ibaPDA-Interface-LANDSCAN
Data Interface for LAND Temperature Scanners

Manual
Issue 2.2

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The current version is available for download on our web site www.iba-ag.com.

Version Date Revision - Chapter / Page Author Version SW
2.2 10-2020 Swap line data RM 7.1.0

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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:

<table>
<thead>
<tr>
<th>Action</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu command</td>
<td>Menu <em>Logic diagram</em></td>
</tr>
<tr>
<td>Calling the menu command</td>
<td><em>Step 1 – Step 2 – Step 3 – Step x</em></td>
</tr>
<tr>
<td></td>
<td>Example: Select the menu <em>Logic diagram - Add - New function block</em>.</td>
</tr>
<tr>
<td>Keys</td>
<td><em>&lt;Key name&gt;</em></td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt;; &lt;F1&gt;</td>
</tr>
<tr>
<td>Press the keys simultaneously</td>
<td><em>&lt;Key name&gt;</em> + <em>&lt;Key name&gt;</em></td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt; + &lt;Ctrl&gt;</td>
</tr>
<tr>
<td>Buttons</td>
<td><em>&lt;Key name&gt;</em></td>
</tr>
<tr>
<td></td>
<td>Example: &lt;OK&gt;; &lt;Cancel&gt;</td>
</tr>
<tr>
<td>File names, paths</td>
<td><em>&quot;Filename&quot;, &quot;Path&quot;</em></td>
</tr>
<tr>
<td></td>
<td>Example: &quot;Test.doc&quot;</td>
</tr>
</tbody>
</table>
1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger!</td>
<td>The non-observance of this safety information may result in an imminent risk of death or severe injury:</td>
</tr>
<tr>
<td>Warning!</td>
<td>The non-observance of this safety information may result in a potential risk of death or severe injury!</td>
</tr>
<tr>
<td>Caution!</td>
<td>The non-observance of this safety information may result in a potential risk of injury or material damage!</td>
</tr>
<tr>
<td>Note</td>
<td>A note specifies special requirements or actions to be observed.</td>
</tr>
<tr>
<td>Tip</td>
<td>Tip or example as a helpful note or insider tip to make the work a little bit easier.</td>
</tr>
<tr>
<td>Other documentation</td>
<td>Reference to additional documentation or further reading.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.001011</td>
<td>ibaPDA-Interface-LANDSCAN</td>
<td>ibaPDA data interface for connecting up to 2 LAND (Ametek) temperature line scanners</td>
</tr>
<tr>
<td>31.101011</td>
<td>One-step-up-Interface-LANDSCAN</td>
<td>Extension license for 2 more LANDSCAN connections (a maximum of 7 licenses permissible)</td>
</tr>
<tr>
<td>30.670040</td>
<td>ibaQPanel-V7-Add-On</td>
<td>Additional package for an ibaPDA client to display process/quality data in an HMI image</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is recommended carrying out the TCP/IP communication on a separate network segment to exclude a mutual influence by other network components.</td>
</tr>
</tbody>
</table>

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.

Fig. 1: LANDSCAN interface in the I/O Manager
3.3.1 Interface settings

The interface itself has the following functions and configuration options:

![LANDSCAN interface settings](image)

**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 18.

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.

**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 prefix 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 measured 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* 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**
Swap the order of the lines. Line 1 will become line 1000 and line 1000 will become line 1.

**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.

![Fig. 5: LANDSCAN analog signal table](image)
Fig. 6: LANDSCAN digital signal table
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.

![Fig. 7: License display in ibaPDA I/O Manager](image-url)
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.

![Fig. 8: PING successful](image)

With no existing connection you receive error messages.

![Fig. 9: PING unsuccessful](image)
4.3 Connection table

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

![LANDSCAN interface screenshot]

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:

<table>
<thead>
<tr>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>The connection is OK and the data is read.</td>
</tr>
<tr>
<td>Red</td>
<td>The connection has failed or been interrupted.</td>
</tr>
<tr>
<td>Gray</td>
<td>No connection configured.</td>
</tr>
</tbody>
</table>

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. 11: Add diagnostic module, example Generic TCP
Module settings diagnostic module

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

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.

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.
Fig. 14: Example: Digital values of a diagnostic module for a TCP Generic module
5 Support and contact

Support

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Note

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

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