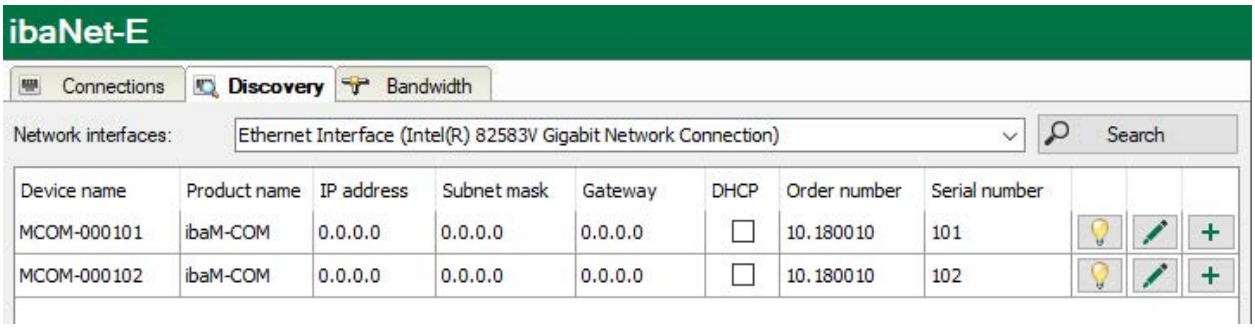
While a valid ibaNet-E receive connection is live, a ping is sent cyclically to the ibaNet-E device. The measured time is displayed here, and indicates the connection quality of the Ethernet net-

work. 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.

9.1.2 Discovery tab

Set the network interfaces via which to search for ibaNet-E devices on the *Discovery* tab.

Note that this search can only be successful if the device is located in the same LAN as the *ibaPDA* computer, and has been preconfigured for that LAN. From the *Network interfaces* drop-down menu select the network adapter(s) via which you can reach the ibaNet-E devices, and start your search by clicking <Search>.



9.2 Device configuration

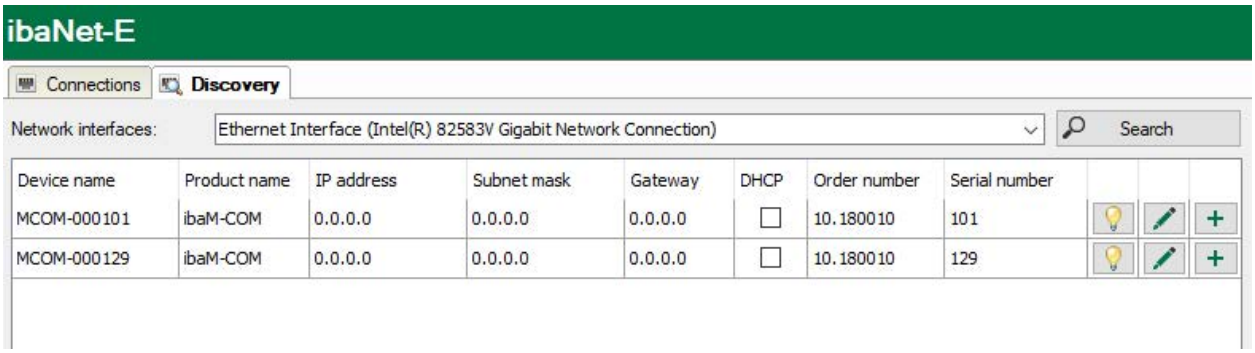
If *ibaM-COM* is not yet configured for the network, or you do not know the configuration, you can search for it in the *ibaPDA* I/O Manager.

Note that this search can only be successful if the device is located in the same LAN as the *ibaPDA* computer, and has been preconfigured for that LAN.

9.2.1 Searching for devices

1. Start *ibaPDA* and open the I/O Manager.
2. Highlight the *ibaNet-E* interface and select the *Discovery* tab.
3. From the *Network interfaces* drop-down list select the network adapter(s) via which you can reach the *ibaM-COM* device, and start your search by clicking <Search>.

→ The devices found are listed in a table, and cannot be changed in that display.



Device name
Device name, or host name of the device.

Product name
ibaM-COM

IP address
The IP address of the device.

Subnet mask
The subnet mask of the IP settings.

Gateway
The gateway of the IP settings.

DHCP
The IP settings are obtained from a DHCP server (enabled), or not

Order number
The iba order number of the *ibaM-COM* device

Serial number
The serial number of the *ibaM-COM* device

Meanings of the buttons:

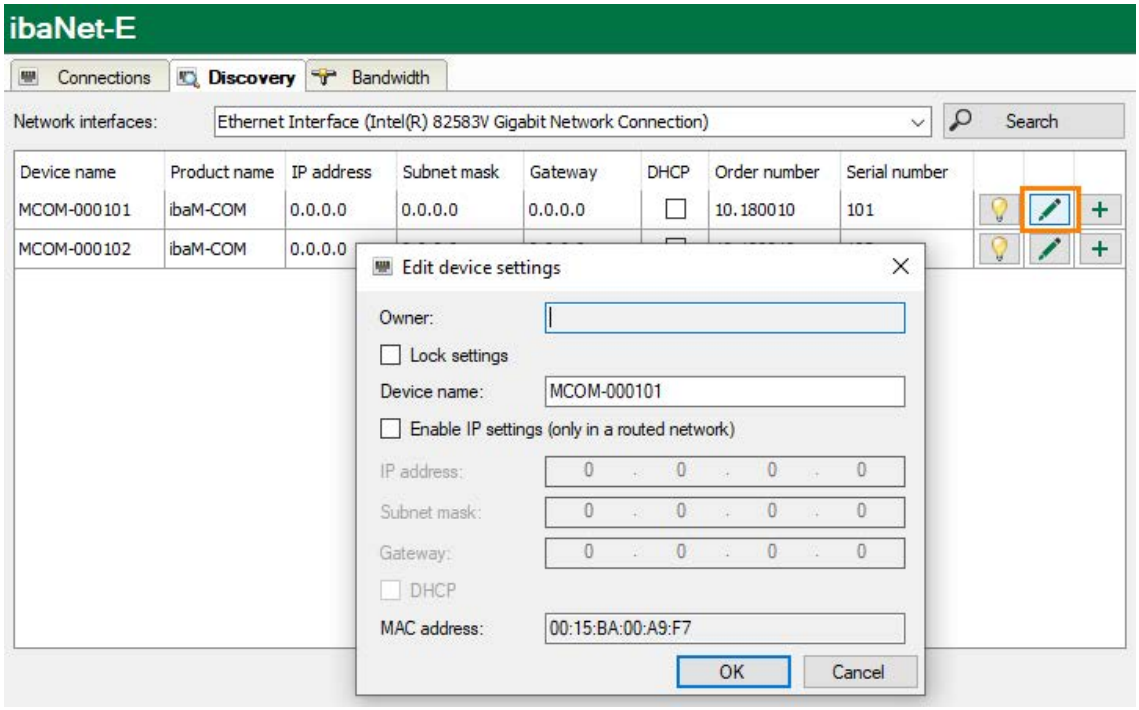

"Identify device"
When you click this button, the status indicators (LEDs) on the front of the device start blinking for a short time. This makes it possible to identify the device directly.


"Edit device settings"
Click this button to open the window for the device and IP settings.


"Add device to I/O configuration"
Click this button to add the device to the I/O configuration of the ibaNet-E-interface in *ibaPDA*. Connected modules are identified and added automatically as far as possible.

9.2.2 Device settings

To open the *Edit device settings* dialog, click the button  . Device-specific values mainly required for the Ethernet network connection are entered in the device settings.



Owner
If the *ibaM-COM* device has already been configured, the last owner is displayed here; otherwise it is empty (when shipped, or after resetting defaults). The owner corresponds to the computer name on which *ibaPDA* is installed and from which this device was last configured. The entry is made automatically, and is read-only.

Lock settings
When this function is enabled, read and write access to the device configuration is blocked for other *ibaPDA* systems.

Device name
The name of the device. If DHCP is enabled, and there is a DHCP/DNS server in the network, the device can be connected via this name.

Enable IP settings (only in a routed network)
If the IP settings are activated, you can enter the IP address of the device, subnet mask and gateway. The IP settings are required in the routed network, i.e. if the device and the *ibaPDA* computer are not in the same LAN.

This option is not enabled by default and the fields are grayed out.

IP address
The IP address of the device. If DHCP is enabled, this field is read-only.

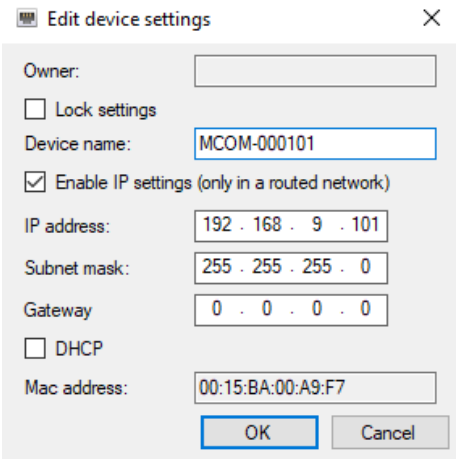
Subnet mask
The subnet mask of the IP settings. If DHCP is enabled, this field is read-only.

Gateway
The gateway of the IP settings. If DHCP is enabled, this field is read-only.

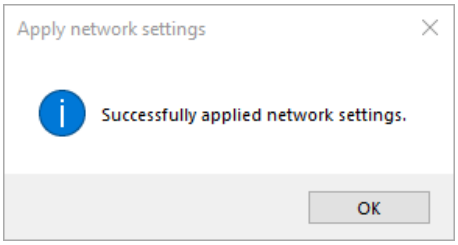
DHCP
If DHCP is not enabled, a static IP address must be selected. If DHCP is enabled, the IP address of a DHCP server in the network is obtained if possible.

DHCP can only be enabled if the IP settings are enabled.

Example of a device setting (with fixed IP address, without DHCP):



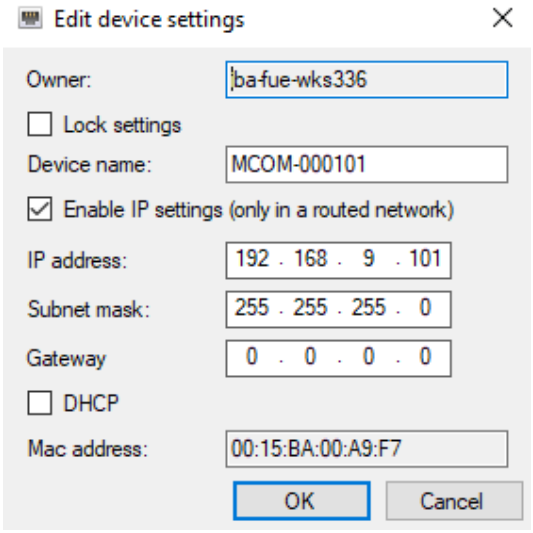
When you click <OK> to apply the settings, the following message appears and the dialog window closes:



The *Discovery* tab displays the configured *ibaM-COM* device.

9.2.3 Owner

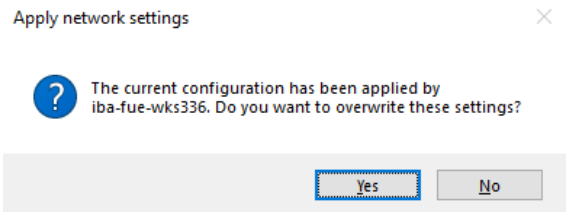
When you re-open the device settings after configuring as per chapter ↗ *Device settings*, page 30, an owner is displayed because the *ibaM-COM* device has already been configured:



If the device settings are opened by the same owner, all configuration settings can still be changed here.

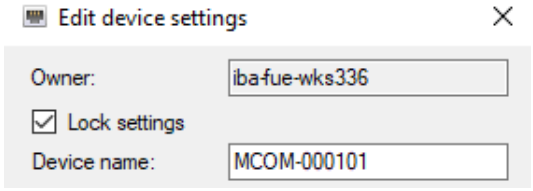
There are also other use cases:

Another ibaPDA computer has set the settings and the settings are not locked:
If the settings have last been **set and not locked** by another *ibaPDA* computer, the following message is displayed after confirming:



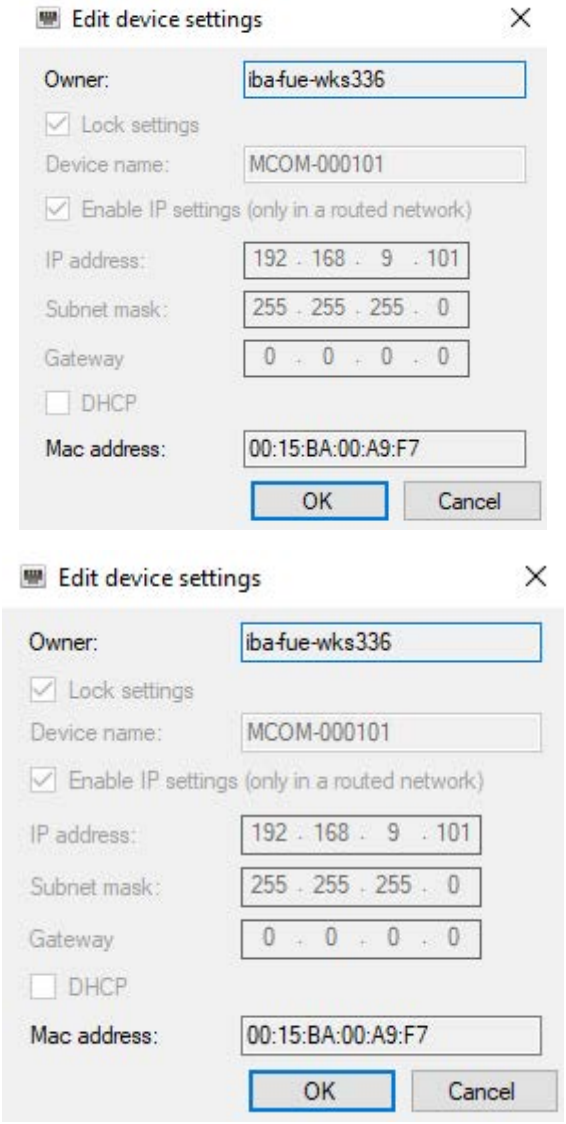
As the configuration is not locked, it can be changed and applied.

Another ibaPDA computer has set and locked the settings:
If the settings have been **set and locked** by another *ibaPDA* computer, the window would look like this:



As the configuration was locked by the other *ibaPDA* computer, it cannot be changed or applied. A locked device configuration can only be changed or reset by the original owner, or by resetting to the default values (see chapter ↗ *Default settings of the device*, page 25).

Another ibaPDA computer accesses an ibaM-COM device with locked settings:
The device settings are as follows and cannot be edited:



9.2.4 Adding an ibaM-COM device

There are several ways to add the *ibaM-COM* device to *ibaPDA*:

- Automatically – the device is in the same LAN

  See chapter ↗ *Adding a device automatically*, page 34.
- Manually – the device is not in the same LAN

  See chapter ↗ *Adding a device manually*, page 34.
- Offline – without connecting a device

  See chapter ↗ *Adding a device offline*, page 36.

9.2.4.1 Adding a device automatically

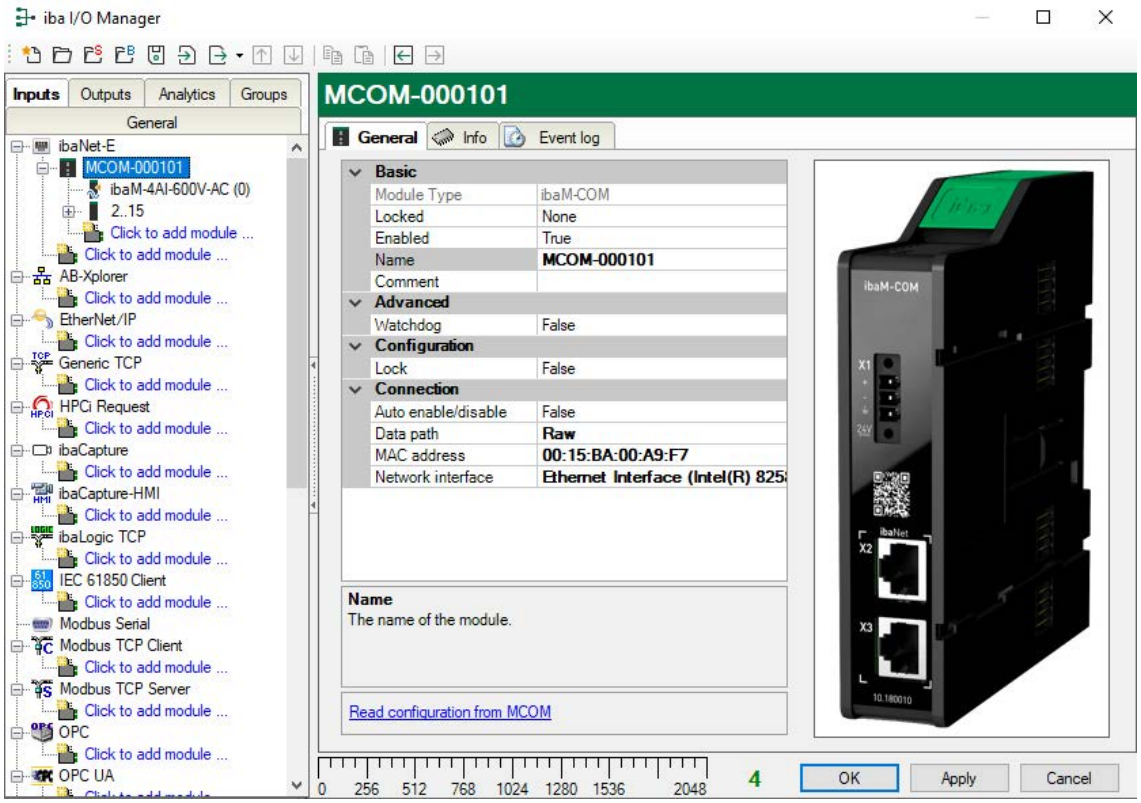
Proceed as follows to add the device as a module to the I/O configuration in *ibaPDA*:

Prerequisites:

- You have searched for existing devices in the same LAN; see chapter ↗ *Searching for devices*, page 28
- The device has been configured; see chapter ↗ *Device settings*, page 30.

► On the Discovery tab of the ibaNet-E interface, highlight the *ibaM-COM* device and click the <+> button.

→ The device appears in the I/O Manager's module tree.



→ Connected modules are detected and added automatically as far as possible.

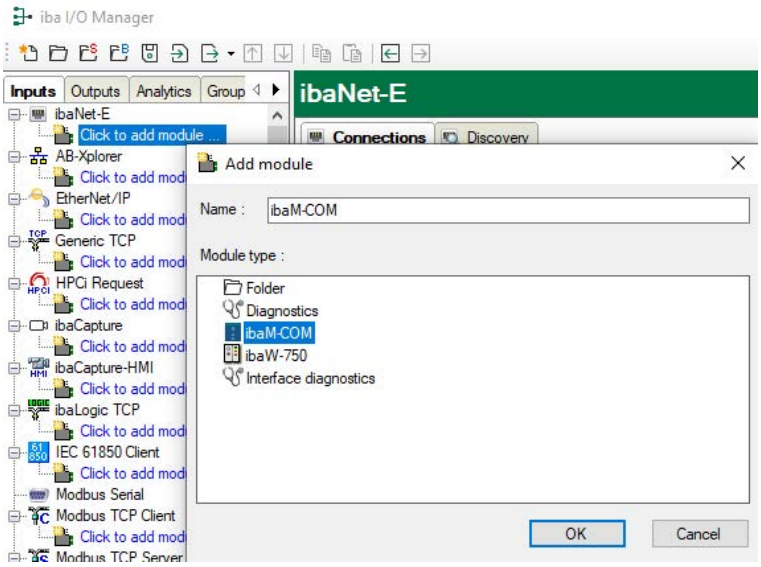
→ If the device has already been configured for acquisition in *ibaPDA*, that existing configuration is also read out and displayed in the I/O configuration.

9.2.4.2 Adding a device manually

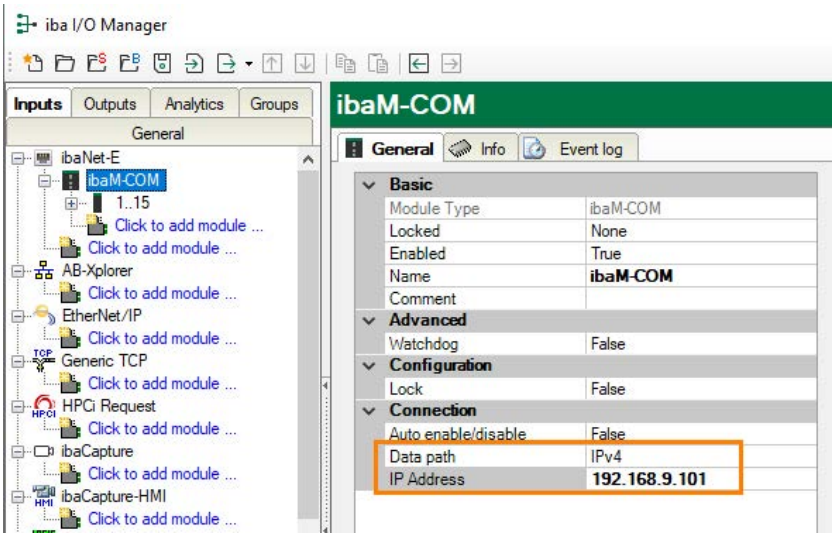
If the *ibaM-COM* device is not to be operated in the same LAN as the *ibaPDA* system, meaning it cannot be automatically located, identified and added, you can also add the device manually to the ibaNet-E interface in the I/O Manager.

Prerequisite:
The device must first have been configured separately in advance. The configuration can only be made within the same LAN. It can, however, be run by another *ibaPDA* system. For information on configuration, see chapter ↗ *Device settings*, page 30.

1. Click on the link *Click to add module …*
2. Select the *ibaM-COM* module type.



3. Once you have added the *ibaM-COM* module, to ensure a successful connection first enter the (network) address via which *ibaM-COM* can be reached.



The address can either be a (fixed) IP address or the host name ("Hostname"). It is advisable to use the host name if the device is located in a DHCP network in which the network devices have not been assigned fixed IP addresses.

4. Provided the *ibaM-COM* device can be reached in the network via Ethernet without restriction using the address entered, you can now either only add the connected modules or also read out the module configuration, if available on the device.

   To do this, use on the link at the bottom of the *General* tab and click "Read configuration from the device".

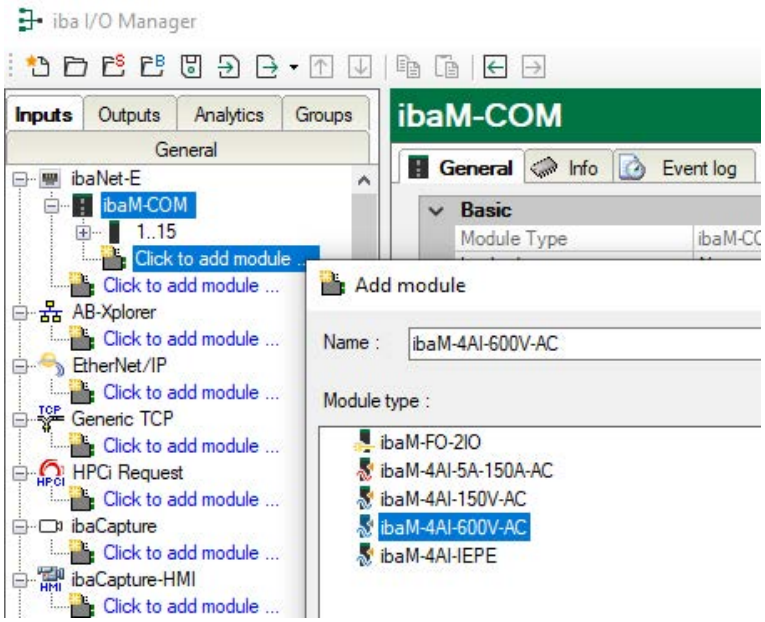
9.2.4.3 Adding a device offline

It is also possible to add the *ibaM-COM* device to the I/O Manager and configure it without connecting the device at the same time.

To do this, follow the procedure described in chapter ↗ *Adding a device manually*, page 34, though in this case the modules, and/or the configuration, cannot be automatically identified and read out at the end, but must be added manually.

1. Highlight the *ibaM-COM* module and click on the link *Click to add module …*

→ The module selection dialog appears:



2. Highlight the module you want, and either click <OK> or double-click on the module.

This offline option makes it possible, for example, to export a device and module configuration, or to save the entire I/O configuration of the I/O Manager.

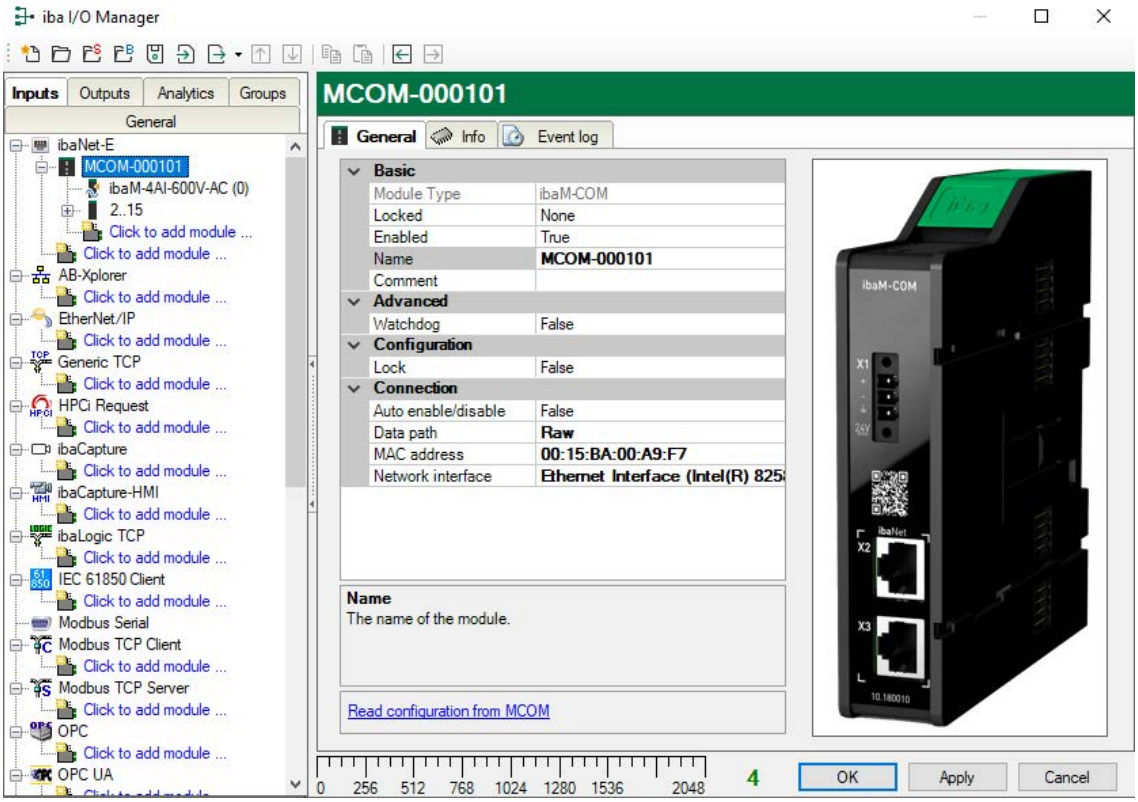
For a detailed description, refer to the current *ibaPDA* manual.

9.3 Configure ibaM-COM

The *ibaM-COM* device module and the diagnostic module are described below.

9.3.1 ibaM-COM – General tab

In the *General* tab, you can make basic settings and settings for the connection to the device.



Basic settings

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

Locked
A module can be locked 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
Extra description about the module. This will be displayed as tooltip in the signal tree.

Advanced

Watchdog
You can enable watchdog for internal errors.

Configuration

Lock
This property determines if the configuration should be locked in the ibaNet-E device. When the configuration is locked, only the owner that sets the lock can change the configuration or remove the lock.

Connection

Auto enable/disable
When this option is enabled and *ibaPDA* cannot connect to this device during the start of the acquisition then it will disable this module and start the acquisition without it. During the acquisition it will try to reconnect to the device. When it succeeds it will automatically restart the acquisition with this module enabled.

If this option is not enabled then *ibaPDA* will not start the acquisition when it cannot connect to the device.

Data path
Select the transport protocol you want to use for data transfer between *ibaPDA* and the ibaNet-E device. The following are available:

- *MAC*: Based on layer 2 of OSI model the communication runs without an IP address. It is used in pure ibaNet-E networks or non-routed networks. The data path MAC offers higher bandwidth with highly synchronous data.

  Enter the MAC address of the device in the field *MAC address* and select the appropriate network interface.

  Only with data path MAC, an ibaNet-E acquisition with High Performance (HP) is generally possible.

- *IPv4*: Based on layer 4 of OSI model IP addresses are needed for UDP/IP communication. It must be used in routed networks.

  Enter the IP address of the device in the field *IP address*.

MAC address, Network interface
These fields appear when the data path MAC is selected.

IP Address
The field appears when the data path IPv4 is selected.

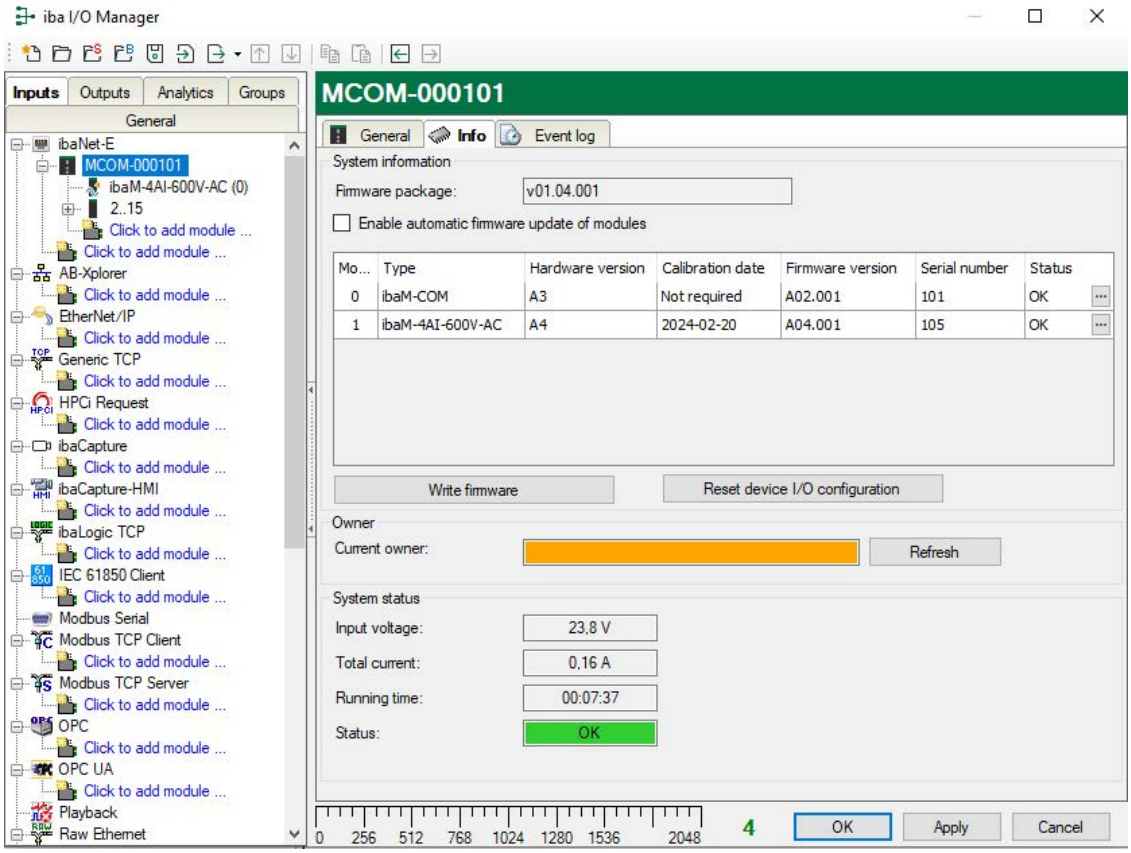
More functions

Read configuration from MCOM
Reads the configuration stored most recently from the device.

Modified settings are applied by clicking on <OK> or <Apply>.

9.3.2 ibaM-COM – Info tab

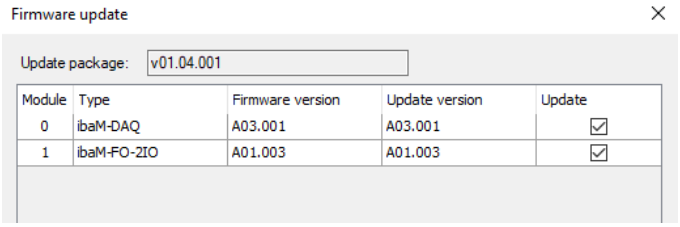
In the "System information" area you will find the firmware version and information on the individual modules connected to the IO bus.



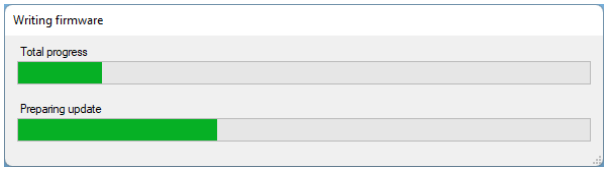
Write firmware

With this button it is possible to perform firmware updates. Select the update file `ibaM_v[xx.yy.zzz].iba` in the browser and start the update process by clicking <Open>.

In the following dialog, you can specifically select which modules you want to update or whether you want to update the overall system.



The update process is started by clicking on <OK>. The following dialog informs you about the progress of the update.



Note

This process may take several minutes and must not be interrupted. After an update, the IO bus will restart automatically.

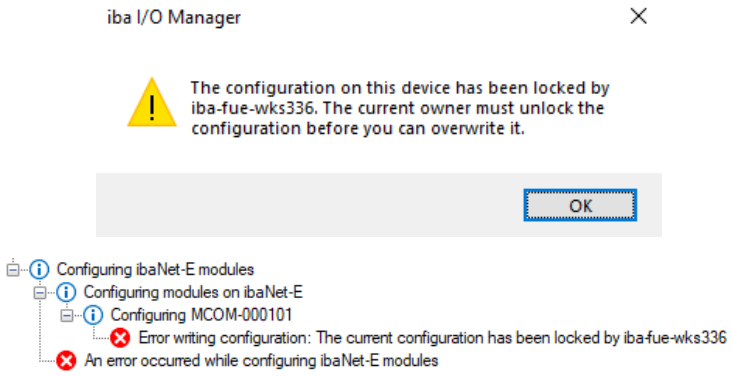
Reset device I/O configuration
You can use this button to reset the entire module configuration.

Owner
If a module configuration has already been carried out on the *ibaM-COM* device, the last owner of this module configuration is displayed here.

After delivery or resetting to factory settings, this field is empty.

The owner corresponds to the computer name on which *ibaPDA* is installed and from which this device was last configured.

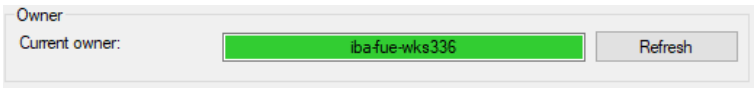
If a module configuration is locked or blocked and another *ibaPDA* system wants to access this module or use it for recording, the following messages appear depending on the situation:



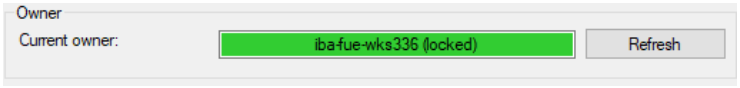
The <Refresh> button can be used to call up the current owner of the module configuration from the device at any time.

Meaning of the colors:

Green The *ibaPDA* system that is currently accessing it is the owner.

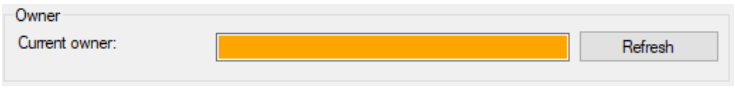


The *ibaPDA* system system that is currently accessing it is the owner and has locked the module configuration.

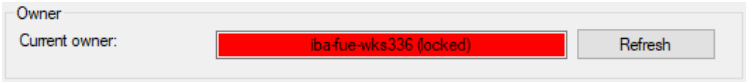


Orange Another *ibaPDA* system is the owner, but has not locked the module configuration.

No owner is displayed (on delivery or reset to factory settings).



Red Another *ibaPDA* system is the owner and has locked the module configuration.



The following information is displayed in the "System status" area:

Input voltage
Internal supply voltage, deviates minimally from the supply voltage at the power supply connector due to the internal circuitry.

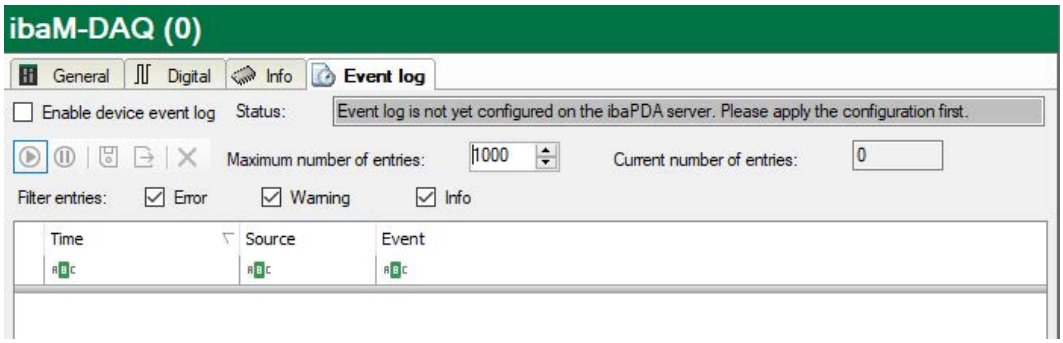
Total current
The power consumption of the entire system including all modules (with an accuracy of ±10 %).

Running time
The total running time of the IO bus since the last start in the format [d].hh:mm:ss

Status
The status of the entire system incl. all modules.

9.3.3 ibaM-COM – Event Log tab

In the *Event log* tab, the status changes of the *ibaM-COM* device are documented in a list.



The following settings and operation modes are available:

Enable device event log
Here, you enable the event log for the device. You have to enable the event log separately for each individual device.

Status
The status of the connection between *ibaPDA* and *ibaM-COM* for reading the events is displayed here.

Maximum number of entries
Here you can set the maximum number of saved entries (100 - 100,000).

Current number of entries
The currently saved number of entries.

Operating elements

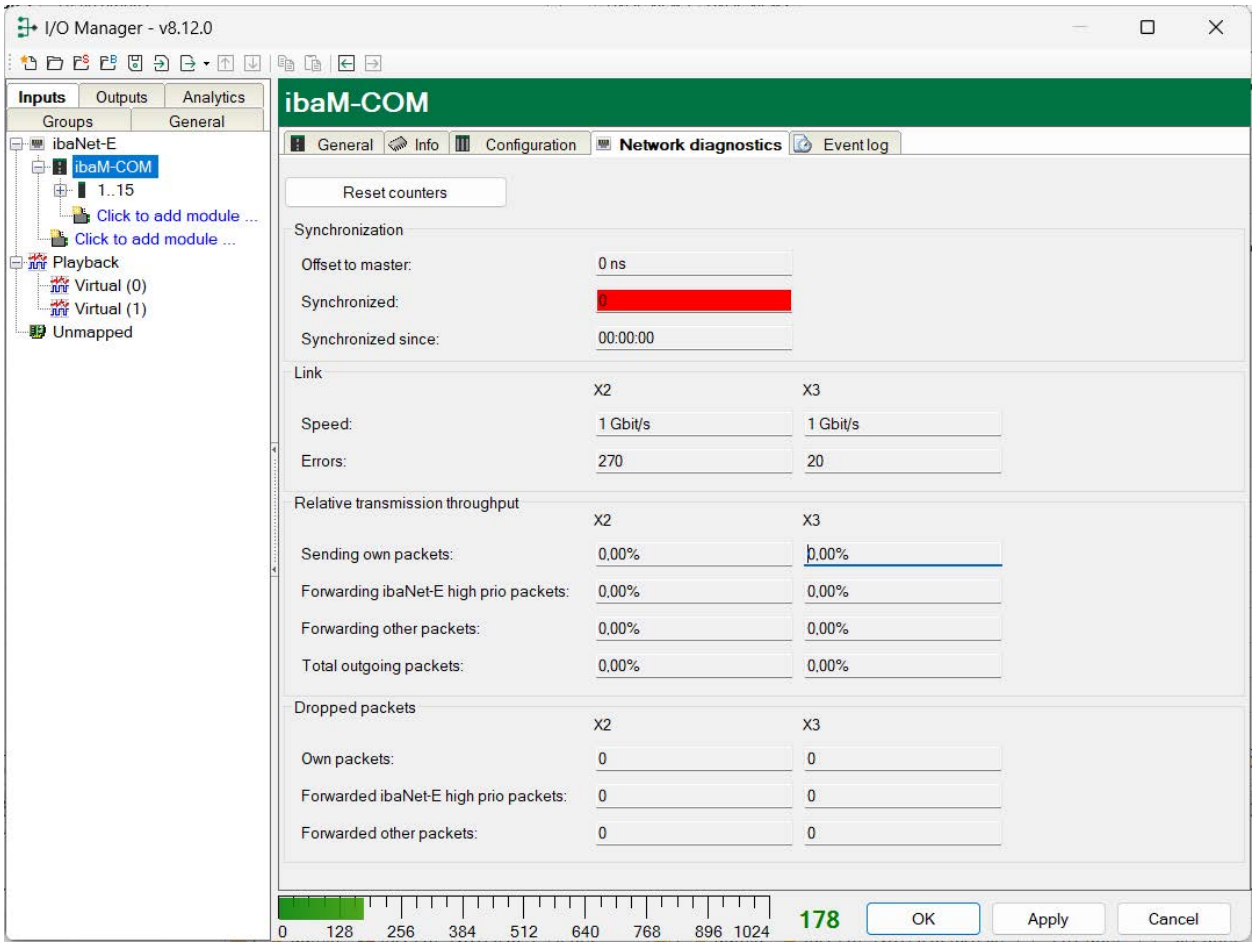
	When pressing the button, the list of events is automatically updated
	The automatic update is paused
	Continuously save messages in a file
	Export visible entries to a text file
	Clear diagnostic buffer

The list of events can be filtered in a customized way. If you want to filter the events according to a type, just select one or more types above the list: error, warning, info.

For further filtering, enter the filter text you are searching for in the desired field in the top line. All events containing the entered search text, will be displayed.

9.3.4 ibaM-COM – Network diagnostics tab

The *Network diagnostics* tab contains information about the network.



You can reset all counters using the <Reset counters> button.

Synchronization
In the *Synchronization* section, you will find information about synchronization in the network.

Link
In the Link section, you will find information about the transmission speed of the individual interfaces and an error counter.

Relative transmission throughput
In the Relative transmission throughput section, you will find information about the utilization of the individual interfaces.

Dropped packets
In the Dropped packets section, you will find information about the various lost packets.

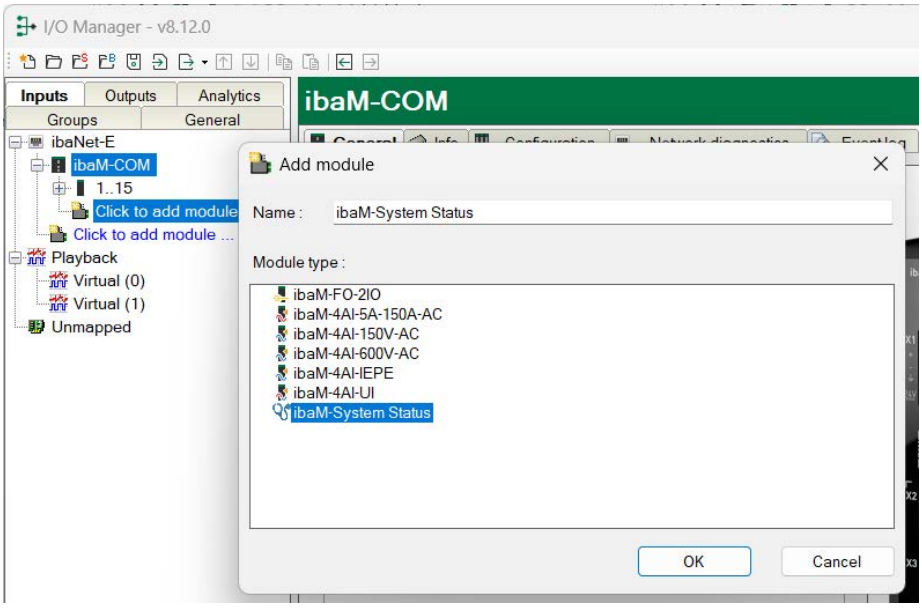
9.3.5 ibaM-COM system status

The *ibaM-System Status* module can be used to record information about the system status of the *ibaM-COM* system as signals.

9.3.5.1 Add system status module

Procedure

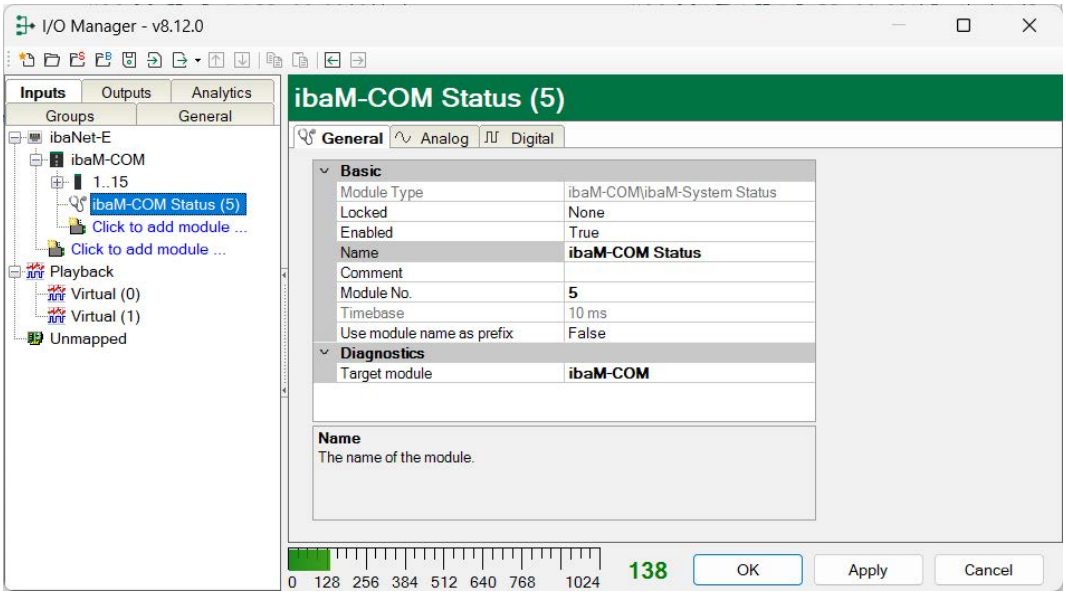
1. Click on the link *Click to add module* under *ibaM-COM*.
2. Select *ibaM-System Status*.



Note: The system status signals reduce the *ibaPDA* signal license.

9.3.5.2 ibaM-COM Status – General tab

The following settings can be made in the General tab.



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
The time base is preset and cannot be changed here.

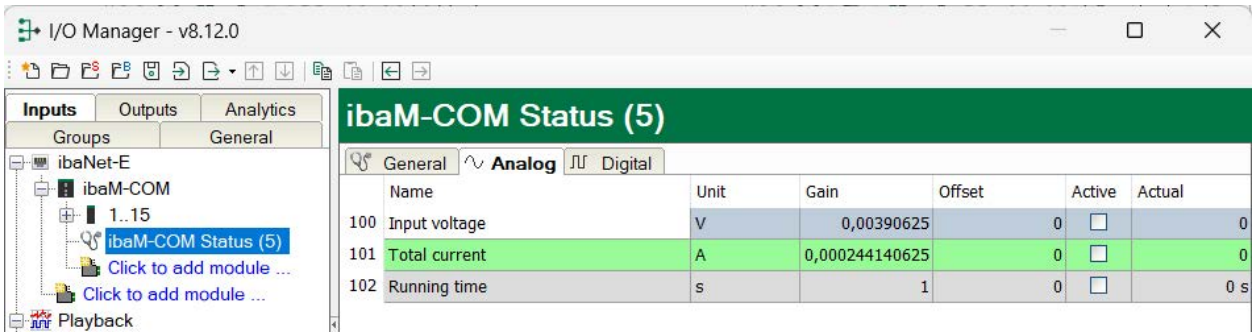
Use module name as prefix
This option puts the module name in front of the signal names.

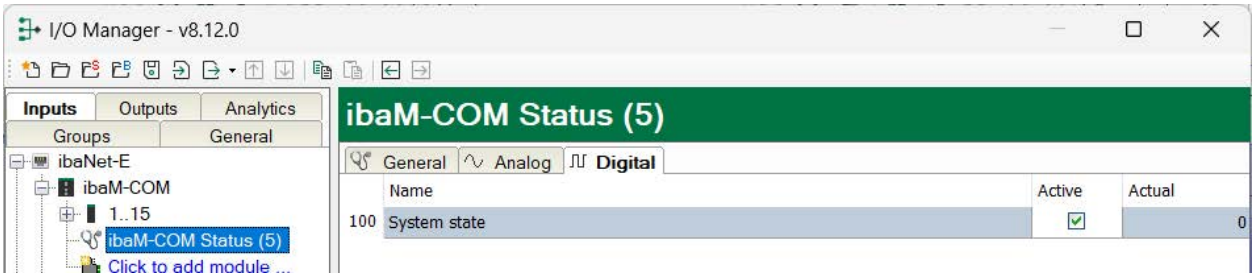
Diagnostics

Target module
The target module *ibaM-COM* is already preset.

9.3.5.3 Status signals

The available signals are automatically generated in the *Analog* and *Digital* tabs.





Analog status signals

Signal name	Description
Input voltage	Internal supply voltage, deviates minimally from the supply voltage at the power supply connector due to the internal circuitry.
Total current	The power consumption of the entire system including all modules (with an accuracy of ±10%).
Running time	The total running time of the IO bus since the last start in the format [d].hh:mm:ss

Digital status signals

Signal name	Description
Status	The status of the entire system incl. all modules.

9.3.6 ibaNet-E Diagnostics

With the *Diagnostics* module at *ibaM-COM* level, information about the *ibaNet-E* connection can be recorded as signals.

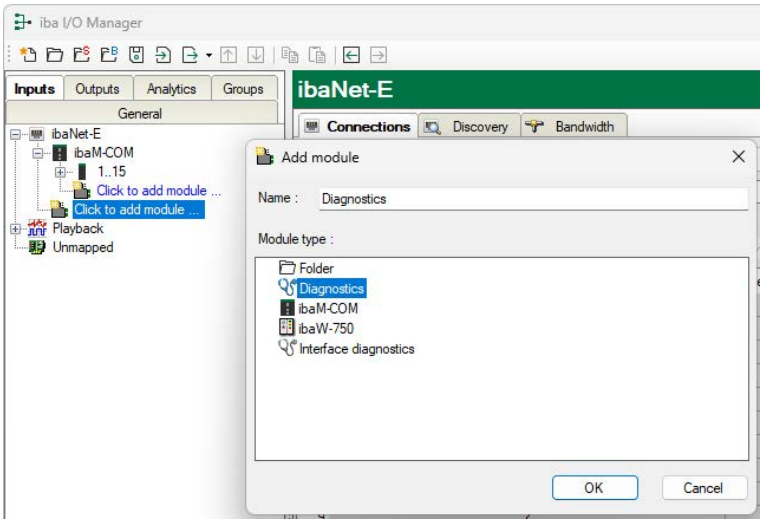
9.3.6.1 Add and assign a diagnostic module

A diagnostic module only becomes active after it has been assigned to an *ibaM-COM* module and provides its connection information.

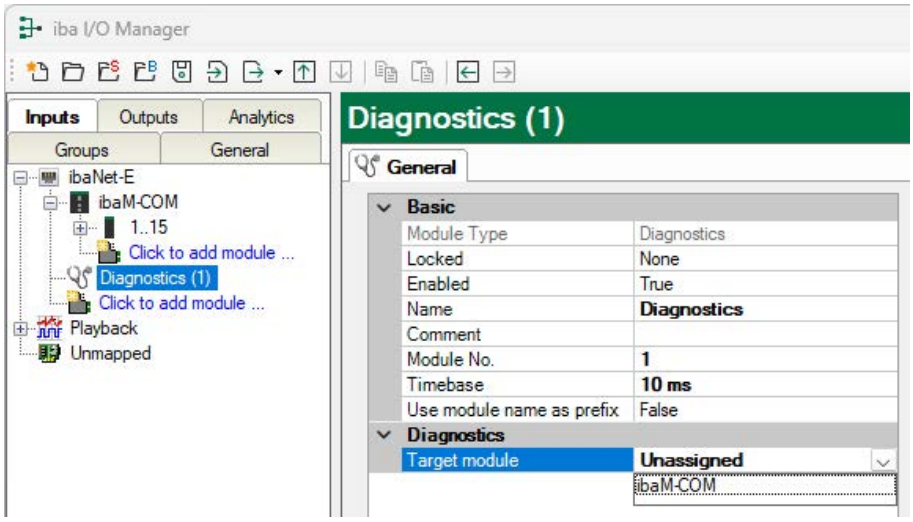
Diagnostic modules do not require an additional license, since they do not establish their own connection, but refer to another module.

Procedure

1. Click on the link *Click to add module* under ibaNet-E.
2. Select *Diagnostics*.



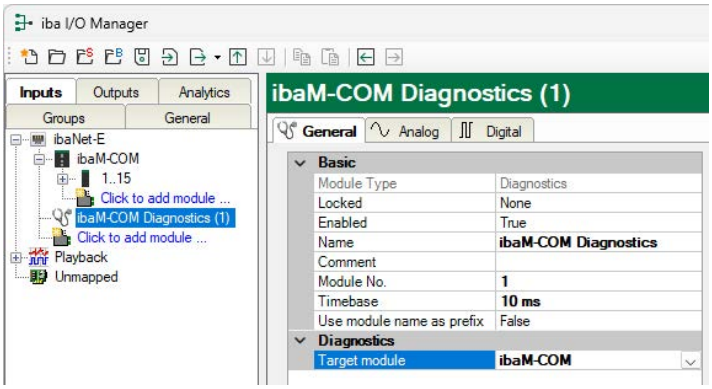
3. Assign the target module.



Note: The diagnostic signals reduce the *ibaPDA* signal license.

9.3.6.2 General tab

After the assignment, the following settings can be made in the *General* tab:



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.

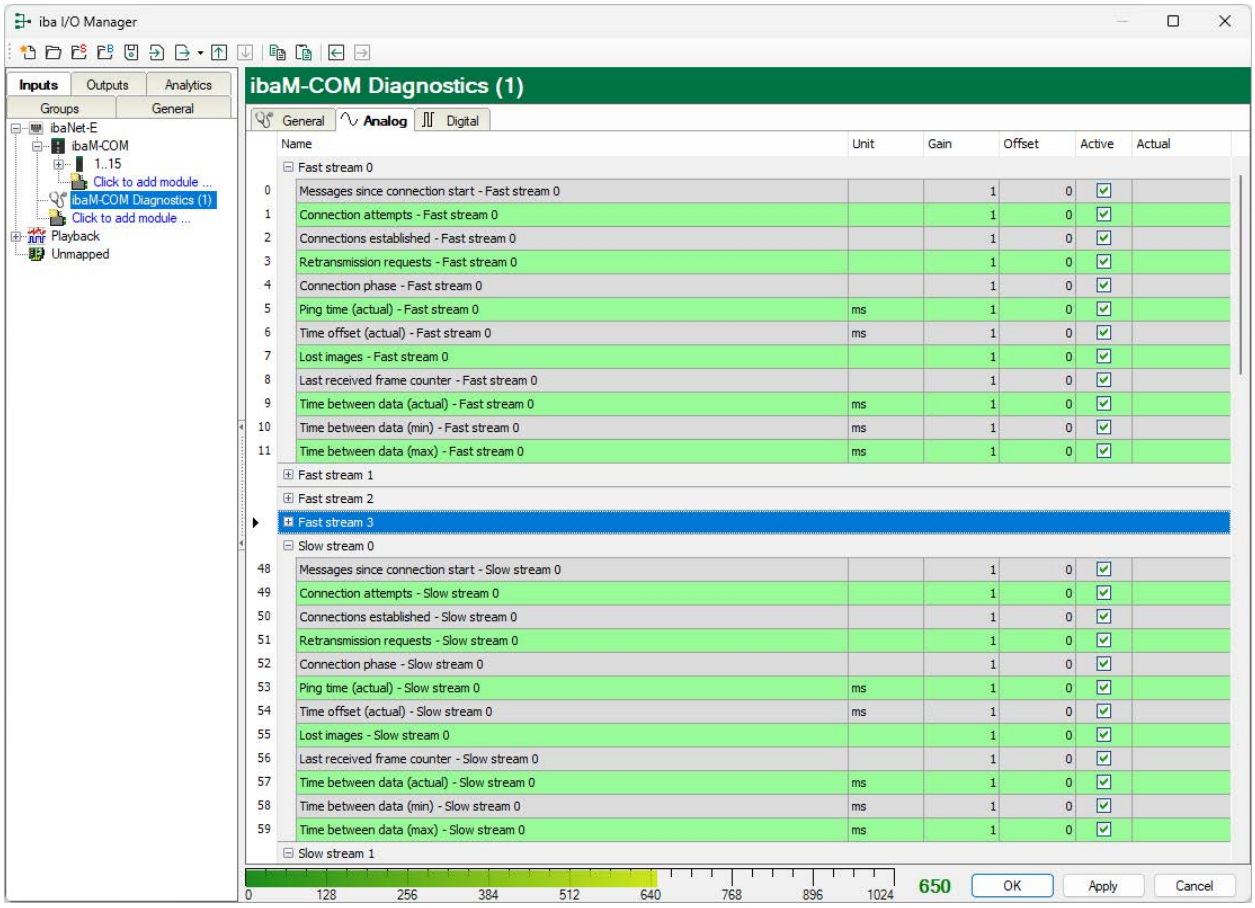
Use module name as prefix
This option puts the module name in front of the signal names.

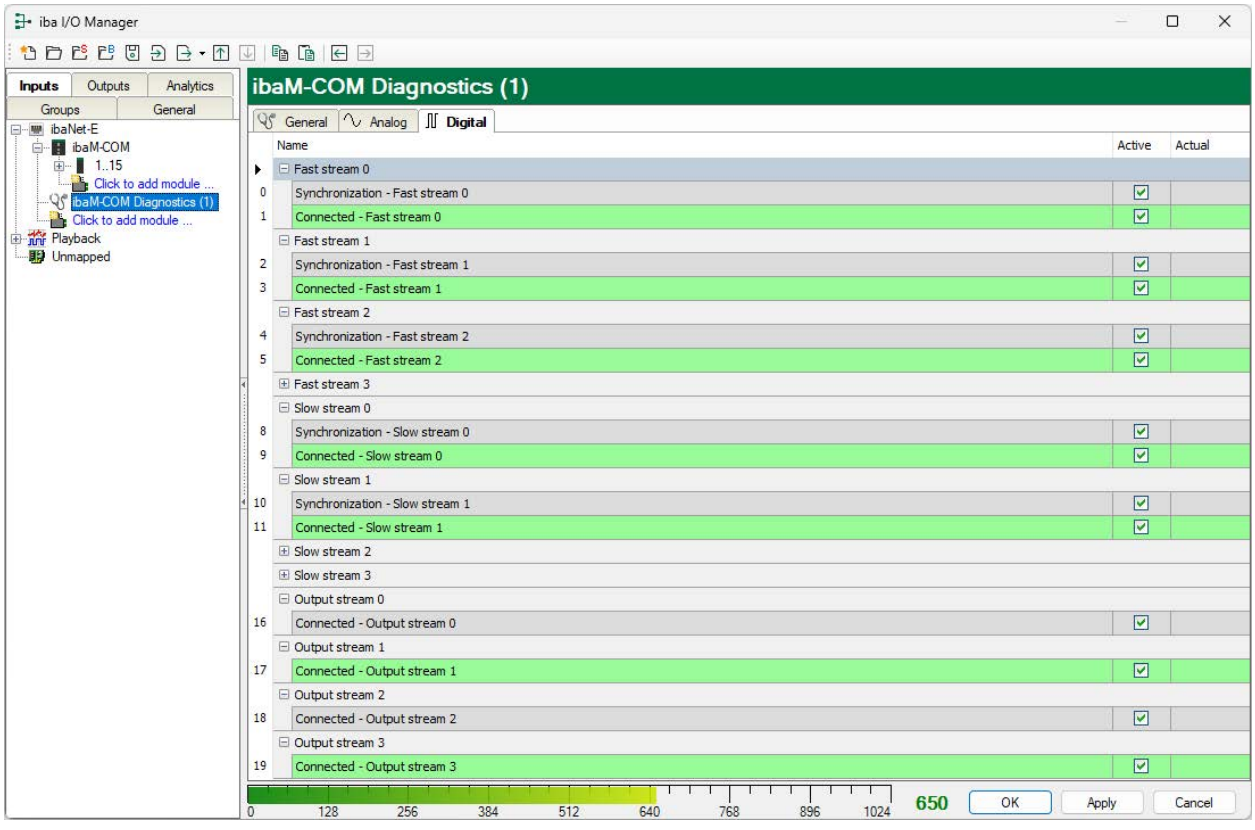
Diagnostics

Target module
By selecting the target module, you assign the diagnostic module to the module whose connection information is to be recorded.

9.3.6.3 Diagnostic signals

After assignment, the available diagnostic signals are automatically generated in the *Analog* and *Digital* tabs.



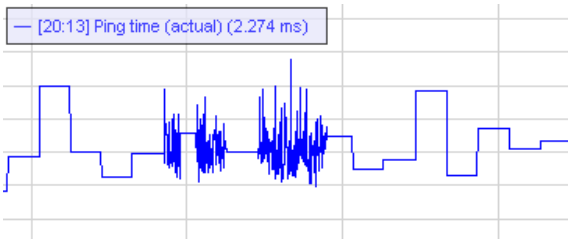


The signals are all enabled by default.

The signals are grouped by connection type:

- Fast Stream: connection diagnostics of the measurement signals
- Slow Stream: connection diagnostics of diagnostic, status and additional signals
- Output Stream: connection diagnostics of the output signals

Examples of diagnostic signals:

Name	Signal type	Description
Ping time (actual)	analog	A feature of the connection quality for the Ethernet: In regular operation, a ping to the ibaNet-E device is performed every one second and the measured time is displayed here. The shorter this time is, the better the connection quality and the more reliable the data transmission. For the synchronization at the start of the acquisition and sporadically during the acquisition, this ping is performed at a much higher frequency. 
Time offset	analog	Measured time difference of synchronicity between *ibaPDA* and the ibaNet-E device
Lost images	analog	Number of lost images that were not received even after a retransmission
Synchronization	digital	The device is synchronized for isochronous acquisition. This is always mandatory at the start of data acquisition, but can also be performed sporadically during data acquisition.

10 Useful information about ibaNet-E

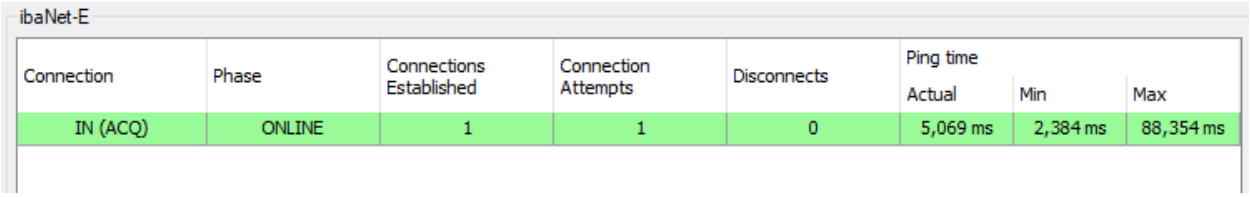
In the following you will find information on the connections with the ibaNet-E protocol.

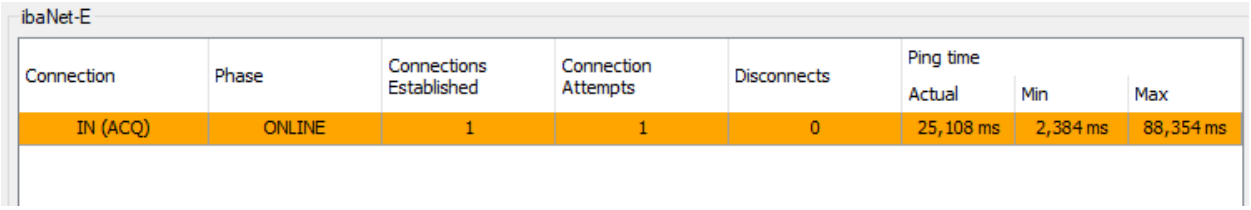
10.1 Connection phases

Each ibaNet-E connection can be in different connection phases. The connection phases are displayed in different colors in the *Connections* tab.

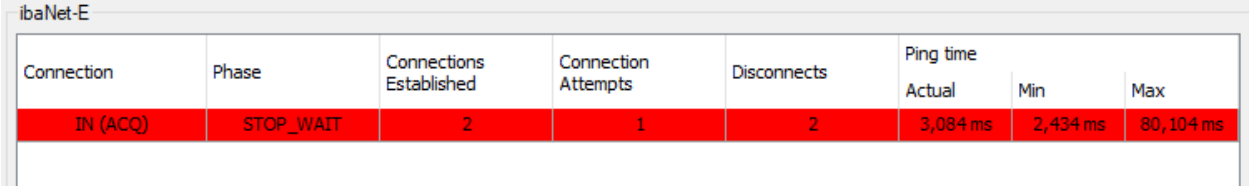
ibaNet-E connection phase	Color	Description
ONLINE	green	Connection; connection quality is OK
	orange	Connection; connection quality is not optimal
STOP_WAIT	red	Connection timeout; waiting for reinitialization
SEND_TADJUST	red	Connection setup; time synchronization
WAIT	red	Connection setup
WAIT_SYNCRESP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

Phase ONLINE





Phase STOP_WAIT



Phase SEND_TADJUST

ibaNet-E

Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	SEND_TADJUST	6	0	6	5,485 ms	2,395 ms	17,557 ms

Phase WAIT

ibaNet-E

Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT	5	1	5	7,252 ms	2,347 ms	26,804 ms

Phase WAIT_SYNCRESP

ibaNet-E

Connection	Phase	Connections Established	Connection Attempts	Disconnects	Ping time		
					Actual	Min	Max
IN (ACQ)	WAIT_SYNCRESP	1	0	1	0,000 ms	0,000 ms	0,000 ms

10.2 Connection type

There are different connection types of an 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.

- **MGT**: Configuration connection

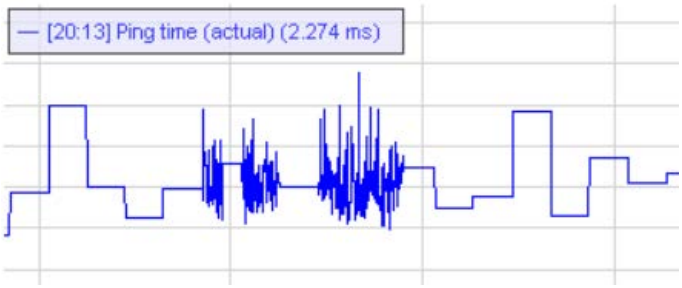
10.3 Ping time / connection quality

The ping time is a characteristic of the connection quality for the Ethernet network used by the ibaNet-E connection.

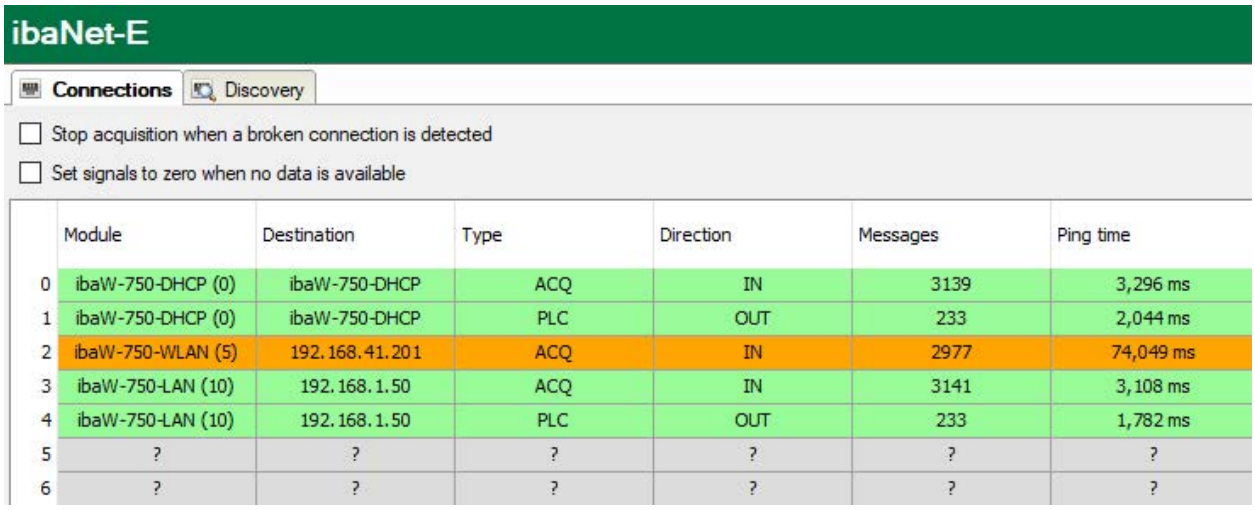
During a valid ibaNet-E receiving connection, a ping to the ibaNet-E device is executed cyclically.

The measured duration, i.e. the round trip time of the ping telegram, is a marker for the physical condition of the network and therefore a benchmark for the connection quality of the Ethernet connection. The shorter this time is, the better the connection quality and the more secure the data transmission.

For synchronization at the start of acquisition and sporadically during acquisition, this ping is executed at a much higher frequency:



If the ping time is longer and therefore the connection quality of the Ethernet connection is not optimal, the corresponding connection is no longer highlighted in green in the connection overview, but in orange:



	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	?	?	?	?	?	?

If the connection is highlighted in orange, it is more likely that measured values may be lost.

11 Technical data

Danger!

Electric shock

If the device is used or operated in a manner other than specified in the *Technical data* chapter, the protection supported by the device may be impaired.

Brief description	
Product name	ibaM-COM
Module label	ibaM-COM
Description	Communication module for the ibaMAQS modular system
Order number	10.180010
Module-module interface	
Number	1
Connection technology	2x 8 sliding contacts
Number of modules	15
Data throughput	
General	typically 512 Mbit/s; depends, among other things, on the time base in ibaPDA, the number of modules, and the signal selection or number of signals.
Display	capacity utilization display integrated in ibaPDA in %
ibaNet interface	
Number	2; switched
Method	copper
ibaNet protocol	ibaNet-E / ibaNet-E HP
Connection technology	2 RJ45 socket; 1GbE, Base-T
Cable length (P2P)	max. 100 m
Cable type	min. Cat. 6a, S/FTP
Supply	
Power supply	DC 24 V SELV; 4 A; external buffer module recommended
Voltage range	21.6 V ... 26.4 V DC
Current consumption (max.)	
ibaM-COM	0.18 A
ibaM-COM with modules	4 A
Electrical isolation	
Supply – system	none
Connection technology	3-pin header, 3.81 mm pitch

Connector	included in delivery; push-in, conductor max. 1.5 mm², protected against reverse polarity, screw connection; information on conductor and stripping length see chapter ↗ *Connection technology connector*, page 19; order number 52.000031
Further interfaces, operating and indicating elements	
Indicators	LEDs for operation and errors
Operating and environmental conditions	
Temperature range	
Operation	14 °F to 131 °F (-10 °C to +55 °C)
Storage	-13 °F to 185 °F (-25 °C to +85 °C)
Mounting	DIN rail according to EN 50022 (TS 35, DIN rail 35)
Cooling	passive
Relative humidity	15 % ... 95 % (indoor), no condensation
Operating altitude	0 m … 2000 m above sea level
Protection type	according to IP20; without test certificate according to IEC 60529
Certifications / standards	CE, C-Tick, UKCA, FCC, IEC 61010-1, IEC 61000-6-5 Interface range 4
Pollution degree	2
MTBF[1)] (+25 °C)	5,102,664 hours / 582 years
Dimensions	
Width x height x depth	28 mm x 133 mm x 120 mm
Height with open lever	160 mm
Height unit	3
Installation clearances	
Top / bottom	30 mm / 30 mm
Left / right (system)	10 mm / 10 mm
Mounting position	vertical, lever up
Weight / incl. packaging	0.25 kg / 0.55 kg

[1)] according to: Telcordia Issue 4 SR332 (Reliability Prediction Procedure of Electronic Equipment; IssueMar. 2016) and NPRD (Non-electronic Parts Reliability Data 2011)

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

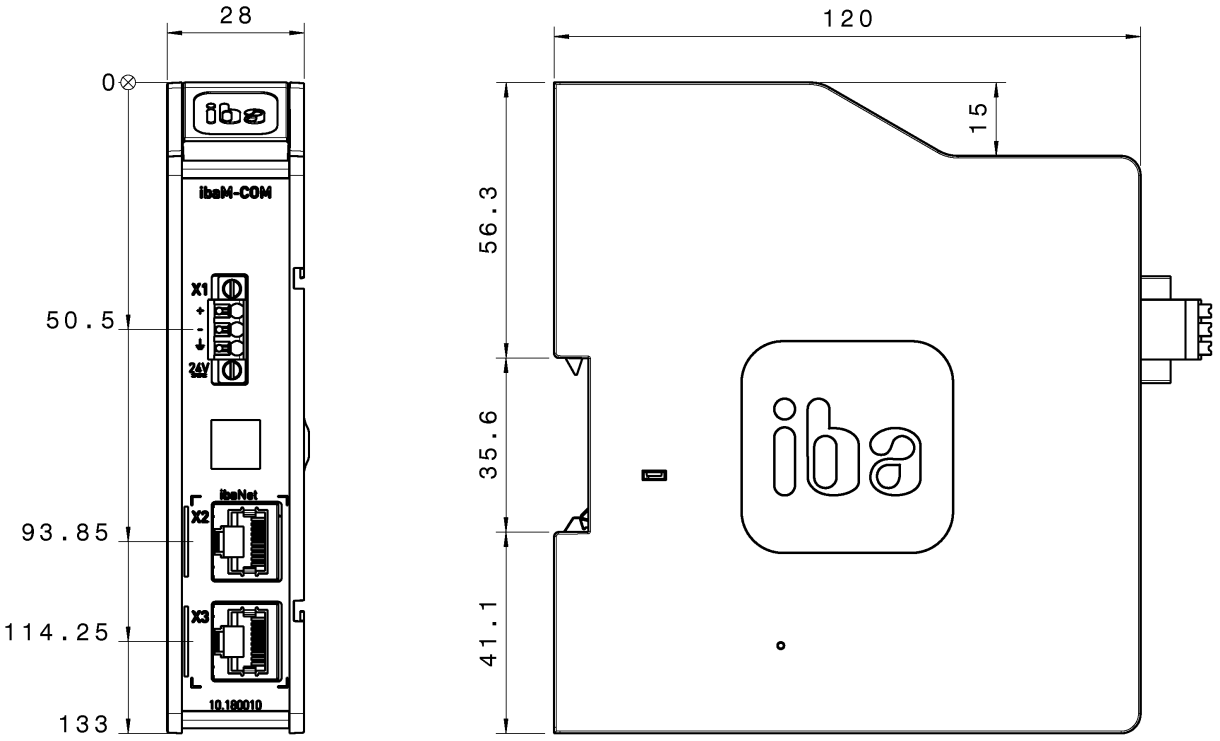
Unique Identifier: 10.180010, ibaM-COM

Responsible Party - U.S. Contact Information
iba America, LLC
370 Winkler Drive, Suite C
Alpharetta, Georgia
30004

(770) 886-2318-102
www.iba-america.com

FCC Compliance Statement
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

11.1 Dimensions

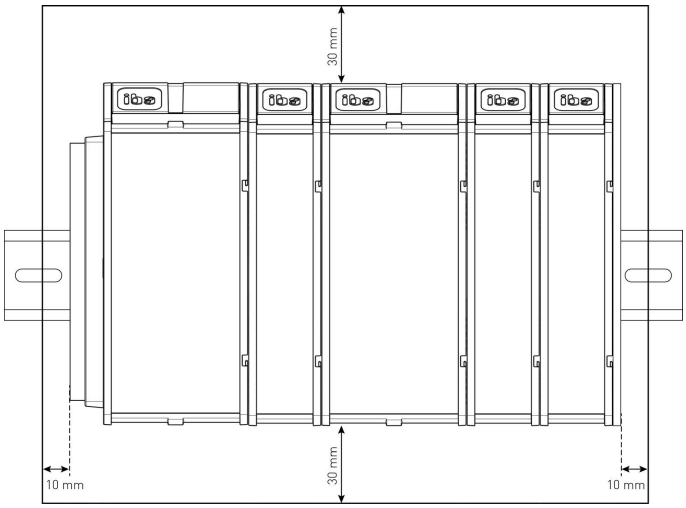


Dimensions *ibaM-COM*, dimensions in mm

Note

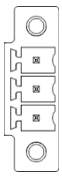
Ensure a minimum clearance of 30 mm above and below the housing and 10 mm to the right and left of the cooling fins to ensure sufficient ventilation of the device.

If the device has been extended with further modules, the above-mentioned clearances apply to the entire system.



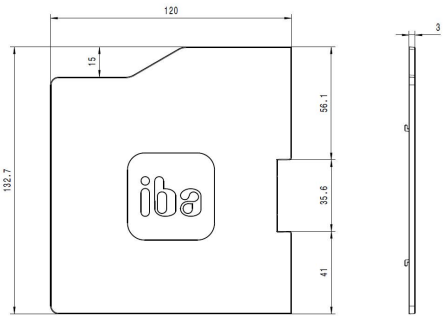
11.2 Connection diagram

Pin assignment power supply X1

Pin	Connector	
1	+ 24 V	
2	0 V	
3	Ground	

12 Accessories

End cover for MAQS modules



Short description	
Name	ibaM-CoverPlate
Description	End cover for MAQS modules
Order number	10.180020
Design	
Dimensions (w x h x d)	3 mm x 132.7 mm x 120 mm
Weight	0.05 kg

Connector for power supply

Short description	
Name	3-Pin Terminal Block MAQS-PWR RM3.81 Push-In SF
Description	3-pin socket connector/plug for power supply, push-in, screw connection
Order number	52.000031

13 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.

Contact

Headquarters

iba AG
Koenigswarterstrasse 44
90762 Fuerth
Germany

Phone: +49 911 97282-0

Email: iba@iba-ag.com

Mailing address

iba AG
Postbox 1828
D-90708 Fuerth, Germany

Delivery address

iba AG
Gebhardtstrasse 10
90762 Fuerth, Germany

Regional and Worldwide

For contact data of your regional iba office or representative
please refer to our web site:

www.iba-ag.com