



# ibaPDA-Interface-Micro-Epsilon

Data interface for Micro-Epsilon  
laser profile scanner

Manual  
Issue 1.0

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).

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# 1 About this Manual

This document describes the function and application of the software interface

*ibaPDA-Interface-Micro-Epsilon*

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

## 1.1 Target group and previous knowledge

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

This documentation in particular addresses persons, who are concerned with the configuration, test, commissioning or maintenance of Programmable Logic Controllers of the supported products. For the handling of *ibaPDA-Interface-Micro-Epsilon* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge of *ibaPDA*
- Knowledge of configuration and operation of the relevant measuring device/system

## 1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <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>
File names, paths	"Filename", "Path" Example: "Test.doc"

## 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.

## 2 System requirements

The following system requirements are necessary for the use of the Micro-Epsilon data interface:

- *ibaPDA* v7.1.0 or higher
- License for *ibaPDA-Interface-Micro-Epsilon* (supports up to 2 devices or 2 connections)
- For more than 2 connections, you need additional *one-step-up-Interface-Micro-Epsilon* licenses for each additional 2 connections. The total limit is 16 connections.

For further requirements for the used computer hardware and the supported operating systems, please refer to the *ibaPDA* documentation.

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### Note



The 2D top view is particularly suitable for displaying the measured values. This display is possible with live data, but only with the trend graph and HD trend graph objects of the *ibaQPanel* software. It is therefore recommended to purchase additional licenses for *ibaQPanel* and/or *ibaHD-Server*.

The 2D top view is included as standard in the offline analysis with *ibaAnalyzer*.

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### License information

Order no.	Product name	Description
31.001016	ibaPDA-Interface-Micro-Epsilon	ibaPDA data interface for connecting up to 2 laser scanners of the Micro-Epsilon scanCONTROL family.
31.101016	one-step-up-Interface-Micro-Epsilon	Extension license for 2 more Micro-Epsilon connections (maximum of 7 licenses permissible)
30.670040	ibaQPanel-V7-Add-On	Additional package for an ibaPDA client to display process/quality data in an HMI image

Table 1: Available Micro-Epsilon interface licenses

## 3 Micro-Epsilon interface

### 3.1 General Information

The Micro-Epsilon interface is suitable for measurement data acquisition of laser profile scanners of the Micro-Epsilon scanCONTROL family. Up to 2 devices or connections are supported with an interface license. In total, a maximum of 8 licenses (=16 devices) can be used.

### 3.2 System topologies

The connections to the devices can be established via the computer's standard Ethernet interfaces.

No further software is necessary for operation.

#### Note



It is recommended to use a direct connection with 1 GBit/s for communication from the *ibaPDA* PC to the device. The device may cause a high network load during operation.

### 3.3 Configuration and engineering ibaPDA

Open the I/O Manager, e.g., from the toolbar .

If all system requirements are met (see above), the "Micro-Epsilon" interface will be displayed in the signal tree.



Fig. 1: Micro- Epsilon interface in I/O Manager

### 3.3.1 Interface settings

The interface itself has the following functions and configuration options:

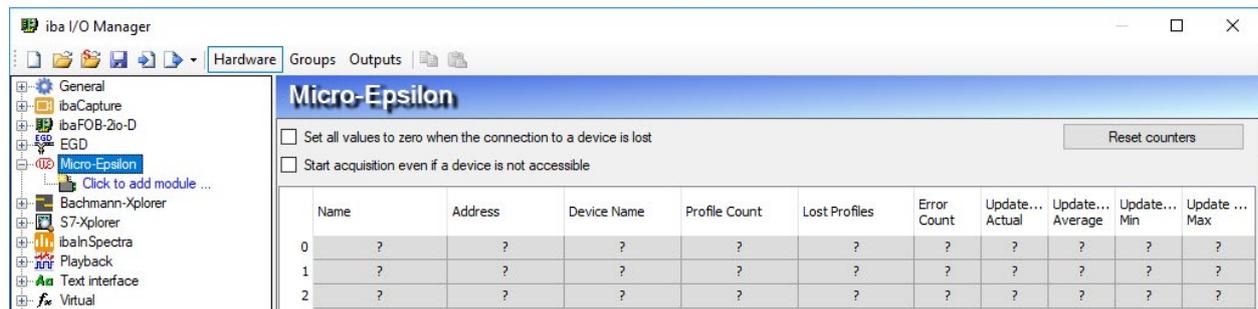


Fig. 2: Micro-Epsilon interface settings

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

If this option is enabled, all measured values of a scanCONTROL device are set to zero as soon as the connection is lost. If this option is disabled, *ibaPDA* will keep the last valid measured value in memory at the time the connection was lost.

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

If this option is enabled, the acquisition will start even if the scanCONTROL device is not accessible. In case of an error, a warning is indicated in the validation dialog. If the system has been started without a connection to the device, *ibaPDA* will periodically try to connect to the device.

#### Connection table

The table shows the cycle times and error counters of the individual connections during data measurement. See chapter [↗ Connection table](#), page 17.

To reset the calculated times and error counters to zero, simply click on the <Reset counters> button.

### 3.3.2 Add module

For each device you need one module of the *scanCONTROL* type.

Add a module by clicking below the interface. Select the desired module type and click <OK>.

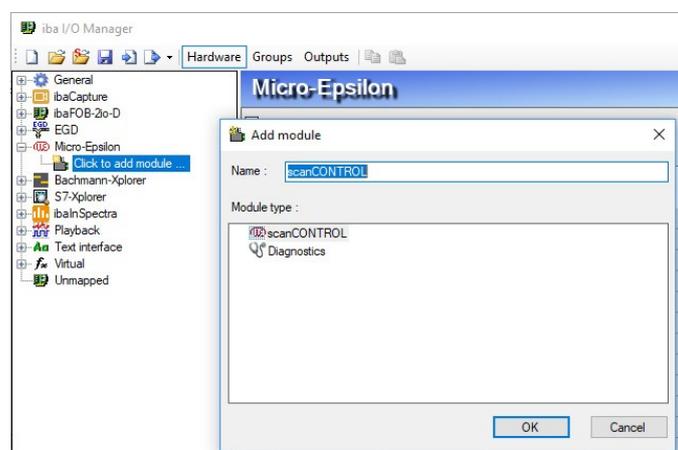


Fig. 3: Add scanCONTROL module

### 3.3.3 General module settings

All modules have the following common settings.

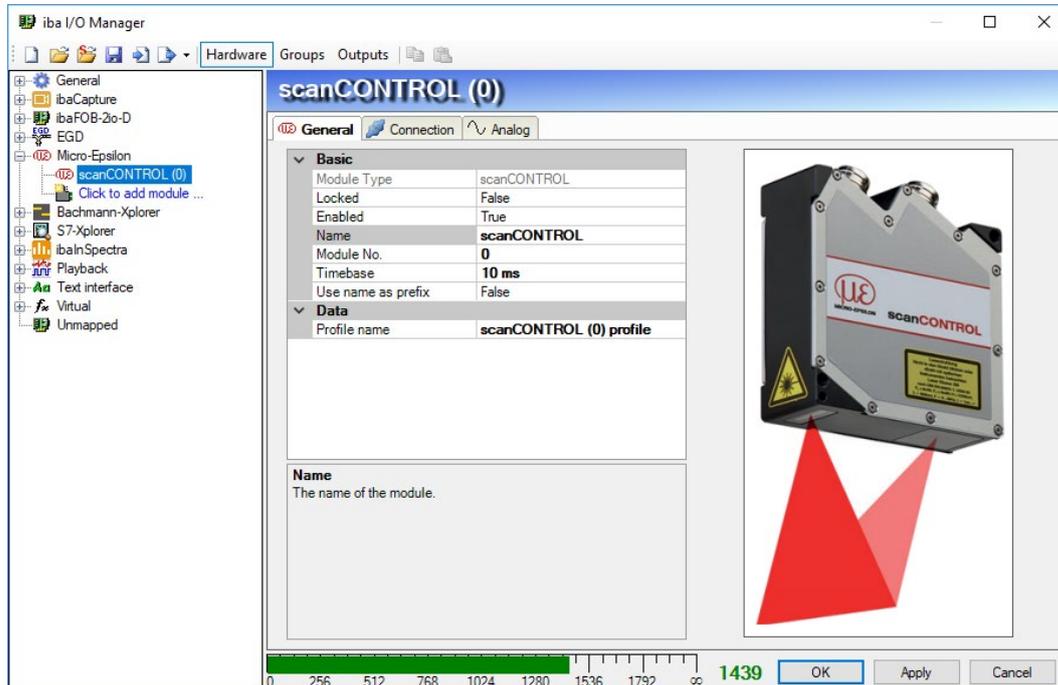


Fig. 4: General settings of the scanCONTROL module

#### Basic settings

##### Module Type (information only)

Indicates the type of the current module.

##### Locked

A module can be locked in order to prevent change of module settings by accident or unauthorized users.

##### Enabled

Disabled modules are excluded from the signal acquisition.

##### Name

The plain text name should be entered here as the module designation.

##### Module no.

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

##### Time base

All signals of the module will be sampled on this time base.

##### Use name as prefix

Puts the module name in front of the signal names.

## Data

### Profile name

For each scanCONTROL module, *ibaPDA* generates a vector signal with the measured line data. The vector signal can be found in the 'Groups' section of the I/O Manager.

You can determine the name of this vector signal by entering it into the *Profile name* field. If the name contains "/" characters, then subgroups are generated. Leave the name empty if you do not want to create any vectors.

### Note



The vector is easy to use for 2D top view of the profile in *ibaQPanel*.

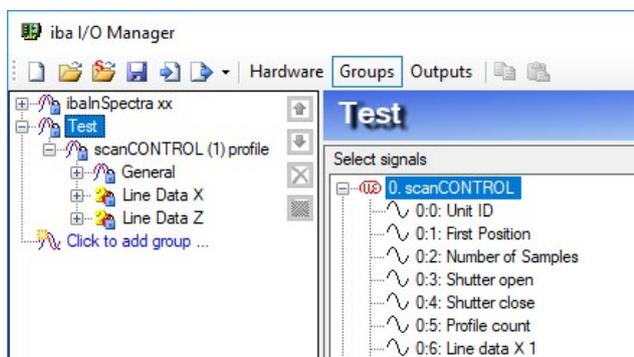
### Example



Entering "Test\scanCONTROL (1) Profile" as profile name will result in a subgroup named "Test" with a vector named "scanCONTROL (1) Profile" as group member.

Timebase	10 ms
Use name as prefix	False
<b>Data</b>	
Profile name	Test\scanCONTROL (1) profile

*Profile name* setting in the general module settings



### 3.3.4 Connection settings

In the *Connection* tab, you configure the settings for the connection setup.

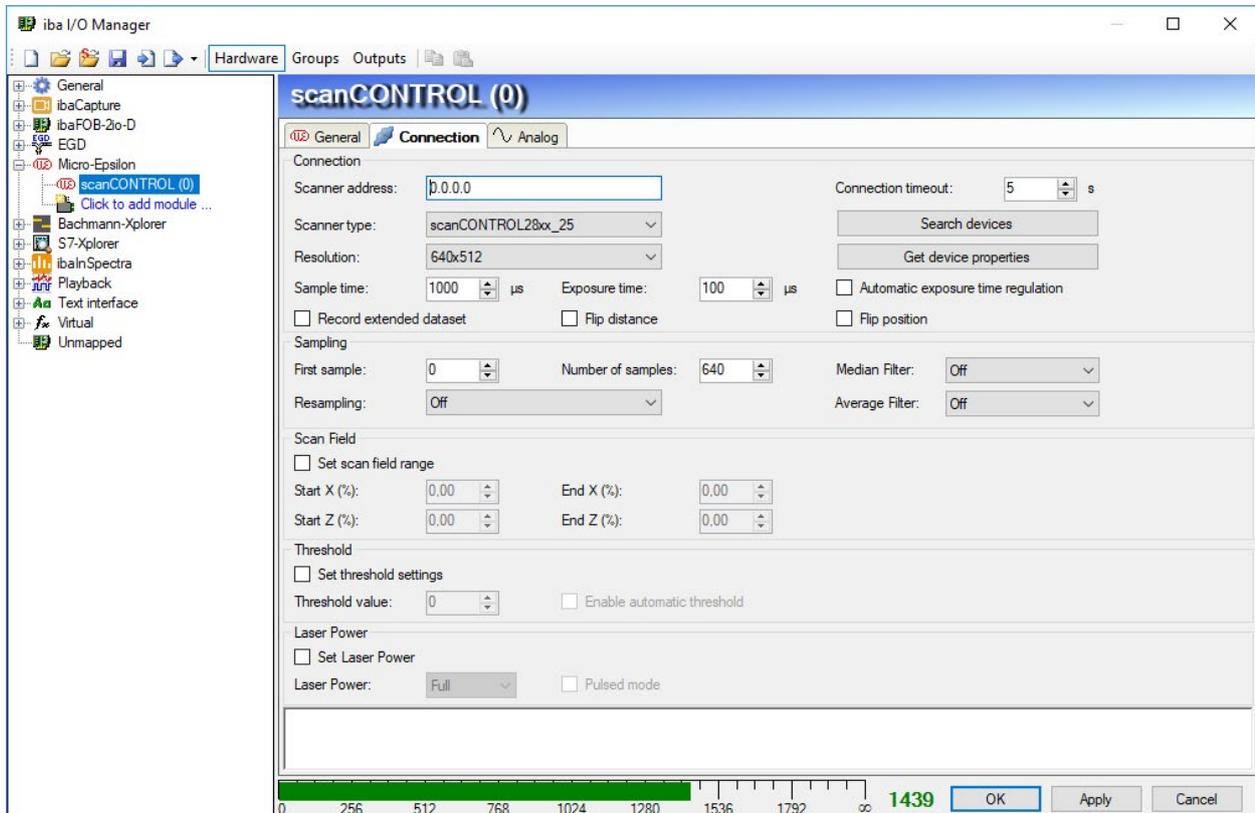


Fig. 5: scanCONTROL connection settings

#### "Connection" area

##### Scanner address

Enter the IP address of the scanCONTROL device here

##### Scanner type

Here, you can select the scanner type.

##### Resolution

Select the resolution used here. The list of available resolutions changes according to the selected scanner type.

##### Connection timeout

The maximum time (in s) between two profile updates, before the connection is considered interrupted.

##### Sample time

The time (in  $\mu\text{s}$ ) between two profile recordings by the scanner.

##### Exposure time

The exposure time can be set here. The exposure time depends on the laser power and the scanned material and must be smaller than the selected sample time. Please refer to the device manual for more information.

**Automatic exposure time regulation**

If you enable this option, the scanCONTROL device starts with the configured exposure time and then automatically sets the exposure time to optimal results.

**Record extended dataset**

The acquisition of the X and Z vectors is sufficient for normal operation. For diagnostic reasons, additional vectors can also be recorded with the used threshold, the reflection width and the reflection maximum. The additional vectors are only visible in the *Analog* tab after applying the IO configuration once.

**Flip distance**

The Z vector contains the distance between the scanned material and the scanner. These values are usually inverse to the material height. To use the values, it can be easier to invert the distance value.

**Flip position**

Due to the scanner position, it may happen that the value alignment from left to right from the scanner view does not match the material position. The alignment will be inverted if this option is enabled.

---

**Note**

Without resampling, this only affects the values in the X vector. The sequence of the values remains unchanged.

---

**“Sampling” area**

These values must always be configured in *ibaPDA*, since they are defined for the device per acquisition session and affect the available size of the vector for further processing.

**First sample**

The first data sample that is sent to *ibaPDA*. Also changes the first sample number in the resulting vectors.

**Number of samples**

Number of samples that are sent to *ibaPDA*. This changes the number of values in the resulting vectors.

---

**Note**

The sum of the first sample and the number of samples must be less than the selected resolution.

---

**Resampling**

You can convert the vector to equidistant values. You can select the desired spacing of values in the dropdown menu.

This is important for the further processing in *ibaAnalyzer*, since *ibaAnalyzer* only supports equidistant values. For further information, please refer to the device manual.

**Median filter / average filter**

You can apply smoothing filters to Z values and set a window width for the filters here. For further information, please refer to the device manual.

**"Scan field" area**

The scan field defines the area of the device sensor used for data acquisition. This is important for data acquisition with short sample times. The scan field can be set independently of the "First Sample" / "Number of Samples" values, but values outside the scan field are set to 0. For further information, please refer to the device manual.

**Set scan field range**

If this option is enabled, the scan field settings are used as defined here.

**Start X / End X / Start Z / End Z**

Define the area of the device sensor, which is used for the data acquisition. Specification in percent of the entire sensor.

**Threshold**

The threshold is used to remove noise resulting from external light reflection or high dispersion due to surface textures. For further information, please refer to the device manual.

**Set threshold settings**

If this option is enabled, the threshold settings are used as defined here.

**Threshold value**

Set the threshold here above which a measured response is valid.

**Enable automatic threshold**

If this option is enabled, the threshold is calculated by the sensor to better adapt to different materials. The current threshold can be checked by recording the extended dataset.

**"Laser power" area**

You can set the laser power used for the measurement here. For further information, please refer to the device manual.

**Set laser power**

If this option is enabled, the laser power settings are used as defined here.

**Laser power**

Choose from the drop-down menu: full, reduced, off

**Pulsed mode**

If this option is enabled, the laser pulses correspond to the sample time.

### 3.3.5 Signal configuration

The module contains all signals that the scanner sends. The complete set of signals of a scanCONTROL device is automatically created for each module.

The signals are grouped in the signal tables by functionality. It is not necessary to add additional signals. If necessary, you can enable/disable individual signals.

Name	Unit	Gain	Offset	Active	Actual
<b>General</b>					
0 Unit ID		1	0	<input checked="" type="checkbox"/>	
1 First Position		1	0	<input checked="" type="checkbox"/>	
2 Number of Samples		1	0	<input checked="" type="checkbox"/>	
3 Shutter open		1	0	<input checked="" type="checkbox"/>	
4 Shutter close		1	0	<input checked="" type="checkbox"/>	
5 Profile count		1	0	<input checked="" type="checkbox"/>	
<b>Line Data X</b>					
6 Line data X 1	mm	1	0	<input checked="" type="checkbox"/>	
7 Line data X 2	mm	1	0	<input checked="" type="checkbox"/>	
8 Line data X 3	mm	1	0	<input checked="" type="checkbox"/>	
9 Line data X 4	mm	1	0	<input checked="" type="checkbox"/>	
10 Line data X 5	mm	1	0	<input checked="" type="checkbox"/>	
11 Line data X 6	mm	1	0	<input checked="" type="checkbox"/>	
12 Line data X 7	mm	1	0	<input checked="" type="checkbox"/>	
13 Line data X 8	mm	1	0	<input checked="" type="checkbox"/>	
14 Line data X 9	mm	1	0	<input checked="" type="checkbox"/>	
15 Line data X 10	mm	1	0	<input checked="" type="checkbox"/>	
16 Line data X 11	mm	1	0	<input checked="" type="checkbox"/>	
17 Line data X 12	mm	1	0	<input checked="" type="checkbox"/>	
18 Line data X 13	mm	1	0	<input checked="" type="checkbox"/>	
19 Line data X 14	mm	1	0	<input checked="" type="checkbox"/>	1439

Fig. 6: "Analog" signal table

The *Analog* tab of a scanCONTROL module shows the available values. When the recording is running, the current values are shown in the "Actual" column.

#### Note



The number of line data signals is always smaller than is configured for 'Number of samples.' The last data fields are always overwritten in the scanCONTROL interface with time data information, which is excluded from the recording in *ibaPDA*. For further information, please refer to the device manual.

## 4 Diagnostics

### 4.1 License

If the "Micro-Epsilon" interface is not displayed in the signal tree, you can either check in *ibaPDA* under *General - Settings - License* in the I/O Manager or in the *ibaPDA* service status application to see whether your license "Interface Micro-Epsilon" has been properly recognized. The number of licensed connections is indicated in brackets.

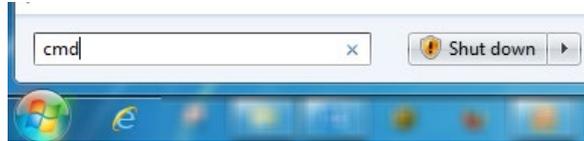


Fig. 7: License display in the I/O Manager

## 4.2 Connection diagnostics with PING

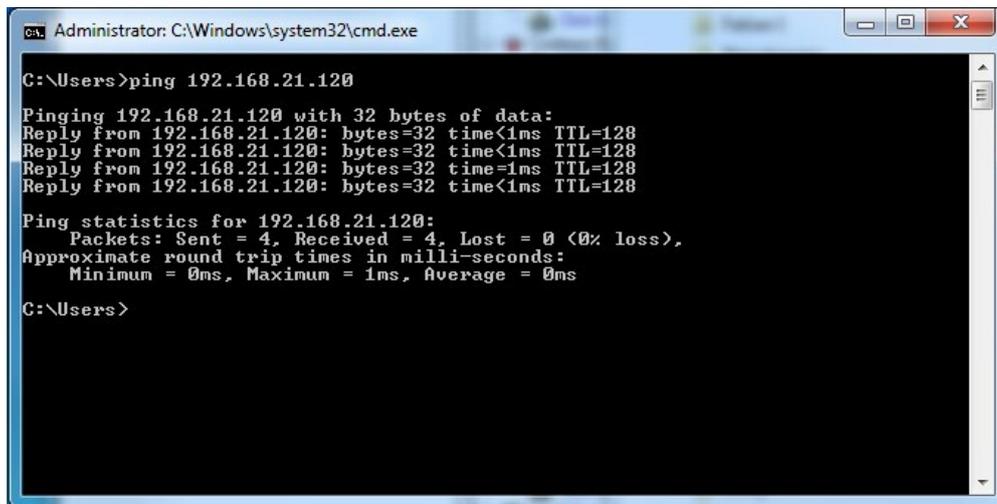
PING is a system command with which you can check if a certain communication partner can be reached in an IP network.

Open a Windows command prompt.



Enter the command “ping” followed by the IP address of the communication partner and press <ENTER>.

With an existing connection you receive several replies.

A screenshot of a Windows command prompt window titled 'Administrator: C:\Windows\system32\cmd.exe'. The prompt shows the command 'C:\Users>ping 192.168.21.120' and its output. The output indicates a successful ping with four replies, each showing 32 bytes of data, a time of less than 1ms, and a TTL of 128. Ping statistics show 4 packets sent, 4 received, and 0% loss, with a minimum round trip time of 0ms, a maximum of 1ms, and an average of 0ms.

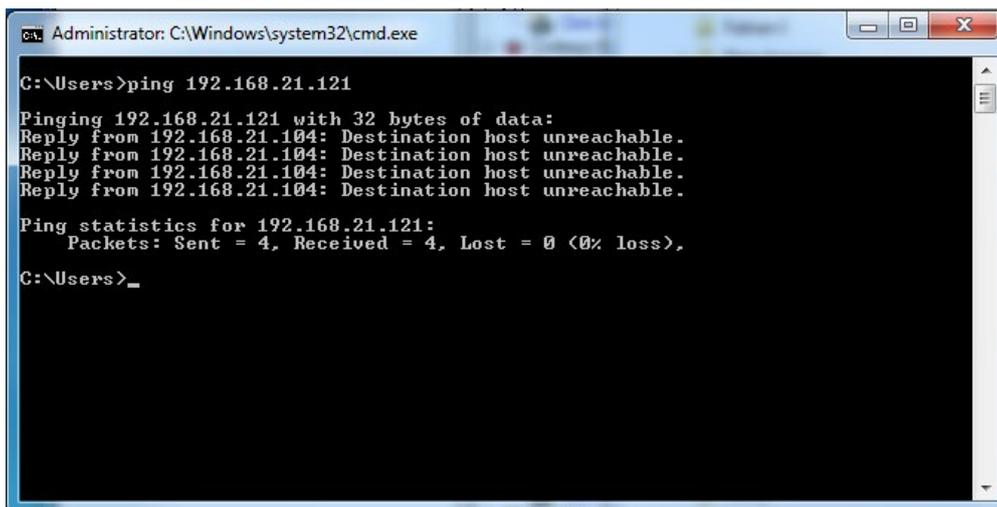
```
Administrator: C:\Windows\system32\cmd.exe
C:\Users>ping 192.168.21.120
Pinging 192.168.21.120 with 32 bytes of data:
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128
Reply from 192.168.21.120: bytes=32 time=1ms TTL=128
Reply from 192.168.21.120: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.21.120:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users>
```

Fig. 8: PING successful

With no existing connection you receive error messages.

A screenshot of a Windows command prompt window titled 'Administrator: C:\Windows\system32\cmd.exe'. The prompt shows the command 'C:\Users>ping 192.168.21.121' and its output. The output indicates an unsuccessful ping with four replies, each showing 'Destination host unreachable'. Ping statistics show 4 packets sent, 4 received, and 0% loss, with a minimum round trip time of 0ms, a maximum of 1ms, and an average of 0ms.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users>ping 192.168.21.121
Pinging 192.168.21.121 with 32 bytes of data:
Reply from 192.168.21.104: Destination host unreachable.

Ping statistics for 192.168.21.121:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users>_
```

Fig. 9: PING unsuccessful

### 4.3 Connection table

The Micro-Epsilon interface shows all connections in a table. There is one row per connection to a scanner.

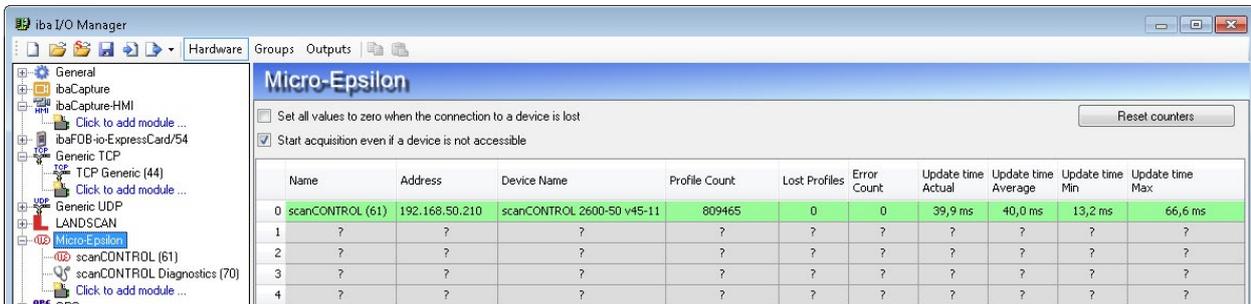


Fig. 10: Micro-Epsilon connection table

The columns in the table and their meaning:

- Name: Name of the module
- Address: IP address of the scanner
- Device name: Name of the scanCONTROL device
- Profile count: is incremented with each update sent by the device, which contains an internal profile number.
- Lost profiles: reflect lost updates according to the internal profile number
- Error count: The number of communication errors that occurred
- Update time actual, average, minimum, maximum: The update time is the time between two consecutive telegrams.

Additional information is provided by the background color of the table rows:

Color	Meaning
Green	The connection is OK and the data is read.
Red	The connection has failed or been interrupted.
Gray	No connection configured.

Table 2: Meaning of background colors of the connection table

For the Micro-Epsilon devices, a diagnostic module can be configured, which records the values available in the connection table for the Micro-Epsilon interface.

## 4.4 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, since 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.

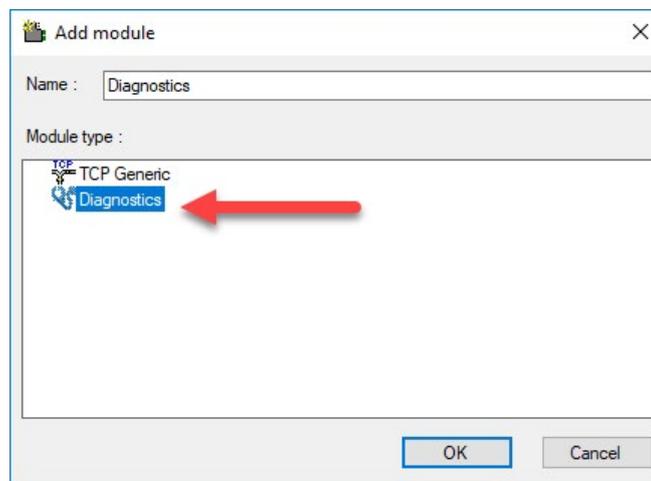


Fig. 11: Add diagnostic module, example Generic TCP

### Module settings diagnostic module

For a diagnostic module, you can make the following settings:

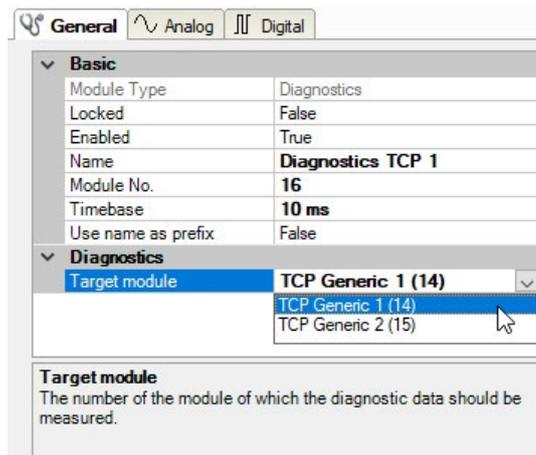


Fig. 12: Module settings diagnostic module, example TCP Generic

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.

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"/>	
11 Time between data (max)	ms		1	0	<input checked="" type="checkbox"/>	

Fig. 13: Example: Analog values of a diagnostic module for a TCP Generic module

For example, the IP (v4-) address of a TCP Generic 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.

General Analog Digital		
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"/>	

Fig. 14: Example: Digital values of a diagnostic module for a TCP Generic module

## 5 Support and contact

### Support

Phone: +49 911 97282-14  
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Email: support@iba-ag.com

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### Note



If you require support, indicate the serial number (iba-S/N) of the product and the license number.

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### Contact

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