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1 About this Manual

This documentation contains a comprehensive description of the ibaPDA-Interface-Sigmatek-Xplorer individual PLC-Xplorer data interface.

This documentation is a supplement to the ibaPDA manual. Information about all the other characteristics and functions of ibaPDA may 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 the 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-Sigmatek-Xplorer the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge of ibaPDA
- Knowledge of configuration and operation of the relevant control 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 Logic diagram</td>
</tr>
<tr>
<td>Calling the menu command</td>
<td>Step 1 – Step 2 – Step 3 – Step x</td>
</tr>
<tr>
<td></td>
<td>Example: Select the menu Logic diagram - Add - New function block.</td>
</tr>
<tr>
<td>Keys</td>
<td>&lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt;; &lt;F1&gt;</td>
</tr>
<tr>
<td>Press the keys simultaneously</td>
<td>&lt;Key name&gt; + &lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;Alt&gt; + &lt;Ctrl&gt;</td>
</tr>
<tr>
<td>Buttons</td>
<td>&lt;Key name&gt;</td>
</tr>
<tr>
<td></td>
<td>Example: &lt;OK&gt;; &lt;Cancel&gt;</td>
</tr>
<tr>
<td>File names, paths</td>
<td>&quot;Filename&quot;, “Path”</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:

⚠️ DANGER

The non-observance of this safety information may result in an imminent risk of death or severe injury:

- From an electric shock!
- Due to the improper handling of software products which are coupled to input and output procedures with control function!

⚠️ WARNING

The non-observance of this safety information may result in a potential risk of death or severe injury!

⚠️ CAUTION

The non-observance of this safety information may result in a potential risk of injury or material damage!

Note
A note specifies special requirements or actions to be observed.

Important note
Note if some special features must be observed, for example exceptions from the rule.

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.

Example
Configuration and application examples for a better understanding
2 System requirements

The following system requirements are necessary for the use of the Sigmatek-Xplorer data interface:

- ibaPDA V6.34 or more recent
- ibaPDA base license + license for ibaPDA-Interface-PLC-Xplorer or ibaPDA-Interface-Sigmathek-Xplorer
- If you need more than 16 connections, you will require additional one-step-up-Interface-Sigmathek-Xplorer licenses for each additional 16 connections.

Note

The ibaPDA-Interface-PLC-Xplorer license contains, among others, the license for the interface Sigmatek-Xplorer.

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

License information

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.001.042</td>
<td>ibaPDA Interface PLC-Xplorer</td>
<td>Extension license for an ibaPDA system adding the data interfaces:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ S7-Xplorer (interface to SIMATIC S7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ Codesys-Xplorer (interface to CODESYS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ AB-Xplorer (interface to Allen-Bradley)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ Sigmatek-Xplorer (interface to SIGMATEK)</td>
</tr>
<tr>
<td>31.000.004</td>
<td>ibaPDA-Interface-Sigmathek-Xplorer</td>
<td>Extension license for an ibaPDA system adding the data interface:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ Sigmatek-Xplorer (interface to SIGMATEK)</td>
</tr>
<tr>
<td>31.100.004</td>
<td>one-step-up-Interface-Sigmathek-Xplorer</td>
<td>Extension license for 16 further Sigmatek-Xplorer connections, a maximum of 3 permissible</td>
</tr>
</tbody>
</table>

Table 1: Available Sigmatek-Xplorer licenses, as at ibaPDA-V6.34.0
Note

The license for individual data interfaces can be enabled multiple times on one dongle, so that it is possible to use more than 16 connections per interface. To this end, you can purchase the one-step-up... extension licenses separately for each interface. Up to 16 further connections to PLCs can be established on each one-step-up-license. Up to 240 connections can be configured and used per data interface with the multiple purchase or multiple release of these licenses (up to 15 in total). Exception of SIGMATEK: here, only up to 4 licenses (64 connections) can be activated.

You have to take into consideration the limitation of the number of signals by the ibaPDA base license.
3 PLC-Xplorer data interface to SIGMATEK systems

3.1 General information

The Sigmatek-Xplorer data interface is suitable for the recording of measured data on a SIGMATEK PLC using TCP/IP over standard network cards. Access is transparent to the controller. It is not necessary to configure or program the controller especially.

Up to 16 connections can be configured with a Sigmatek-Xplorer interface on each license. A total of a maximum of 64 connections can be implemented by the additional purchase of up to three further one-step-up-Sigmatek-Xplorer licenses. One connection is required for each SIGMATEK PLC.

The signals to be measured can be conveniently selected using their symbolic names with support from the ibaPDA Symbol Browser. This allows access to all measurable symbols (servers, clients, global variables), on the basis of the server object list imported for the SIGMATEK LASAL project. LASAL SERVICE is SIGMATEK's programming software.
3.2 System topologies

The connections to the controllers can be established via the computer's standard Ethernet ports.

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 SIGMATEK

No particular configuration and programming is required on the controller side as a matter of principle. In particular, it is not necessary to call any program modules. *ibaPDA* can use the following objects for measurements:

- Servers
- Clients
- Global variables (not if they have the STRUCT data type)

The SIGMATEK Lasal software has to be used only to generate a server object list so that the measuring signals can be selected in *ibaPDA* through the signal browser. This list then contains all the objects with the "Visualized" property.

You can generate this list either manually or automatically.

Use the **Build – Write Server List** menu item to generate the list manually.

Enable **Server list – Write on save** in the project options to have the list generated automatically. A current list will then be generated automatically every time the project is saved.

The global variables will also be exported together with the server objects if the **Server list – Write global variable** option is also enabled.
The generated list is exported to a file named `MaeExp.txt` which can be found in the same folder as the project file (*.lcp).

Later, when you are configuring the system in *ibaPDA*, you can open and load this file using the `<Generate address book>` button. The symbol browser will then access it.

As the objects to be measured are always accessed using the full name of the objects in SIGMATEK controllers, the name is sent by *ibaPDA* to the PLC. The PLC then returns the address that *ibaPDA* has to read.
3.4 Configuration and engineering ibaPDA

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

If all system requirements are met (see System requirements, Page 4 section), the Sigmatek-Xplorer interface will be displayed in the signal tree.

Figure 2: Interface in the I/O Manager

3.4.1 Interface settings

The interface itself has the following functions and configuration options:

- **Set all values to zero when the connection to a PLC is lost**
  If enabled, all measured values of the PLC 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 PLC is not accessible**
  If this option is enabled, the acquisition will start even if the controller 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 controller, ibaPDA will periodically try to connect to the PLC.
- Allow inaccessible symbols.
  Enable this option if you wish to start acquisition even if symbols are not accessible. The inaccessible symbols are issued as warnings in the validation dialog box. This can only occur if the address book is not up-to-date.
  Measurement will not start when inaccessible symbols are present if you do not enable this option.

- 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.
  ➤ See the Connection table, Page 22 section in this regard.

- <Open log file>
  If connections to AB controllers have been established, all connection-specific actions are logged in a text file. Using this button, you can open and see this file. In the file system on the harddisk, you will find the log file in the program path of the ibaPDA server (...\Programs\iba\ibaPDA\Server\Log). The file name of the current log file is SigmatekLog.txt, the name of the archived log files is SigmatekLog_yyyy_mm_dd_hh_mm_ss.txt.

### 3.4.2 Adding a module

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

![Add module dialog box](image)

Figure 4: Add modules

A connection is allocated for each module.
3.4.3 General module settings

All modules have the following common settings.

![General module settings](image)

**Basic settings**
- **Locked**
  A module can be locked to prevent inadvertent or unauthorized modification 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 trees 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 name.

**Module layout**
- **Number of analog and digital signals**
  Defines the number of configurable analog and digital signals in the signal tables. The default value is 32 for each. You can change the number. The maximum value is 1000.

**PLC**
- **Update time**
  Gives the reference update time in which the data is called from the PLC. During measurement, the real current update time can be higher than the specified value if the...
PLC needs more time to transmit the data. You can check in the verification table how quickly the data is actually updated.

### 3.4.4 Connection settings

The connection of the module to the controller is configured in the *Connection* tab.

**Figure 6:** Connection settings

#### Enter connection parameters

- **IP address**
  You need only enter the IP address of the PLC here to establish a connection.

- **Port**
  The port number can remain on the default setting of 1954 usually.

- **Timeout**
  Here you can specify a value for the timeout in seconds for establishing the connection and for read accesses. Exceeding the time specified here can lead to the controller being declared not accessible or not responsive.

- **<Test> button**
  An attempt is made to establish a connection to the controller using the connection parameters specified. If successful the information relating to the PLC, such as status, name, project currently loaded and some CPU ratings are displayed.

- **<Generate address book> button**
  Click on this button to open the *MaeExp.txt* file previously generated with the SIGMATEK Lasal software and to generate the address book.

Once the address book has been generated you are able to open the symbol browser to allow you to select the measuring signals by clicking on the *Select symbols* hyperlink.
in the *General* tab of the module or in the Symbol column of the *Analog* and *Digital* tabs.

### 3.4.5 Signal configuration

The variables to be measured are configured in the *Analog* and *Digital* tabs.

The length of the signal tables, i.e. the number of signals per table, is specified in the general module settings, module layout (see *General module settings*, Page 12).

**Note**

Observe the maximum number of signals permitted by your licence.

**Note**

Take into consideration that the number of signals, which are read by a CPU, influences the minimum achievable update cycle. The more signals acquired, the longer the achievable update time.

### Selection of the signals to be measured

You have two options to select the signals to be measured:

1. Click on the *Select symbols* hyperlink in the module's *General* tab.

   ![Sigmatek-Xplorer (18)](image)

   Clicking on the link opens the Sigmatek symbol browser.

2. Clicking on a field in the Symbol column of the *Analog* or *Digital* tab.

   The 📝 icon is displayed. A click on the icon opens the Sigmatek symbol browser.

   All the available signals are listed if you open the signal browser via the hyperlink in the *General* tab. The *Analog* or *Digital* tab will be opened in the background depending on whether you select an analog or digital signal in the browser's signal tree. When you add a signal it will be inserted in the next free row of the appropriate signal table.
When you open the signal browser via a field in the Symbol column of a signal table (analog or digital), all the signals of the corresponding data type are shown in the browser signal tree. When you add a signal, it will be inserted in the row in which you have opened the symbol browser.

Figure 7: Symbol browser
You can select individual or multiple signals from the signal tree.

Click on <Add> to add them to the corresponding analog or digital signal table. When you choose a single signal, the next signal is highlighted when you click on <Add>. You can add several consecutive signals by clicking on <Add> multiple times. You can also add a signal to the signal table by double-clicking on a signal.

You can import the MaeExp.txt file again or select a different file with a click on the <Update symbols> button.
The symbol browser also supports bit fields (BSINT, BINT and BDINT). The individual bits can be used as digital signals or the integer value can be used as an analog signal.

You can look for the symbol name in the Search tab of the symbol browser. The signal tree for the search result can be used just like the complete signal tree.

**Note**

You can hide all unsupported datatypes by checking the "Hide symbols with an unsupported datatype" checkbox.
Description of the tables

The analog signals to be measured have to be entered into the signal tables with the complete name (symbol) and the data type. This is done automatically for visualized servers and global variables when the symbol browser is used. You have to enter the information manually for clients and non-visualized servers. You can assign the text names for the symbols individually.

Figure 9: Example for Analog signal table
The full symbol name, the datatype and the bit number have to be entered for each digital signal. Digital signals may occur as a variable of datatype BOOL or come from a bit field.

Figure 10: Example for Digital signal table
3.4.6 Module diagnostics

All the configured signals are listed in tabular format with their datatype and current actual value in the *Diagnostics* tab of the Sigmatek-Xplorer module.

Figure 11: Module diagnostics analog values

Figure 12: Module diagnostics digital values
4 Diagnostics

4.1 License

If the "Sigmatek-Xplorer" 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 Sigmatek-Xplorer" has been properly recognised. The number of licensed connections is indicated in brackets.

Figure 13: License displayed in the ibaPDA I/O manager, example of the Sigmatek-Xplorer license.

4.2 Log files

For many interfaces, there is an <Open log file> button in the specific interface overview in the I/O Manager.

If connections to target platforms have been established, all connection-specific actions are logged in a text file. Using this button, you can open this (current) file and, e.g., scan it for indications of possible connection problems.

In the file system on the harddisk, you will find the log files in the program path of the ibaPDA server (...\Programs\iba\ibaPDA\Server\Log\). The file names of the log files include the name or abbreviation of the interface type.

Files named interface.txt are always the current log files. Files named interface_yyyy_mm_dd_hh_mm_ss.txt are archived log files.

Examples:

- ethernetipLog.txt (EtherNet/IP connections log)
- AbEthLog.txt (log of Allen-Bradley Ethernet connections)
4.3 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.

![CMD window with ping command]

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

With an existing connection you receive several replies.

![Screen capture of successful PING results]

Figure 14: PING successful

With not existing connection you receive error messages.

![Screen capture of unsuccessful PING results]

Figure 15: PING unsuccessful.
4.4 Connection table

For every Ethernet-based interface there is a table available in the I/O manager which shows the status of each connection. Each line represents one connection.

![Connection table example](image)

Figure 16: Connection table, example for Codesys-Xplorer

The table shows the cycle times of the different connections during the data acquisition. Click the <Reset counters> button to reset the error counters and the calculation of the response times.

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 are read.</td>
</tr>
<tr>
<td>Yellow</td>
<td>The connection is OK, however the data update is slower than the configured update time.</td>
</tr>
<tr>
<td>Red</td>
<td>The connection has failed.</td>
</tr>
<tr>
<td>Grey</td>
<td>No connection configured.</td>
</tr>
</tbody>
</table>

Table 2: Meaning of background colors

4.5 Module diagnostics

You will find another diagnostic aid with a tabular display of the actual analog and digital values and the data types on the Diagnostics tab of each Xplorer module.

For further information, see Module diagnostics, Page 19
5 Support and contact

Support
Phone: +49 911 97282-14
Fax: +49 911 97282-33
Email: support@iba-ag.com

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

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Phone: +49 911 97282-0
Fax: +49 911 97282-33
Email: iba@iba-ag.com
Contact: Mr Harald Opel

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