**Manufacturer**

iba AG  
Koenigswarterstr. 44  
90762 Fuerth  
Germany

**Contacts**

<table>
<thead>
<tr>
<th>Category</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main office</td>
<td>+49 911 97282-0</td>
</tr>
<tr>
<td>Fax</td>
<td>+49 911 97282-33</td>
</tr>
<tr>
<td>Support</td>
<td>+49 911 97282-14</td>
</tr>
<tr>
<td>Engineering</td>
<td>+49 911 97282-13</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:iba@iba-ag.com">iba@iba-ag.com</a></td>
</tr>
<tr>
<td>Web</td>
<td><a href="http://www.iba-ag.com">www.iba-ag.com</a></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Revision - Chapter / Page</th>
<th>Author</th>
<th>Version SW</th>
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<tr>
<td>1.2</td>
<td>10-2020</td>
<td>Module settings</td>
<td>st</td>
<td>7.0.0</td>
</tr>
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</table>

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Content

1 About this Manual .............................................................................................................4
  1.1 Target group and previous knowledge ......................................................................4
  1.2 Notations .................................................................................................................4
  1.3 Used symbols .........................................................................................................5

2 System requirements .......................................................................................................6

3 TC-net interface ...............................................................................................................7
  3.1 General information ...............................................................................................7
  3.2 System topologies ...................................................................................................8
  3.3 Configuration and engineering ibaPDA ....................................................................9
    3.3.1 Interface configuration ....................................................................................9
    3.3.2 Station list tab ...............................................................................................11
    3.3.3 Scan block list tab .........................................................................................11
    3.3.4 Diagnostics tab ...............................................................................................12
    3.3.5 TC-net symbol browser ..................................................................................13
    3.3.6 Add module .....................................................................................................16
    3.3.7 Raw scan block module type ..........................................................................18
      3.3.7.1 Module settings .......................................................................................18
      3.3.7.2 Signal configuration .................................................................................20
    3.3.8 Symbolic scan block module type ....................................................................23
      3.3.8.1 Module settings .......................................................................................23
      3.3.8.2 Signal configuration .................................................................................24

4 Diagnostics .....................................................................................................................25
  4.1 License ....................................................................................................................25
  4.2 Interface diagnostics tab .........................................................................................25

5 Support and contact ......................................................................................................26
1 About this Manual

This document describes the function and application of the software interface
ibaPDA-Interface-TC-net

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 prod-
ucts. For the handling ibaPDA-Interface-TC-net 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!**

⚠️ 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 TC-net data interface:

- **ibaPDA V6.37.0 or more recent**
- **License for ibaPDA-Interface-TC-net**
- **At least one of the following Toshiba TC-net 100 PCI-/PCIe or TC-net 1G PCIe transmission cards:**

<table>
<thead>
<tr>
<th>Card type</th>
<th>Slot</th>
<th>Network type</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>JTNI11/JTNI12</td>
<td>PCI</td>
<td>TC-net 100</td>
<td>Single/double electrical link</td>
</tr>
<tr>
<td>JTNI21/JTNI22</td>
<td>PCI</td>
<td>TC-net 100</td>
<td>Single/double optical link</td>
</tr>
<tr>
<td>JTNI31/JTNI32</td>
<td>PCI</td>
<td>TC-net 100</td>
<td></td>
</tr>
<tr>
<td>JTNI41/JTNI42</td>
<td>PCI</td>
<td>TC-net 100</td>
<td></td>
</tr>
<tr>
<td>JTNI61/JNTI62</td>
<td>PCIe</td>
<td>TC-net 100</td>
<td></td>
</tr>
<tr>
<td>JTGI23</td>
<td>PCIe</td>
<td>TC-net 1G</td>
<td>Giganet</td>
</tr>
</tbody>
</table>

Table 1: Supported TC-net boards

For more prerequisites concerning the used PC hardware and the supported operating systems, please see the **ibaPDA** documentation.

**License information**

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.001047</td>
<td>ibaPDA-Interface-TC-net</td>
<td>Extension license for an ibaPDA system for the connection to a Toshiba TC-net network via TC-net 100 or TC-net 1G board. The acquisition of data from max. 64 Scan Blocks (64 words each, max. 4096 bytes in total) is possible.</td>
</tr>
<tr>
<td>31.101047</td>
<td>one-step-up-Interface-TC-net</td>
<td>Extension license to increase the number of scan blocks. Scan Blocks per extension: 64 (64 words each, max. 4096 bytes in total) Max. total number of Scan Blocks per interface: 64+ (127 * 64)= 8192</td>
</tr>
</tbody>
</table>

For more information on the use of licenses by the **ibaPDA** modules, see 🔄 Add module, page 16
3 TC-net interface

3.1 General information

TC-net realizes high-speed and real-time transmission between supervisory units, computers and controllers via the Information and control LANs.

It is an information and control network based on the Ethernet, a de-facto standard network, and is available for the message transmission with the use of the TCP/IP and the UDP/IP. However, specialized transmission modules or transmission boards for PC are required.

The TC-net hardware interface allows the acquisition of values from a TC-net via Toshiba TC-net 100 or TC-net 1G boards.

Faster transfer rates through DMA are only possible with PCI express boards. *ibaPDA* makes use of the official Toshiba API which supports DMA transfers. For the API to function properly, the official Toshiba device driver supplied with the hardware needs to be installed. *ibaPDA* does not install a device driver for TC-net boards.

*ibaPDA* supports the Toshiba APIs for all board types, mentioned in Table 1. Due to limitations in the APIs, only up to 2 boards per type can be used in one computer. This implies that the maximum amount of TC-net boards in the *ibaPDA* server computer is 6:

- 2 TC-net 100 PCI boards +
- 2 TC-net 100 PCI express boards +
- 2 TC-net 1G PCI express boards

**Note**

In the BIOS of the used computer deactivate the ASPM function (Active State Power Management) for the PCIe slots used with TC-net boards. Otherwise system instabilities may occur.

This manual will only focus on setting up the TC-net board in *ibaPDA*. For further information on how to install the device driver for the TC-net board or how to setup a TC-net, please refer to the documentation provided by Toshiba.
3.2 System topologies

The following drawing in figure 1 gives a principle overview of a possible configuration where e. g. 2 TMACS controllers and one ibaPDA server are connected to the TC-net network.

Fig. 1: Possible TC-net network topology
3.3 Configuration and engineering ibaPDA

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

In case all requirements are met (see System requirements, page 6), the Toshiba TC-net interface card(s) will be displayed in the signal tree. The board types (100 PCI, 100 PCIe, 1G) are automatically recognized.

![TC-net 100 PCIe interface card in the I/O manager](image)

Fig. 2: TC-net 100 PCIe interface card in the I/O manager

3.3.1 Interface configuration

![Settings of the interface](image)

Fig. 3: Settings of the interface

When selecting the interface node of a TC-net 100 board, the settings shown in Figure 3 will appear.
**Hardware settings**
This group contains diagnostic information on the TC-net board.

**Card type**
Toshiba-specific card type

**Logical ID**
Used internally, to distinguish between multiple TC-net boards from the same API type (TC-net 100, TC-net 100 PCI express or TC-net 1G). The ID is either 0 or 1.

**Rotary switch**
Value of the two hex switches on the PCI board to identify the board in the TC-net.

**DIP switch**
Setting of the DIP switch on the TC-net board (only available for PCI express boards)

**Driver version**
Version of the Toshiba device driver

**API version**
Version of the Toshiba API that interfaces between the Toshiba driver and *ibaPDA*.

**Board version**
Version of the hardware

**FPGA version**
Version of the FPGA firmware on the TC-net board (only available for PCI express boards)

**Network settings**
This group contains parameters that need to be set correspondingly to the rest of the network in order to enter the TC-net. More information on these settings can be found in the related Toshiba documentation (see General information, page 7).

**Symbols**

**Symbol file path**
The full path to a symbol file. The addressbook is generated by *ibaPDA*, based on the symbol file. For more information on how the symbol file is created, refer to the corresponding Toshiba documentation.

**Structure definitions folder**
For structure definitions (*.typ) a separate path to the folder containing these definitions can be specified here. If this field remains empty *ibaPDA* automatically searches for structure definitions in the "Symbol file path" directory.

**User name**
User name for accessing the address book file via a network.

**Password**
Password for accessing the address book file via a network.

The interface node for a TC-net 1G board looks very similar to the node of a TC-net 100 board except for the **Network settings**.
Button <View symbols>
Clicking this button the TC-net symbol browser will be opened. To show symbols, it is required that an address book file path is available under "Symbol file path".
For further information, see TC-net symbol browser, page 13

Automatically update signal comments
If you enable this option, the signal comments from the address book are automatically transferred as signal comments to the signal lists or updated there.

3.3.2 Station list tab
The Station list tab shows an array of 256 boxes. Each box represents a station on the TC-net network and shows the status:

- Gray: Station is not connected or inactive.
- Green: Station is connected and active.
- Green + bold border: This is the ibaPDA node (no. 1 in the Fig. below)

![Station list](image)

Fig. 4: Station list indicates: station node #1 (ibaPDA) and node #22 are active

3.3.3 Scan block list tab
The Scan block list tab shows all the scan blocks in the TC-net. There are 2048 blocks for TC-net 100 boards and 4096 blocks for TC-net 1G boards. Each box corresponds to a scan block and shows its status.

- Gray: Scan block is not OK
- Red + bold border: Scan block is not OK while ibaPDA is measuring from that block
- Green: Scan block is OK
- Green + bold border: Scan block is OK while ibaPDA is measuring from that block (like nos. 9 and 10 in the fig. below)
TC-net interface ibaPDA-Interface-TC-net

Fig. 5: Active scan blocks #0, 1, 2, 3, 4, 5, 9, 10 and 11, nos. 9 and 10 are configured in ibaPDA

### 3.3.4 Diagnostics tab

The Diagnostics tab shows some basic information about how fast data is retrieved from the TC-net board.

For each different update time value, an entry is shown with the following columns:

**Update time**
The time interval between two read operations from the TC-net board

**Actual**
The time it took to transfer all data for this update time from the TC-net board to ibaPDA memory

**Maximum**
The maximum amount of time it took to transfer all data for this update time from the TC-net board to ibaPDA memory. This value can be reset by clicking the <Reset> button.

**Minimum**
The minimum amount of time it took to transfer all data for this update time from the TC-net board to ibaPDA memory. This value can be reset to zero by clicking the <Reset> button.

![Diagnostics Tab](image)

![Update and data transfer time table](image)

**Fig. 6: Update and data transfer time between TC-net board and ibaPDA for 2 scan blocks**
Total size
The total amount of bytes that need to be transferred for every update time

Scan blocks
Scan block IDs linked to TC-net modules with this update time

Button <Reset>
Clicking this button will reset the Maximum and Minimum values.

3.3.5 TC-net symbol browser

When clicking <View symbols> in the Configuration tab, the TC-net symbol browser will appear. To show symbols it is required that an address book file path is available under "Symbol file path" in the Configuration tab.

The symbol browser will also appear when clicking <Select symbols> in the General tab of the module or when trying to edit a symbol in the Analog or Digital tab.

Fig. 7: The TC-net symbol browser in ibaPDA I/O manager

When opening the TC-net symbol browser from the interface node, it is possible to automatically generate ibaPDA modules.

In the Symbols tab, a tree structure will appear containing all symbols parsed from the TC-net address book file. The top-level node is the TC-net, which contains a number of station nodes which each in turn contain a number of scan blocks. These scan blocks finally contain the actual variables to be measured.
When selecting a variable, the data type, the address and a comment as supplied by the address book file will be displayed.

The address indicates at which offset (in number of WORDs) the variable is located in the scan block. For digital signals, the position of the bit inside the WORD is added. The statement 4.10, e. g., refers to the 10th bit in the 4th word in the scan block.

Structures are supported as well. The structure definition files (typically named [Structure-Name].typ) either need to be located in the same directory as the address book file or you can use the "Structure definitions folder" in case you keep your structure definitions separately.

When selecting a scan block, the scan block speed will be displayed. This value can be either "Low", "Middle", "High" or a term.

For TC-net and station nodes, the ID is displayed.

Option "Use station name as signal name prefix"
By checking this option, the name of the TC-net station will be added to the signal name as a prefix. Hence, the original signal names can be kept short, but if needed, the origin of the signal can be recognized, e. g. in the signal legend of a trend view.

Option "Use scan block number as signal name prefix"
By checking this option, the number of the hosting scan block will be added to the signal name as a prefix. If needed, the origin of the signal can be recognized, e. g. in the signal legend of a trend view.

Option "Hide symbols with an unsupported datatype"
By checking this option, variables with a datatype that could not be parsed properly will not be displayed. Variables with an invalid data type are marked with the icon 🟢 whereas supported variables are marked with the icon 🟡.

In case no symbols appear in the tree structure in the Symbols tab, click <Update symbols>. If still no symbols appear, there is probably something wrong with the format of the supplied address book file.

Instead of manually looking for a certain variable, it is possible to perform a search.
By using the Search tab, it is possible to look for variables, whose names match a certain pattern.

To search for variables, click the Search tab, enter part of the complete variable name you are looking for and click <Search>. The symbol browser will only list variables that match the supplied pattern. Note that the complete variable name contains the network name, station name and scan block ID as well. For instance, if you enter "TC-net" in the search box and click <Search>, the entire symbol tree will be shown since every variable starts its complete name with "TC-net 100 LAN" in this case.

When selecting a scan block, a TC-net station or a TC-net node in the symbol browser, the <Add> button will become available. See chapter Add module for description, Add module, page 16.
3.3.6 Add module

Add modules with the symbol browser
You can automatically create *ibaPDA* TC-net modules with the TC-net symbol browser. This provides that you have correctly referenced an address book file. A TC-net module is always one-to-one linked to a certain scan block.

When selecting a scan block in the symbol browser, the <Add> button will become available. When clicking the button, a new TC-net module will be generated containing all variables in that scan block. In case a module already exists linked to the selected scan block, the variables that are not yet included in the module are added.

Apart from being able to select multiple scan blocks at once, it is also possible to select TC-net station or TC-net nodes. When mapping a TC-net station node, all scan blocks linked to the station node will be added. When mapping a TC-net node, all scan blocks linked to all stations in the TC-net will be added.

When mapping scan blocks, the module update time provided in "Update time" will be applied to all newly created modules.

For more information on how to define the module update time, see *Module settings*, page 18

Add modules manually
To add a module manually, click on "Click to add module" below the interface node in the interface tree of the I/O manager. The following dialog will open:

![Add module dialog](image)

Fig. 9: Add module
Two module types for the TC-net interface are available:

- Raw scan block
- Symbolic scan block

Select the desired module type and click <OK>.

---

**Note**

**How many scan block licenses are used for a module?**

For every symbolic scan block and raw scan block module used in the *ibaPDA* a scan block license is used from the dongle. Hence, you can record signals with a total length of 64 words in a module. If you intend to record more data with the module, then a further scan block license for a data block of 64 words is required.

The interface license *ibaPDA-Interface-TC-net* allows the usage of 64 scan block licenses. The maximum length of signals recordable with this license is $64 \times 64 = 4.096$ words.

In case you need more you can extend your license using the license product *one-step-up-Interface-TC-net*. This will add another 64 scan block licenses. It is possible to use max. 127 step-ups which results in a maximum of 8192 scan block licenses.

**Example:**

You want to record data from a scan block which has the size of 256 words (4 times the standard size of 64 words). The total length of the signals in your module is e.g. 226 words. Therefore 4 scan block licenses from the dongle will be required to run this module.
3.3.7 Raw scan block module type

3.3.7.1 Module settings

When using this module type, no address book information is used and the addresses and data types of the requested variables need to be entered manually.

![Module settings interface](image)

**Fig. 10: General module settings for Raw scan block**

**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.

**Advanced**

**Swap analog signals**

Set the swap mode according to the signal source. You can choose between four different options:

<table>
<thead>
<tr>
<th>Mode</th>
<th>16 bit</th>
<th>32 bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>No swap</td>
<td>AB</td>
<td>ABCD</td>
</tr>
<tr>
<td>Depending on data type</td>
<td>BA</td>
<td>DCBA</td>
</tr>
<tr>
<td>Swap 16 bit</td>
<td>AB</td>
<td>CDAB</td>
</tr>
<tr>
<td>Swap 8 bit</td>
<td>BA</td>
<td>BADC</td>
</tr>
</tbody>
</table>

**Swap digital signals**

Here, you can select if you want to swap the digital signals, which are interpreted as 16-bit WORDs.

- **False**: No swap (Default)
- **True**: Changes the byte sequence from AB to BA

**Tip**

Leave the default setting "Depending on data type" unchanged.

**Module Layout**

**No of analog/digital signals**

Here, you can increase or decrease the signal scope of the module. The default setting are 32 signals. You can enter different values:

- For analog signals from 0 to 128
- For digital signals from 0 to 1024

The signal tables are adapted accordingly.

**TC-net**

**Update time**

This is the time interval (ms) between two read operations from the TC-net board for this module. Either a constant value can be supplied or an expression containing one of the following placeholders:
### Placeholder Meaning

<table>
<thead>
<tr>
<th>Placeholder</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>{HiScan}</td>
<td>High-speed scan cycle time defined for this board (in ms)</td>
</tr>
<tr>
<td>{MidScan}</td>
<td>Middle-speed scan cycle time defined for this board (in ms)</td>
</tr>
<tr>
<td>{LowScan}</td>
<td>Low-speed scan cycle time defined for this board (in ms)</td>
</tr>
</tbody>
</table>

The placeholders {HiScan}, {MidScan} and {LowScan} correspond with the scan cycle settings 'High-speed scan cycle', 'Middle-speed scan cycle' and 'Low-speed scan cycle' on the Configuration tab of the TC-net card node.

**Example:**

Suppose you have a scan block that transmits data using the middle-speed scan cycle time. Instead of setting the update time to exactly that value you might want to set it just a bit lower to make sure you never miss a cycle. To achieve this, you can set the update time e.g. to $0.9 \times \{\text{MidScan}\}$.

**Scan block**

This is the scan block ID, associated with this module.

**Used licenses**

The number of scan block licenses used by this module. Display only.

### 3.3.7.2 Signal configuration

When selecting the Analog tab of the module, you can define the analog signals to be measured.

**Name**

Here, enter a clear text name of the signal.

You can enter two comment lines in the Names column for every signal. You get to the comments with a mouse-click on the small button 📝 in the name field of the respective signal.

---

**Tip**

A useful feature is the automatic fill function: If you enter a signal name and click on the column header as long as the cursor is still in the name field then all empty fields below will be filled with that name. If the last character in the name is a digit, then this number is incremented from line to line. You may use this function in any row of the table. Fields which already have names will not be overwritten.

**Unit**

Assigns a physical channel dimension (e.g. °C, Ampere, Volt, N etc.)
**Gain and Offset**
The gradient and the position of a linear scaling characteristic curve are determined using the values gain and offset (signal value in the zero point).

You can enter the values directly or by means of the two-point-scaling with two known pairs of values.

You get to the dialog of the two-point-scaling by clicking in the cell (Gain or Offset). Then, click on the little button ✖️.

**Address**
The address determines the offset of the first byte of this value within the scan block. The offset can be entered as hexadecimal or decimal values by selecting the desired setting in the context menu.

![Selecting decimal display of addresses](image)

In order to get some default values you may use the automatic fill function (see *ibaPDA manual*). The addresses will be determined with regard to the data type.

**Data type**
You can select the data type used for every signal in the fields of this column. Click in the respective field and choose the data type from the drop-down list. The address space is depending on the data type. Hence, an adjustment of address entries may be necessary after change of data types.

<table>
<thead>
<tr>
<th>Data type</th>
<th>Description</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYTE</td>
<td>8-Bit without positive sign or negative sign</td>
<td>0 ... 255</td>
</tr>
<tr>
<td>INT</td>
<td>16-Bit with positive sign or negative sign</td>
<td>-32768 ... 32767</td>
</tr>
<tr>
<td>WORD</td>
<td>16-Bit without positive sign or negative sign</td>
<td>0 ... 65535</td>
</tr>
<tr>
<td>DINT</td>
<td>32-Bit with positive sign or negative sign</td>
<td>-2147483648 ... 2147483647</td>
</tr>
<tr>
<td>DWORD</td>
<td>32-Bit without positive sign or negative sign</td>
<td>0 ... 4294967295</td>
</tr>
<tr>
<td>FLOAT</td>
<td>IEEE754; Single Precision; 32-bit floating point value</td>
<td>1,175·10⁻³⁸ ... 3,403·10³⁸</td>
</tr>
<tr>
<td>DOUBLE</td>
<td>IEEE754; Double Precision; 64-bit floating point value</td>
<td>2,225E-308 ... 1,798E+308</td>
</tr>
<tr>
<td>FP_REAL</td>
<td>Fixed Point Real; Q15.16; 15 bits in Integer format and 16 bits im &quot;fractional&quot; format;</td>
<td>-32768 ... 32767,9999</td>
</tr>
</tbody>
</table>

Table 2: Possible data types
If you click on the header of the Address column, then *ibaPDA* calculates the addresses, based on the data types of the signals.

![General Analog Digital](image)

<table>
<thead>
<tr>
<th>Name</th>
<th>Unit</th>
<th>Gain</th>
<th>Offset</th>
<th>Address</th>
<th>Data Type</th>
<th>Active</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td>1 BYTE</td>
<td></td>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>3 BYTE</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>4 BYTE</td>
<td></td>
<td>✓</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>5 BYTE</td>
<td></td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>6 DWORD</td>
<td></td>
<td>✓</td>
<td>151515156</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>7 BYTE</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>8 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>9 BYTE</td>
<td></td>
<td>✓</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>0</td>
<td>10</td>
<td>10 BYTE</td>
<td></td>
<td>✓</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
<td>11</td>
<td>11 BYTE</td>
<td></td>
<td>✓</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>12 WORD</td>
<td></td>
<td>✓</td>
<td>2318</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>0</td>
<td>13</td>
<td>13 BYTE</td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>0</td>
<td>14</td>
<td>14 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>0</td>
<td>15</td>
<td>15 BYTE</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
<td>16</td>
<td>16 BYTE</td>
<td></td>
<td></td>
<td>130</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>0</td>
<td>17</td>
<td>17 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>18 BYTE</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>0</td>
<td>19</td>
<td>19 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>0</td>
<td>20</td>
<td>20 BYTE</td>
<td></td>
<td></td>
<td>114</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>0</td>
<td>21</td>
<td>21 BYTE</td>
<td></td>
<td></td>
<td>128</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>0</td>
<td>22</td>
<td>22 BYTE</td>
<td></td>
<td></td>
<td>82</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>0</td>
<td>23</td>
<td>23 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>0</td>
<td>24</td>
<td>24 BYTE</td>
<td></td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>0</td>
<td>25</td>
<td>25 BYTE</td>
<td></td>
<td></td>
<td>2350</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>0</td>
<td>26</td>
<td>26 BYTE</td>
<td></td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td>0</td>
<td>27</td>
<td>27 BYTE</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>0</td>
<td>28</td>
<td>28 BYTE</td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>0</td>
<td>29</td>
<td>29 DWORD</td>
<td></td>
<td>✓</td>
<td>156955558</td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>0</td>
<td>30</td>
<td>30 BYTE</td>
<td></td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>0</td>
<td>31</td>
<td>31 DWORD</td>
<td></td>
<td>✓</td>
<td>1944117769</td>
</tr>
</tbody>
</table>

Fig. 12: Analog signal table of a Raw scan block module

The Actual column shows the current value of the signal. By clicking on the Actual column header you can switch between raw and scaled view of the value.

A similar table is shown for the digital signals on the Digital tab.

For a digital signal you have to specify the address (hex or decimal) relative to the start address of the scan block and the bit number. The bit number goes from 0 to 15.
3.3.8 Symbolic scan block module type

3.3.8.1 Module settings

![General module settings for Symbolic scan block](img/ibaPDA-Interface-TC-net.png)

**Fig. 13:** General module settings for Symbolic scan block

**Basic, Advanced and Module Layout settings**

See ➔ Module settings, page 18

**Update time**

This is the time interval (ms) between two read operations from the TC-net board for this module. Either a constant value can be supplied or a term containing one of the following placeholders:

<table>
<thead>
<tr>
<th>Placeholder</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>{HiScan}</td>
<td>High-speed scan cycle time defined for this board (in ms)</td>
</tr>
<tr>
<td>{MidScan}</td>
<td>Middle-speed scan cycle time defined for this board (in ms)</td>
</tr>
<tr>
<td>{LowScan}</td>
<td>Low-speed scan cycle time defined for this board (in ms)</td>
</tr>
<tr>
<td>{BlockSpeed}</td>
<td>Speed property of scan block as defined in address book</td>
</tr>
</tbody>
</table>

**Example:**

Suppose you want to map a number of scan blocks using the symbol browser on the TC-net interface node that operate at different scan cycle speeds. The update time term in the symbol browser is applied to all scan blocks. However, you would prefer an update time of \(0.9 \times \{\text{MidScan}\}\) for middle-speed scan blocks and an update time of \(0.9 \times \{\text{HiScan}\}\) for high-speed scan blocks. To achieve this, you can set the Update time to \(0.9 \times \{\text{BlockSpeed}\}\) for every module.
**Used licenses**
The number of scan block licenses used by this module. Display only.

**Link "Select symbols"**
The “Select symbols” hyperlink below the *Module settings* table opens the TC-net symbol browser, where only variables contained in the scan block assigned to this module are shown.

### 3.3.8.2 Signal configuration

Best way to configure the signals in a symbolic scan block module is to use the TC-net symbol browser.

On the *Analog* tab it looks as follows:

![Analog signal grid of a symbolic scan block module](image)

Instead of having to enter address and data type for each signal, only the symbolic variable name is required here. The symbol name can either be entered manually or selected using the TC-net symbol browser.

When entering the *Symbol* column of a signal, a button will appear at the right side of the cell. Clicking this button will open the TC-net symbol browser where the currently selected symbol will be selected if available in the address book. If the table row is empty, you can select a signal in the symbol browser and insert it into the table with <Add>.

On the *Digital* tab it works in the same way.
4 Diagnostics

4.1 License

If the "TC-net" 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 "Hardware TC-net" has been properly recognized.

![License Information]

Fig. 15: Display of the license in the *ibaPDA* I/O manager, example TC-net

The number in brackets behind the license name indicates how many scan blocks are licensed. If the license is not available, please contact your local iba office to purchase a TC-net hardware license.

4.2 Interface diagnostics tab

You will find a diagnostic help with a tabular display of the update time and data transfer time between the TC-net board and *ibaPDA* on the **Diagnostics** tab of the TC-net interface.

For further information, see 📖*Diagnostics tab*, page 12
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