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The current version is available for download on our web site 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-AB-Xplorer". 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 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 "ibaPDA-Interface-AB-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;, &quot;Path&quot;</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!

![Danger Symbol]

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

- Observe the specified measures.

---

Warning!

![Warning Symbol]

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

- Observe the specified measures.

---

Caution!

![Caution Symbol]

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

- Observe the specified measures

---

Note

![Note Symbol]

A note specifies special requirements or actions to be observed.

---

Tip

![Tip Symbol]

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

---

Other documentation

![Book Symbol]

Reference to additional documentation or further reading.
# System requirements AB-Xplorer

The following system requirements are necessary when using the AB-Xplorer data interface:

- **ibaPDA V6.33 or higher**
- **Base license for ibaPDA + license for ibaPDA-Interface-PLC-Xplorer or ibaPDA-Interface-AB-Xplorer**
- With more than 16 connections you need additional one-step-up-Interface-AB-Xplorer licences for each additional 16 connections.

**Note**

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

- Allen-Bradley PLC-5
- Allen-Bradley SLC 500 (5/05) or MicroLogix
- Ethernet interface, Ethernet module or 1761-NET-ENI-Gateway
  
  Please contact Rockwell Automation, where required, to get information on Ethernet modules for the different controllers.

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 <em>ibaPDA</em>-System. All additional Xplorer-data interfaces are added. (Complete specifications under <a href="http://www.iba-ag.com">www.iba-ag.com</a>)</td>
</tr>
<tr>
<td>31.000.003</td>
<td>ibaPDA-Interface-AB-Xplorer</td>
<td>Extension license for an ibaPDA system adding the data interface: + AB-Xplorer (interface to Allen-Bradley)</td>
</tr>
<tr>
<td>31.100.003</td>
<td>one-step-up-Interface-AB-Xplorer</td>
<td>Extension license for 16 additional AB-Xplorer-connections (a maximum of 14 permissible)</td>
</tr>
</tbody>
</table>

Table 1: Available AB-Xplorer-licenses, as at ibaPDA-V6.39.0
**Note**

If you intend to use more than 16 data links per interface, 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 interface to Allen-Bradley systems

3.1 General information

The AB-Xplorer interface is suitable for the acquisition of measured data with *ibaPDA* from an Allen-Bradley controller via an Ethernet connection.

Allen-Bradley controllers have two ways to communicate via Ethernet:

- CIP (EtherNet/IP)
- CSP (also known as AB/Enet)

Other documentation

More information on the Ethernet/IP protocol can be obtained from the *ibaPDA-Interface-EtherNetIP* manual.

The AB-Xplorer interface uses CSP.

CSP (Client Server Protocol) is used to connect an *ibaPDA* system with an AB controller via an AB-Ethernet module. CSP or AB/Enet is a legacy TCP protocol for the PLC5E series which uses the port 2222 and is closely connected with DH+ (Data Highway Plus Industrial LAN) and DF1 (serial protocol for device communication). Basically, CSP contains the PCCC protocol embedded in the Ethernet header.

*ibaPDA* works as client and sends request telegrams to the controller. The controller of the Allen-Bradley PLC works as server and waits for request telegrams from the *ibaPDA* driver.

In the Allen-Bradley controller, no programming or configuration is required to establish a connection between *ibaPDA* and a controller with defined IP address and to send the corresponding signals. Also, no further Rockwell Automation software is required to transfer measurement data.

Useable, analog and digital signals are all measurable, global operands (O, I, S, B3, T4, C5, R6, N7, F8, ...) of the Allen-Bradley controller.

In *ibaPDA*, all standard features are available to the user.

The communication via the AB-Xplorer interface with the PLC-5 system has been successfully tested with a shortest sampling time of 20 ms.
3.2 System topologies

Physically, the connection is established between the ibaPDA computer and the PLC-5 or SLC 500 controller via the standard network interface of the computer or an additional network interface card.

**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 Allen-Bradley PLC

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.

**Note**

If you are using a 1761-NET ENI gateway with a PLC-5 controller, ensure the channel 0 of the PLC-5 is set to RS232 and CRC is selected as the error detection.
3.4 Configuration and engineering ibaPDA

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

If the system requirements are met, the “AB-Xplorer” interface is displayed in the signal tree.

![IBAPDA-Interface-AB-Xplorer PLC-Xplorer interface to Allen-Bradley systems](image)

**Fig. 2: AB-Xplorer interface in I/O Manager**

3.4.1 Interface settings

An overview of diagnostics information on the configured connections between *ibaPDA* and the controllers is displayed if the AB-Xplorer interface in the tree is selected. The interface has the following features and configuration options:

![IBAPDA-Interface-AB-Xplorer PLC-Xplorer interface to Allen-Bradley systems](image)

**Fig. 3: Overview AB-Xplorer interface**

**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 value 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 Allen-Bradley 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 Allen-Bradley controller, *ibaPDA* will periodically try to connect to the PLC.

**Connection table**
The table shows the cycle times and error counters of the individual connections during data measurement. To reset the calculated times and error counters to zero, simply click on the <Reset counters> button.

See also ![Connection table, page 20](image).
<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 hard disc, 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 AbEthLog.txt, the name of the archived log files is AbEthLog_yyy_mm_dd_hh_mm_ss.txt.

Note
For TCP/IP connections, the RSLinx software does not have to be installed on the ibaPDA computer.

3.4.2 Adding a module
Add a module by clicking below the interface.

Select the desired module type according to the PLC type to be connected and click <OK>.
3.4.3 **General module settings**

The explanations referring to the PLC-5 example also apply analogously to SLC-500/MicroLogix. All modules have the following common setting options.

![Module settings screenshot](image)

**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*.

**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.
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.

Connection

Mode
Please make sure that a connection to the controller is established either via 1761-NET-ENI-gateway or directly.

If you use a 1761-NET-ENI-gateway please pay attention to the note under Configuration and engineering Allen-Bradley PLC, page 10

IP address
Enter the IP address or the computer name of the PLC-5 controller here.

Maximum request size
The setting determines how many words can be requested with one telegram to the PLC.
0 (Default) = unlimited
Depending on the processor type and its firmware version, there might be limitations regarding the number of words that can be requested by one message.

3.4.4 Signal configuration

The principle behind the signal configuration is the same for all modules.

The selection of the signals to be measured is carried out in the I/O Manager by means of the absolute operand address supported by the operand address constructor.

The configuration of the signals to be measured is made in the signal tables in the Analog bzw. Digital tab.

The length of the signal tables or the number of signals per table is defined for each table in the General Module Settings, module structure.(see General module settings, page 13).

Note
Observe the maximum number of signals permitted by your license.

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

The following operand types are supported:

- all measurable global operands of the PLC
  (O, I, S, B3, T4, C5, R6, N7, F8, ...)


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

1. In the General tab of the module, click the Select PLC-5 addresses hyperlink or Select SLC-500 addresses.

By clicking on the link, the PLC-5 or SLC-500 address constructor opens - depending on the module type.

2. In the Analog or Digital tab by clicking on a field in the "Address" column

The icon becomes visible. A click on the icon opens the PLC-5 or SLC-500 address constructor, depending on the module type.
The file types can be selected in a default table or a custom file name can be entered. After selecting a file, the corresponding bit numbers or members of the element are available for selection, too.

If the address constructor has been opened via the hyperlink in the General tab, the address will be entered into the corresponding table (analog/digital) by clicking <OK> and the address constructor remains open.

If the address constructor was opened in a field of a signal table, “Address” column, the selected address is entered into the selected row by clicking <OK> and the address constructor will be closed.
3.4.5 Module diagnostics

During measurement, the actual values of the analog and digital signals can be seen in the Diagnostics tab of the relevant module.

<table>
<thead>
<tr>
<th>Address</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0:0</td>
<td>-24576</td>
</tr>
<tr>
<td>N0:1</td>
<td>-24576</td>
</tr>
<tr>
<td>N0:2</td>
<td>300</td>
</tr>
<tr>
<td>N0:3</td>
<td>3</td>
</tr>
<tr>
<td>N0:4</td>
<td>1031</td>
</tr>
<tr>
<td>N0:5</td>
<td>24</td>
</tr>
<tr>
<td>N0:6</td>
<td>12304</td>
</tr>
<tr>
<td>N0:7</td>
<td>1792</td>
</tr>
<tr>
<td>N0:8</td>
<td>6194</td>
</tr>
<tr>
<td>N0:9</td>
<td>1023</td>
</tr>
</tbody>
</table>

Fig. 8: Module diagnostics analog values
4 Diagnostics

4.1 License

If the "AB-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 has been properly recognized. The number of licensed connections is indicated in brackets.

![Image of License Displayed in ibaPDA I/O Manager]

Fig. 9: License displayed in the ibaPDA I/O manager, example of the AB-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 hard drive, 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  (log of EtherNet/IP connections)
- 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.

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. 10: PING successful](image)

With no existing connection you receive error messages.

![Fig. 11: PING unsuccessful](image)
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. The following figure shows, as an example, the connection table of the Codesys-Xplorer interface:

![Connection table, example Codesys-Xplorer](image)

The connected target systems (controllers) are identified by their name or IP address in the first (left) column.

Depending on the interface type the table shows error counters, read counters and/or data sizes, as well as the cycle times, refresh times and/or update 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>Gray</td>
<td>No connection configured.</td>
</tr>
</tbody>
</table>

Table 2: Meaning of background colors

4.5 Diagnostics on module level

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, please see ⬇️ Module diagnostics, page 17
5 Support and contact

Support

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Note

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

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