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1 About this Manual

This document describes the function and application of the software interface 
ibaPDA-Interface-OPC-UA Client

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 to as professional if he/she is capable of assessing safety and recognizing possible con-
sequences and risks on the basis of his/her specialist training, knowledge and experience and 
knowledge of the standard regulations.

This documentation in particular addresses people, who are concerned with the configuration, 
test, commissioning or maintenance of control systems using OPC UA communication. For the 
handling of ibaPDA-Interface-OPC-UA Client the following basic knowledge is required and/or 
useful:

■ Windows operating system
■ Basic knowledge of ibaPDA
■ Knowledge needed for configuring an OPC UA server

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!**

⚠️ 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**

ℹ️ 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 OPC UA Client data interface:

- ibaPDA V6.37.0 or more recent
- License for ibaPDA-Interface-OPC-UA Client
- Network connection to one or more OPC UA servers

**Note**

It is recommended carrying out the OPC UA communication for data acquisition on a separate network segment to exclude an influence of the OPC UA messages by the Ethernet data traffic between ibaPDA and other nodes in the network (file servers, data file requirements etc.).

For further requirements for the computer hardware used 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>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.001.111</td>
<td>ibaPDA-Interface-OPC-UA Client</td>
<td>Extension license for an ibaPDA system adding the data interface: + OPC UA client</td>
</tr>
<tr>
<td>31.101.111</td>
<td>one-step-up-Interface-OPC-UA Client</td>
<td>Extension license for further 16 OPC UA connections; max.15</td>
</tr>
</tbody>
</table>

Table 1: Available OPC UA Client licenses, version ibaPDA-V6.37.0
3 OPC UA interface

3.1 General information

The OPC UA Client data interface is suitable for the recording of measured data from several OPC UA servers over standard network boards of the PC.

ibaPDA is not cyclically polling for new measurement data. Instead, ibaPDA will be notified whenever one of the values to be measured has changed.

ibaPDA can only read and not write the variables provided by the OPC UA server.

Up to 16 connections can be configured with an OPC UA Client interface on each license. A total of a maximum of 256 connections can be implemented by the additional purchase of up to 15 further one-step-up OPC UA Client licenses.

You can import or generate the certificates required for the communication between OPC UA Client (ibaPDA) and an OPC UA server in ibaPDA.

The signals to be measured can be conveniently selected using their symbolic names with support from the OPC UA Symbol Browser. This allows access to all measurable symbols, which are defined in the OPC UA server.

Only the acquisition of current values is supported.

3.2 System topologies

The following drawing gives an overview of a possible configuration.

![Fig. 1: Possible OPC UA network topology](image-url)
3.3 Configuration and engineering ibaPDA

Open the I/O manager, e.g. from the tool bar.

If all system requirements are met (see System requirements, page System requirements, page 6), the OPC UA Client interface will be displayed in the signal tree.

![Fig. 2: OPC UA Client interface in the I/O manager](image)

3.3.1 Interface - Connections

The interface itself has the following functions and configuration options:

![Fig. 3: Activating and creating interface connections](image)

Set all values to zero when the connection to an OPC UA server is lost:

If enabled, all measured values of the respective OPC UA server 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 an OPC UA server is not accessible

If this option is enabled, the acquisition will start even if the OPC UA server 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 a configured OPC UA server, ibaPDA will periodically try to connect to that server. The measurement values remain at zero, as long as the OPC UA server is not connected.

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, in case the symbol whose address is requested by ibaPDA from the OPC UA server is no longer available on the server. Then, the OPC UA server will prompt an error.
If you enable this option, *ibaPDA* will ignore this error message and starts the acquisition nonetheless.

Measurement will not start when inaccessible symbols are present if you do not enable this option.

**Connection table**
The table shows the response time values (actual, average, minimum and maximum) 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.

Please see also chapter **Connection table**, page 26

The data size column shows how much data is read per read.

**<Open log file>**
If connections to OPC UA servers have been established, all connection-specific actions are logged in a text file. Using this button, you can open and check this file. In the file system on the hard disk, you will find the log files in the program path of the *ibaPDA* server (...\Programs\iba\ibaPDA\Server\Log\). The file name of the current log file is *OpcUAClientLog.txt*, the name of the archived log files is *OpcUAClientLog_yyyy_mm_dd_hh_mm_ss.txt*.

### 3.3.2 Interface - Certificates

For a safe way of communication, OPC UA uses the so-called certificates. First of all, you have to configure an application certificate. Only then, *ibaPDA* can connect to an OPC UA server. Certificates can be provided by the server as well as by the client. An OPC UA communication can only take place in case each communication partner trusts the certificate.

Certificates can be exchanged spontaneously when a connection is being established. You can also register the certificates as trusted certificates in advance. If a previously unknown certificate comes up when the connection is established, the user must interactively accept or decline this certificate. Accepted certificates are automatically registered in the “Certificates” table of the register and are marked as trustworthy. In case a certificate is rejected, no communication will be established.

You can also register certificates and mark them as “not trusted”. The communication with a partner having a certificate like that will be rejected as a matter of principle.

Once, certificates have been registered, i.e. have been entered in the table, the user will not be notified or asked at the establishment of a connection; no matter, if the certificates are marked as “trusted” or “not trusted”.
3.3.2.1 List of certificates

The Certificates tab displays a list of available certificates. Here, you can manage the certificates.

You find several buttons in the tool bar of the tab. These buttons have the following functions:

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Image" alt="plus" /></td>
<td>With this button, you open a dialog, which allows you to load an existing certificate file.</td>
</tr>
<tr>
<td><img src="Image" alt="file" /></td>
<td>With this button, you open a dialog, which allows you to generate a new certificate.</td>
</tr>
<tr>
<td><img src="Image" alt="file" /></td>
<td>With this button, you can export a certificate to a file. You can then register this file e.g. on an OPC UA server.</td>
</tr>
<tr>
<td><img src="Image" alt="delete" /></td>
<td>With this button, you delete the marked certificate from the table.</td>
</tr>
<tr>
<td><img src="Image" alt="check" /></td>
<td>With this button, you mark the selected certificate as “trusted”.</td>
</tr>
<tr>
<td><img src="Image" alt="check" /></td>
<td>With this button, you mark the selected certificate as “not trusted”. However, the certificate remains in the table.</td>
</tr>
<tr>
<td><img src="Image" alt="check" /></td>
<td>Mit diesem Button können Sie ein Zertifikat als OPC UA Client-Zertifikat kennzeichnen. Das heißt, dass ibaPDA als OPC UA-Client dieses Zertifikat verwendet. For a certificate to become an OPC UA Client certificate, the private key must be available. If this is the case, a key symbol will be displayed in the table.</td>
</tr>
</tbody>
</table>

The commands always refer to that certificate in the table that is marked at the left beginning of a row with an arrow.

The symbols in the Properties column have the following meaning.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Image" alt="check" /></td>
<td>The certificate is classified as “trusted”.</td>
</tr>
<tr>
<td><img src="Image" alt="check" /></td>
<td>The certificate is not trustworthy.</td>
</tr>
<tr>
<td><img src="Image" alt="key" /></td>
<td>For this certificate, a private key is available.</td>
</tr>
<tr>
<td><img src="Image" alt="package" /></td>
<td>This certificate is used as OPC UA Client certificate and hence represents ibaPDA as OPC UA client.</td>
</tr>
</tbody>
</table>

Example

In the above figure, the “ibaPDA” certificate (marked in blue) is the OPC UA Client certificate. There are another two OPC UA server certificates. One of them is displayed as trusted, the other one as not trusted.
3.3.2.2 Generate a new certificate

1. Click on the button and the following dialog will be prompted

2. Enter a name of your choice for the certificate.

3. When required, enter an Application URI.
   The URI (Uniform Resource Identifier) is a global unique identification of the application, as *ibaPDA* in our case. If you do not fill in this field, a standard URI will be generated, provided that the OPC UA server checks an Application URI. This standard URI consists of machine name and name of the application:
   \[\text{urn: machinename: applicationName} \].

4. Please, define the desired period for the validity (lifetime) of the certificate.

5. Select the desired Hash algorithm for the encryption.
   It depends on the OPC UA server, which algorithms are suitable. SHA-1 is an old Hash algorithm, meanwhile classified as unsafe. We do not recommend using this algorithm. Some old or simple OPC UA servers merely support this algorithm. Increasingly, the algorithms of the SHA-2 family are used, e.g. the SHA-256. These algorithms offer a higher depth of encryption and hence a higher degree of security. If your OPC UA server supports this algorithm, you should choose it.

6. Close the dialog with <OK>.

Now, you will be asked, if you want to use the certificate you have just generated as OPC UA Client certificate for *ibaPDA*. In case you answer <Yes>, the entry in the list looks as follows:
3.3.3 Add module

Add a module by clicking below the interface or by clicking on the desired connection.

Available modules:

- OPC UA Client

3.3.4 General module settings

![General module settings table]

**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.

**Module layout**

**Number of analog and digital signals**
Here, you can increase or decrease the number of signals in the module. By default, 32 signals are preset. You may enter any value between 0 and 1000. The signal tables will be adjusted accordingly.

**OPC UA Server**

**Publishing interval**
Minimum period of time the OPC UA server will wait before notifying *ibaPDA* about a change in values for one of the requested variables.

Default setting: 10 ms

**Sampling interval**
Time base for sampling the underlying data source in the OPC UA server. Basically, the sampling interval can equal the publishing interval.

However, we recommend setting the sampling interval no more than half the size of the publishing interval. This way, small delays within the OPC UA server can be compensated.

Default setting: 5 ms

**Link "Select symbols"**
With this link, you open the Symbol Browser for selecting the variables to be measured. First, you have to establish the connection to the OPC UA server. Only then, the signals can be configured.
3.3.5 Module - Connections

On the Connection tab of the module, you configure the connection to the OPC UA server. The communication connection between OPC UA Client and server is always being established to a so-called Endpoint on the OPC UA server side. Several endpoints can be defined within one OPC UA server.

An endpoint is defined by the following parameters:

- URI of the endpoint
- Message Security
- Security Protocol
- User authentication

ibaPDA offers a convenient search function for available endpoints.

1. Click on the button to open the dialog for the endpoint search.

2. Enter in the “Discovery URI” field the so-called “Discovery” address of the OPC UA server and click on <Search>.

   Now, a list of the endpoints available on the OPC UA server will be displayed in the dialog.

3. Select the desired endpoint and close the dialog with <OK> or double-click on the endpoint.

   Now, the complete endpoint URI will be copied to the “Endpoint” field on the Connection tab.
4. When selecting the endpoint, also the message security and security protocol are adopted. Please also synchronize the authentication with the configuration of the OPC UA server. *ibaPDA* supports the authentications “Anonymous” and “User/Password”.

5. Test the connection with a click on <Test connection>. When *ibaPDA* connects to the OPC UA server for the first time, the certificate is not “known” in the *ibaPDA* list of certificates. This is why you are asked, if you want to trust the certificate or not. Click on <Yes> or <No>.

![Certificate Trust](image)

In case you reject the certificate, no connection can be established. If you trust the certificate, the device will try to establish a connection. When establishing a connection, the OPC UA server also checks the *ibaPDA* OPC UA Client certificate.

The error message shown in the next figure will be displayed, unless the *ibaPDA* OPC UA Client certificate is identified yet by the OPC UA server as trusted. Otherwise no security guidelines will be applied.
Occasionally, the *ibaPDA* OPC UA Client certificate is categorized automatically by the OPC UA server in the list of the rejected certificates. In that case, you have to mark the OPC UA Client certificate on the OPC UA server as trustworthy.

Then, there should not occur any problems, when establishing a connection.

If *ibaPDA* can establish a valid connection to the OPC UA server, you can see some characteristic values in the display area of the dialog.

Click on `<Create address book>` in order to read the symbols from the OPC UA server and save them locally. Then, the symbols are also offline available via the Symbol Browser, i.e. without a connection to the OPC UA server. Thus, you can configure the signals for the measurement process.
3.3.6 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 license.

---

Selecting the signals to be measured by means of the Symbol Browser

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

1. Clicking on the Select symbols hyperlink in the module’s General tab.

   ![Select symbols](image.png)

   Fig. 8: Opening the Symbol Browser

   A click on the link opens the OPC UA Symbol Browser.

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

   The icon is shown. A click on the icon opens the OPC UA Symbol Browser.
The Symbol Browser shows all the symbols that were loaded from the OPC UA server. You can select single or multiple symbols in the tree.

Click the <Add> button to add them to the corresponding analog or digital signal table. If you selected a single symbol then the next symbol will be selected after you clicked the <Add> button. This allows you to click <Add> multiple times in order to add consecutive symbols. You can also double click a symbol to add it to the signal table. Use the <Update symbols> button to read the symbols again from the OPC UA server.

On the Search tab, you can search symbols by name. The search result tree works in the same way as the complete symbol tree.

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

The data type and comment of the selected symbol are also shown in the browser.
Signal Table

Name
In the Name column, enter a clear text name for each signal.
When selecting the signals in the Symbol Browser, the symbol names are applied automatically, provided that there is no entry in the Name column.
Up to two lines of comment may be entered for each signal in the column Name.
You can access the comments by clicking on the small button in the Name field of the corresponding signal.

Tip
A useful feature when completing the name fields is the automatic fill function. If you enter a signal name and double-click on the column header as long as the cursor is still in the name field then all empty fields below will be filled automatically with that name. If the name is ending with a number you will get names with an incrementing number per line. You may use this function in any row of the table. Fields which already contain names will not be overwritten.

Unit
Assignment of an engineering unit (such as °C, Ampere, Volt, N etc.) for the signal.

Gain and Offset
The values for gain and offset describe the inclination and position of a linear characteristic curve for scaling.
Gain and offset can be entered directly in the corresponding fields or by means of the two-point-scaling dialog with two pairs of applicable values.
You can open the two-point-scaling dialog with a click in the fields gain or offset and then on the little button.

Symbol
Here, you can enter the symbol name or open the Symbol Browser.

Activating the channels
You can enable and disable every channel for acquisition just with a mouse-click.

3.3.7 Module diagnostics
After you have applied the configuration, all the configured signals are listed in tabular format with their datatype and current actual value in the Diagnostics tab of the OPC UA client module. Gray rows in table indicate inactive signals.
3.3.8 Output modules

The interface OPC UA Client provides the capability to send data from the *ibaPDA* system to a PLC or OPC UA Server respectively. Therefore, the following output modules are available:

- **OPC UA Client**
  This is not a discrete module but rather the output extension of an OPC UA Client module

- **OPC UA text output module**
  This is a discrete module, which can be added independently from any OPC UA Client module

3.3.8.1 OPC UA Client module

Modules, which have been added on the input side are available in the output interface tree too and can be used for output signals.

If you want to use output signals, make sure that appropriate tags have been configured on the corresponding OPC UA server.

As for all output modules, the time base of the output cycle is at least 50 ms.

**General module settings**

The general module settings are partly the same as on the input side.

![OPC UA Client outputs, gen. module settings](image)

Fig. 10: OPC UA Client outputs, gen. module settings

On the output module, no separate settings can be made for the OPC UA server.
Calculation timebase
The calculation timebase determines the refresh interval of the values and corresponds to the timebase of the module. The transmission of values to the server occurs in “minimum output time” (see I/O-Manager - node General - tab Timing).

The number of analog and digital output signals is set to 32 by default. You can change the number if needed (max. 1000).

With a click on the blue hyperlink, you can open the OPC UA symbol browser. Provided, you have created the address book of the connected OPC UA server before you can now see all available tags. Double-click on a tag or select a tag and click on <Add> in order to add the tag in the next free row of the appropriate signal table (Analog or Digital). The tag will be entered in the Node ID column.

Connection
The connection settings are the same as on the input side (OPC UA Client module, I/O-Manager, section Hardware).

Analog and digital signals
On the tabs Analog and Digital, in the column Value you can either select signals from the signal tree and publish them as OPC UA output signals or create your own (virtual) signals by means of the expression builder.

The assignment of the signals and the OPC UA tags of the OPC UA server can be done in the column Node ID. With a click on the button <...> in a table cell, you can open the OPC UA symbol browser and select the desired tag.
If you open the symbol browser out of the signal tables instead of clicking on the hyperlink on the General tab, then the tags with matching data types are presented.

### 3.3.8.2 OPC UA text output module

This type of module is only available in the Outputs area and can only be added to the I/O-configuration there. It can be used to transmit strings to an OPC UA server. One output signal corresponds to one Technostring section or text channel in ibaPDA.

**General module settings**

The general settings are the same as for all other modules.

The number of output signals is set to 32 by default. You can change the number if needed (max. 10,000).

**Connection**

Use this tab to configure the connection to the OPC UA server and generate the address book.

**Analog**

Only the tab Analog is available.

In the signal table you determine which text shall be mapped to which OPC UA tag.
Click on a cell in the column **Value**. A signal tree showing the configured Technostrings or text channels in ibaPDA will open. Select the desired text.

Then click on a cell in the column **Node ID** and open the OPC UA symbol browser by clicking on the button <...>. The symbol browser will show the configured tags of the OPC UA server the text can be written to.

Select the desired tag and click on <OK>.

Fig. 12: Example, OPC UA symbol browser with selection of tags for text outputs
4  Diagnostics

4.1  License

If the "OPC UA Client" 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 OPC UA Client" has been properly recognized.

![License displayed in the ibaPDA I/O Manager](image)

4.2  Log files

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

The log file can be opened via the button <Open log file>. The button is available in the I/O Manager:

- for many interfaces in the respective interface overview
- for integrated servers (e.g. OPC UA server) in the Diagnostics tab.

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)
- **OpcUAServerLog.txt** (log of OPC UA server 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. 14: PING successful

With no existing connection you receive error messages.

Fig. 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. The following figure shows, as an example, the connection table of the Codesys-Xplorer interface:

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 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 OPC UA Client module.

For further information see chapter ➔ Module diagnostics, page 19
4.6 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.

![Add module dialog with Diagnostic module selected](image)

Fig. 17: Add diagnostic module, example Generic TCP
Module settings diagnostic module

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

![Module settings diagnostic module, example TCP Generic](image)

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.

![Example: Analog values of a diagnostic module for a TCP Generic module](image)

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Active</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Active connection mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Invalid packet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Connecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Connected</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 or the license number.

Contact

Headquarters

iba AG
Koenigswarterstrasse 44
90762 Fuerth
Germany

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

Mailing address

iba AG
Postbox 1828
D-90708 Fuerth, Germany

Delivery address

iba AG
Gebhardtstrasse 10
90762 Fuerth, Germany

Regional and Worldwide

For contact data of your regional iba office or representative please refer to our web site