



ibaM-EIP-S-1G

Fieldbus module EtherNet/IP sniffer

Manual
Issue 1.0

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, deviations cannot be excluded completely so that the full compliance is not guaranteed. However, the information 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 website www.iba-ag.com and can be found in the iba Help center docs.iba-ag.com.

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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.

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1 About this documentation

This documentation describes the design, application and operation of the device *ibaM-EIP-S-1G*.

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.

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 they are capable of assessing safety and recognizing possible consequences and risks on the basis of their 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 <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram – Add – New function block</i> .
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	<i>Filename, Path</i> Example: <i>Test.docx</i>

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-EIP-S-1G

Modular concept

The I/O module described in this documentation is part of the ibaMAQS modular measurement system.

The modular system consists of a central unit (*ibaM-DAQ* processor module or the *ibaM-COM* communication module), which can be combined with up to 15 different I/O modules. Modules are available for discrete input and output signals as well as for special technological features.

The I/O modules do not require their own power supply since they are powered via the module-module interface. The operating status of the module as well as the status of the individual channels are indicated by LEDs.

ibaM-EIP-S-1G

EtherNet/IP (EtherNet Industrial Protocol) is a real-time Ethernet which is mainly used in automation technology.

The fieldbus module *ibaM-EIP-S-1G* is a device for acquiring the cyclical data exchange between EtherNet/IP originator (controller) and target (IO devices). The device can be integrated into an existing EtherNet/IP network.

The device works as sniffer, i.e. it listens to the cyclic data exchange of the IO data (implicit messaging) between EtherNet/IP originator and target (IO devices).

The communication via the network interfaces X2 and X3 is being mirrored to the mirror port and can be recorded using an external network analysis tool.

Overview of the most important features:

- Network interfaces for sniffer function (RJ45, 1 Gbit/s)
- Mirror interface for connecting a network analysis tool
- Data acquisition with *ibaPDA*
- Rugged housing, easy installation

3 Scope of delivery

After unpacking, check that the delivery is complete and undamaged.

The scope of delivery includes:

- *ibaM-EIP-S-1G* device
- USB-C cable
- Adapter USB-A to USB-C

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 equipment. 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

The device is only designed for electrical measured variables as specified in the “Technical data” chapter!

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.

This applies in particular to the permissible operating and environmental conditions and voltages outside the corresponding CAT protection classes.

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!**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.

Warning!

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

Caution**Connecting and removing network cables**

Changes in the EtherNet/IP network might have an impact on the functionality of the control system.

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 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 or recalibration, return the device to iba.

5 System requirements

Hardware

ibaMAQS central unit

- *ibaM-DAQ* processor module or *ibaM-COM* communication module

Software

- *ibaPDA* v8.14.0 or higher

Firmware

- ibaMAQS v1.07.001 or higher

6 Mounting and dismantling

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.

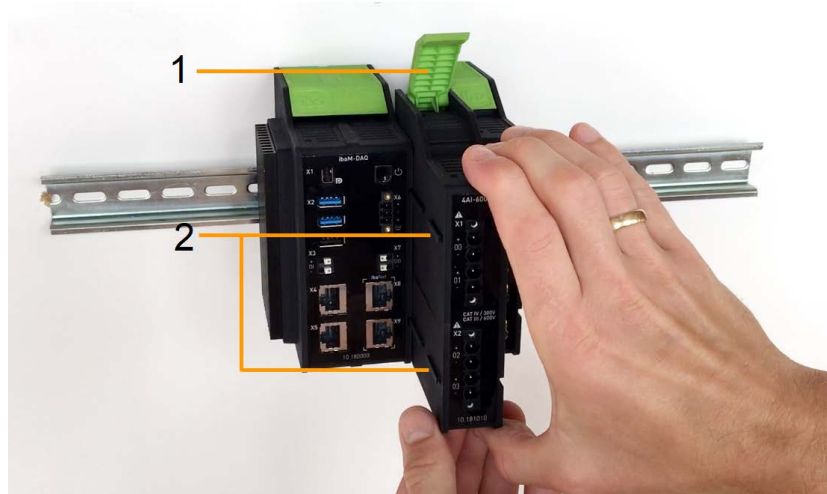
This disconnecting device must include a switch or circuit breaker that is easily accessible at a suitable location in the vicinity and is also clearly marked as a disconnecting device for this system.

6.2 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 14.*
- 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 14](#).
- Remove all connections from the module that is to be dismantled.
- 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 dismantled.
- 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.

6.3 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

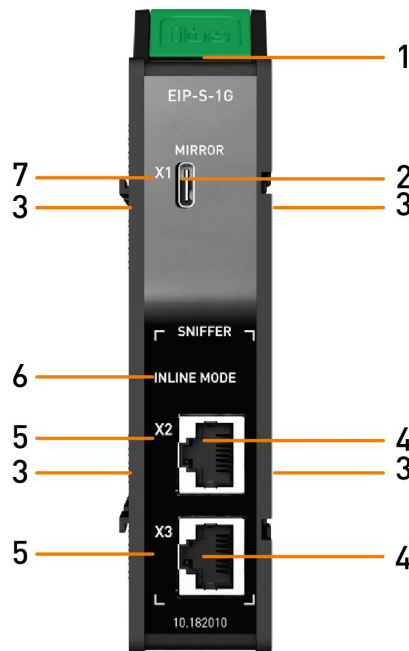


An end cover is included in the scope of delivery of the central unit.
The end cover is also available as an accessory or spare part from iba.

7 Device description

Here you will find views and descriptions of the device *ibaM-EIP-S-1G*.

7.1 View



- | | | | |
|---|----------------------------------|---|-----------------------------|
| 1 | Module status indicator | 5 | Network interface indicator |
| 2 | Mirror interface X1 | 6 | Inline mode indicator |
| 3 | Contacts module-module interface | 7 | Mirror interface indicator |
| 4 | Network interfaces X2, X3 | | |

7.2 Indicating elements

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

7.2.1 Module 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 EtherNet/IP communication status

The status of the EtherNet/IP communication is indicated by colored light diodes (LED).

Network interface

Color	Status	Description
Green	on	cyclic EtherNet/IP telegrams are detected and a configuration for the sniffer is active.
Green	flashing fast	boot phase
Green	flashing slowly	update mode
Red	on	hardware error

Status: Inline mode

Color	Status	Description
Green	on	Inline mode enabled
	off	Inline mode is not enabled

Status of the mirror interface

Color	Status	Description
Green	on	network analysis tool is connected
	off	no network analysis tool is connected

7.3 Connectors

You will find the following connections and interfaces on the device *ibaM-EIP-S-1G*.

7.3.1 Network interfaces X2, X3

With the network interfaces X2, X3, the device can be operated in an EtherNet/IP network without any interferences. The entire continuous data exchange can be recorded.

Both interfaces are RJ45 ports and support speeds of up to 1 Gbit/s.

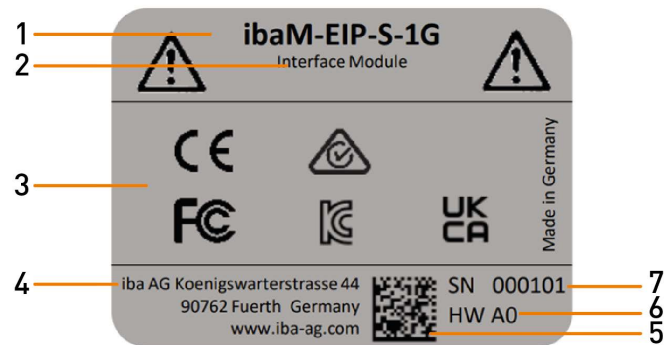
7.3.2 Mirror interface X1

The Mirror X1 USB-C port is used to connect a network analysis tool, such as Wireshark¹⁾. The communication via the network interfaces is mirrored and output on the X13 interface.

¹⁾ <https://www.wireshark.org/>

7.4 Type label

The type label provides the following information:



- | | | | |
|---|---------------------------|---|--------------------------------|
| 1 | Product name | 5 | DataMatrix code (iba internal) |
| 2 | Module type | 6 | Hardware version |
| 3 | Certifications, standards | 7 | Serial number |
| 4 | Manufacturer | | |

8 System integration

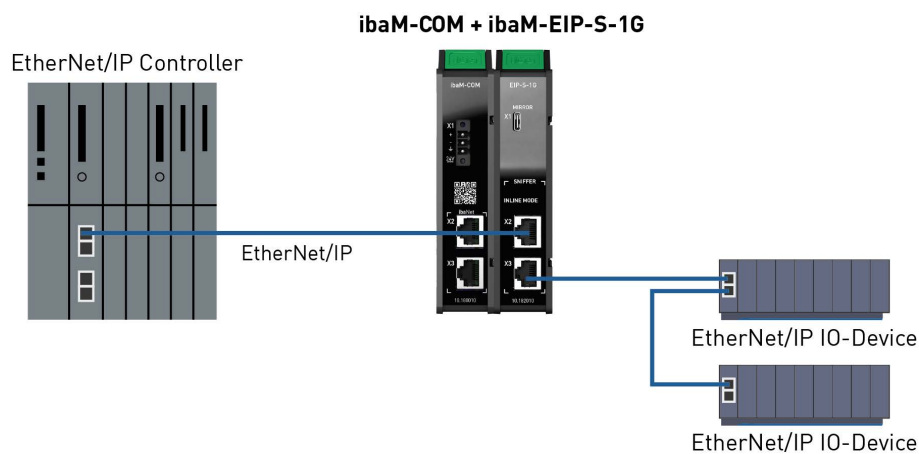
8.1 Data acquisition with sniffer

ibaM-EIP-S-1G is a device for acquiring the cyclical data exchange between EtherNet/IP originator and target. The device can be integrated into an existing EtherNet/IP network with one or more EtherNet/IP originator.

The device works as sniffer, i.e. it listens to the cyclic data exchange of the IO data (implicit messaging) between EtherNet/IP originator (controller) and target (IO device).

Inline mode

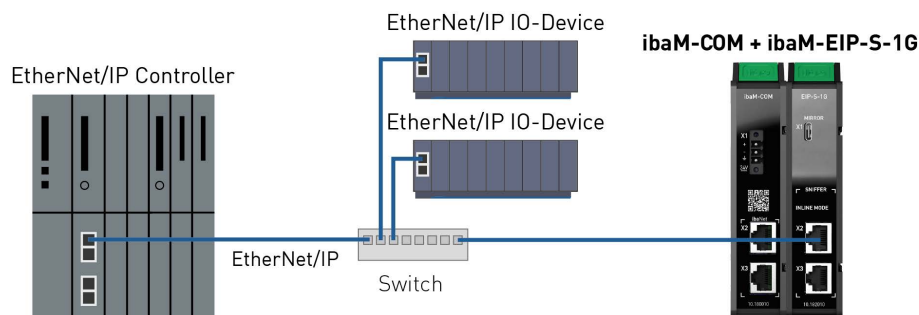
The installation location within the EtherNet/IP network is relevant. The network interfaces must be connected in a daisy-chain configuration. Only data that is being transmitted at this position in the network can be acquired.



Inline mode is not enabled

The EtherNet/IP originator (controller), targets (IO devices), and *ibaM-EIP-S-1G* are connected via a switch. *ibaM-EIP-S-1G* must be connected to the switch's mirror port.

ibaM-EIP-S-1G supports connections to two ports on different subnets in this configuration and can monitor traffic from both networks.



9 Configuration in ibaPDA

With *ibaPDA* you can search for devices in the network and configure them for operation in the network, but *ibaPDA* can also be used to configure, acquire and record the analog and digital signals of the connected terminals, and output them.

Modules from the ibaMAQ system can only be operated at an ibaMAQS central unit, either at the processor module *ibaM-DAQ* or communication module *ibaM-COM*. Configure the respective central unit before adding further modules.

Other documentation



Please read the description and configuration of the modules *ibaM-DAQ* or *ibaM-COM* in the corresponding device manuals.

9.1 Adding modules

There are several ways to add modules in *ibaPDA*:

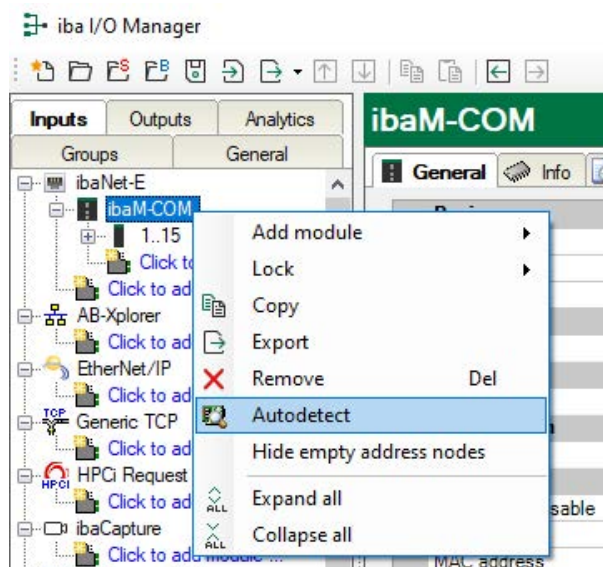
- Automatically
- Manually / offline

The procedure is described using the example of the communication module *ibaM-COM*.

9.1.1 Adding module automatically

1. Select the "ibaM-COM" link in the I/O Manager.
2. Right-click on the link to open a submenu.
3. Select *Autodetect*.

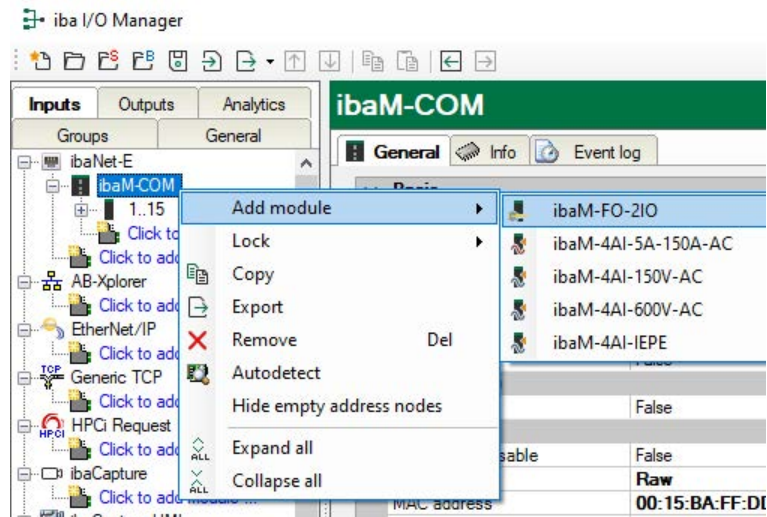
→ If *ibaPDA* detects the device automatically, the device and the connected modules are listed in the module tree.



9.1.2 Adding module manually / offline

Modules can also be added manually.

1. Right-click on the "ibaM-COM" link and select *Add module*.
2. Select the desired modules from the list.



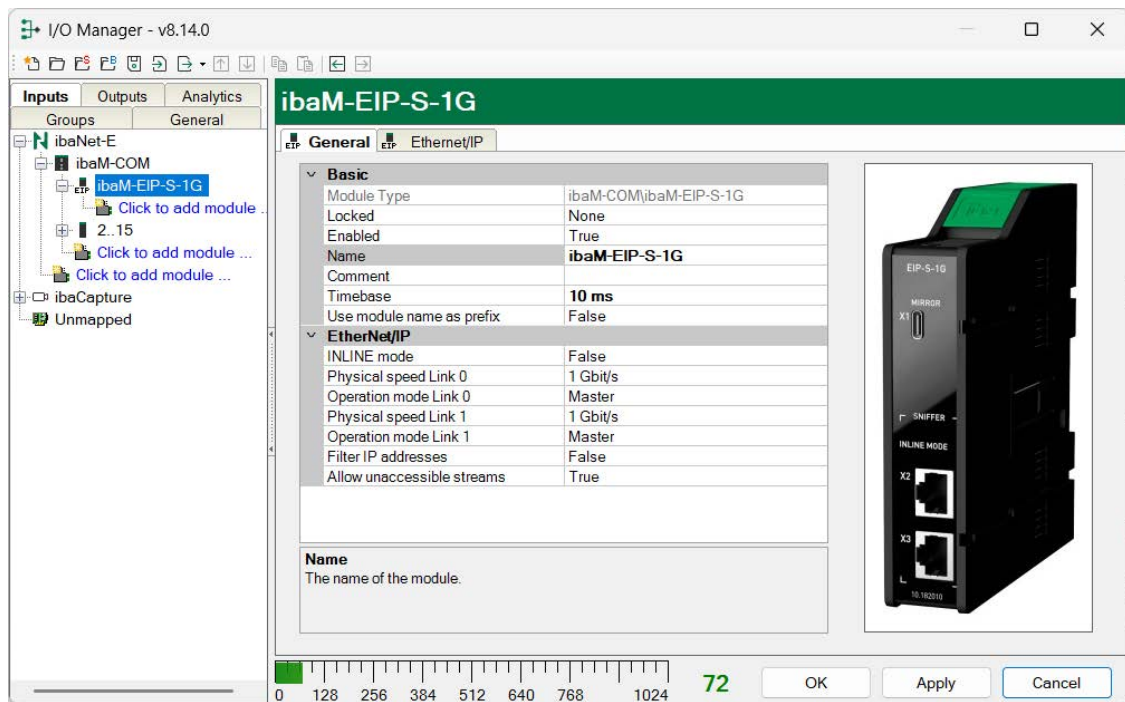
An offline configuration makes it possible, for example, to export a module configuration without existing or connected modules or to save the entire I/O configuration of the I/O Manager.

9.2 Module configuration

If the module is displayed correctly, carry out the configuration as described below.

9.2.1 ibaM-EIP-S-1G module

The *ibaM-EIP-S-1G* module has 4 registers. The *General* and *EtherNet/IP* tabs are always visible. The *Analog* and the *Digital* tab contain dynamic online views of the analog and digital signals acquired by the device. This is why these two tabs are only visible after modules of *EtherNet/IP Sniffer* type have been added and the configuration has been transferred to the device.



Basic

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.

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.

EtherNet/IP

INLINE mode

Enable INLINE mode for both interfaces (true) if the device is connected in a daisy-chain configuration to the EtherNet/IP network.

Physical speed Link 0/1

You can set the network speed for communication on links 0 and 1 separately. The available options are:

- 10 Mbit/s
- 100 Mbit/s
- 1 Gbit/s
- Autodetect

Depending on the physical speed, additional settings may be required.

- Settings for 10 Mbit/s and 100 Mbit/s:

Duplex Link 0/1

Select Full duplex or Half duplex.

Force settings Link 0/1

Enable *autonegotiation* or select *Force speed and duplex* for devices that do not support auto-negotiation.

Autonegotiation is a method in which two Ethernet devices automatically negotiate the highest possible transmission speed and the optimal duplex mode.

- Settings for 1 Gbit/s

Operation mode Link 0/1

Set Link 0 or Link 1 to *Master*. Only one link can be set to *Master*. For the other link, select *Slave* or *Automatic*.

Autonegotiation is a prerequisite for 1 Gbit/s connections. During this process, the clock source for the connection is also negotiated. Consequently, one endpoint must be configured as the master and the other as the slave.

Filter IP addresses

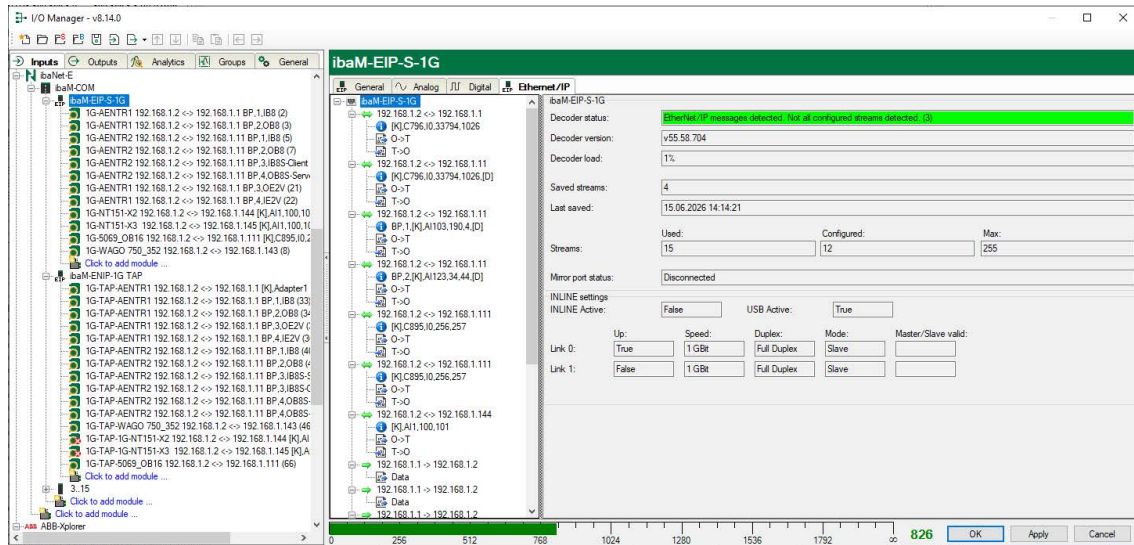
If you select *True*, the device will only process EtherNet/IP streams from devices with an IP address within the filter range. This should be used in networks with more than 1024 EtherNet/IP streams. You still need to enter the first and last IP addresses for the filter range. Up to 255 streams are supported.

Allow unaccessible streams

If you select *True*, acquisition can be started even if streams are not accessible.

9.2.1.1 Ethernet/IP tab

In the *Ethernet/IP* tab, you can see diagnostic information about the data streams and connections.



Decoder status, version, load

Display of status, version, and utilization (in %) of the decoder

Saved streams, last saved

Number of saved data streams, and the time of the last saving.

Streams used, configured, max.

Number of used, configured and maximum permitted data streams

Mirror port status

Status of the mirror port

INLINE settings

Inline mode setting, properties of link 0/1

Create module

The connection tree on the left lists all detected EtherNet/IP connections. If you mark a connection and click the button <Create module>, a corresponding *EtherNet/IP sniffer* module is created. The automatically detected configuration, such as originator and target address, connection path, header sizes, is adopted.

The <Create module> button is inactive if a module has already been created for this connection.

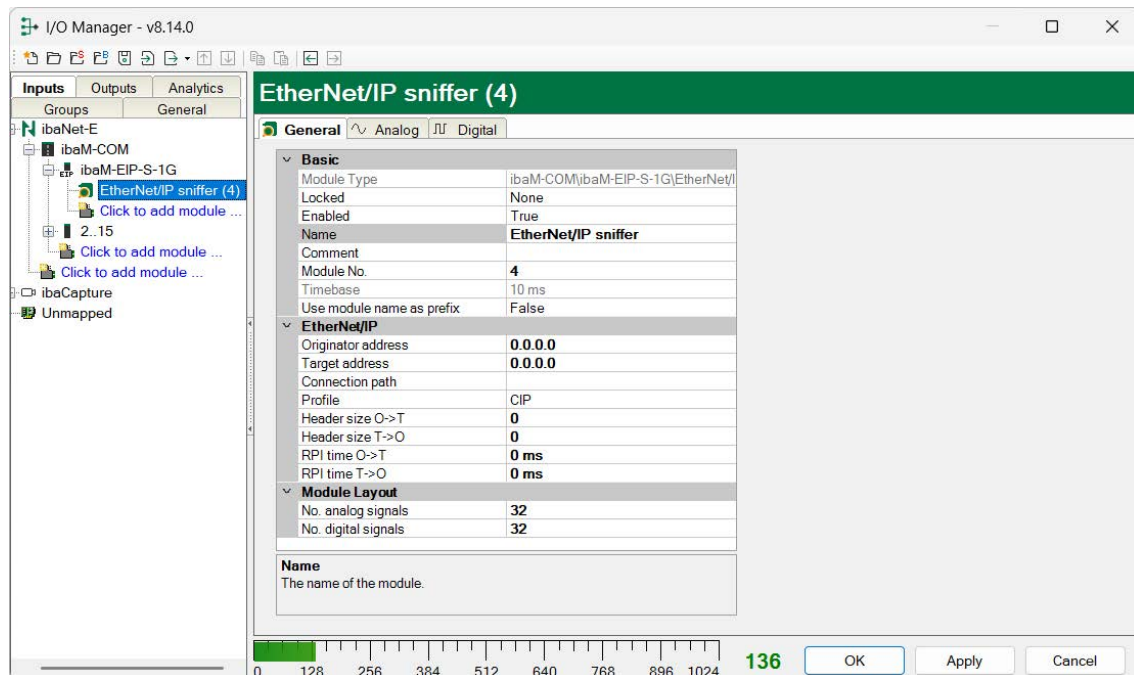
The parameters on the right side show different EtherNet/IP detailed information.

Display telegram content

The current contents of the respective telegrams are displayed when you mark a branch in the connection tree.

9.2.2 EtherNet/IP sniffer module

The module EtherNet/IP sniffer is only available underneath the *ibaM-EIP-S-1G* module.



Basic

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.

Modul 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.

EtherNet/IP

Originator address

The IP address of the sender (originator) of the EtherNet/IP connection you want to measure. The originator is the one that initiates the connection. This usually is a PLC.

Target address

The IP address of the target of the EtherNet/IP connection you want to measure. The target is the one receiving a connection request. This is usually an I/O module.

Connection path

The connection path of the EtherNet/IP connection you want to measure. This uniquely identifies a connection between an originator and a target. If there is only a single connection between the originator and the target then the connection path is not required.

Profile

Select the CIP profile used for this connection:

- CIP
- CIP Motion (extension of CIP for highly dynamic drive and motion control)

See also chapter [↗ CIP Motion, page 37](#)

Header size O→T

The size of the CIP real time format header. This determines the position of signal address 0 in the EtherNet/IP user data.

Header size T→O

The size of the CIP real time format header. This determines the position of signal address 0 in the EtherNet/IP user data.

RPI time O→T

RPI time O→T for asymmetric connections

RPI time T→O

RPI time T→O for asymmetric connections

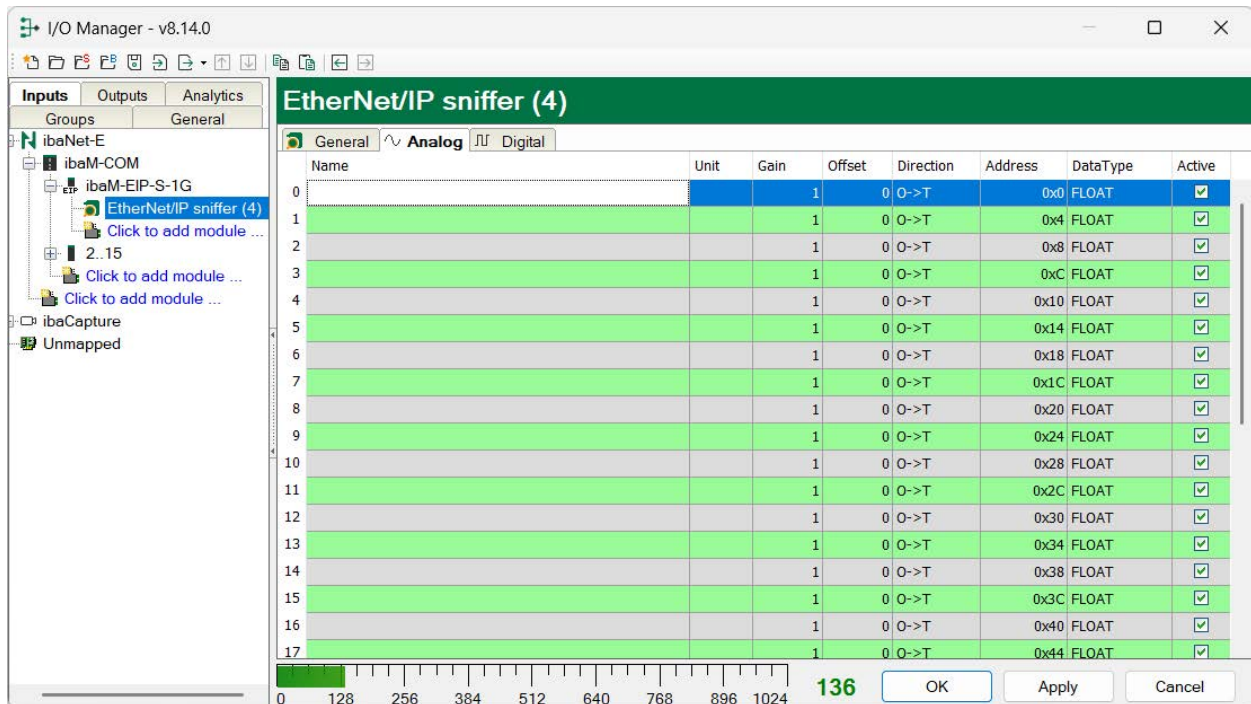
Module layout

No. analog signals / digital signals

Specify the number of analog signals/digital signals for this module (up to 1024 each)

9.2.2.1 EtherNet/IP Sniffer – Analog tab

Enter the signals you want to acquire in sequential order in the *Analog* tab.



The individual columns in the signal list have the following meanings:

Name

Here, you can enter a signal name and additionally two comments when clicking the  icon in the *Name* field.

Unit

Here, you can enter the physical unit of the analog value.

Gain / Offset

Gradient (Gain) and y axis intercept (Offset) of a linear equation. You can convert a standardized and unitless transmitted value into a physical value.

Direction

Select the direction from the drop-down menu:

O->T: originator -> target

T->O: target -> originator

Data block

The *Data Block* column is visible only if the *CIP Motion* profile has been selected in the *General* tab. The data block of a CIP Motion telegram can contain various types of information that are defined in the EtherNet/IP configuration. See also chapter [CIP Motion](#), page 37. The following options are available:

- Cyclic Actual
- Cyclic Read/Write
- Event
- Service

Address

The byte address of the signal within the input or output data range. The address range always begins with the address 0.

Data type

Data type of the signal. Available data types:

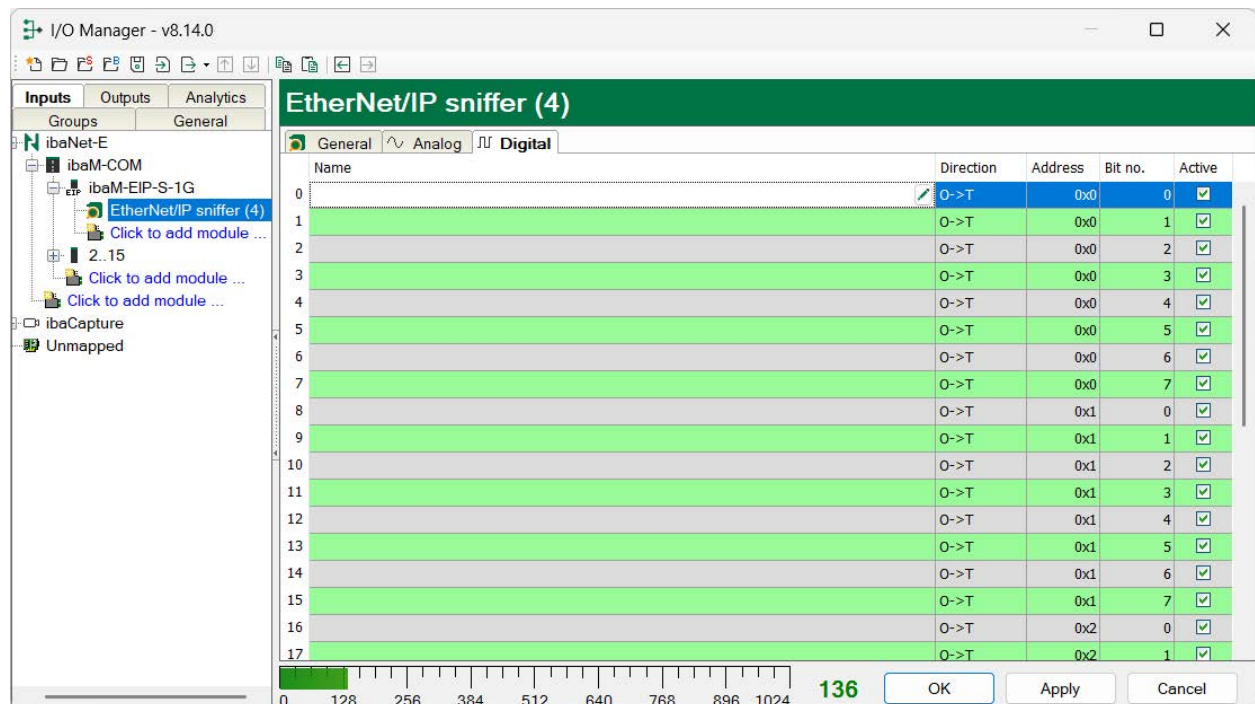
Data type		Description	Value range
Big Endian	Little Endian		
BYTE	BYTE	8 bit without plus/minus sign	0 to 255
INT_B	INT	16 bit with plus/minus sign	-32768 to 32767
WORD_B	WORD	16 bit without plus/minus sign	0 to 65535
DINT_B	DINT	32 bit with plus/minus sign	-2147483647 to 2147483647
DWORD_B	DWORD	32 bit without plus/minus sign	0 to 4294967295
FLOAT_B	FLOAT	IEEE754; Single Precision; 32 bit floating point	$\pm 3,402823 \text{ E}+38 \dots$ $\pm 1,175495 \text{ E}-38$

Active

Only when this option is selected, the signal is acquired and also considered when checking the number of licensed signals.

9.2.2.2 EtherNet/IP sniffer – Digital tab

Enter the signals you want to acquire in sequential order in the *Digital* tab.



The individual columns in the signal list have the following meanings:

Name

You can enter a signal name and additionally two comments when clicking on the  icon in the *Name* field.

Direction

Select the direction from the drop-down menu:

O->T: originator -> target

T->O: target -> originator

Data Block

The *Data Block* column is visible only if the *CIP Motion* profile has been selected in the *General* tab. The data block of a CIP Motion telegram can contain various types of information that are defined in the EtherNet/IP configuration. See also chapter [↗ CIP Motion, page 37](#). The following options are available:

- Cyclic Actual
- Cyclic Read/Write
- Event
- Service

Address

The byte address of the signal within the input or output data range. The address range always begins with the address 0.

Bit no.

Enter the bit no within the byte defined as "Address".

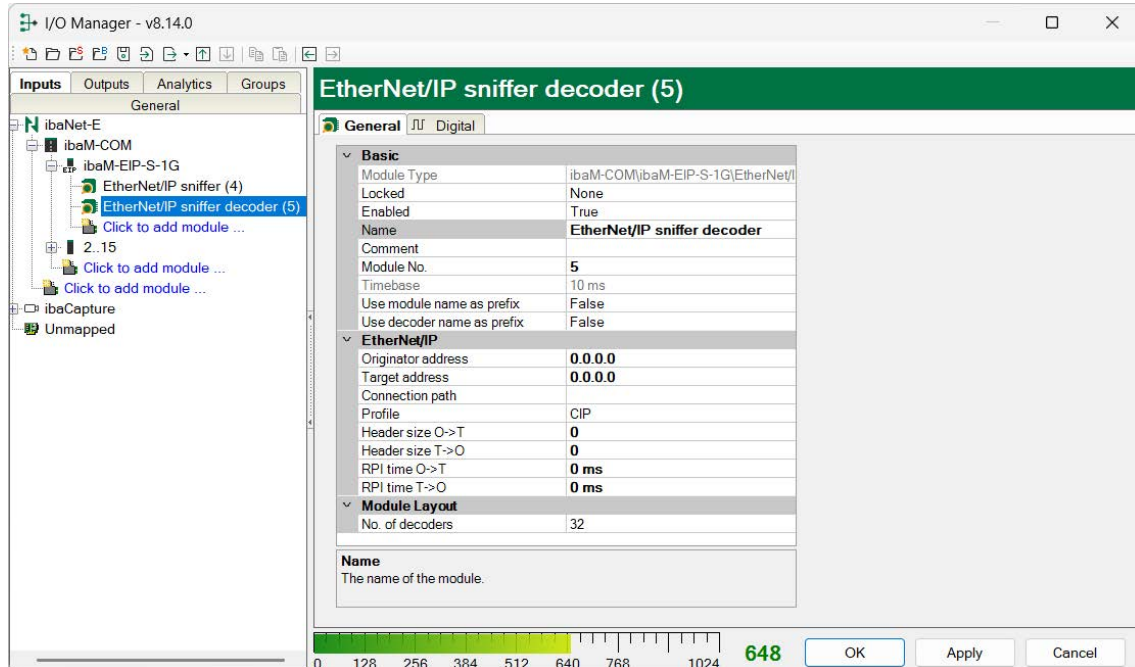
Active

Only when this option is selected, the signal is acquired and also considered when checking the number of licensed signals.

9.2.3 EtherNet/IP sniffer decoder module

The module EtherNet/IP sniffer decoder is available underneath the *ibaM-EIP-S-1G* module.

The *EtherNet/IP sniffer decoder* module is suitable for acquiring large amounts of digital signals that are present in the form of bytes, words, or double words in an EtherNet/IP network.



Basic

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.

Modul 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.

Use the decoder name as a prefix

This option puts the decoder name in front of the signal name.

EtherNet/IP**Originator address**

The IP address of the sender (originator) of the EtherNet/IP connection you want to measure. The originator is the one that initiates the connection. This usually is a PLC.

Target address

The IP address of the target of the EtherNet/IP connection you want to measure. The target is the one receiving a connection request. This is usually an I/O module.

Connection path

The connection path of the EtherNet/IP connection you want to measure. This uniquely identifies a connection between an originator and a target. If there is only a single connection between the originator and the target then the connection path is not required.

Profile

Select the CIP profile used for this connection:

- CIP
- CIP Motion (extension of CIP for highly dynamic drive and motion control)

See also chapter [↗ CIP Motion, page 37](#)

Header size O→T

The size of the CIP real time format header. This determines the position of signal address 0 in the EtherNet/IP user data.

Header size T→O

The size of the CIP real time format header. This determines the position of signal address 0 in the EtherNet/IP user data.

RPI time O→T

RPI time O→T for asymmetric connections

RPI time T→O

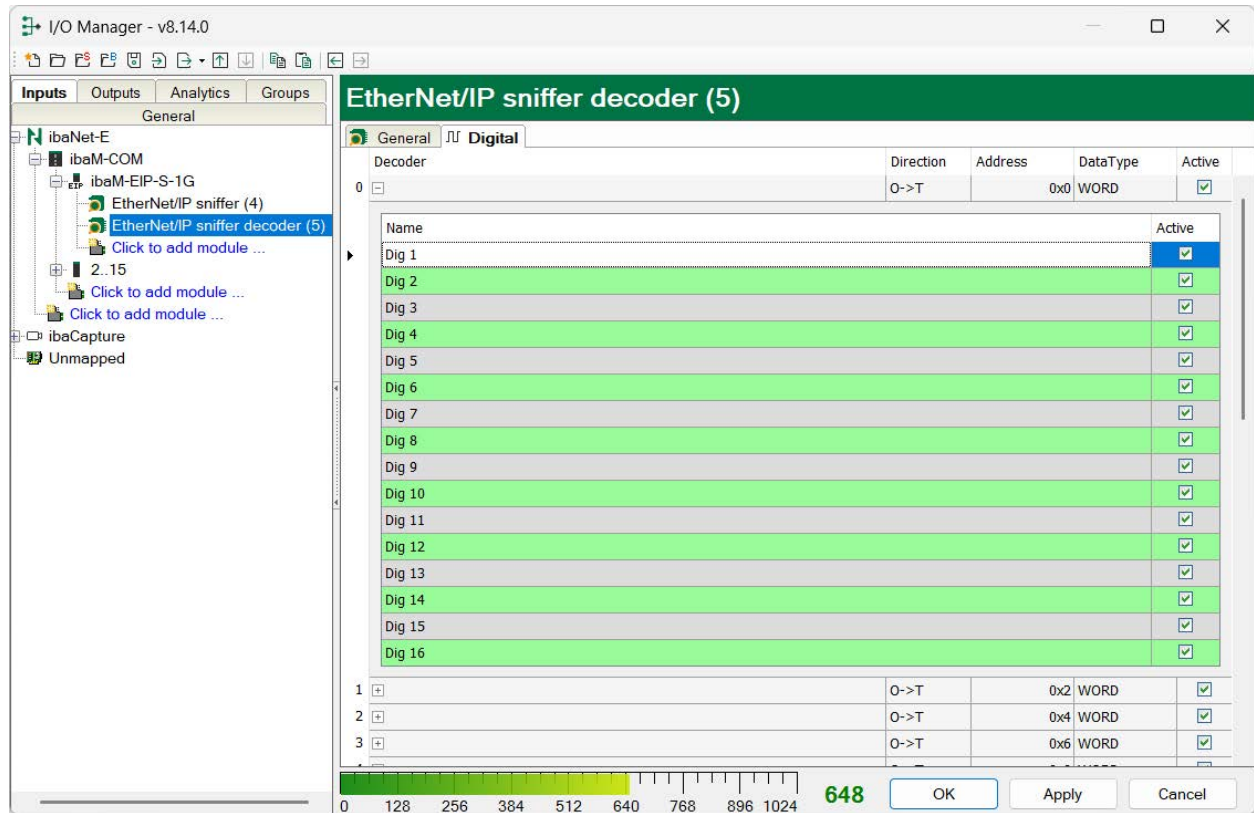
RPI time T→O for asymmetric connections

Module layout**No. of decoders**

Specify the number of analog values that can be decoded into digital signals (max. 256).

9.2.3.1 EtherNet/IP sniffer decoder – Digital tab

The signals are declared in two steps. First, the signals you want to acquire as source for the digital signals have to be defined in sequential order.



In the *Digital* tab enter the signals, that contain the digital signals. The individual columns in the signal list have the following meanings:

Decoder

Give the source signal a meaningful name.

Direction

Select the direction from the drop-down menu:

O->T: originator -> target

T->O: target -> originator

Data Block

The *Data Block* column is visible only if the *CIP Motion* profile has been selected in the *General* tab. The data block of a CIP Motion telegram can contain various types of information that are defined in the EtherNet/IP configuration. See also chapter [CIP Motion](#), page 37. The following options are available:

- Cyclic Actual
- Cyclic Read/Write
- Event
- Service

Address

The byte address of the signal within the input or output data range. The address range always begins with the address 0.

Data type

Data type of the signal. The following types are available: BYTE, WORD, WORD_B, DWORD, DWORD_B.

Active

With this option enabled, the source signal is acquired with its digital signals and is also considered when checking the number of licensed signals. Individual digital signals can be disabled.

For every source signal, the list of digital signals can be opened by clicking on the plus sign. Here, the single bits of the source signal are defined.

Name

Enter a meaningful name to the individual digital signals.

Active

Only when this option is selected, the signal is acquired and also considered when checking the number of licensed signals.

Note

Only the activated digital signals are considered when counting the number of licensed signals, hence no additional signal for the source signal.

ibaM- EIP-S-1G only acquires one analog value, which is then decoded by *ibaPDA*. Thus, the range of analog values is used in *ibaM-EIP-S-1G* for acquiring large amounts of digital signals.

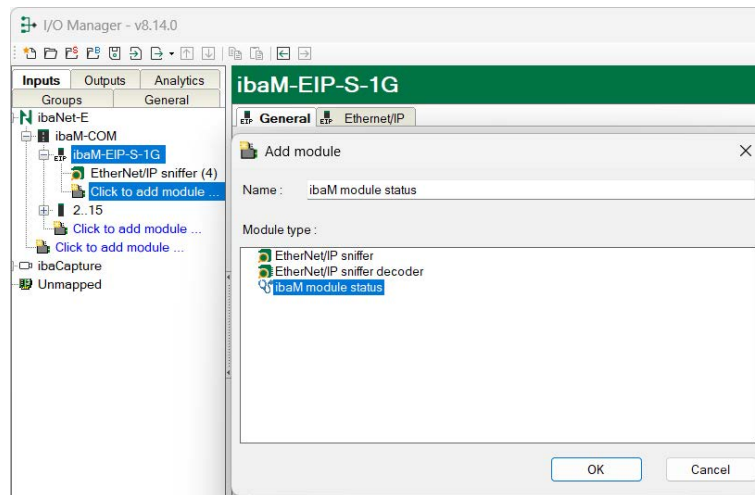
9.2.4 ibaM-EIP-S-1G module status

The *ibaM module status* module can be used to acquire information about the module status of the *ibaM- EIP-S-1G* module as signals.

9.2.4.1 Add status module

Procedure

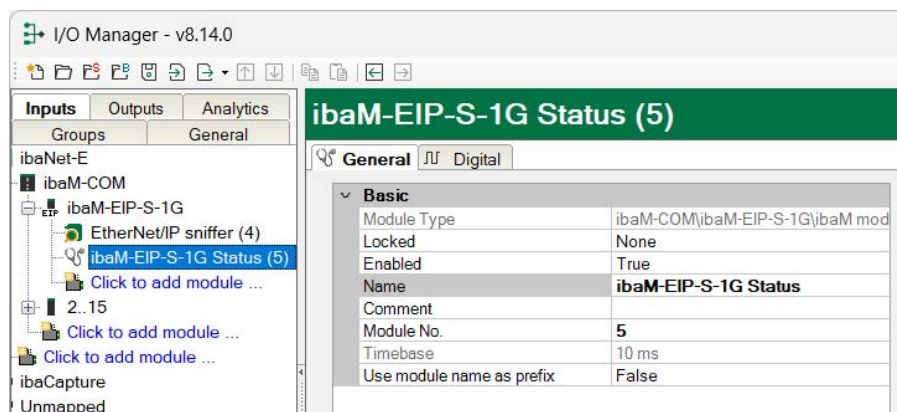
1. Click on the link *Click to add module* under *ibaM- EIP-S-1G*.
2. Select ibaM module status.



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

9.2.4.2 ibaM-EIP-S-1G Status - General tab

The following settings can be made in the General tab.



Basic

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.

Modul No.

This internal reference number of the module determines the order of the modules in the signal tree of *ibaPDA* client and *ibaAnalyzer*.

Timebase

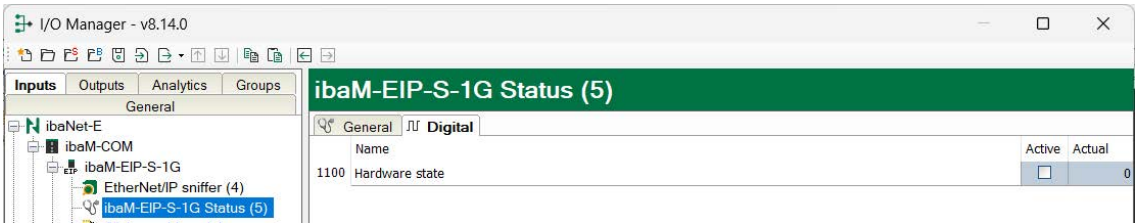
All signals of the module are sampled on this timebase.

Use module name as prefix

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

9.2.4.3 Status signals

The available status signals are automatically created in the *Digital* tab.



Signal name	Description
Hardware state	Status of the <i>ibaM-EIP-S-1G</i> module

9.2.5 Module information

For information on the individual modules connected to the IO bus, see the Info tab on the central unit.

Select the central processing unit module in the I/O Manager—either *ibaM-DAQ* or *ibaM-COM*—and choose the *Info* tab. In the *System information* section, you will find a table containing details such as module type, hardware version, calibration date, firmware version, serial number, and status.

Module	Type	Hardware version	Calibration date	Firmware version	Serial number	Status
0	ibaM-DAQ	A4	Not required	A05.002	000165	Error
1	ibaM-FO-2IO	A1	Not required	A01.005	000105	OK
2	ibaM-FO-2IO	A1	Unknown	A01.006	000160	OK
3	ibaM-4AI-UI	A3	2025-06-25	A01.001	000110	OK
4	ibaM-4AI-600V-AC	A4	2024-02-21	A04.004	000116	OK
5	ibaM-4AI-600V-AC	A4	2024-02-20	A04.004	000111	Missing

Meaning of the following columns:

Calibration date

The following information can be displayed in the *Calibration date* column:

- Not required: The module does not need to be calibrated.
- Unknown: The state of the calibration cannot be determined.

In this case, restart the device or the IO bus. If “Unknown” continues to be displayed, contact the iba support.

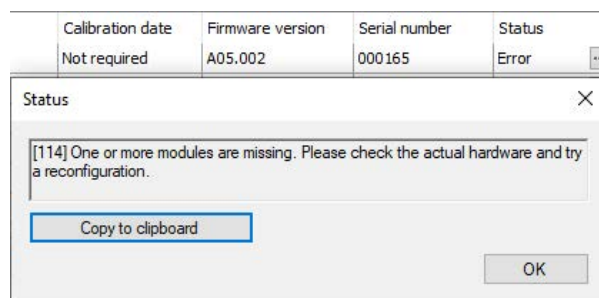
- YYYY-MM-DD: Date of last calibration (in year-month-day format)

Firmware version

If the firmware version of a module does not match the version included in the firmware package or if no firmware is included for this module in the firmware package, an exclamation mark appears.

Status

If an error is displayed here, click <...> to see information about the cause of the error.



9.3 CIP Motion

CIP Motion is an extension of CIP designed specifically for highly dynamic drive and motion control.

When CIP Motion is selected as the profile, an additional *Data Block* column appears in the *Analog* tab. Depending on the data block, different information is transmitted:

- *Cyclic Actual*: transmits the actual values from the IO device to the controller
- *Cyclic Read/Write*: bidirectional data block for cyclic setpoints and attributes (Write: setpoints from the controller to the I/O device; Read: response from the I/O device to the controller)
- *Event*: transmits event-based information, such as alarms, status changes, and limit violations
- *Service*: transmits asynchronous service information, such as configuration, diagnostic queries, etc.

10 EtherNet/IP engineering

Caution



Connecting and removing network cables

Changes in the EtherNet/IP network might have an impact on the functionality of the control system.

10.1 Operation as sniffer

When the device operates as sniffer, no configuration in the engineering tool of the used EtherNet/IP scanners (master) is necessary.

To configure *ibaPDA*, knowledge concerning the structure of the transferred user data is needed, basically the following information:

- Between which scanner and which adapter the data is transferred.
- Will the data be transferred from the scanner to the adapter (OUTPUT) or will it be transferred from the adapter to the scanner (INPUT)?
- Where (Byte offset) in the slot data the corresponding signal is saved and which data type is used.

A distinction must be made between (TCP) connections and (UDP) data streams. An EtherNet/IP connection usually consists of one connection and two data streams (one in each direction). The data streams are used for cyclic IO data exchange.

The following technical restrictions are to be taken into consideration:

- To detect the EtherNet/IP connection, the telegram traffic must be sniffed during connection setup (CPU start-up, cable reconnection). If this is not the case, only the running data streams are detected. In this case, it may be that the cyclic I/O data cannot always be clearly assigned to EtherNet/IP connections. Data acquisition is then not reasonably possible.
- A maximum of 1024 analog and 1024 digital signals from up to 64 bidirectional connections can be configured.
- Up to 1023 data streams and 511 connections can be displayed in the online diagnostics.

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.

Short description

Name	ibaM-EIP-S-1G
Module label	EIP-S-1G
Description	fieldbus module for EtherNet/IP
Order number	10.182010

Module-module interface

Number	2
Connection technology	4x 8 sliding contacts

EtherNet/IP interface

Network interface	2x RJ45 socket, 1 Gbit/s
Mirror interface	USB-C port

Supply

Supply	
Supply voltage	24 V DC via module-module interface
Current consumption max.	
Own consumption	0.3 A
Input/output current	4 A

Other interfaces, operating and indicating elements

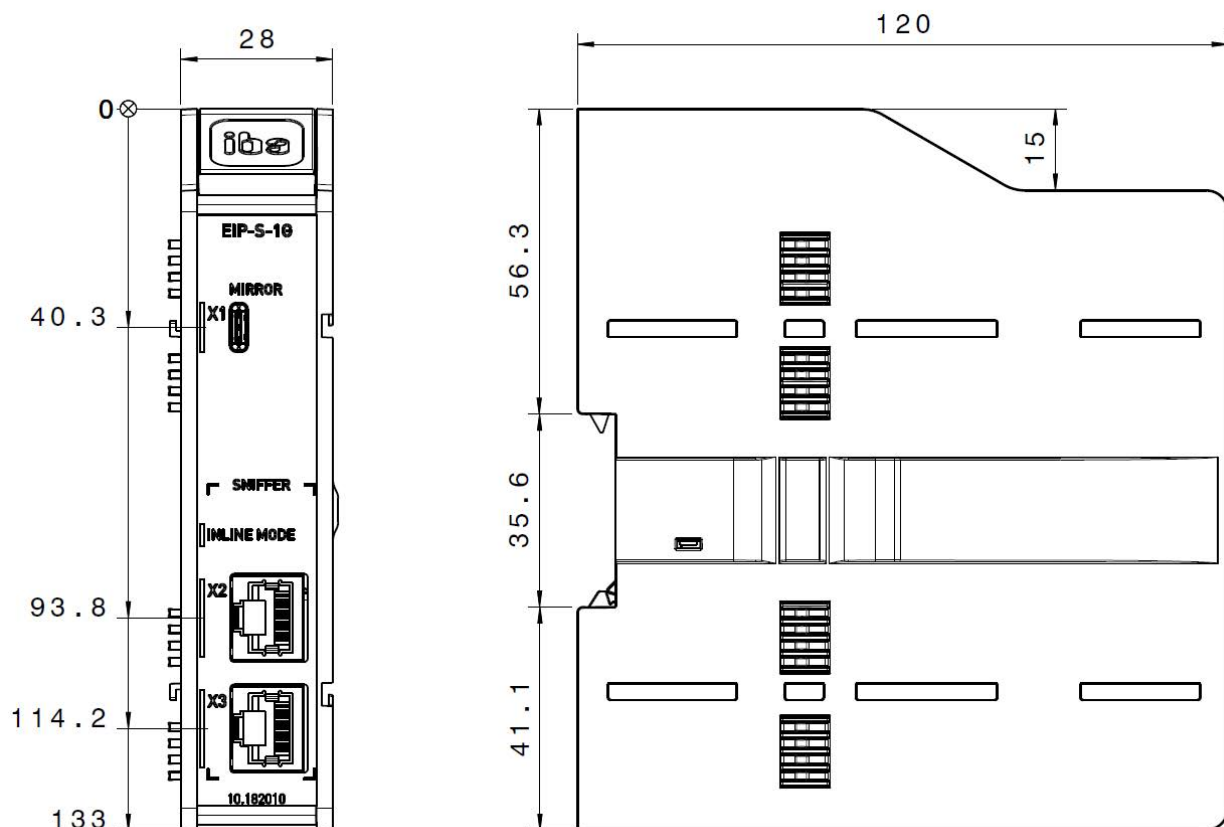
Indicators	LEDs for operation and status of the network interface
------------	--

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	on DIN rail according to EN 50022 (TS 35, DIN rail 35)
Cooling	passive
Relative humidity	15 % ... 95 % (indoor), no condensation
Operating altitude	0 ... 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
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 / 0.49 kg

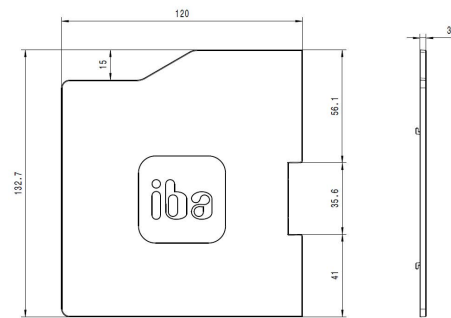
11.1 Dimensions



Dimensions *ibaM-EIP-S-1G*, dimensions in mm

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

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.

Product Security Incident Response Team (PSIRT) at iba

Current advisories: www.iba-ag.com/en/security

Email: psirt@iba-ag.com

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www.iba-ag.com