



# ibaPDA-Interface-Audio

Record Windows audio signals

Manual  
Issue 2.2

Measurement Systems for Industry and Energy

[www.iba-ag.com](http://www.iba-ag.com)

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The current version is available for download on our web site [www.iba-ag.com](http://www.iba-ag.com).

Version	Date	Revision	Author	Version SW
2.2	04-2024	sample-synchronous recording not guaranteed	rm	8.5.0

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# 1 About this documentation

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

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

## 1.1 Target group and previous knowledge

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

## 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:

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### 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.

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### Tip



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

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### Other documentation



Reference to additional documentation or further reading.

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## 2 System requirements

The following system requirements are necessary for the use of the audio interface:

- *ibaPDA* v8.5.0 or higher
- License for *ibaPDA-Interface-Audio*
- Windows audio source in the *ibaPDA* server computer (sound card, USB device, etc.)

### License information

Order no.	Product name	Descriptio
31.001101	ibaPDA-Interface-Audio	Extension license for an <i>ibaPDA</i> system for data acquisition and recording of audio signals from the Windows system from audio devices. Number of connections: 4 audio modules for 4 audio inputs (mono/stereo)
31.101101	one-step-up-Interface-Audio	Extension license for 4 additional audio modules; the maximum permitted number of these licenses is 4.

## 3 Audio interface

### 3.1 General information

The audio interface in *ibaPDA* is used to acquire audio data from Windows audio sources. For this purpose, suitable components must be installed in the *ibaPDA* server computer, e.g. a sound card or a USB device that can work as an audio source.

This allows microphone signals, for example from a headset, to be acquired and recorded. Other audio sources coming from a “line-in” input can also be acquired. Finally any source can be used that can be configured under Windows as an audio source.

The acquisition and recording of audio signals can occur along with acquisition and recording of other signals. However, a sample-synchronous acquisition and recording cannot be guaranteed.

Possible applications are, for example, ...

- of the voice traffic via industrial intercom systems
- from radio communication in the plant
- from loudspeaker announcements
- from announcements from automated audio information systems (e.g. text-to-speech)
- of acoustic recordings on a machine for search for faults

*ibaPDA* can process several audio inputs (mono or stereo).

The audio interface is not designed for high-quality records (HiFi).

### 3.2 Settings under Windows

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#### Note



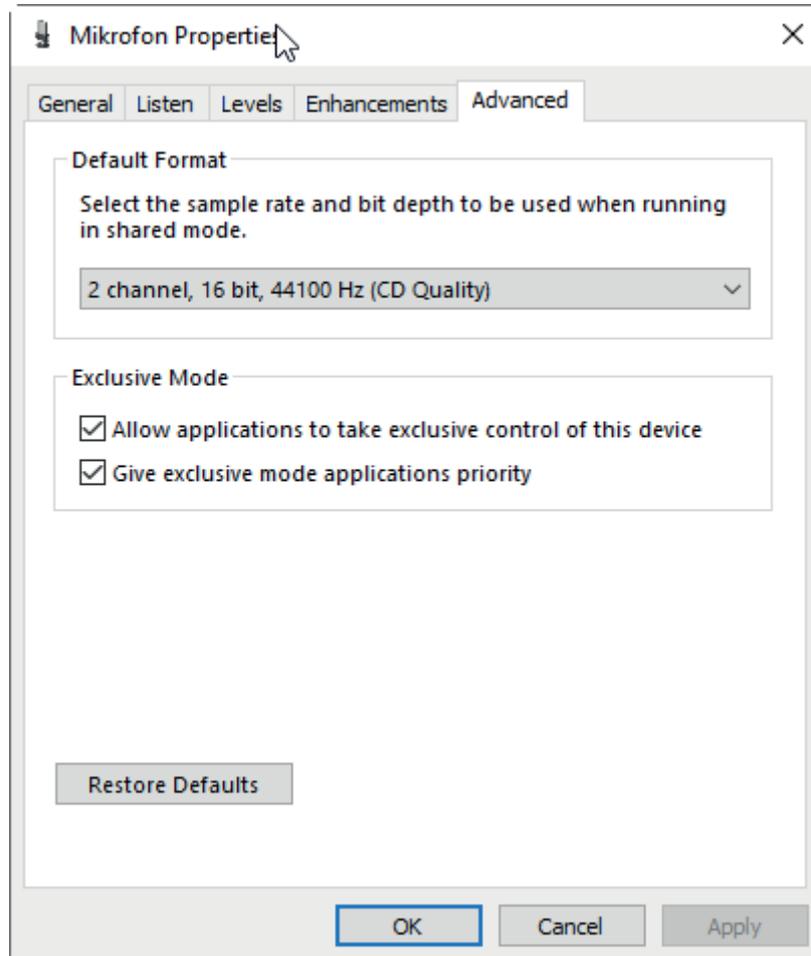
Please note that the driver for the device you are using may need to be manually installed first.

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An audio device is operated in “shared mode,” which means several applications can use the same device simultaneously. This also means that the audio system settings cannot be changed with respect to the recording. Proceed as follows to be able to change these settings (example: Microphone under Windows 10):

1. Click the right mouse button on the “Sound” icon in the taskbar (Windows tray).
2. Open *Sound settings*.
3. Under “Input,” select the device or microphone that should be recorded by *ibaPDA*.
4. Click below on *Device properties*.
5. In the dialog for device properties, click on *Additional device properties* under “Related settings.”

6. Select the tab *Advanced* in the dialog “Properties of...” Depending on the installed sound card, you can choose between different sample rates and bit depths here. This may not be possible with different devices. Later in the configuration of the audio module in *ibaPDA*, the system sample rate can be adapted to the desired acquisition rate (resampling).



7. The options for the exclusive mode should be enabled.
8. Exit the dialog by clicking <OK> and also close the Windows sound settings.
9. Then check whether the audio input signal under Windows is detected and, if necessary, adjust the input level.

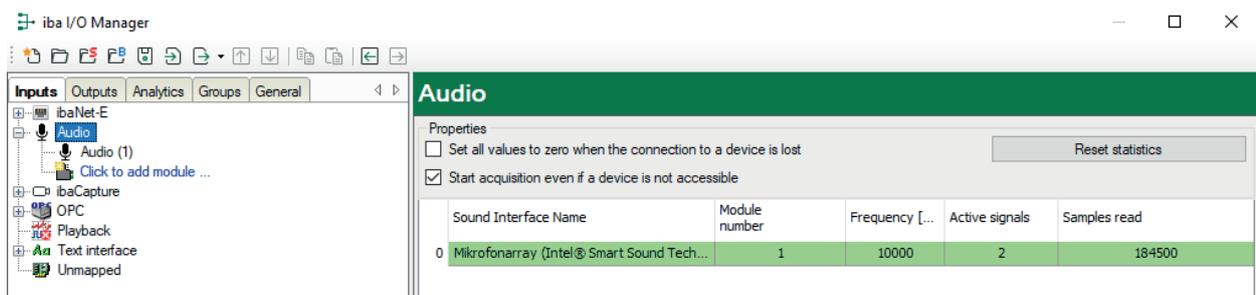
In the next step, configure the audio interface in *ibaPDA*.

### 3.3 Configuration and engineering ibaPDA

The engineering for *ibaPDA* is described in the following. If all system requirements are fulfilled, *ibaPDA* displays the *Audio* interface in the interface tree of the I/O Manager.

#### 3.3.1 Interface settings

There are no settings at the interface level. The view shows the most important information about the connected audio source when the acquisition is running.



#### Set all values to zero when the connection to a device is lost

If this option is enabled, all measured values of the audio device are set to zero as soon as the connection is lost. If this option is disabled, *ibaPDA* keeps the last valid measured value in memory when the connection is lost.

#### Start acquisition even if a device is not accessible

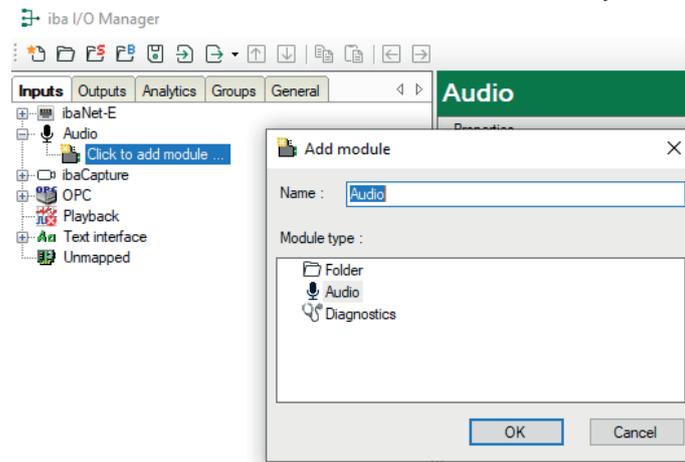
If this option is enabled, the acquisition starts even if the audio device is not accessible. A warning is prompted in the validation dialog, not an error. If the system was started without a connection to the device, *ibaPDA* periodically tries to connect to the device.

#### Connection table

In the *Samples read* column, a counter value runs from the start of acquisition. You can zero the value by pressing the <Reset statistics> button.

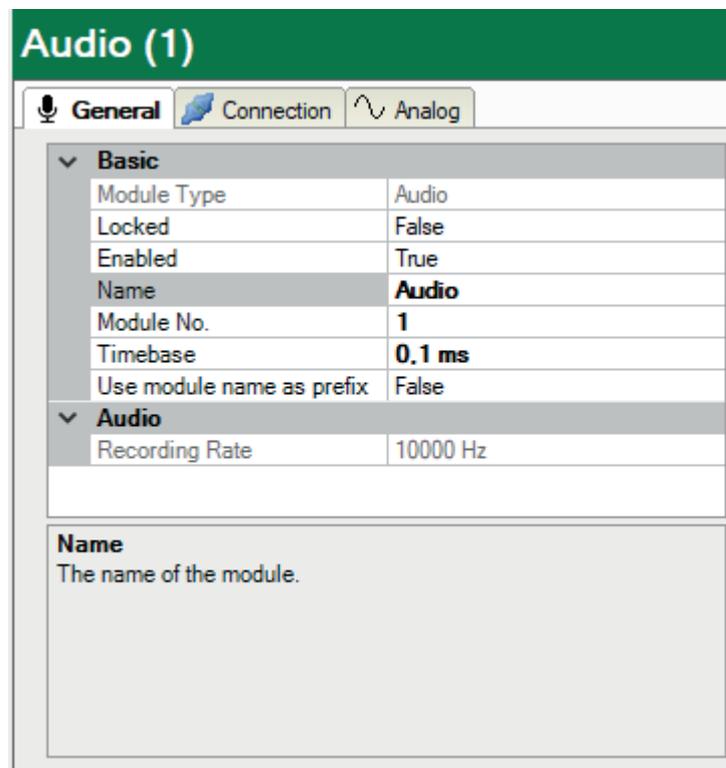
### 3.3.2 Add Module

1. Click on the blue command *Click to add module...* located under each data interface in the *Inputs* or *Outputs* tab.
2. Select the desired module type in the dialog box and assign a name via the input field if required.
3. Confirm the selection with <OK>.



### 3.3.3 General module settings

The audio module has the following setting options.



**Basic settings****Module Type (information only)**

Indicates the type of the current module.

**Locked**

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

**Enabled**

Enable the module to record signals.

**Name**

You can enter a name for the module here.

**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.

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**Note**

The timebase of the module is preset to 0.1 ms (10 kHz). You can adjust the timebase, which directly influences the recording rate. A resampling of the original signal is therefore automatically implemented.

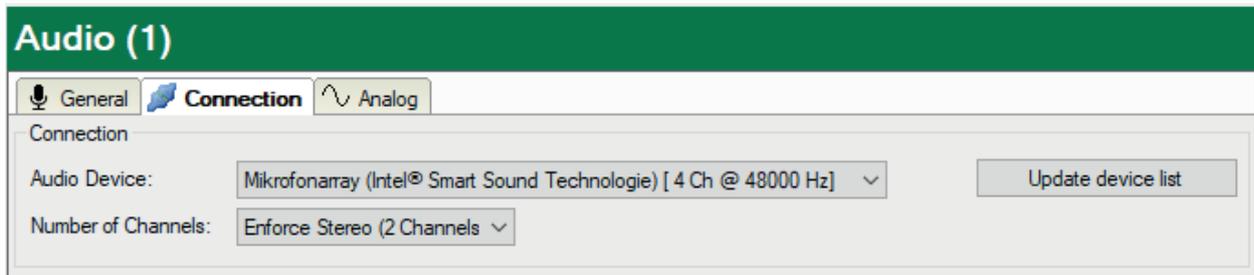
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**Audio****Recording rate**

This value is only displayed here. It is directly influenced by the setting of the timebase of the module (reciprocal value). The audio signal is recorded by *ibaPDA* at this rate.

### 3.3.4 Connection settings

In the *Connection* tab, you will find the settings for the audio source.



#### Audio device

If several audio sources are configured on the computer, select the desired device here, which should be recorded by *ibaPDA*.

If the desired device is not contained in the drop-down list, click on <Update device list>. If the device still does not appear, check the configuration in the Windows system settings for audio devices.

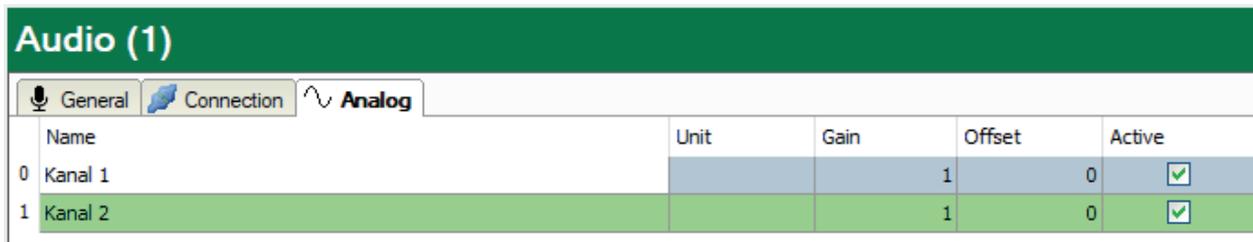
#### Number of channels

Select here whether you want to record mono (1 channel) or stereo (2 channels).

Enforce mono (1 channel)	If the audio source provides a stereo signal, both channels are arithmetically averaged and recorded as one channel by <i>ibaPDA</i> . This setting may be useful if you have a stereo source, but the difference between the right and left is irrelevant for the analysis.
Enforce stereo (2 channels)	If the audio source provides a mono signal, this is duplicated and two channels are recorded by <i>ibaPDA</i> , which however contain an identical signal. This setting is more of an emergency solution if, for example, a faulty stereo microphone has been replaced by a mono-microphone. Analyses with <i>ibaAnalyzer</i> , which are based on two channels, can therefore still be executed.
Use installed x channels	x = number of original channels of the audio source (1 or 2) This setting uses the original channels of the audio source.

### Signal configuration

The module only offers one (mono) or two (stereo) analog signals according to the setting for the number of channels. The following figure shows analog input signals of the audio module.



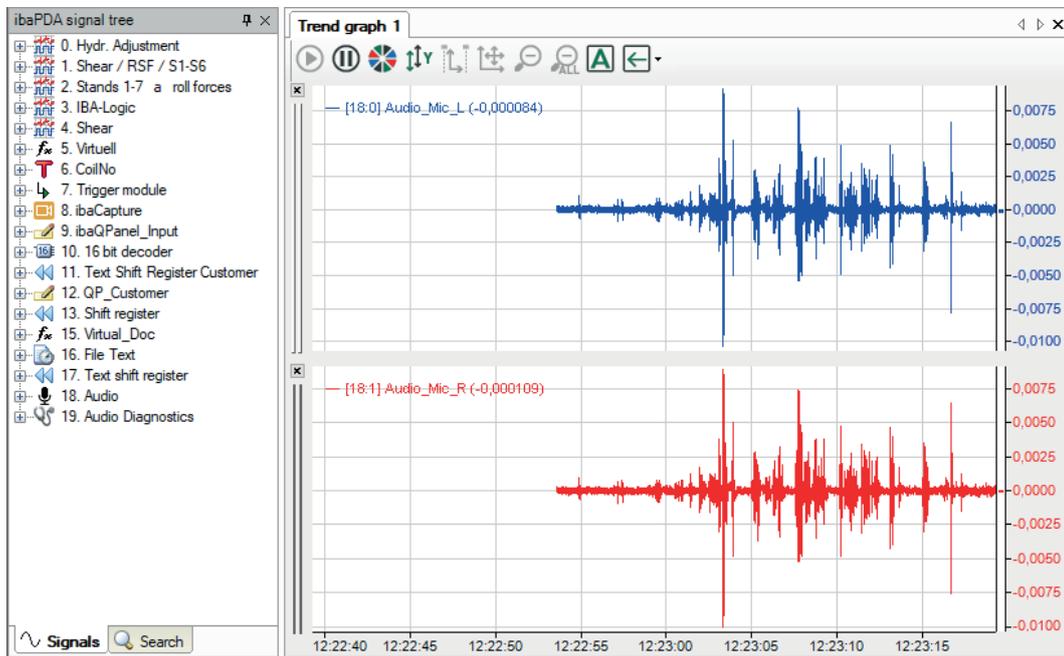
The screenshot shows a configuration window titled "Audio (1)" with three tabs: "General", "Connection", and "Analog". The "Analog" tab is selected, displaying a table with two channels. The table has columns for "Name", "Unit", "Gain", "Offset", and "Active". Channel 0 is named "Kanal 1" and Channel 1 is named "Kanal 2". Both channels have a Gain of 1 and an Offset of 0, and both are active (checked).

	Name	Unit	Gain	Offset	Active
0	Kanal 1		1	0	<input checked="" type="checkbox"/>
1	Kanal 2		1	0	<input checked="" type="checkbox"/>

You can change the name here, enter a unit and change the gain and offset. The signal values are supplied by Windows as floating point values in the range from -1.0 to 1.0.

### 3.4 Display in ibaPDA

After accepting the I/O configuration, the audio channels are available in the signal tree. The signals can be visualized, for example, as a trend graph or in an FFT view.

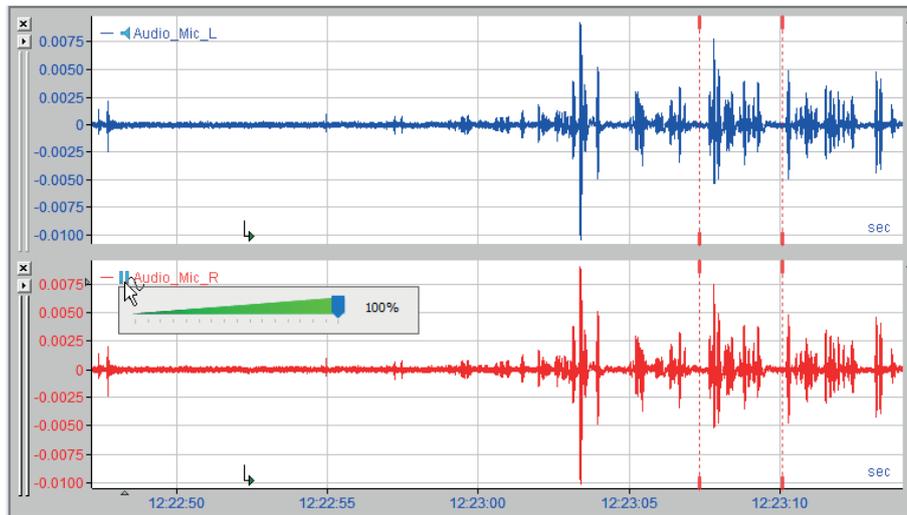


### 3.5 Display in ibaAnalyzer

If you open a data file containing audio signals, you can drag these into a trend view from the signal tree as usual and display them as a trend graph.

If you have enabled the audio player in the *View* menu, then a small speaker symbol will be displayed on the signal legend.

Click on the speaker symbol to play the recorded signal through the speaker or the computer's sound interface.



## 4 Diagnostics

### 4.1 License

If the interface is not displayed in the signal tree, you can either check in *ibaPDA* in the I/O Manager under *General – Settings* or in the *ibaPDA* service status application whether your license for this interface has been properly recognized. The number of licensed connections is shown in brackets.

The figure below shows the license for the *Codesys Xplorer* interface as an example.

License information		Licenses:
License container:	3-...	...
Customer name:	i...	...
License time limit:	Unlimited	...
Container type:	WIBU CmStick v4.40	ibaPDA-Interface-Codesys-Xplorer (16)
Container host:	...	...
Required EUP date:	01.02.2023	...
EUP date:	31.12.2025	...

## 4.2 Diagnostic modules

Diagnostic modules are available for most Ethernet based interfaces and Xplorer interfaces. Using a diagnostic module, information from the diagnostic displays (e.g. diagnostic tabs and connection tables of an interface) can be acquired as signals.

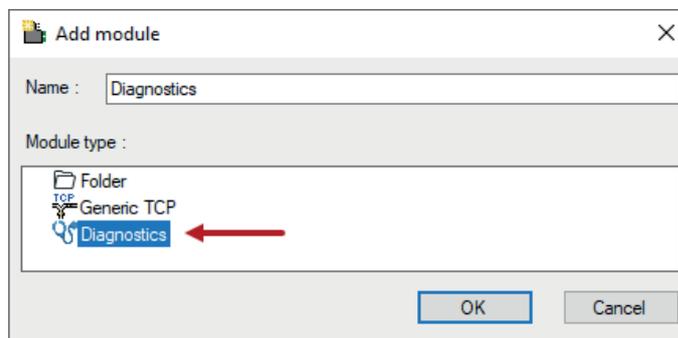
A diagnostic module is always assigned to a data acquisition module of the same interface and supplies its connection information. By using a diagnostic module you can record and analyze the diagnostic information continuously in the *ibaPDA* system.

Diagnostic modules do not consume any license connections because they do not establish their own connection, but refer to another module.

Example for the use of diagnostic modules:

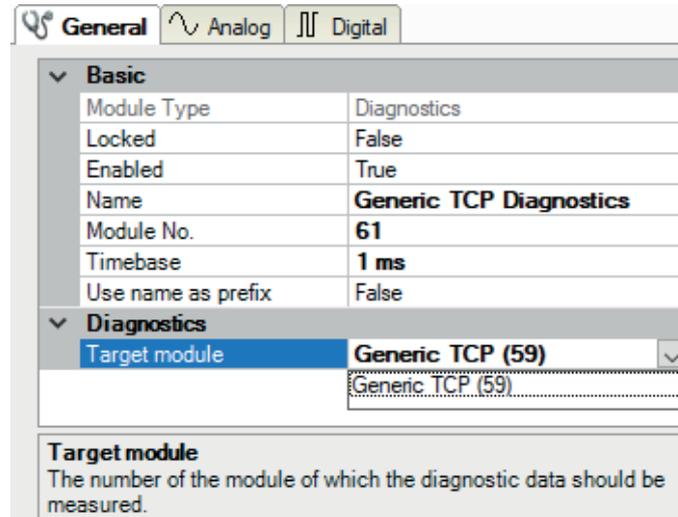
- A notification can be generated, whenever the error counter of a communication connection exceeds a certain value or the connection gets lost.
- In case of a disturbance, the current response times in the telegram traffic may be documented in an incident report.
- The connection status can be visualized in *ibaQPanel*.
- You can forward diagnostic information via the SNMP server integrated in *ibaPDA* or via OPC DA/UA server to superordinate monitoring systems like network management tools.

In case the diagnostic module is available for an interface, a "Diagnostics" module type is shown in the "Add module" dialog (example: Generic TCP).



## Module settings diagnostic module

For a diagnostic module, you can make the following settings (example: Generic TCP):



Basic	
Module Type	Diagnostics
Locked	False
Enabled	True
Name	<b>Generic TCP Diagnostics</b>
Module No.	<b>61</b>
Timebase	<b>1 ms</b>
Use name as prefix	False

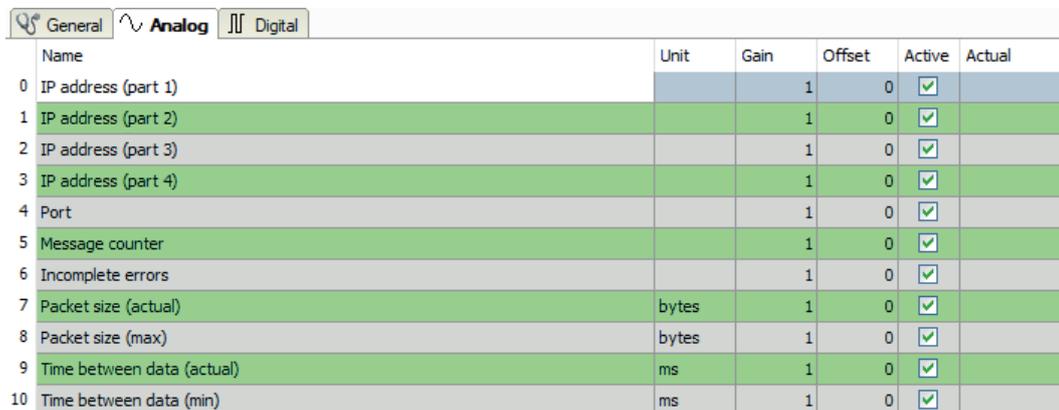
Diagnostics	
Target module	Generic TCP (59)

**Target module**  
The number of the module of which the diagnostic data should be measured.

The basic settings of a diagnostic module equal those of other modules.

There is only one setting which is specific for the diagnostic module: the target module.

By selecting the target module, you assign the diagnostic module to the module on which you want to acquire information about the connection. You can select the supported modules of this interface in the drop down list of the setting. You can assign exactly one data acquisition module to each diagnostic module. When having selected a module, the available diagnostic signals are immediately added to the *Analog* and *Digital* tabs. It depends on the type of interface, which signals exactly are added. The following example lists the analog values of a diagnostic module for a Generic TCP module.



Name	Unit	Gain	Offset	Active	Actual
0 IP address (part 1)		1	0	<input checked="" type="checkbox"/>	
1 IP address (part 2)		1	0	<input checked="" type="checkbox"/>	
2 IP address (part 3)		1	0	<input checked="" type="checkbox"/>	
3 IP address (part 4)		1	0	<input checked="" type="checkbox"/>	
4 Port		1	0	<input checked="" type="checkbox"/>	
5 Message counter		1	0	<input checked="" type="checkbox"/>	
6 Incomplete errors		1	0	<input checked="" type="checkbox"/>	
7 Packet size (actual)	bytes	1	0	<input checked="" type="checkbox"/>	
8 Packet size (max)	bytes	1	0	<input checked="" type="checkbox"/>	
9 Time between data (actual)	ms	1	0	<input checked="" type="checkbox"/>	
10 Time between data (min)	ms	1	0	<input checked="" type="checkbox"/>	

For example, the IP (v4) address of a Generic TCP module (see fig. above) will always be split into 4 parts derived from the dot-decimal notation, for better reading. Also other values are being determined, as there are port number, counters for telegrams and errors, data sizes and telegram cycle times. The following example lists the digital values of a diagnostic module for a Generic TCP module.



Name	Active	Actual
0 Active connection mode	<input checked="" type="checkbox"/>	
1 Invalid packet	<input checked="" type="checkbox"/>	
2 Connecting	<input checked="" type="checkbox"/>	
3 Connected	<input checked="" type="checkbox"/>	

## Diagnostic signals

Depending on the interface type, the following signals are available:

Signal name	Description
Active	Only relevant for redundant connections. Active means that the connection is used to measure data, i.e. for redundant standby connections the value is 0. For normal/non-redundant connections, the value is always 1.
Buffer file size (actual/avg/max)	Size of the file for buffering statements
Buffer memory size (actual/avg/max)	Size of the memory used by buffered statements
Buffered statements	Number of unprocessed statements in the buffer
Buffered statements lost	Number of buffered but unprocessed and lost statements
Connected	Connection is established
Connected (in)	A valid data connection for the reception (in) is available
Connected (out)	A valid data connection for sending (out) is available
Connecting	Connection being established
Connection attempts (in)	Number of attempts to establish the receive connection (in)
Connection attempts (out)	Number of attempts to establish the send connection (out)
Connection ID O->T	ID of the connection for output data (from the target system to <i>ibaPDA</i> ). Corresponds to the assembly instance number
Connection ID T->O	ID of the connection for input data (from <i>ibaPDA</i> to target system). Corresponds to the assembly instance number
Connection phase (in)	Status of the <i>ibaNet-E</i> data connection for reception (in)
Connection phase (out)	Status of the <i>ibaNet-E</i> data connection for sending (out)
Connections established (in)	Number of currently valid data connections for reception (in)
Connections established (out)	Number of currently valid data connections for sending (out)
Data length	Length of the data message in bytes
Data length O->T	Size of the output message in byte
Data length T->O	Size of the input message in byte
Destination IP address (part 1-4) O->T	4 octets of the IP address of the target system Output data (from target system to <i>ibaPDA</i> )
Destination IP address (part 1-4) T->O	4 octets of the IP address of the target system Input data (from <i>ibaPDA</i> to target system)
Disconnects (in)	Number of currently interrupted data connections for reception (in)
Disconnects (out)	Number of currently interrupted data connections for sending (out)
Error counter	Communication error counter
Exchange ID	ID of the data exchange
Incomplete errors	Number of incomplete messages

Signal name	Description
Incorrect message type	Number of received messages with wrong message type
Input data length	Length of data messages with input signals in bytes ( <i>ibaPDA</i> receives)
Invalid packet	Invalid data packet detected
IP address (part 1-4)	4 octets of the IP address of the target system
Keepalive counter	Number of KeepAlive messages received by the OPC UA Server
Lost images	Number of lost images (in) that were not received even after a retransmission
Lost Profiles	Number of incomplete/incorrect profiles
Message counter	Number of messages received
Messages per cycle	Number of messages in the cycle of the update time
Messages received since configuration	Number of received data telegrams (in) since start of acquisition
Messages received since connection start	Number of received data telegrams (in) since the start of the last connection setup. Reset with each connection loss.
Messages sent since configuration	Number of sent data telegrams (out) since start of acquisition
Messages sent since connection start	Number of sent data telegrams (out) since the start of the last connection setup. Reset with each connection loss.
Multicast join error	Number of multicast login errors
Number of request commands	Counter for request messages from <i>ibaPDA</i> to the PLC/CPU
Output data length	Length of the data messages with output signals in bytes ( <i>ibaPDA</i> sends)
Packet size (actual)	Size of the currently received message
Packet size (max)	Size of the largest received message
Ping time (actual)	Response time for a ping telegram
Port	Port number for communication
Producer ID (part 1-4)	Producer ID as 4 byte unsigned integer
Profile Count	Number of completely recorded profiles
Read counter	Number of read accesses/data requests
Receive counter	Number of messages received
Response time (actual/average/max/min)	Response time is the time between measured value request from <i>ibaPDA</i> and response from the PLC or reception of the data.  Actual: current value  Average/max/min: static values of the update time since the last start of the acquisition or reset of the counters.
Retransmission requests	Number of data messages requested again if lost or delayed

Signal name	Description
Rows (last)	Number of resulting rows by the last SQL query (within the configured range of result rows)
Rows (maximum)	Maximum number of resulting rows by any SQL query since the last start of acquisition (possible maximum equals the configured number of result rows)
Send counter	Number of send messages
Sequence errors	Number of sequence errors
Source IP address (part 1-4) O->T	4 octets of the IP address of the target system Output data (from target system to <i>ibaPDA</i> )
Source IP address (part 1-4) T->O	4 octets of the IP address of the target system Input data (from <i>ibaPDA</i> to target system)
Statements processed	Number of executed statements since last start of acquisition
Synchronization	Device is synchronized for isochronous acquisition
Time between data (actual/ max/min)	Time between two correctly received messages Actual: between the last two messages Max/min: statistical values since start of acquisition or reset of counters
Time offset (actual)	Measured time difference of synchronicity between <i>ibaPDA</i> and the <i>ibaNet-E</i> device
Topics Defined	Number of defined topics
Topics Updated	Number of updated topics
Unknown sensor	Number of unknown sensors
Update time (actual/average/ configured/max/min)	Specifies the update time in which the data is to be retrieved from the PLC, the CPU or from the server (configured). Default is equal to the parameter "Timebase". During the measurement the real actual update time (actual) can be higher than the set value, if the PLC needs more time to transfer the data. How fast the data is really updated, you can check in the connection table. The minimum achievable update time is influenced by the number of signals. The more signals are acquired, the greater the update time becomes. Average/max/min: static values of the update time since the last start of the acquisition or reset of the counters.
Write counter	Number of successful write accesses
Write lost counter	Number of failed write accesses

## 5 Support and contact

### Support

Phone: +49 911 97282-14

Email: [support@iba-ag.com](mailto:support@iba-ag.com)

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#### Note



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

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### Contact

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