



ibaPDA-Interface-LANDSCAN

Data Interface for LAND Temperature Scanners

Manual
Issue 2.3

Measurement Systems for Industry and Energy

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1 About this manual

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

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-LANDSCAN* 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:

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 System requirements

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

- *ibaPDA* v6.35 or higher
- License for *ibaPDA-Interface-LANDSCAN* (supports up to 2 scanners, i.e. 2 connections)
- For more than 2 connections, you need additional *one-step-up-Interface-LANDSCAN* 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.

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*.

License information

Order no.	Product name	Description
31.001011	ibaPDA-Interface-LANDSCAN	ibaPDA data interface for connecting up to 2 LAND (Ametek) temperature line scanners
31.101011	One-step-up-Interface-LANDSCAN	Extension license for 2 more LANDSCAN connections (a 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 LANDSCAN interface licenses

3 LANDSCAN interface

3.1 General information

The LANDSCAN interface can be used to measure data from LAND (Ametek) temperature line scanners. Up to 2 devices or connections are supported with an interface license. In total, a maximum of 8 licenses (=16 devices) can be used. The scanners generate 1000 samples per line and they can scan at up to 150 lines per second. The scanners can send their data in ASCII or binary mode. Both modes are supported by *ibaPDA*, while the binary mode is more efficient and is therefore recommended if the scanner supports it. Older versions of the scanners only support ASCII mode. Furthermore *ibaPDA* supports the dynamic correction of changing distances between scanner and material as well as the control of the emissivity of the scanner via an analog signal.

3.2 System topologies

The connections between the devices and *ibaPDA* can be established via the computer's standard Ethernet interfaces.

No further software is necessary for operation.

Note



It is recommended carrying out the TCP/IP communication on a separate network segment to exclude a mutual influence by other network components.

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 LANDSCAN interface will be displayed in the signal tree.



3.3.1 Interface settings

The interface itself has the following functions and configuration options:



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

If enabled, all measured values of the device are set to zero as soon as the connection is lost. If this option is disabled, *ibaPDA* will keep the last valid measured data 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 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 for the individual connections during data measurement. To reset the calculated times and error counters to zero, simply click on the <Reset counters> button.

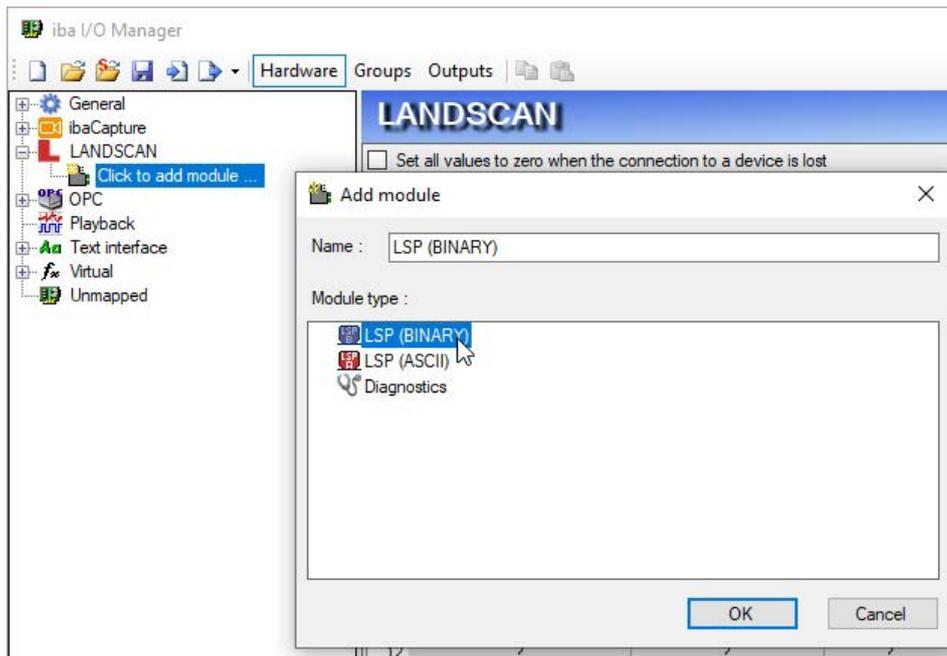
3.3.2 Add module

For each device you need one module. *ibaPDA* supports 2 module types:

- LSP (BINARY) for binary mode This module supports polling (SBD) and streaming (SLD) mode.
- LSP (ASCII) for ASCII mode This module supports polling (SND) mode.

You can also add one or more diagnostic modules. For more information on diagnostic modules, refer to chapter [↗ Diagnostic modules](#), page 19 .

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



3.3.3 General module settings

All modules have the following common settings.

LSP (BINARY) (8)	
General Analog Digital	
▼ Basic	
Module Type	LSP (BINARY)
Locked	False
Enabled	True
Name	LSP (BINARY)
Module No.	8
Timebase	10 ms
Use name as prefix	False
▼ Connection	
IP Address	10.1.10.101
Port	1050
High priority	False
▼ Data	
Profile samples	1000
Temperature units	°F
Profile name	LSP (BINARY) (8) profile
▼ Advanced	
Swap line data	False
Current distance	Unassigned
Reference distance	2000
Set emissivity	Unassigned

Basic settings

Module Type (information only)

Indicates the type of the current module.

Locked

A module can be locked to avoid unintentional or unauthorized changing of the module settings.

Enabled

Disabled modules are excluded from 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*.

Timebase

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.

Connection

IP Address

Enter the IP address of the LANDSCAN device.

Port

Enter the port number of the LANDSCAN device *ibaPDA* should connect to. The default value is 1050. The port number can also be changed if necessary.

High priority (BINARY type only)

In binary mode the data is streamed. This means that the scanner sends the data as soon as a line is completely captured. A scanner supports up to 4 connections, i.e. up to 4 clients. One of these connections may have the highest priority. This connection will get the full speed of up to 150 Hz. If you want the fastest connection to be used for *ibaPDA*, then set the *High priority* property to true.

Data**Profile samples**

The scanner always sends 1000 samples per line in binary mode. You can reduce the number of samples via the *Profile samples* property. If you set the *Profile samples* to e.g. 200 then *ibaPDA* will take every 5th sample. There is no aggregation done.

In ASCII mode you can configure how many samples per line the scanner sends. You have to configure this in the scanner itself via the LANDSCAN configuration software. In *ibaPDA* you have to set the *Profile samples* property to the same value as configured in the scanner.

Update time (ASCII type only)

In ASCII mode the data is polled. You have to configure how often *ibaPDA* reads the data from the scanner. You do this via the *Update time* property.

Temperature units

Select the appropriate temperature unit, °C or °F.

Profile name

For each LANDSCAN module *ibaPDA* generates a vector for the active line data. The vector can be found in the *Groups* section of the I/O Manager.

You can determine the name of this profile vector by entering it at *Profile name*. You can use the `\` character to assign the profile vector to a subgroup.

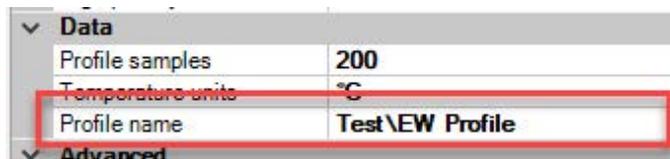
Note

The vector is easy to use for 2D top view of the temperature profile either in *ibaQPanel* (trend graph) and/or *ibaAnalyzer*.

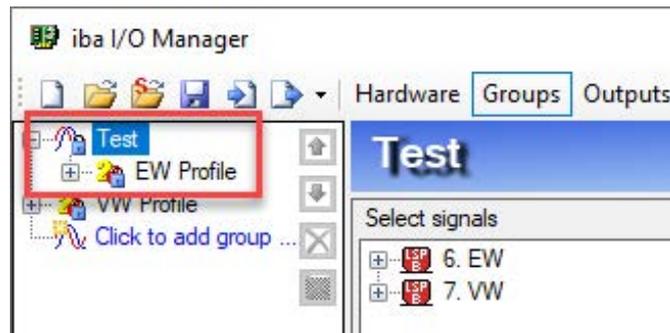
Example



Entering "Test\EW profile" as profile name will result in a subgroup named "Test" with a vector named "EW profile" as group member.



Profile name property in the General tab of the module



Advanced

Swap line data

Reversing the measuring point sequence in the scan line. Measuring point 1 becomes measuring point 1000 and vice versa. In relation to the measured material, this corresponds to swapping the left and right side.

Current distance, Reference distance

In case the distance between the scanner and the material is not fix then *ibaPDA* can scale the received data to a reference distance so that the material width will stay constant. To be able to do this, a signal that determines the current distance between scanner and material must be provided. You can freely choose the unit of the reference distance and current distance as long as you use the same unit for both.

Set emissivity

The emissivity of the scanner can be changed by *ibaPDA* via this signal. The valid emissivity range is between 0.01 and 1.00. This feature can be used when different materials are being processed that require a different emissivity.

3.3.4 Signal configuration

The module contains all analog and digital signals that the scanner sends. The complete set of signals of a LANDSCAN device is automatically created with every module.

The signals are grouped in the signal tables by functionality. There is no need to select any other signals. If necessary, you can enable/disable individual signals.

iba I/O Manager

Hardware Groups Outputs

LSP (BINARY) (6)

General Analog Digital

Name	Unit	Gain	Offset	Active	Actual
General					
0 Unit ID		1	0	<input checked="" type="checkbox"/>	
1 Number of samples		1	0	<input checked="" type="checkbox"/>	
2 Actual scanner speed	Hz	1	0	<input checked="" type="checkbox"/>	
3 Line number		1	0	<input checked="" type="checkbox"/>	
4 Ambient temperature	°C	0,01	0	<input checked="" type="checkbox"/>	
5 Sample position of first edge		1	0	<input checked="" type="checkbox"/>	
6 Sample position of last edge		1	0	<input checked="" type="checkbox"/>	
7 Position of the first sample		1	0	<input checked="" type="checkbox"/>	
8 Configured scan angle	°	1	0	<input checked="" type="checkbox"/>	
Zone data					
Zone start					
Zone end					
Analog inputs					
Errors					
Line data					
66 Line data 1	°C	0,1	0	<input checked="" type="checkbox"/>	
67 Line data 2	°C	0,1	0	<input checked="" type="checkbox"/>	
68 Line data 3	°C	0,1	0	<input checked="" type="checkbox"/>	
69 Line data 4	°C	0,1	0	<input checked="" type="checkbox"/>	
70 Line data 5	°C	0,1	0	<input checked="" type="checkbox"/>	
71 Line data 6	°C	0,1	0	<input checked="" type="checkbox"/>	
72 Line data 7	°C	0,1	0	<input checked="" type="checkbox"/>	

0 512 1024 1536 2048 2560 3072 3584 ∞ 2249 OK Apply Cancel

iba I/O Manager

Hardware Groups Outputs

LSP (BINARY) (6)

General Analog Digital

Name	Active	Actual
General		
0 Connected	<input checked="" type="checkbox"/>	
1 System alarm	<input checked="" type="checkbox"/>	
2 Product detected	<input checked="" type="checkbox"/>	
Zone alarms		
3 Zone alarm 1	<input checked="" type="checkbox"/>	
4 Zone alarm 2	<input checked="" type="checkbox"/>	
5 Zone alarm 3	<input checked="" type="checkbox"/>	
6 Zone alarm 4	<input checked="" type="checkbox"/>	
7 Zone alarm 5	<input checked="" type="checkbox"/>	
8 Zone alarm 6	<input checked="" type="checkbox"/>	
9 Zone alarm 7	<input checked="" type="checkbox"/>	
10 Zone alarm 8	<input checked="" type="checkbox"/>	
11 Zone alarm 9	<input checked="" type="checkbox"/>	
12 Zone alarm 10	<input checked="" type="checkbox"/>	
13 Zone alarm 11	<input checked="" type="checkbox"/>	
14 Zone alarm 12	<input checked="" type="checkbox"/>	
15 Zone alarm 13	<input checked="" type="checkbox"/>	
16 Zone alarm 14	<input checked="" type="checkbox"/>	
Digital inputs		
17 Digital input 1	<input checked="" type="checkbox"/>	
18 Digital input 2	<input checked="" type="checkbox"/>	
19 Digital input 3	<input checked="" type="checkbox"/>	
20 Digital input 4	<input checked="" type="checkbox"/>	

0 512 1024 1536 2048 2560 3072 3584 ∞ 2249 OK Apply Cancel

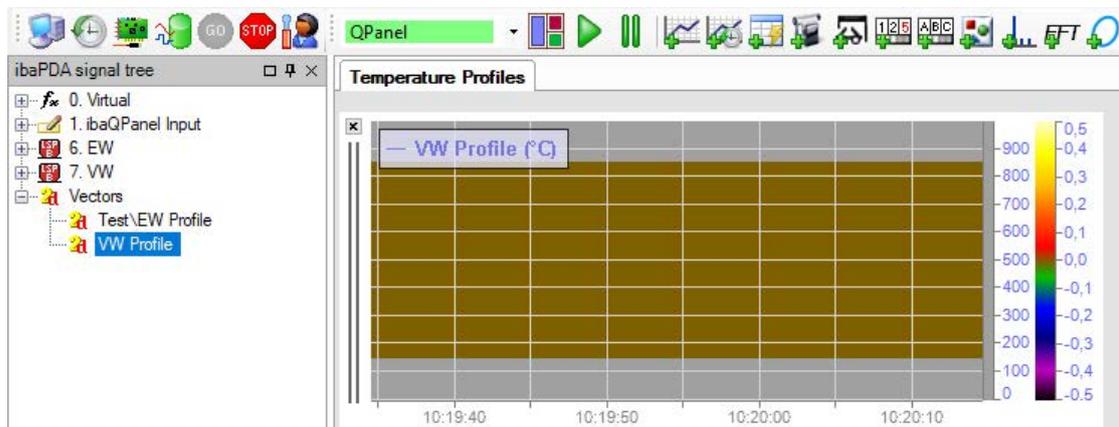
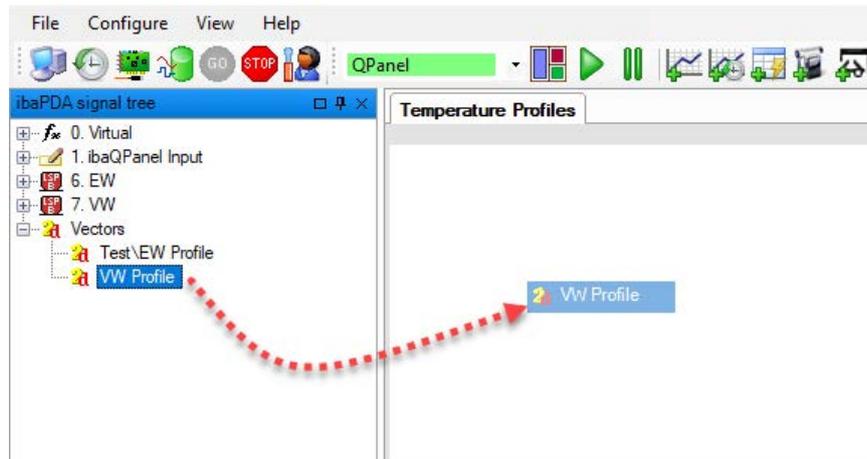
3.3.5 Visualization

For the visualization of temperature profiles, the 2D false color display has proven successful.

In *ibaPDA*, you can implement this form of representation with the element *Trend graph* in *ibaQPanel*.

To do this, create a trend graph in a QPanel view and then exit the design mode.

Now simply drag the corresponding profile vector, which was automatically created with the configuration of the module, from the signal tree into the trend display (drag & drop). The vectors can usually be found at the very bottom of the signal tree, under the *Vectors* node.

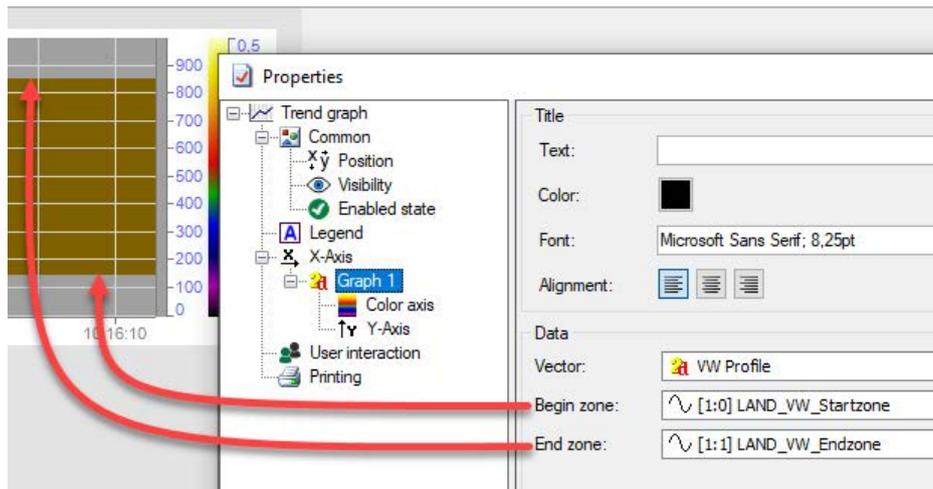


In this view, the Y-axis corresponds to the measuring point number from the line data 1 to max. 1000. The temperature is displayed using the colors.

Further settings can be defined in the properties dialog of the trend view.

For example, in addition to the usual settings for the X and Y axes, you can also change the color assignment for the temperatures.

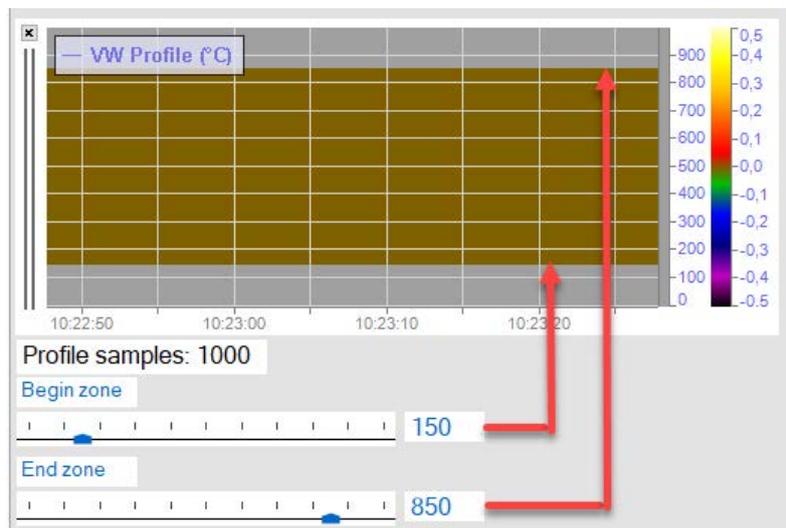
With the parameters *Begin zone* and *End zone* you can hide areas at the edges that are not relevant. Select in each case a signal that provides the corresponding value. This can be a static virtual signal, a calculated virtual signal or an input signal from a PLC.



The value for begin and end zone is the number of the measuring point within a line.

Example

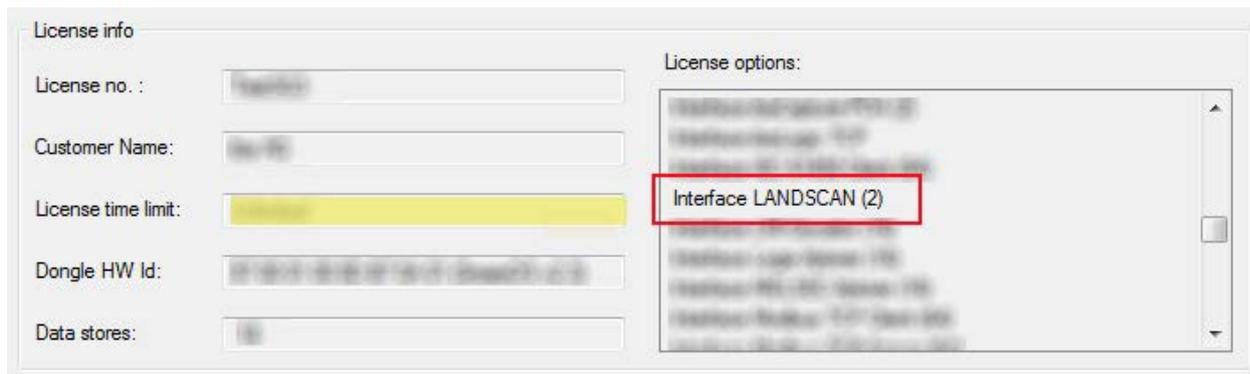
The following picture shows the result of a setting with a number of profile samples of 1000, begin zone 150 and end zone 850. Thus the first 149 measuring points and the last 150 measuring points (851 to 1000) are hidden.



4 Diagnostics

4.1 License

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



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.

```
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
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. 1: PING successful

With no existing connection you receive error messages.

```
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),
C:\Users>
```

Fig. 2: PING unsuccessful

4.3 Connection table

The LANDSCAN interface shows a connection table. There is one row per connection to a scanner.

	Name	Address	Error Count	Mode	Update time Actual	Update time Average	Update time Min	Update time Max
0	EW (6)	192.168.123.56	0	BINARY (SLD)	11,7 ms	11,7 ms	10,9 ms	12,5 ms
1	VW (7)	10.1.10.101	1	BINARY (SBD)	0,0 ms	0,0 ms	0,0 ms	0,0 ms
2	EW (ASCII) (8)	192.168.123.56	0	ASCII (SND)	20,0 ms	20,0 ms	19,9 ms	21,0 ms
3	?	?	?	?	?	?	?	?
4	?	?	?	?	?	?	?	?
5	?	?	?	?	?	?	?	?
6	?	?	?	?	?	?	?	?
7	?	?	?	?	?	?	?	?
8	?	?	?	?	?	?	?	?
9	?	?	?	?	?	?	?	?
10	?	?	?	?	?	?	?	?
11	?	?	?	?	?	?	?	?
12	?	?	?	?	?	?	?	?
13	?	?	?	?	?	?	?	?
14	?	?	?	?	?	?	?	?
15	?	?	?	?	?	?	?	?

The columns in the table and their meaning:

- Name: Name of the module
- Address: IP address of the scanner
- Error count: The number of communication errors that occurred
- Mode: This indicates how the data is transferred from the scanner to *ibaPDA*. The possible values are:
 - BINARY (SBD): Streaming binary data
 - BINARY (SLD): Polling binary data
 - ASCII (SND): Polling ASCII data
- Update time actual, average, min, max:

The update time is the time between consecutive data messages. It should be the same as the configured scan speed in the scanner when using binary mode. It should be the same as the *Update time* property in ASCII mode.

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

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.

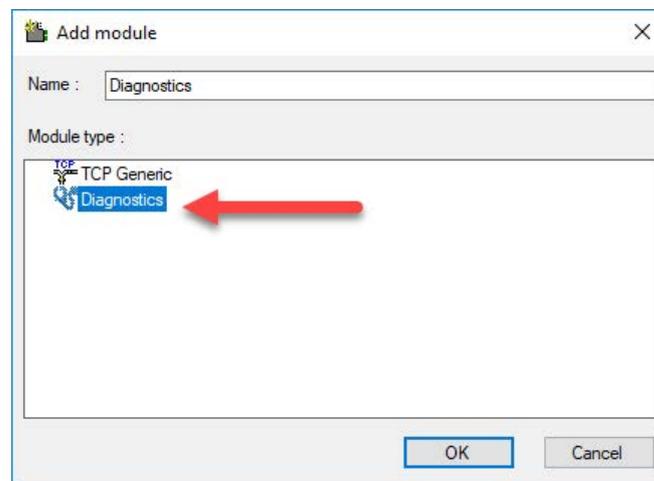


Fig. 3: Add diagnostic module, example Generic TCP

Module settings diagnostic module

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

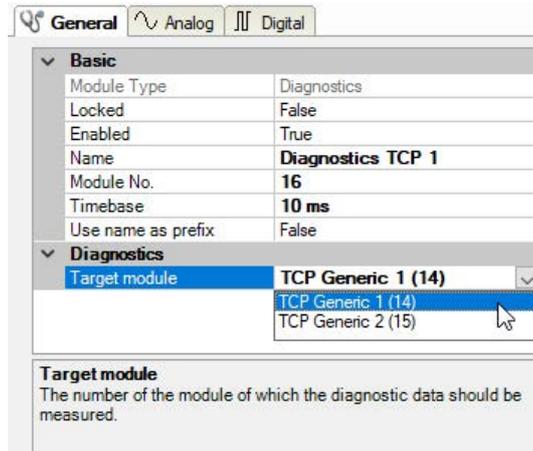


Fig. 4: Module settings diagnostic module, example TCP Generic

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.

		General	Analog	Digital			
	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. 5: 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. 6: Example: Digital values of a diagnostic module for a TCP Generic module

5 Support and contact

Support

Phone: +49 911 97282-14
Fax: +49 911 97282-33
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Note



If you need support for software products, please state the license number or the CodeMeter container number (WIBU dongle). For hardware products, please have the serial number of the device ready.

Contact

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