ibaMS8xIEPE

Input module for IEPE vibration sensors

Manual

Issue2.3

Measurement Systems for Industry and Energy

www.iba-ag.com

Manufacturer

iba AG

Gebhardtstrasse 10-20

90762 Fuerth

Germany

Contacts

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

Issue	Date	Revision	Author	Version HW/FW
2.3	03-2026	Grounding recommendation	st	A1/-

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.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Contents

1 About this documentation

This documentation describes the construction, the use and the operation of the device *ibaMS8xIEPE*. You can find a general description of the iba modular system and further information about the design of the central units and how to use and operate them in separate manuals.

Other documentation

For a general description of the iba modular system and additional information about layout, application and operation of the modules, please refer to the dedicated documentations.

The documentation of the iba modular system is part of the data medium "iba Software & Manuals".

The documentation of the iba modular system comprises the following manuals:

- **Central units**

  The manuals of the central units contain information about:

  - Scope of delivery
  - System requirements
  - Device description
  - Mounting/dismounting
  - Start-up
  - Configuration
  - Technical data
  - Accessories

- **Modules**

  The manuals of the single modules contain specific information on the individual module. For example:

  - Short description
  - Scope of delivery
  - Product characteristics
  - Configuration
  - Description of the functions
  - Technical data
  - Connection diagram

1.1 Target group and previous knowledge

This documentation is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if 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 *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 ibaMS8xIEPE

The *ibaMS8xIEPE* module is oart of the iba modular system. The modular concept is designed on the basis of a backplane. You can plug on this backplane not only the CPU, but also up to 4 input/output modules. The module is supplied with power via the backplane bus in the module rack.

The module offers 8 analog inputs.

A brief overview

- Extension module for the iba modular system
- 8 analog inputs
- Galvanically isolated groups of 2 inputs each
- Constant current source 4 mA for sensors
- Typically for IEPE vibration sensors
- Detection of broken line and short circuit
- Analog and digital anti-aliasing filter
- Synchronous sampling
- 4 channels can be configured as ±24 V voltage input
- High-pass 1 Hz or 0.1 Hz can be configured
- Sampling rate 1 kHz[1)] max. 40 kHz, freely adjustable
- 24 bit resolution
- Rugged housing, easy mounting
- Certification according to CE

Fields of application

Measurement of mechanical vibration by means of IEPE vibration sensors:

- Wind turbines
- Condition Monitoring
- Test benches
- Monitoring of bearings
- Mill chatter monitoring

[1)] Due to the integrated filters, a minimum sampling rate of 1 kHz is recommended for the correct operation of this module, even if an even lower sampling rate (time base) can be set in the ibaPDA configuration.

3 Scope of delivery

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

The scope of delivery includes:

- Device *ibaMS8xIEPE*
- 2 x 12-pin multi-pin connector
- Data medium “iba Software & Manuals” (only for single delivery)

4 Safety instructions

Observe the following safety instructions for *ibaMS8xIEPE*.

4.1 Intended use

The device is an electrical apparatus. It is only allowed to use the device for the following applications:

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

The device may only be operated in conditions as specified in the technical data, see ↗ *Technical data, page 35*.

4.2 Special safety instructions

Danger!

Risk of electric shock!

- The device is only designed for electrical measuring currents as specified in the "Technical data" chapter.
- Never use damaged measuring cables!
- Measuring cables must NOT be attached or detached to/from the device under voltage!

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!

Modules must NOT be attached or detached to/from the rack under voltage.

Switch off the central unit or disconnect power supply before attaching or detaching the modules.

Note

Do not open the device! Opening the device will void the warranty!

Note

To clean the device, use a dry or slightly moistened cloth.

5 System requirements

Hardware

- Central unit: *ibaPADU-S-IT-2x16* or *ibaPADU-S-CM* (version 02.12.004 or higher)
- Backplane panel, e. g. *ibaPADU-B4S*

Software

- *ibaPDA* version 6.35.0 or higher
- *ibaLogic-V5* version 5.0.3 or higher

Note

The use of *ibaLogic-V5* requires the central unit *ibaPADU-S-IT-2x16*. If the module is used with the predecessor *ibaPADU-S-IT-16*, only *ibaLogic-V4* can be used.

6 Mounting and dismounting

In the following, you will learn how to install, connect and dismount the modules *ibaMS8xIEPE* . Also refer to the notes in chapter ↗ *Safety instructions*, page 11.

Caution!

Before working on or dismounting the device, disconnect it from the power supply.

Note

Mount one or more modules on the right next to the central unit (slot X2 to X5 can be freely selected).

6.1 Mounting

Proceed as follows to mount the *ibaMS8xIEPE* module.

1. Disconnect the central unit from the power supply.
2. Remove the cover from the backplane bus, to which the module should be attached.
3. Attach the module to the backplane bus and press it firmly against the module rack.
4. Screw the module to the top and bottom of the module rack using the fastening screws.

Note

Always screw the device and the modules tightly. Plugging or unplugging the connectors for the inputs/outputs can otherwise cause damage.

6.2 Connecting

Note

The module rack and the device must be connected to a protective conductor.

1. Connect all cables.
2. If all required cables are connected, connect the central unit to the power supply.
3. Switch on the central unit.

6.3 Dismounting

To dismount the module, proceed as follows.

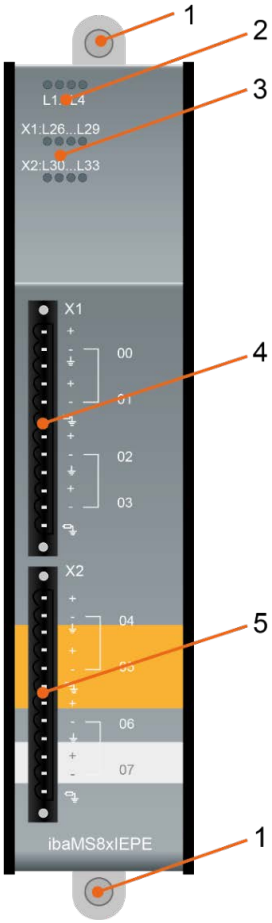
1. Disconnect the central unit from the power supply.
2. Remove all cables.
3. Loosen the upper and lower fixing screws that secure the module to the module rack.
4. Pull the device straight from the backplane.
5. Put the cover on the backplane bus.

7 Device description

Here you will find views and descriptions of the device *ibaMS8xIEPE*.

7.1 Front view

The following illustration shows the front view of the module *ibaMS8xIEPE*.



1	Fixing screws	4	Connector X1 of analog inputs 00…03
2	Operating status indicator L1…L4	5	Connector X2 of analog inputs 04…07
3	Status LED L26…L33 of analog inputs 00…07		

7.2 Indicating elements

Colored LEDs on the device indicate the status of the device and the status of the IEPE inputs.

7.2.1 Operating state

The following overview shows the possible operating states of the module *ibaMS8xIEPE*.

LED	Color	State	Description
L1	green	flashing	device ready for operation
		off	device not ready for operation (switched off)
L2	yellow	on	access to the backplane bus
L3	white	-	-
L4	red	off	normal status, no errors
		flashing	failure/error

Note

If an error is displayed on LED L4, contact iba support.

7.2.2 Status of IEPE inputs

The following overview shows the possible states of the IEPE inputs and provides information on the respective mode.

LED per channel	State	IEPE mode	AI mode
L26 … L33	Off	Channel not active	± (0 V … 0.3 V)
	Green	± (0 V … 4.5 V) 0..90% Within measuring range	± (0.3 V … 21.6 V)
	Yellow	± (4.5 V … 5.0 V) 90 ... 100% Out of measuring range	± (21.6 V … 24 V)
	Red	Not connected or broken line (Vcc > 20 V)	Out of measuring range
	Flashing red	Shorted	

7.3 Analog inputs

Note

A channel requires a settling time of about 10 to 50 seconds after switching on. The settling time in IEPE 1Hz mode is shorter than in IEPE 0.1Hz mode.

This also applies, if the signal was overdriven for a short time.

The analog inputs can be adjusted to different operating modes per channel. The operating mode is configured in *ibaPDA*.

- IEPE input (±5 V) with 1 Hz high-pass filter[2)]
- IEPE input (±5 V) with 0.1 Hz high-pass filter
- 24V AC input (AI)
- 24V DC input (AI)

4 inputs are adjusted permanently to IEPE mode. The mode of the second input of each root can be configured: IEPE 1Hz, IEPE 0.1Hz, 24V AC or 24V DC. The following table shows the possible input settings:

	IEPE 1Hz	IEPE 0.1Hz	24V AC	24V DC
Analog input 0	✓	✓	-	-
Analog input 1	✓	✓	✓	✓
Analog input 2	✓	✓	-	-
Analog input 3	✓	✓	✓	✓
Analog input 4	✓	✓	-	-
Analog input 5	✓	✓	✓	✓
Analog input 6	✓	✓	-	-
Analog input 7	✓	✓	✓	✓

Caution!

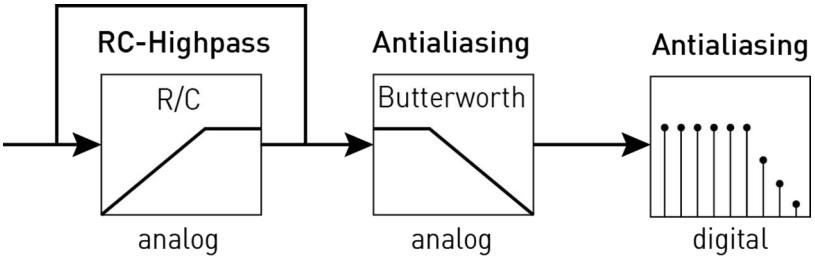
When set to IEPE mode (default setting) an integrated constant current source provides 4 mA (30 V DC) for the connection of IEPE sensors. However, when the inputs are used as 24 V input, the configuration to 24 V mode has to be done in *ibaPDA* **before wiring**, see ↗ *ibaMS8xIEPE – Analog tab, page 29*!

[2)] Default setting

7.3.1 Filters

All used filters are permanently active.

Filter sections



RC high-pass

The cutoff frequency depends on the mode:

Mode	Cutoff frequency
IEPE 0.1Hz	0.1 Hz
IEPE 1Hz	1 Hz
24V DC	-
24V AC	1 Hz

Anti-aliasing Butterworth 4th order

The cutoff frequency depends on the sampling rate:

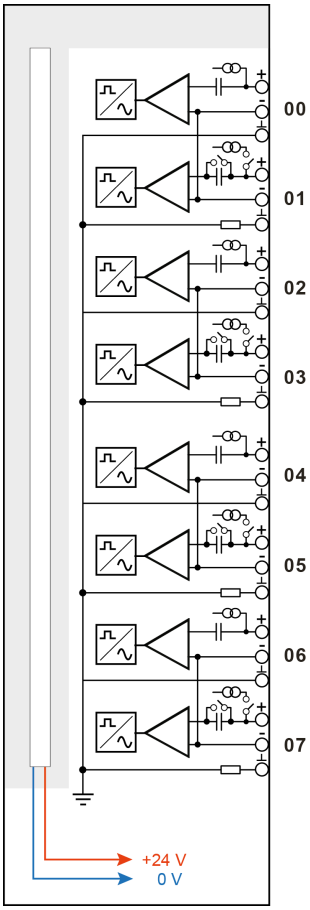
Sampling rate	Cutoff frequency
≤ 8 kHz	4 kHz
> 8 kHz	20 kHz

Digital anti-aliasing filter

Parameter	Value
Group run time	37 / f
Settling time	74 / f
Pass bandwidth	0.453 x f
-3 dB bandwidth	0.49 x f
Stopband frequency	0.547 x f
Stopband attenuation	100 dB

7.3.2 Connection diagram and pin assignment

Here, you can connect 8 input signals (0...7), each bipolar plus grounding. 2 input channels of a plug are grouped to one root. Each connector/each root is galvanically isolated.

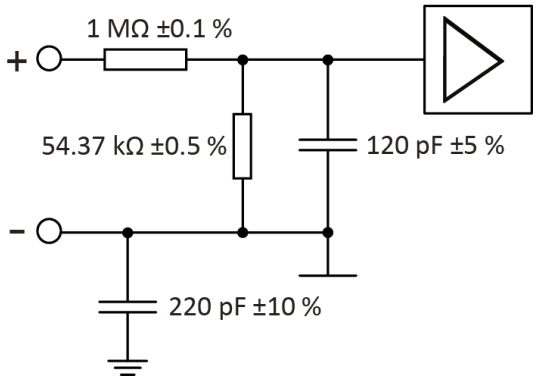


Pin assignment

Pin	Connection	LED		Pin	Connection	LED
1	Analog input 00 +	L26		1	Analog input 04 +	L30
2	Analog input 00 –			2	Analog input 04 –	
3	GND			3	GND	
4	Analog input 01 +	L27		4	Analog input 05 +	L31
5	Analog input 01 –			5	Analog input 05 –	
6	GND 50 Ω			6	GND 50 Ω	
7	Analog input 02 +	L28		7	Analog input 06 +	L32
8	Analog input 02 –			8	Analog input 06 –	
9	GND			9	GND	
10	Analog input 03+	L29		10	Analog input 07 +	L33
11	Analog input 03 –			11	Analog input 07 –	
12	GND 50 Ω			12	GND 50 Ω	

Circuit diagram 24V DC/AC

The input circuit diagram of one channel is shown here as an example.



7.3.3 Grounding recommendation

The shield of a connected sensor should always be connected to the analog inputs of the *ibaMS8xIEPE* device and grounded on one side only. The stripped shield is connected as short as possible via a corresponding ground pin (GND) of the connectors.

The system must be grounded via the backplane.

Note

The *ibaMS8xIEPE* device together with the system should not be positioned near drives and frequency converters.

7.3.4 Error and status signals

The following table shows the error and status signals available in different operating modes:

	IEPE 1Hz/0.1Hz	24V AC	24V DC
Status signal			
Data valid	✓	✓	✓
Error signal			
Broken line	✓	-	-
Shorted	✓	-	-

7.3.4.1 Data valid

The “Data valid” signal (TRUE) indicates, when the settling process of the corresponding signal is completed.

If the measured input values are processed before the signal is TRUE, the resulting values may be falsified.

When an error occurs during IEPE operation (broken line, short circuit), the signal changes to FALSE.

7.3.4.2 Broken line

The signal indicates both, a broken line and when a IEPE sensor is not connected.

When the sensor supply voltage exceeds 20 V, a broken line will be detected. After a delay of 10 seconds the error signal “Broken line” changes to TRUE.

When the sensor supply voltage decreases below 20 V again, the error state will be reset and the signal changes to FALSE with a 10 second delay.

7.3.4.3 Shorted

In case of a short circuit, this error signal changes to TRUE with a delay of 10 seconds.

When the short circuit is eliminated and the sensor is connected properly again, the error state will be reset automatically and the signal changes to FALSE with a 10 second delay.

8 Start-up and Update

Note

Do not switch off the device during an update as you may damage the device. Installing an update can take some minutes.

8.1 Auto-Update

After having mounted the module and applied the voltage to the central unit, the central unit detects the modules and checks the software version.

The central unit has a so called “overall release version“. This version contains the current software version of the central unit as well as the software versions of the modules. You can find the “overall release version“ on the website of the central unit on the *firmware* tab.

When the software version of a module does not match the “overall release version” of the central unit, the central unit does an automatic up- or downgrade of the module. After that the module is ready for use.

Note

The “overall release version” contains all modules developed up to the date of release of this firmware and the corresponding software versions. If the module is not yet known (i.e. newer than the firmware version of the central unit), it is ignored and framed in red in the web interface.

In this case, a new update file has to be installed for the "overall release version", see ↗ *Update, page 24*. Therefore, contact the iba support.

8.2 Overall release version

The “overall release version” provides information about the software version of the entire iba modular system. You can find it on the website of the central unit or in the I/O Manager of *ibaPDA*.

Note

Specify the "overall release version" for support cases.

8.3 Update

An update can be installed in two different ways:

- Web interface (only with *ibaPADU-S-IT-2x16*)

  see ↗ *Perform update via web interface, page 24*

- *ibaPDA*

  see ↗ *Perform update via ibaPDA, page 25*

No matter which of the both ways you choose to install an update: the progress of the update is shown by the LEDs L5 … L8. Beginning with L5, the LEDs are flashing one after another, at first in orange and then in green and at a slower rate. When the update is finished, the device will be rebooted.

Note

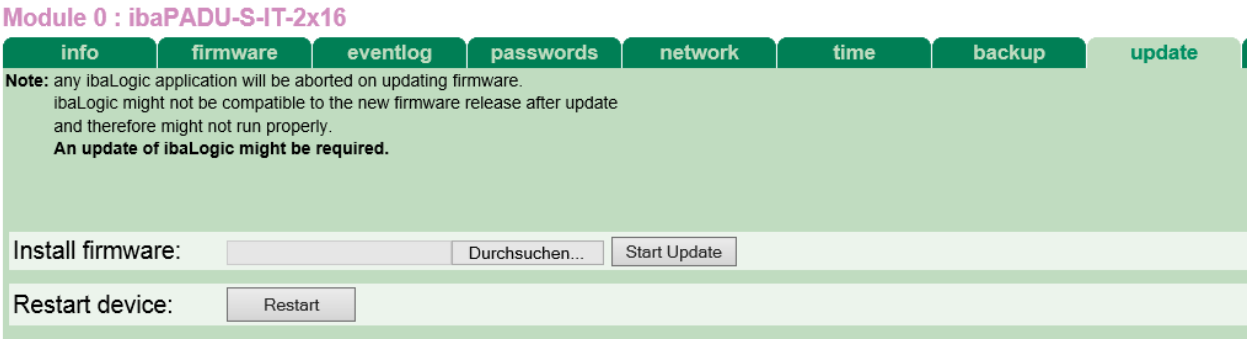
When updating the iba-modular system, a possible autostart of the *ibaLogic* PMAC is deactivated and the existing *ibaLogic-V5* application deleted. Furthermore, an update of the *ibaLogic-V5* software (*ibaLogic* Clients) might be necessary.

8.3.1 Perform update via web interface

Note

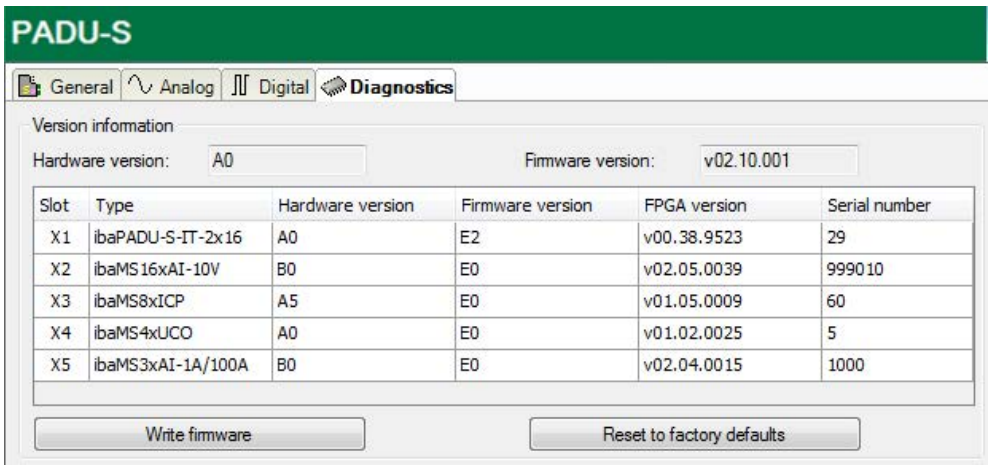
The web interface is available only with the central unit *ibaPADU-S-IT-2x16*.

1. Open the website of the iba modular system in your browser and select the central unit.
2. On the *update* tab, click on the <Browse…> button and choose the `padusit2x16_v[xx.yy.zzz].iba` update file.
3. By clicking on <Start Update>, you start the update.



8.3.2 Perform update via ibaPDA

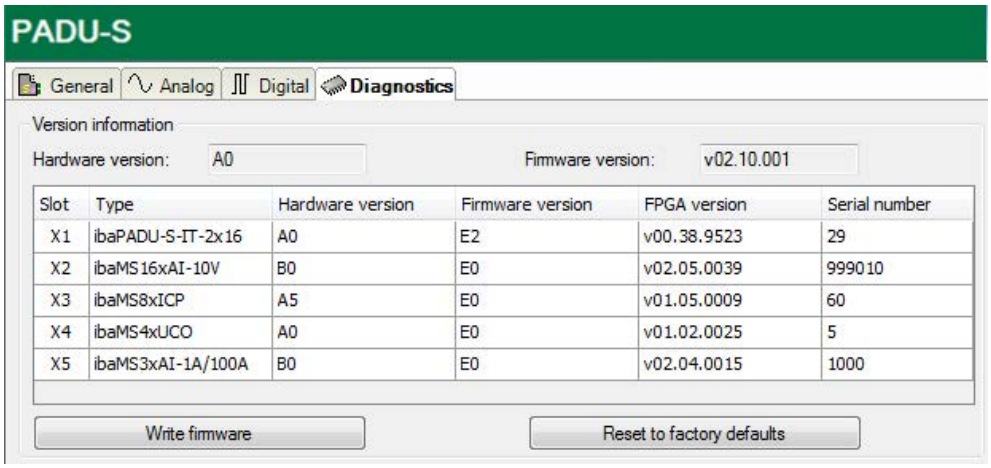
1. Open the *ibaPDA* I/O Manager and navigate to your iba modular system in the tree structure.
2. On the *Diagnostics* tab, click on the <Write firmware> button and select the `padusit2x-16_v[xx.yy.zzz].iba` or `paduscm_v[xx.yy.zzz].iba` update file.
3. You start the update by clicking on <OK>.



8.4 Module information/diagnostics

8.4.1 Diagnostics

Important information about the iba modular system, like hardware version, firmware version, FPGA version and serial number is displayed in the *Diagnostics* tab. Open the *ibaPDA* I/O Manager and choose your iba modular system in the tree structure.



8.4.2 Web interface

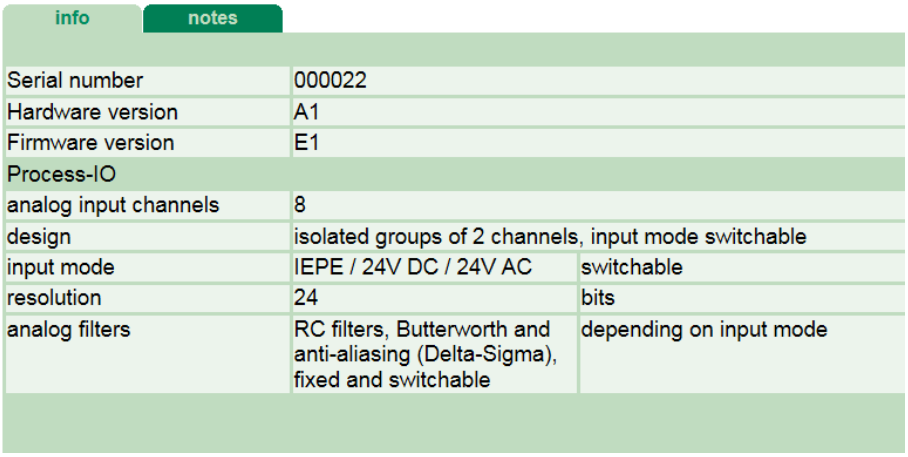
Only information on status and parameters is displayed on the module website. You cannot change the values.

Note

The web interface is available only with the central unit *ibaPADU-S-IT-2x16*.

8.4.2.1 info tab

The *info* tab displays general information and technical specifications of the I/O module.



Serial number	000022	
Hardware version	A1	
Firmware version	E1	
Process-IO		
analog input channels	8	
design	isolated groups of 2 channels, input mode switchable	
input mode	IEPE / 24V DC / 24V AC	switchable
resolution	24	bits
analog filters	RC filters, Butterworth and anti-aliasing (Delta-Sigma), fixed and switchable	depending on input mode

8.4.2.2 notes tab

On the *notes* tab, you can enter notes, e.g. for notes on wiring or on recording of changes.

By clicking on <save notes>, the notes are permanently stored on the device.

9 iba Applications

Observe the use cases described for your configuration, see chapter ↗ *Appendix, page 39*.

9.1 Configuration with ibaPDA

You can configure the signals with the I/O Manager of *ibaPDA*. If the iba modular system is already installed and you want to add a new module, click on “Read configuration from device”. The module will be detected automatically.

Note

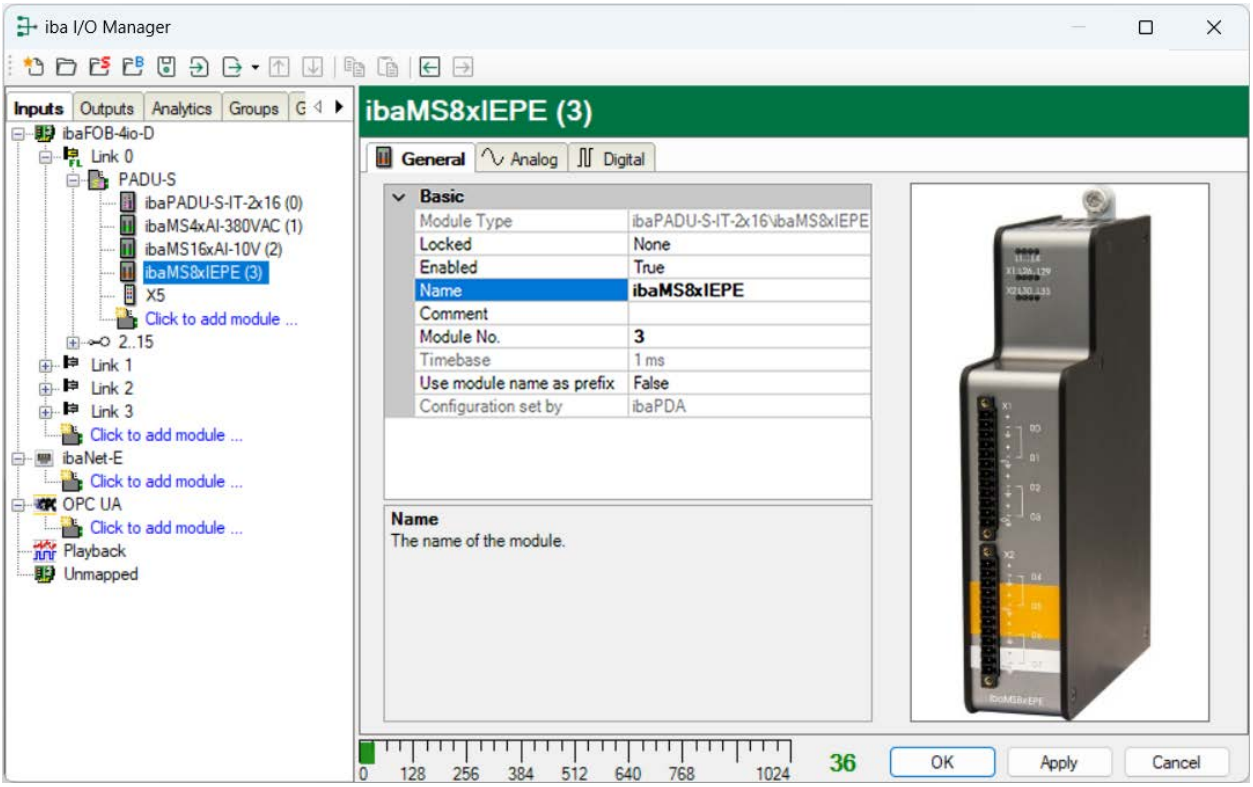
The automatic detection requires a bidirectional FO connection from the *ibaPDA* computer to the central unit.

Other documentation

If you want to install the iba modular system at first, refer to the manual of the central unit, chapter “Configuration with ibaPDA”.

9.1.1 ibaMS8xIEPE – General tab

If the module is detected, click on the module in the tree structure and the *General* tab appears.



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.

Timebase, specified in the PADU-S module.

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

Configuration set by
This item is only visible when *ibaPADU-S-IT-2x16* is used as central unit. When an embedded application has been started on *ibaPADU-S-IT-2x16* (e.g. *ibaLogic*), then *ibaPDA* cannot modify the configuration of the modules and signals. In this case the configuration is set by the embedded application. The following entries can be displayed:

- *ibaPDA*

  If *ibaPDA* is displayed, an embedded application has not been started and the configuration can be set by *ibaPDA*.

- Embedded application

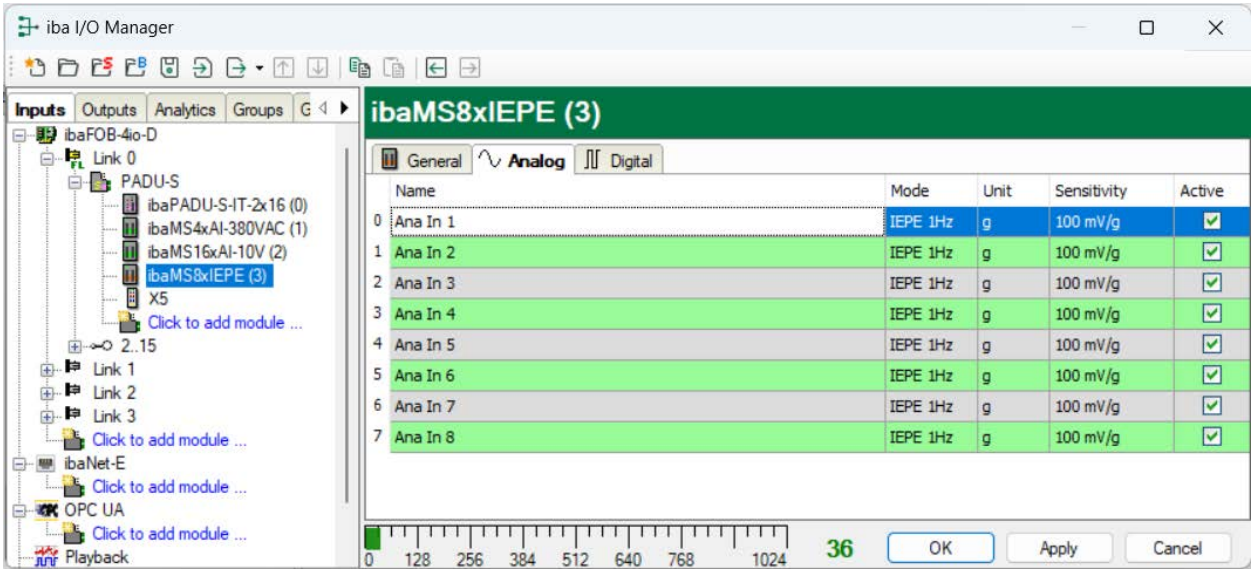
  If embedded application is displayed, the configuration of the modules and signals is set by the embedded application on the device. In this case, it is also possible to import user-defined signal names - assigned by the runtime configuration - into *ibaPDA* (Import signal names: True), if the embedded application supports this function.

  The modules and signals configured by the embedded application cannot be configured in *ibaPDA*, they are displayed in gray in the respective fields.

ibaPDA reads out this configuration and uses it for acquisition in *ibaPDA*. Modules and signals which are not displayed in gray can be used in *ibaPDA*.

9.1.2 ibaMS8xIEPE – Analog tab

In the *Analog* tab, make the following settings for the *ibaMS8xIEPE* module:



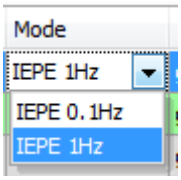
Name

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

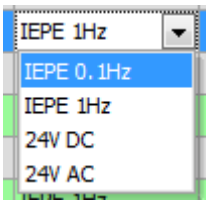
Mode

The mode can be selected from a drop-down menu, see ↗ *Analog inputs*, page 18.

- IEPE mode is the fixed setting for channels 0, 2, 4 and 6, but the filter can be selected:

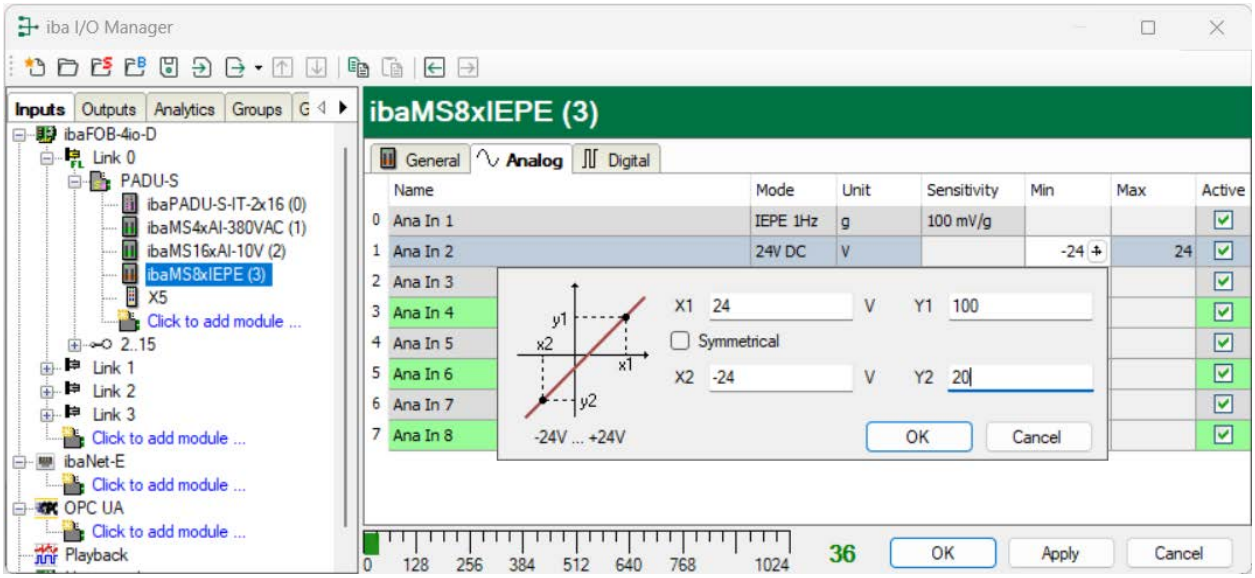


- Mode selection for the channels 1, 3, 5 and 7:



Min/Max

When the modes “24V AC” or “24V DC” are selected, the columns *Min* and *Max* appear additionally. You can define a lower or upper measuring range limit here. The nominal voltage level of +/-24 V is assigned to a physical value.

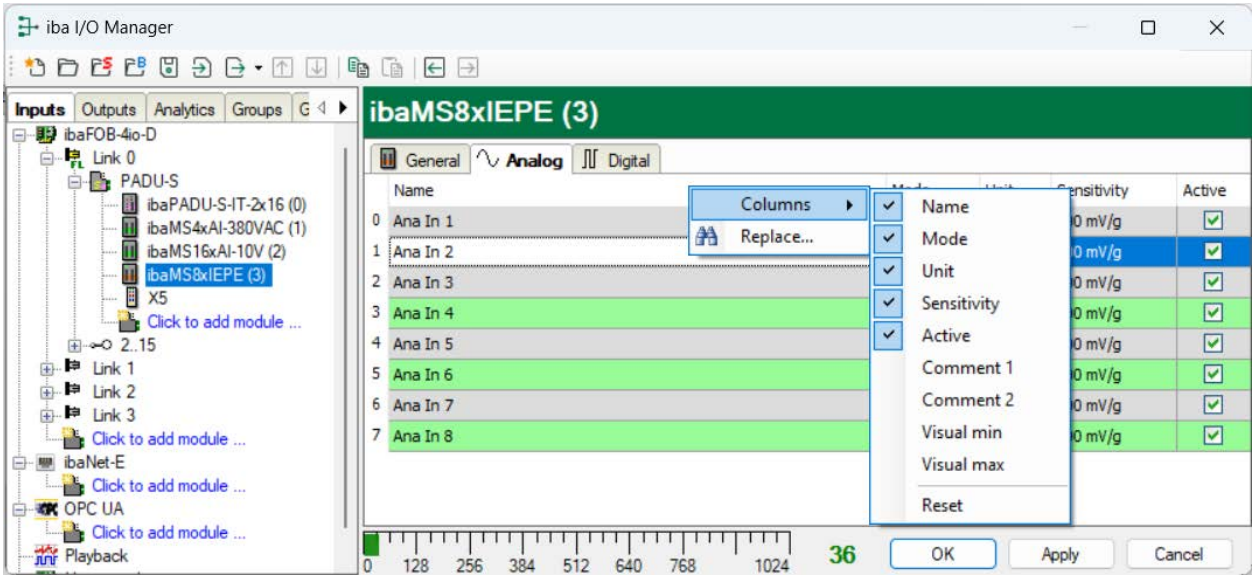


Unit
You can enter a unit, the default setting is „g“.

Sensitivity
Enter here the sensitivity according to the used IEPE sensor.

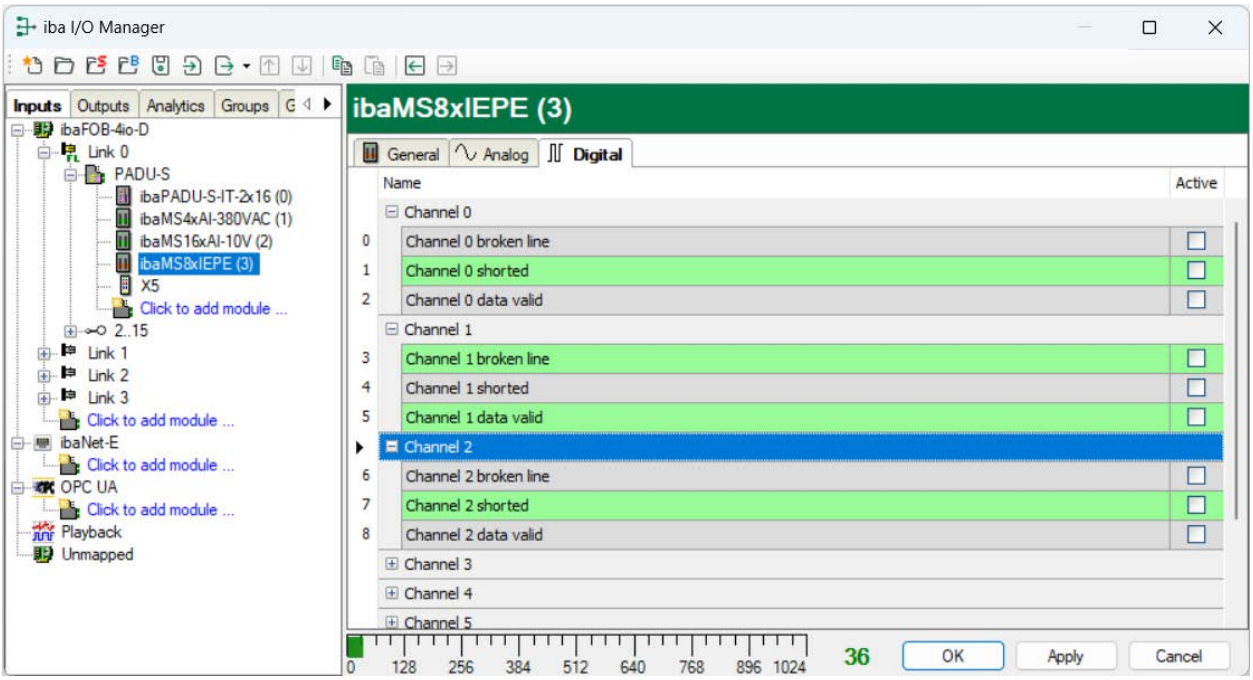
Active
Enabling/disabling the signal.

You can display or hide additional columns using the context menu (right mouse click in the heading line).



9.1.3 ibaMS8xIEPE – Digital tab

Depending on the operating mode, error and status signals can be enabled for each channel in the *Digital* tab, see ↗ *Error and status signals*, page 21.



Name

The names are already preset. You can enter additional two comments when clicking the  symbol in the *Name* field.

- Channel […] broken line (only in IEPE mode)

  Status signal indicates, whether there is a broken line or a channel is not connected.

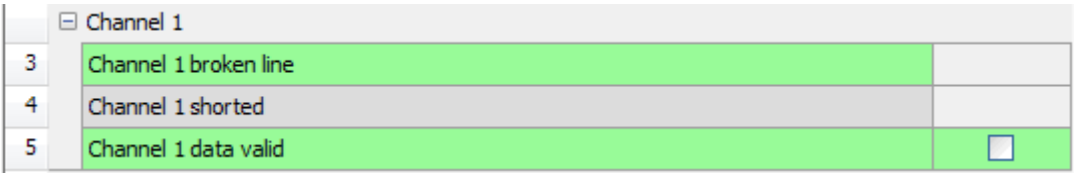
- Channel […] shorted (only in IEPE mode)

  Status signal indicates a short circuit of the channel.

- Channel […] data valid (in IEPE and 24V DC/AC mode)

  Status signal indicates, whether the data is valid.

  When 24V DC/AC mode is selected, only the signal “Channel […] data valid” can be selected:



Active

Enabling/disabling the signal.

9.2 Configuration with ibaLogic-V5

Combined with *ibaLogic-V5*, an *ibaPADU-S-IT-2x16* device can be used to realize individual signal preprocessing or stand-alone applications.

Other documentation

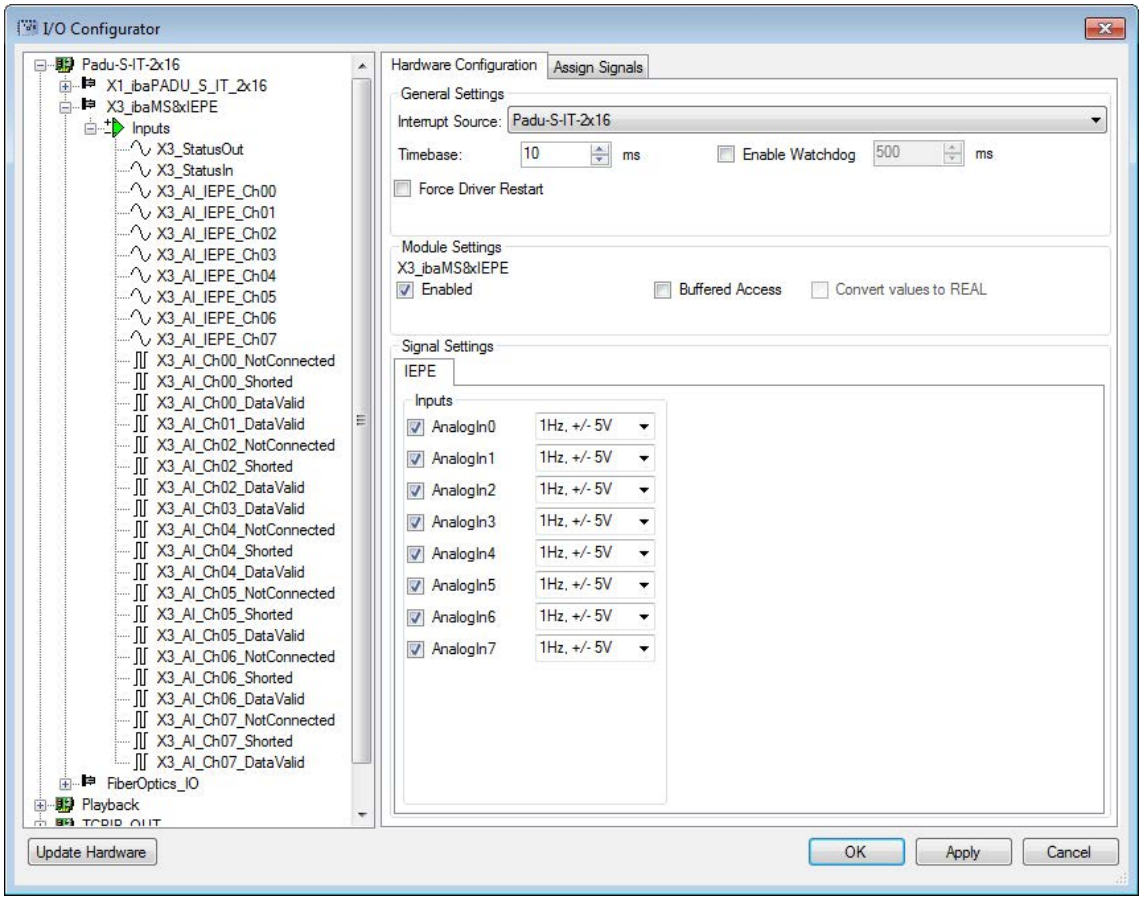
The basic procedure with *ibaLogic-V5* is described in the manual for the *ibaPADU-S-IT-2x16* central unit. This manual only describes the signals belonging to this module.

9.2.1 Configuring signals

The signals can be configured in the I/O Configurator of *ibaLogic-V5*.

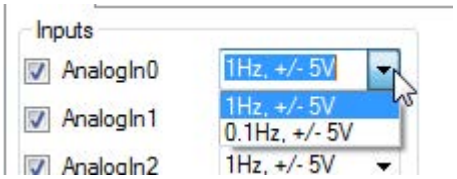
1. Open the I/O Configurator in the *Tools* – I/O Configurator menu.
2. Click on the <Update hardware> button.

→ *ibaLogic-V5* detects the module.

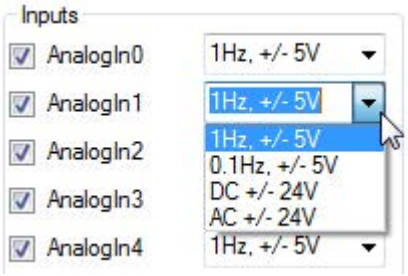


The analog input channels and the status signals are displayed in the *Inputs* tab.

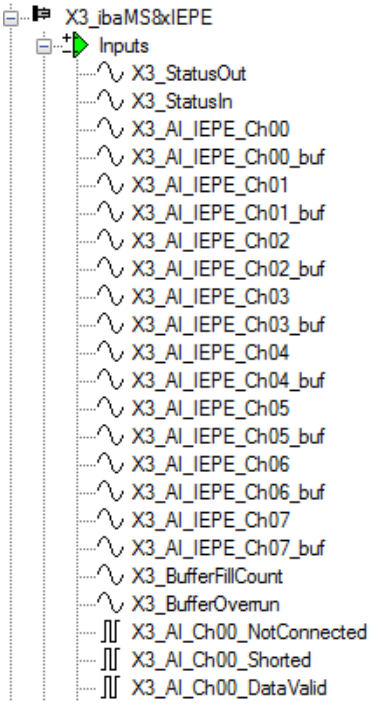
3. Select the input mode from the selection menu, see ↗ *Analog inputs*, page 18.
   - IEPE mode is the fixed setting for channels 0, 2, 4 and 6, but the filter can be selected:



- Mode selection for the channels 1, 3, 5 and 7:



If *Buffered Access* is enabled, you can see additional input and output signals.



Note

You need to apply the buffered access by clicking on the <Apply> button. Only then, you will see additional signals in the signal tree that can be configured as output or input resources.

Signal	Meaning
Inputs	
AI_IEPE_Ch[00…07]	Analog input signals
AI_Ch[00…07]_NotConnected	Status signal indicates, whether there is a broken line or a channel is not connected (only in IEPE mode)
AI_Ch[00…07]_Shorted	Status signal indicates a short circuit (only in IEPE mode)
AI_Ch[00…07]_DataValid	Status signal indicates, whether the data is valid
StatusIn	Status information about the plugged input module (for output module without function): 0 = module not initialized 1 = module running >1 = error (e.g. Module cannot be initialized)
StatusOut	Status information about the plugged module (for input module without function): 0 = module not initialized 1 = module running >1 = error (e.g. Module cannot be initialized)
Additional input signals for buffered access	
AI_IEPE_Ch[00…07]_buf	Input buffer of analog signals:
BufferFillCount	Counter, when buffer is filled
BufferOverrun	Counter for Buffer-overrun
Additional output signals for buffered access	
BufferSize	Buffersize
SubSampling	Subsampling of the signals

10 Technical data

In the following you will find the technical data and dimensions for *ibaMS8xIEPE*.

10.1 Main data

Short description

Name	ibaMS8xIEPE
Description	input module with 8 analog inputs and different modes: DC, AC and IEPE: 4x IEPE non-adjustable, 4x IEPE / DC / AC adjustable
Order number	10.124302

Supply

Power supply	24 V DC, internal via backplane bus
Power consumption max.	8 W

Indicating elements

Indicators (LEDs)	4 LEDs for device status 8 LEDs for state of the analog inputs

Operating and environmental conditions

Temperature ranges	
Operation Storage/transport	32 °F to 122 °F (0 °C to 50 °C) -13 °F to 158 °F (-25 °C to 70 °C)
Mounting position	vertical, plugged into backplane bus
Cooling	passive
Humidity class	F, no condensation
Protection class	IP20
Certification/Standards	EMC: IEC 61326-1 FCC part 15 class A
MTBF[3)]	1,840,484 hours / 210 years
Dimensions (width x height x depth)	43 mm x 214 mm x 148 mm
Weight (incl. packaging)	2.43 lbs (1.1 kg)

[3)] According to: Telcordia Issue 3 SR332 (Reliability Prediction Procedure of Electronic Equipment; Issue 3 Jan. 2011) 2016) and NPRD (Non-electronic Parts Reliability Data 2011)

10.2 Analog inputs

Number	8
Design	4 galvanically isolated roots with 2 inputs each, single ended The second input of each root can be adjusted: IEPE 1Hz, IEPE 0.1Hz, 24V DC or 24V AC 1 GND and 1 GND with 50 Ω per root
IEPE	integrated constant current source +4 mA (up to 30 V DC) for direct connection and supply of IEPE sensors
Resolution	24 bit (delta-sigma)
Delay	37 / sampling rate
Filters	
RC filter	
24V DC	R/C low-pass, 1st order, 25 kHz
24V AC	like AI-24V DC, in addition R/C high-pass, 1st order, 1 Hz
IEPE	R/C high-pass, 1st order, 1 Hz or 0.1 Hz, can be adjusted
Analog filter	
24V DC / 24V AC / IEPE	anti-aliasing filter (Butterworth), 4th order Sampling rate ≤ 8 kHz: cutoff frequency = 4 kHz Sampling rate > 8 kHz: cutoff frequency = 20 kHz
Digital filter	
24V DC / 24V AC / IEPE	anti-aliasing filter (delta-sigma) oversampling = 16 * sampling rate cutoff frequency = 0.49 * sampling rate
Input signal range	
24V DC / 24V AC	-24.0 V to +24.0 V
IEPE	-5.0 V to +5.0 V (at ~160 Hz)
Max. input voltage	±60 V permanent
Input gain IEPE	none
Input impedance 24V DC/AC	
device switched off	1.0 MΩ
device switched on	1.1 MΩ
Input capacity	120 pF
Sampling rate	1 kHz[4)] to 40 kHz, freely adjustable
Frequency range	0.1 Hz to 20 kHz

[4)] Due to the integrated filters, a minimum sampling rate of 1 kHz is recommended for the correct operation of this module, even if an even lower sampling rate (time base) can be set in the ibaPDA configuration.

Error and status signals (per channel)	
24V DC / 24V AC	data valid
IEPE	data valid, broken line, shorted
Electrical isolation	
Root-root	1.5 kV AC
Root-housing/power supply	1.5 kV AC
Connector type inputs	2x 12-pin multi-pin connector, screw-type terminal (0.14 mm^2 to 1.5 mm^2), screw connection, included in delivery
Sensor cable length	up to 30 m at 100 pF/m cable capacitance and a bandwidth of used signals up to 20 kHz

10.3 Declaration of conformity

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

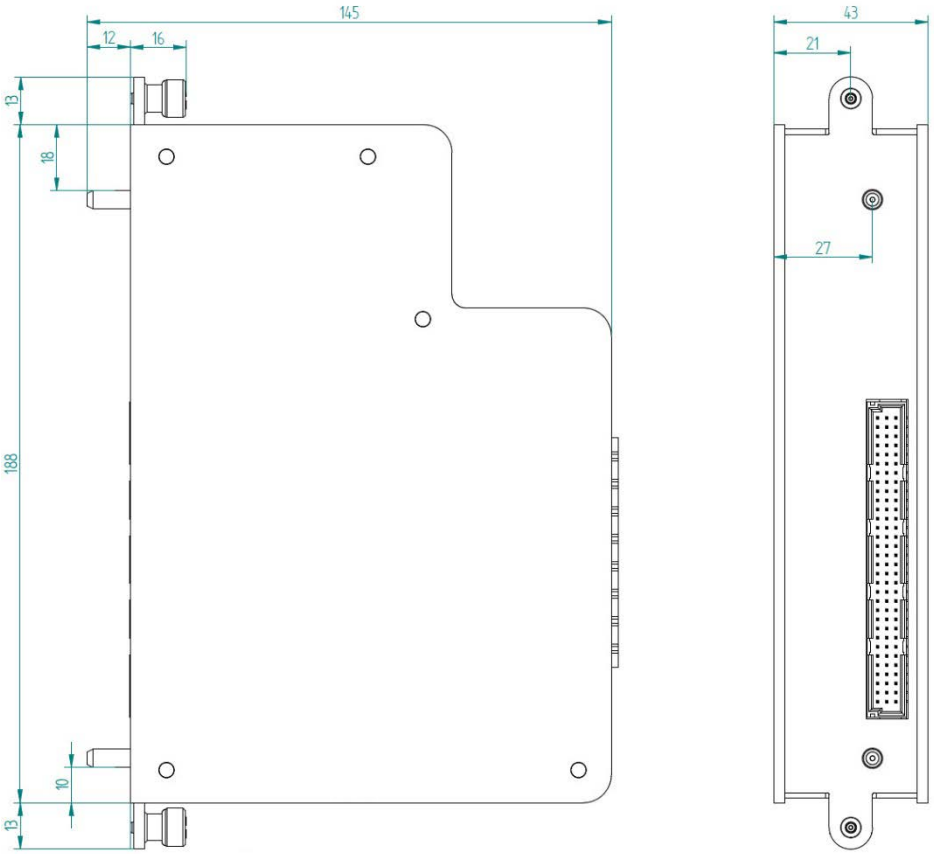
Unique Identifier: 10.124302 ibaMS8xIEPE

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.

10.4 Dimensions



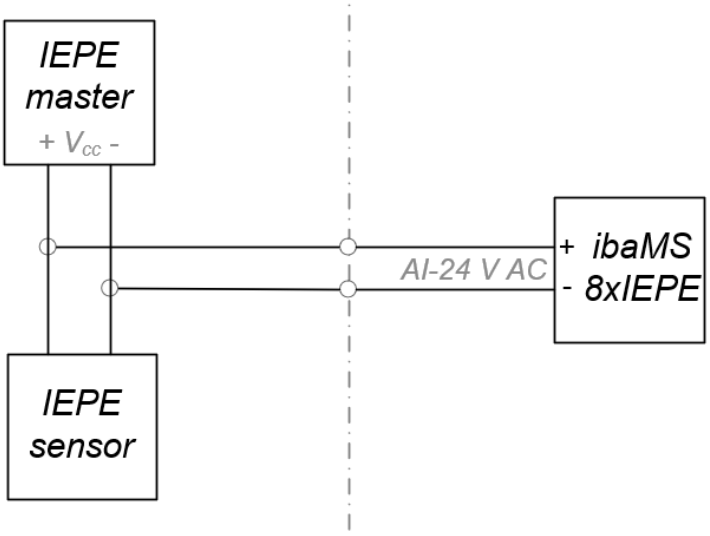
(dimensions in mm)

11 Appendix

11.1 Use cases

11.1.1 Monitoring

If the iba system is used to monitor IEPE sensors that are already present and supplied from another side, this is possible with the "AI-24 V AC" mode.



This mode is available on four of the eight input channels (channel 01, 03, 05 and 07) and can be configured via the iba application.

Please note that the R/C filter is active at 1 Hz in this mode.

11.1.2 Adjust measurement delays

During measurements within the iba modular system, where signals of different input modules are to be compared to each other, it has to be observed that the measurement delays of the *ibaMS8xIEPE* module are increased compared to the other input modules in the system.

Due to the delta-sigma converter used in the input circuit, the *ibaMS8xIEPE* module causes an internal delay of 37 * sampling time.

Other iba input modules do not have such a delay.

This leads to time differences when signals of the IEPE module are to be compared with those of other input modules within a system.

This time delay can be compensated if necessary. Three options are available:

1. In a subsequent offline analysis with ibaAnalyzer, the signal can be shifted by 37 * sampling time with the function Shl().
2. During the running acquisition (online), the signals of the other input modules to be compared can be delayed by 37 * sampling time in ibaPDA with the help of a virtual module and the function Delay().

3. Four of the eight input channels of the IEPE module (channel 01, 03, 05 and 07) can also be used as analog inputs with 24 V. This measurement mode "AI-24 V DC" is configured via the iba application.

   Signals measured via these inputs have the same delay as IEPE signals at the other inputs.

12 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
Gebhardtstrasse 10-20
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