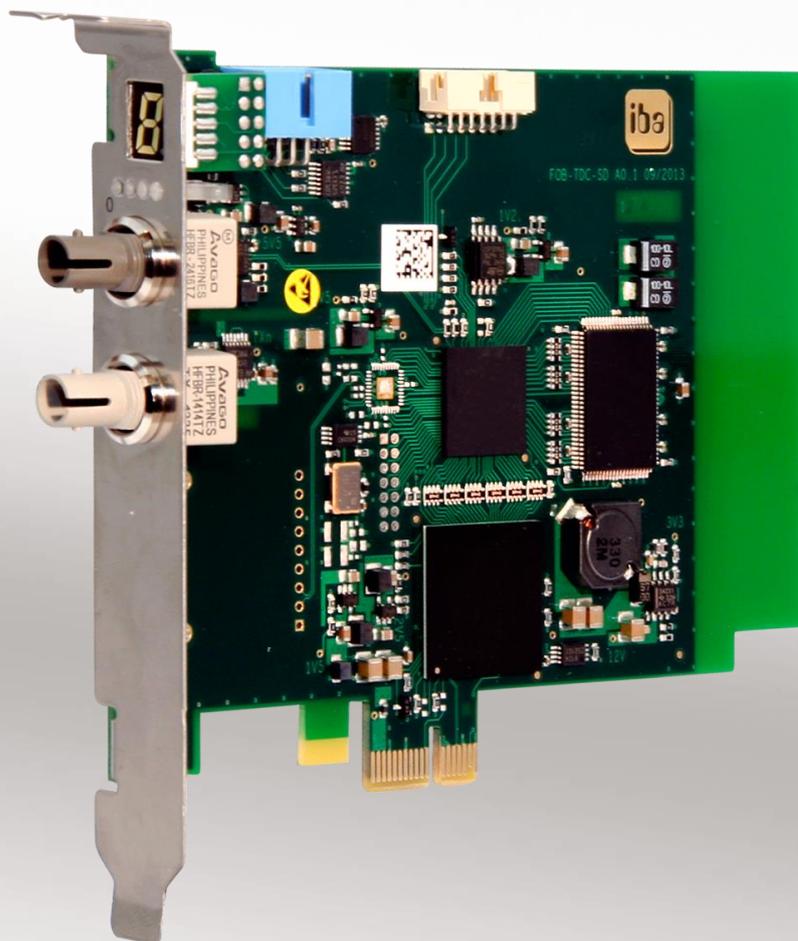


ibaFOB-SDexp

Interface Board for SIMADYN D



Manual

Issue 1.1

Measurement and Automation Systems



Manufacturer

iba AG
Koenigswarterstr. 44
90762 Fuerth
Germany

Contacts

Main office	+49 911 97282-0
Fax	+49 911 97282-33
Support	+49 911 97282-14
Engineering	+49 911 97282-13

E-Mail: iba@iba-ag.com

Web: www.iba-ag.com

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The current version is available for download on our web site <http://www.iba-ag.com>.

Protection note

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Certification

The device is certified according to the European standards and directives. This device corresponds to the general safety and health requirements. Further international customary standards and directives have been observed.

Issue	Date	Revision	Chapter / pages	Author	Version HW/FW
V 1.1	01/12/17	Integration SD-TDC-lite	Chapter 7	ko/ip	

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1 About this manual

This manual describes in detail the configuration and use of the product ibaFOB-SDexp.

1.1 Target group

This manual addresses in particular the 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 consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

1.2 Notations

In this manual the following notations are used:

Action	Notation
Menu command	Menu „Logic diagram“
Call of menu command	„Step 1 – Step 2 – Step 3 – Step x“ Example: Select menu „Logic diagram – Add – New logic diagram ”
Keys	<Key name> Example: <Alt>; <F1>
Press keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Button name> Example: <OK>; <Cancel>
File names, Paths	„File name“, „Path“ Example: „Test.doc“

1.3 Symbols used

If safety instructions or other information 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:

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

If you do not observe the safety instructions regarding the process and the system or machine to be controlled, there is a risk of death or severe injury!

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 indicates special requirements or actions to be observed.



Important information

Information that a special indication has to be observed, e.g. exceptions from the general rule.



Tip

Tip or example which serves as helpful information or a trick to facilitate the work.



Other documentation

Reference to supplementary documentation or further literature.

2 Scope of delivery

The following components are included with the delivery:

- ibaFOB-SDexp card
- Manual
- Synchronization cable (sync cable)

➤ For more accessories, not included in the scope of delivery, please refer to www.iba-ag.com.

3 Safety information

Please consider the following safety advises:

 DANGER

To prevent electrical shock during installation or uninstallation of the device disconnect the power supply from the computer before opening!

** CAUTION**

This board contains components which can be destroyed by electrostatic discharge. Prior to touching any electronics board, your body must be electrically discharged. This can be simply done by touching a conductive, grounded object immediately beforehand (e.g. bare metal cabinet components, socket protective conductor contact).

4 System requirements

4.1 Hardware

IBM-PC compatible computer with the following minimum configuration:

- Pentium IV/3 GHz
 - At least one free PCIe 1.0-x1 compatible slot
 - 512 MB RAM
 - >10 GB hard disk space
- Please see <http://www.iba-ag.com> for further details.

4.2 Software

- ibaPDA Version 6.32.0 or higher

5 Introduction

5.1 Application

The ibaFOB-SDexp PC card couples the iba Process Data Acquisition system ibaPDA with the Siemens control system SIMADYN D (SD). Therefore, the ibaFOB-SDexp must be connected to one of the free fiber optic links of the SIMADYN D CS12, CS13 or CS14.

The boards only differ in the amount of links supported by the cards (1, 4 or 8). If in the following text the CS14 is referred to the meaning is valid for CS12 and CS13 too.

The slaves are connected via their CS22 cards to the master rack. The CS14 is the coupling partner in the master rack. Via the communication memory of the CS14 the slaves may communicate with the master and other slaves. The ibaPDA PC with an ibaFOB-SDexp card acts like a slave rack in the SIMADYN D system, the ibaFOB-SDexp card acts like a CS22.

This topology enables the ibaFOB-SDexp to communicate in theory with every processor in one of the connected racks (max. 7) or the master rack. This would be up to 64 CPUs.

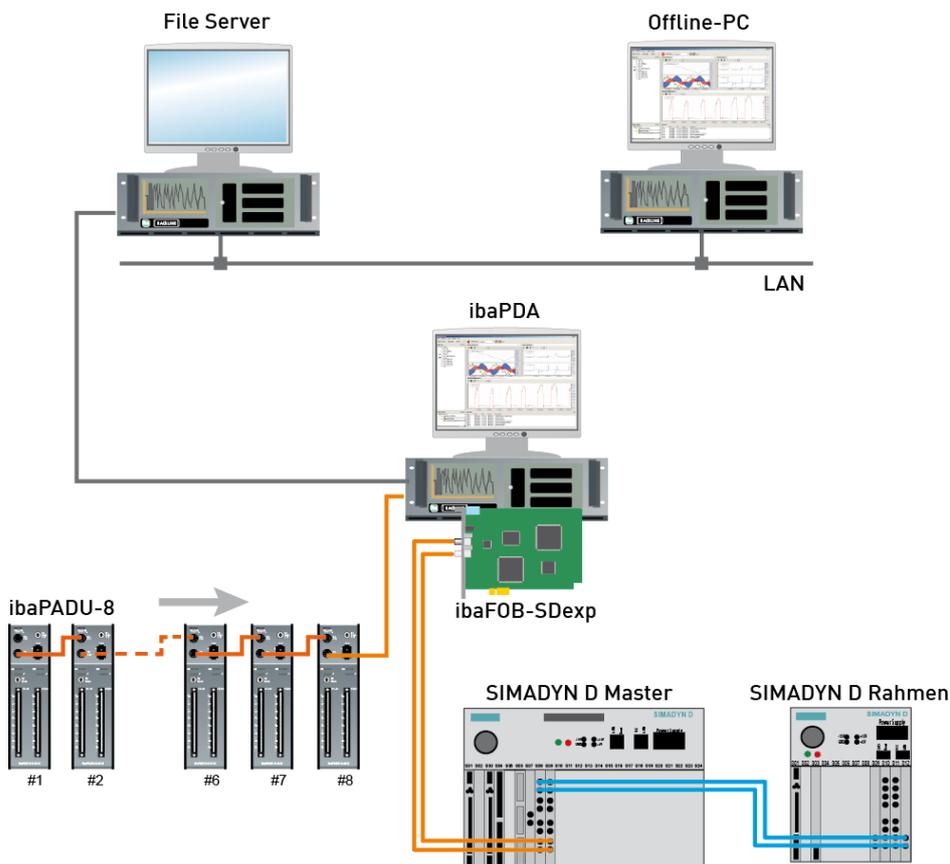


Figure 1: Example of configuration with ibaPDA

By means of the Siemens interface board CP53M0 the ibaFOB-SDexp card can be connected with the SIMATIC TDC control system. The board is available in SIMATIC TDC (D7-SYS V7.1 or higher) and can be configured as master or slave. In master mode one port can be used for connection to ibaPDA with an ibaFOB-SDexp card. The other port provides for connection to a slave rack. The slave rack can be either SIMADYN D with CS22 board or SIMATIC TDC with CP53 board (slave mode).

5.2 Characteristics

The card has the following characteristics:

- PCI Express card for 1.0-x1 compatible slot
- 100% functional compatible with the predecessor ibaFOB-SD
- Firmware update without dismounting the card
- 1 bidirectional fiber optic channel with 96 Mbit/s (ST coupling)
- Absolutely noise free acquisition of process data
- Enhanced SIMADYN D system diagnostics
- Display for card ID, processor and link status via 7-segment display and LEDs
- Up to 4 PCIe cards per PC
- Plug and Play installation
- All component parameters are 100% controlled by software. No wiring or jumpering is necessary for that board.

5.3 Operational modes

To measure SIMADYN D system numeric and binary values must be transported between the SD system and the PC, which means that internal variables of the SD system may be visualized and recorded. For recording purposes two different software packages are supported by the ibaFOB-SDexp card:

- SD-TDC-lite:
All values to be measured by ibaPDA have to be manually programmed in the control unit. Changes of signals require a change in this program. Up to 16 process telegrams are to be defined per card which transport the values to ibaPDA containing 32 analog plus 32 digital variables each. Structure and length of the process telegrams are determined by ibaPDA. Up to 4 cards in a PC are supported by ibaPDA. In addition the ibaPDA-Technostring (non-structured ASCII-string with a length of up to 512 bytes) can be configured.
- SD-TDC-Request:
The definition of the signals to be measured is independent of the connected control unit system. All changes are done in ibaPDA. ibaPDA supports the functionality to select the internal variables by their names, i.e. the chart, function block and the connector names. To do that for every SD CPU special service function blocks must be included in the program of the control unit.
The information about the variable names (address books) is transferred from the SD CPU to the ibaPDA system directly (for CFC) or is created by the STRUC editor and then transmitted to ibaPDA by file transfer.
ibaPDA supports up to 4 cards with up to 50 processor connections per card and additionally the ibaPDA-Technostring.

**Note**

An additional software license “ibaPDA-Request-SD” is required in order to use the SD-/TDC request function. It must be enabled on the iba software dongle.

The service function blocks required for the request function are included in the iba function block library FBAPDA. You will find the library on the DVD-ROM delivered with ibaPDA.

**Other documentation**

The configuration of the request function is described in the “ibaPDA-Request-SD-TDC” manual.

5.4 Front view

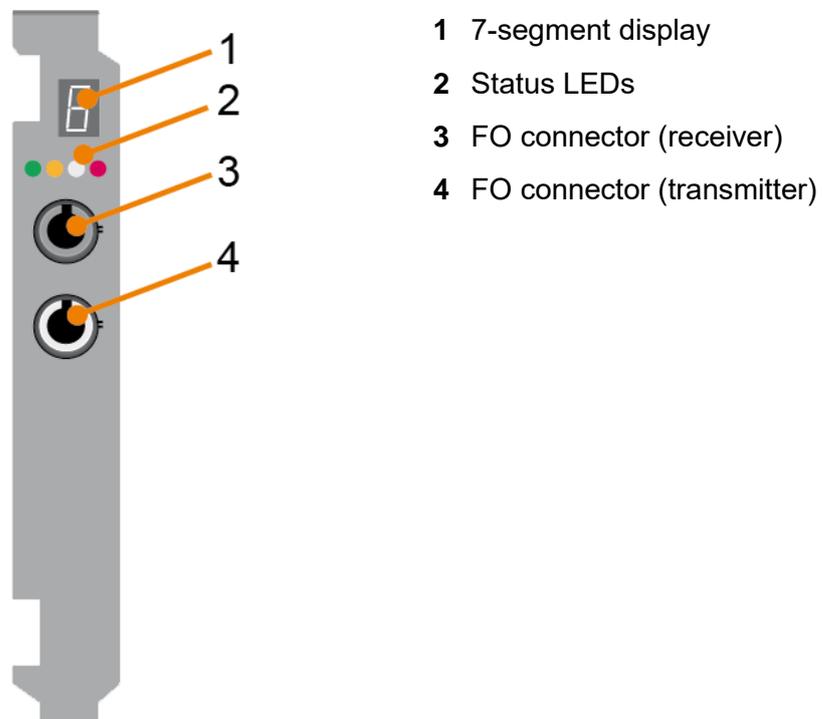


Figure 2 : Front view

5.5 Plug and socket connections

1 Sync connector (blue)

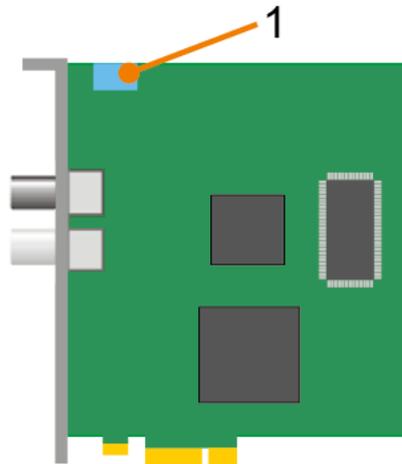


Figure 3: Plug and socket connections

5.6 Indicators

5.6.1 Device LEDs

LEDs indicate the operational state of the card and fiber optic channels. On power on all LEDs are lit for a few seconds to prove their proper function.

LED	Status	Indication
(green)	Off	Card is dead or defect
	Blinking	Normal operation
(yellow)	Off	No signals detected; fiber optics not connected or sending device is switched off
	Blinking	Connection ok, but SD system not ready
	On	Connection ok, SD system ready
(white)	Off	No data transfer
	On	Data transfer in progress
(red)	Off	Normal state
	Blinking	Running in FPGA factory rescue mode
	On	Hardware failure (FPGA not configured)

5.6.2 7-Segment display



The 7-segment display shows the following information:

- Horizontal line: After System switch-on until ibaPDA has initialized the board
- Board-ID: After board was initialized
- The decimal dot ON: Card is configured as an internal interrupt master
- The decimal dot blinking: Card is configured as an external interrupt master
- The decimal dot OFF: Card is configured as an interrupt slave



Important note

It is not allowed to configure the ibaFOB-SDexp as **external** interrupt master.

5.7 Fiber optic interface

The ibaFOB-SDexp board provides 2 ST-type jacks:

- 1 optical transmitter TX (white)
- 1 optical receiver RX (grey)

6 Mounting and dismantling

6.1 Safety information

The following safety advices apply when handling the card:



Electric shock!

Switch off the PC and disconnect it from the mains power supply before opening!



Electrostatic discharge!

This board contains components which can be destroyed by electrostatic discharge. Before touching the board make sure that your body is electrically discharged or works in a designated ESD protected area!

The standards for handling electrostatic sensitive devices (ESD) must be followed.

6.2 Mounting

1. Shut down the PC.
2. Unplug the mains power line and open the PC so you can reach the PCIe slots.
3. Take the card carefully out of the package. Use a grounding cable or discharge any electrostatic charge before taking the card.
No wiring or jumpering is necessary.
4. Grab the card at the front plate and the rear upper corner. Do not touch the contacts.
5. Plug in the card carefully into a free PCIe slot and fix the card to the housing of the PC.
6. If more than one iba card is installed connect all cards with one another by the flat ribbon cable (sync cable), see chapter 9 "Synchronization of iba cards".
7. Close the PC.
8. Plug in the power line and start the PC.

6.3 Dismounting

1. Shut down the PC.
2. Unplug the mains power line and open the PC so you can reach the PCIe slots.
3. Disconnect all external connections from the card.
4. Release the fixing screw on the upper side of the front plate.
5. Unplug the card carefully out of the slot. Store the card in an appropriate container.

7 Configuration

7.1 Configuration on the control unit

7.1.1 SD-TDC-lite transmission channels

When projecting the transmission channels, the following is to be observed:

- ❑ The names of the channels are established and should not be used elsewhere. The names of the max. 16 transmission channels (from the perspective of the control) are as follows:
 - Channel 1: M0PDADAT
 - Channel 2: M1PDADAT
 - :
 - :
 - Channel 10: M9PDADAT
 - Channel 11: MAPDADAT
 - :
 - :
 - Channel 16: MFPDADAT
- ❑ The data structure of the telegrams is established and cannot be changed: 32 analog values as data type FLOAT and 32 binary values as DWORD.
- ❑ The channels are to be projected as process data channels in the REFRESH or MULTIPLE channel mode.



Important information

All channels must support the same channel mode, either all REFRESH or all MULTIPLE.

- ❑ The channels can be on different processors. The CTS connectors of the transmission function blocks must indicate the rack link component to which ibaFOB-SDexp is also connected (CS14 or CP53M0).
- ❑ The channels can be projected in different time slices.
- ❑ The "CTV" or "CTV_P" function blocks are to be used for transmission.



Note

When using the CTV function block, you have to apply all telegram data to the virtual connection, see figure 4.

When using the CTV_P function block (for CFC only), you only have to enter the telegram length 132 bytes at the NBY connector, see figure 5.



Note

All analog values are to be converted to FLOAT, if applicable.

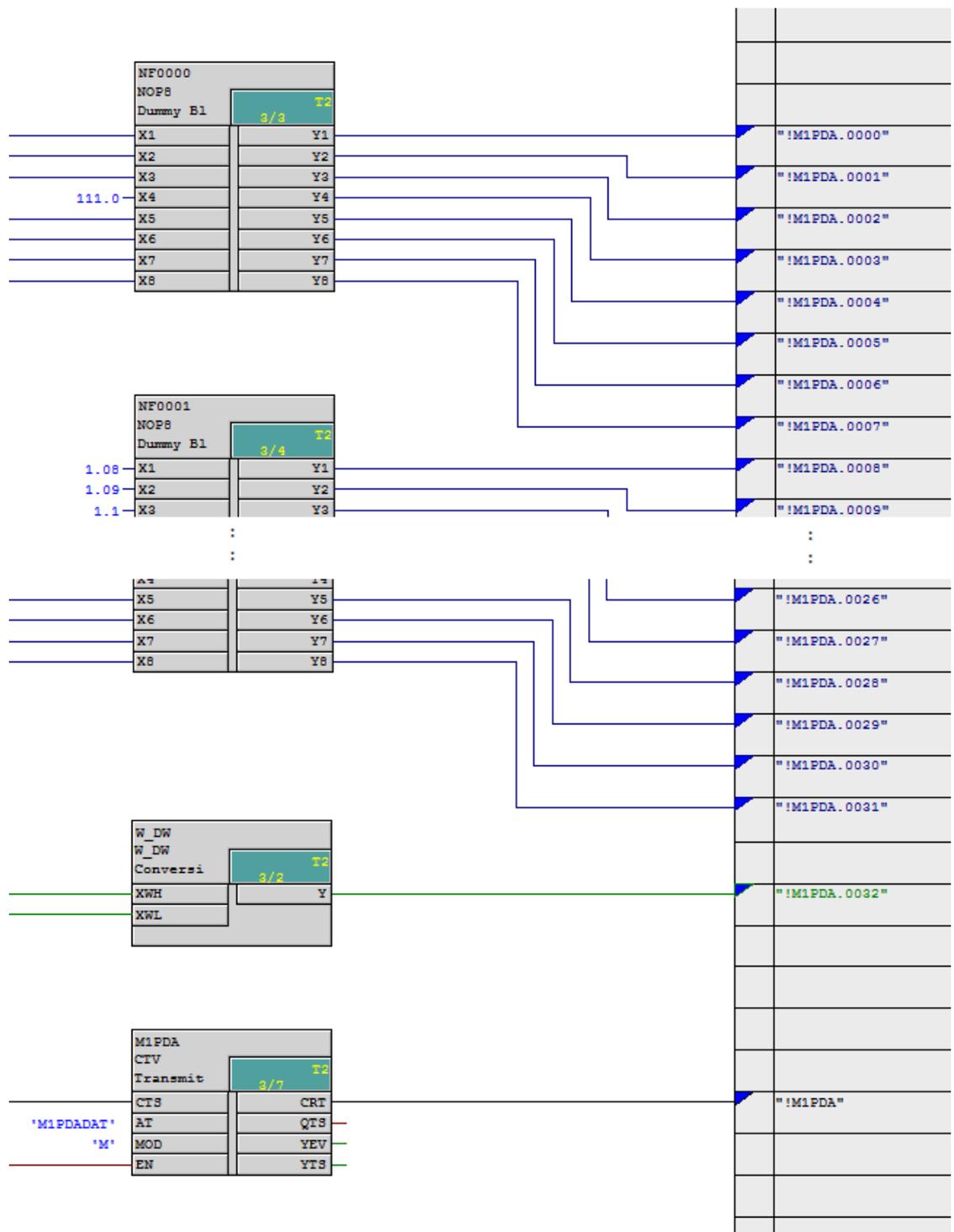


Figure 4: Configuration transmission channel with CTV

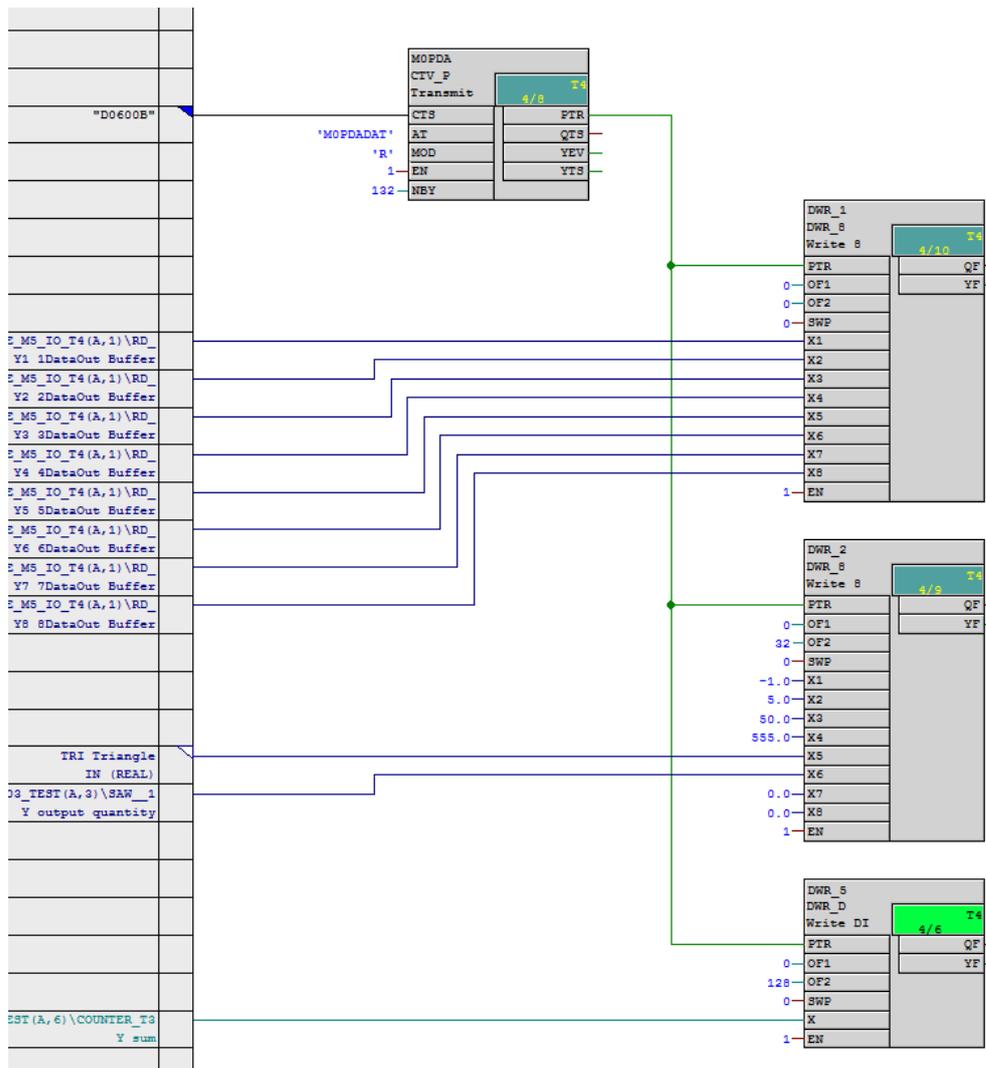


Figure 5: Configuration transmission channel with CTV_P

Description of the CTV_P connectors:

Connector	Value	Description
CTS		Connection to board: Component name of CS14 resp. CP53M0
AT	MOPDADAT	Name of the transmission channel
MOD	R	REFRESH channel mode
EN	1	Transmits the cycle of the time slice
NBY	132	Telegram length in bytes
PTR	-	Pointer on telegram buffer which must be connected to the PTR connector of the DWR-xx function blocks

7.1.2 SD-TDC-lite reception channels



Note

Though the current firmware version provides the reception channels, they are not yet supported by iba-Software.

7.1.3 Technostring

The Technostring (TS) is a slow process data channel with which additional non-cyclical alphanumeric data that accompany the measurement can be transmitted to ibaPDA. The TS runs independently of the PDA data channels.

The TS channel must be projected on the control side. The user has to make sure that the TS is transmitted to ibaPDA in case of a change or in a slow cycle (≥ 1 second).

The TS channel is queried each second by ibaPDA.



Note

Only 1 TS is possible for each rack link. However, beyond the rack link you have the possibility of transmitting other technostrings, e.g., via TCP/IP or serial interface.

The channel characteristics are defined as follows:

ibaPDA-Technostring	
Channel name	PDA_ASCII
Channel length	512 Byte
Data format	Unformatted alphanumeric character string
Channel mode	Handshake
Use	Transmission of strip attributes, technology and material related data before entry of a new strip in the rolling train.
Cycle	1 second



Note

When using the CTV function block, you have to apply all telegram data to the virtual connection or put the telegram together from partial telegrams.

When using the CTV_P function block, you only have to enter the telegram length 512 bytes at the NBY connector (see example below).



Note

Make sure that non-printable characters are used to indicate the end of the string, e.g. 0x0D ('CR') or 0x00 ('NUL').

7.1.4 Time synchronization

If you want to synchronize the time of the ibaPDA system with the Siemens control, then you have to project an **RTCM** function block that reads the system time from a source or generates it itself and distributes it on the frame. This time function block may only be projected once per frame.

Synchronization is done by means of a DCF77 digital signal that is generated on the control:

On the control side, project on one CPU a **DCF77** function block in the fastest sampling time (<5 ms). This function block supplies a digital DCF77 signal with polarity 0=active. Put it on a bit of a SD-TDC-lite telegram.

The function block is contained in the FBAPDA function block library of iba AG. (If you require more information, please contact the support of iba AG.)

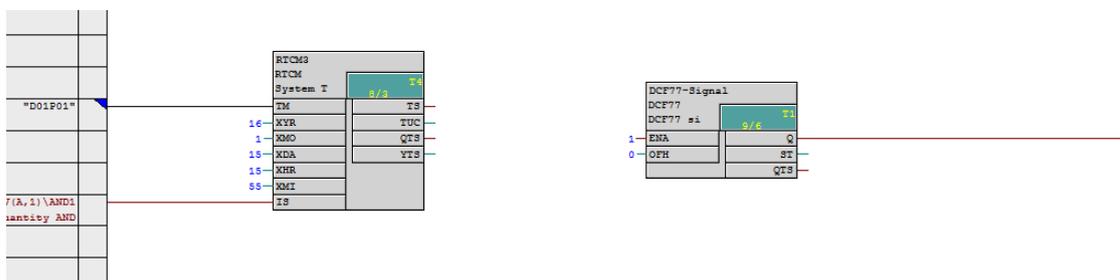


Figure 6: Configuration DCF77 time signal

Alternatively the **synchronization can be done with an IEC-1131 time signal**. For this, convert the integer value of the relative time stamp of the function block RTCREL (CFC) resp. RTC005 (STRUC) (seconds and 1/10 milliseconds starting 01/01/1988) to the data format REAL and enter the values into the SD-TDC-lite telegram.

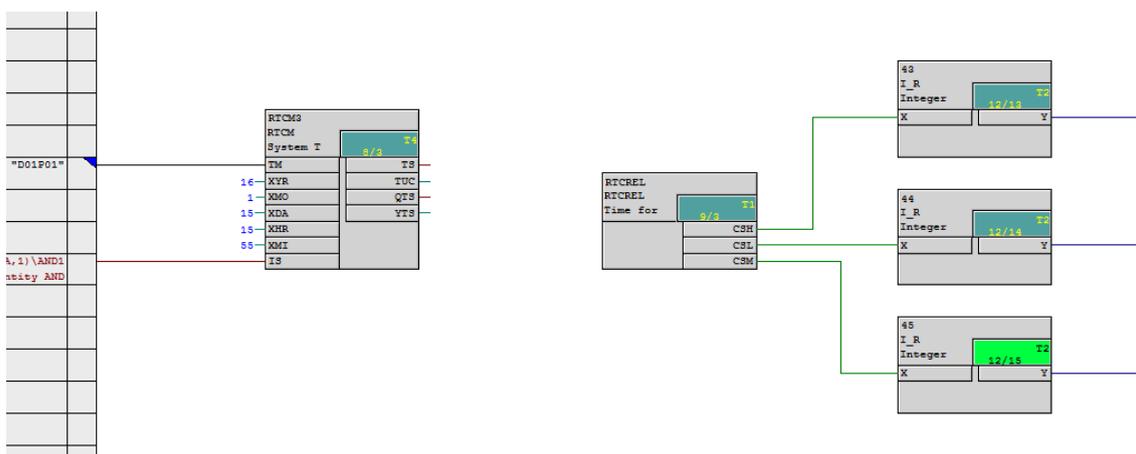


Figure 7: Configuration IEC-1131 time signal

7.2 Configuration in ibaPDA

If the card has been installed correctly it should be available in the I/O manager's signal tree as a data interface. If you click on the interface icon you will get a simplified image of the card and essential information in the right part of the dialog.

7.2.1 Card configuration

Select the „Configuration“ tab.

Interrupt mode

The interrupt mode is automatically generated by ibaPDA: as soon as an ibaFOB-D card is being used for configuration it is specified as “Interrupt-Master”. The “Slave-Mode” is activated for ibaFOB-SDexp. In case the ibaFOB-D card is not being used but several ibaFOB-SD(exp) or ibaFOB-TDC(exp) cards are activated, the mode “Interrupt-Master intern” can be defined for one of these cards. As a result this card will generate the interrupt for the other cards (Interrupt-Slaves). The interrupt will be transmitted to these iba cards via the synchronization cable (sync cable is included in delivery).

Check the option “In use” if the card is being used by ibaPDA; remove the tick in the “In use” checkbox when the card is used by other applications (e.g. ibaLogic).

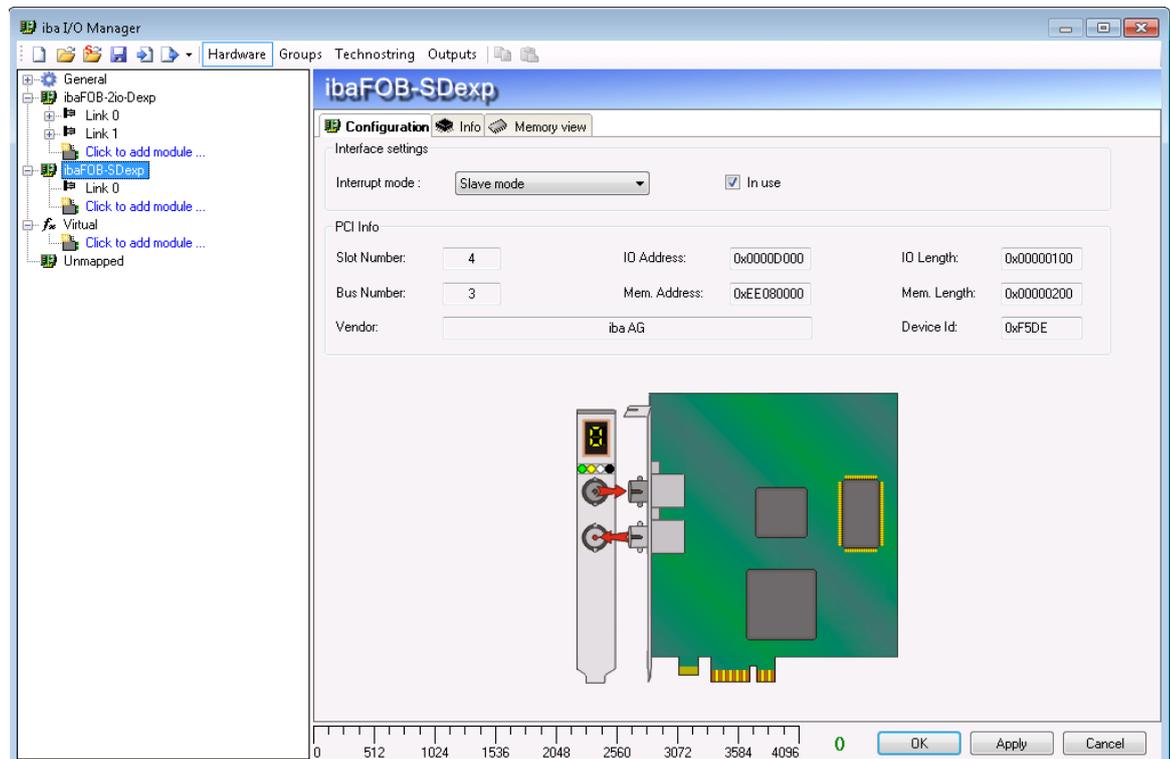


Figure 8: Card representation of ibaFOB-SDexp

➤ Further data and tabs are described in chapter 8 “Diagnostics”

7.2.2 Link configuration

If you mark the „Link 0“ under the ibaFOB-SDexp card in the signal tree, then the menus for diagnostics of the communication connection appear on the right side.

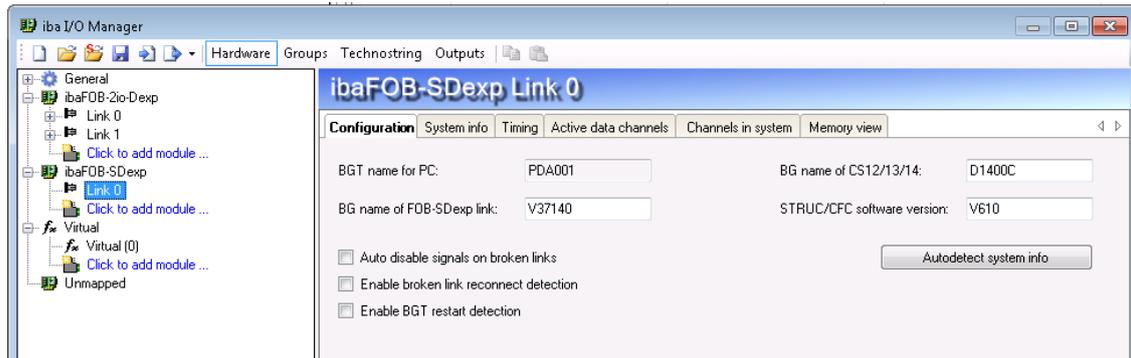


Figure 9: Link level for ibaFOB-SDexp

In the “Configuration” tab you will find the data and entry fields which are necessary for the connection to the CS14:

BGT name for PC:

With this name, ibaPDA logs in on the rack link function block group as BGT.

Default setting: “PDA001”

If there are several ibaPDA or ibaQDR system links to the CS14, it is recommended to change the BGT name. For this purpose start the Windows Registry Editor “regedit”.

You will find the key “SDE_BgtName” under HKLM\SYSTEM\CurrentControlSet\Service\PdaDrv.

BG name of FOB-SDexp link:

With this name, iba FOB-SDexp logs in on the rack link as BG. The default setting is the ibaPDA license number, limited to 6 characters.



Important note

If there are several ibaPDA systems connected to a computer coupling, you have to enter different BG names. The name of the connection needs to be unique within the rack link.

BG name of CS12/13/14:

When the link is established, you can read the BG name from the control by a click on <Autodetect system info>.

STRUC/CFC software version:

When the link is established, you can read the version of the software from the control by a click on <Autodetect system info>.



Note

The following options will **not** be displayed if an “ibaPDA-Request-Simadyn-D” (31.001330) license is available. In this case the options for the Simadyn-Request-Interface are applicable.

Options:

- Auto disable signals on broken links:

If this function is activated, the measurement channels of the CPUs which do not answer are temporarily disabled. This occurs e.g. when a frame is switched off while ibaPDA starts acquisition. At the next start, they are active again.

- Enable broken link reconnect detection:

When the FO link to CS14 resp. CP53 is interrupted or the rack is switched off, ibaPDA keeps running with the last received values frozen. With this option you can restart ibaPDA after the link is reconnected.

- Enable BGT restart detection:

When a rack which is connected to CS14 resp. CP53 is switched off, ibaPDA keeps running with the last received values frozen. With this option you can restart ibaPDA after the deactivated rack is available again.



Note

ibaPDA will not be restarted after the restart of another ibaPDA or ibaQDR system which is connected to the same CS14 if the BGT name of this system is "PDA00x" (x=1...9).

➤ For description of other tabs, please refer to chapter 8.2 "Link diagnostics"

7.2.3 Configuration of data modules

Add module

To add a module, mark the data interface link "Click to add module..." in the signal tree and select the module type.

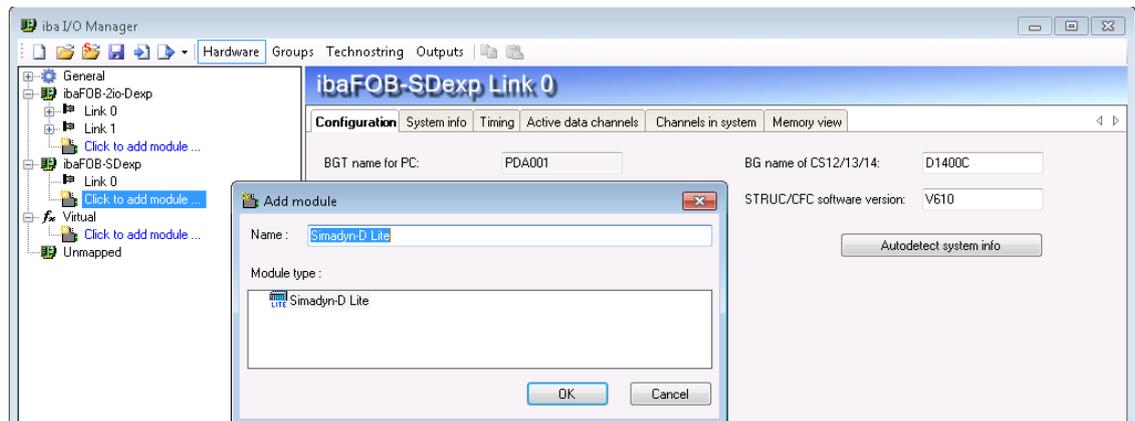


Figure 10: Add the Simadyn-D Lite module



Note

When a connection exists, a Simadyn-D Lite module with the correct channel name is automatically created for each transmission channel which was found in the CS14. For this, choose from the "Link 0" context menu (right mouse click) the "Autodetect" menu point.

“General” tab

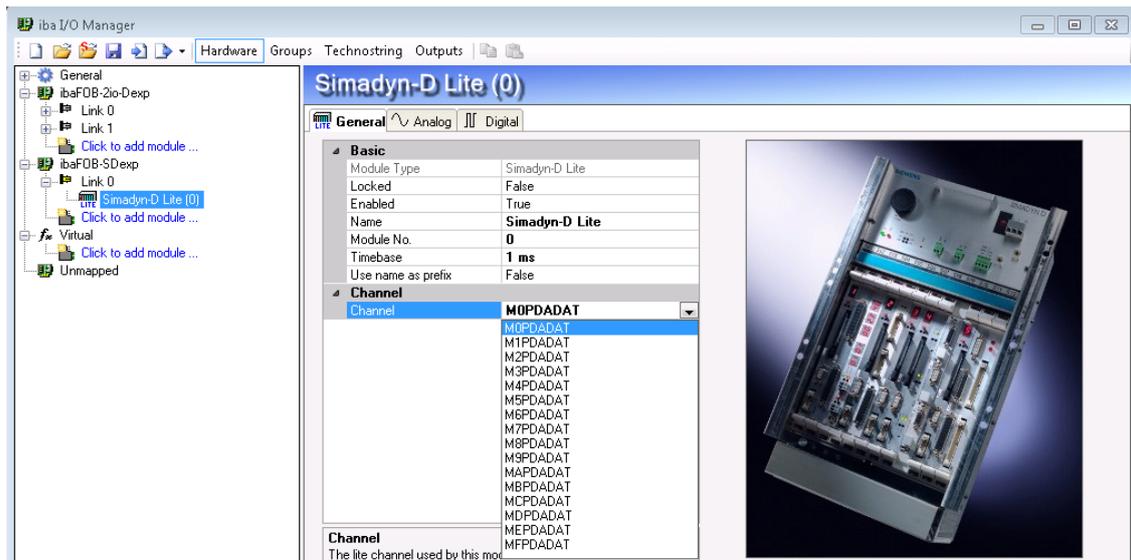


Figure 11: “General” tab

On the “General” tab, the following standard settings can be found:

Locked:

The module can be locked to avoid unauthorized access to module settings.

Enabled:

Data capturing for this module is enabled; data capturing for deactivated modules is not possible.

Name:

You can enter a name for the module.

Module No.:

Internal reference number of the module.

Time base:

Here all signals of the module are captured. The time base should be adjusted to the configured time slice of the transmission block of the control unit (multiple of general ibaPDA acquisition cycle time).

Use name as prefix:

Prefix the signal names of this module with the module name.

Channel:

You can select the channel name M0PDADAT....MFPDADAT.



Note

If you click on a field, the associated description is displayed in the text field below the entry field. For more details on the parameters, please refer to the general ibaPDA manual.

“Analog” and “Digital” signal tables tab

In the “Analog” and “Digital” signal tables you can specify the analog and digital signals which are received in the telegrams by the control.

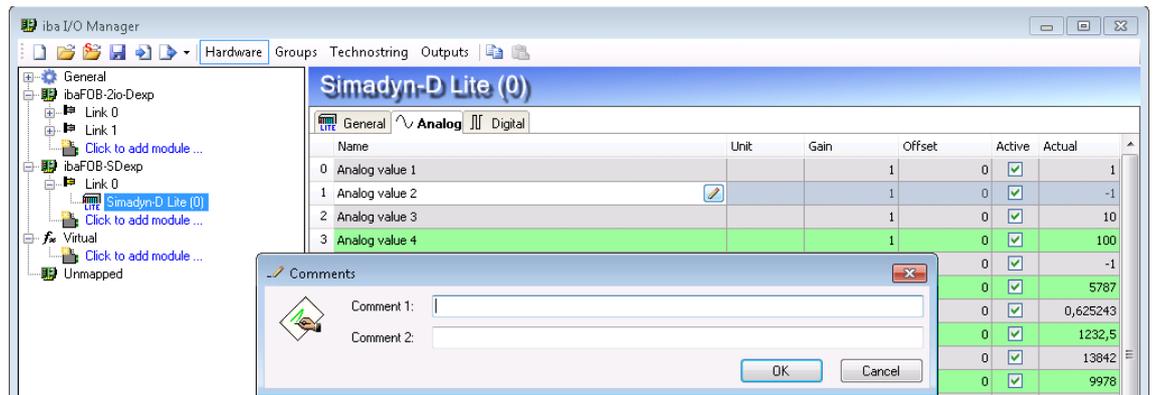


Figure 12: “Analog” tab

Name:

Here you can enter a name for the signal. Two additional comments can be defined for each signal by clicking on the  icon.

Unit:

Here you can specify a physical unit.

Gain / Offset:

For analog values, there is the possibility of scaling the measured raw values to physical values.

Active

Here you can select a specific captured value.

Actual:

Display of current variable raw values in numerical representation.



Other documentation

You will find a more detailed description of the columns in the general ibaPDA manual.

7.2.4 Configuration of Technostring

If the card has been installed correctly the interface Simadyn-D should be available under Technostring.

After adding a Technostring module you can enter the data that is needed for the Technostring reception and the data processing.

After entry of the standard parameters the following settings must be defined:

- Entry of terminator character according to the Technostring definition in chapter 7.1.3 “Technostring”, default is 13 (‘CR’).
- Selection of board type ibaFOB-SD or ibaFOB-SDexp.

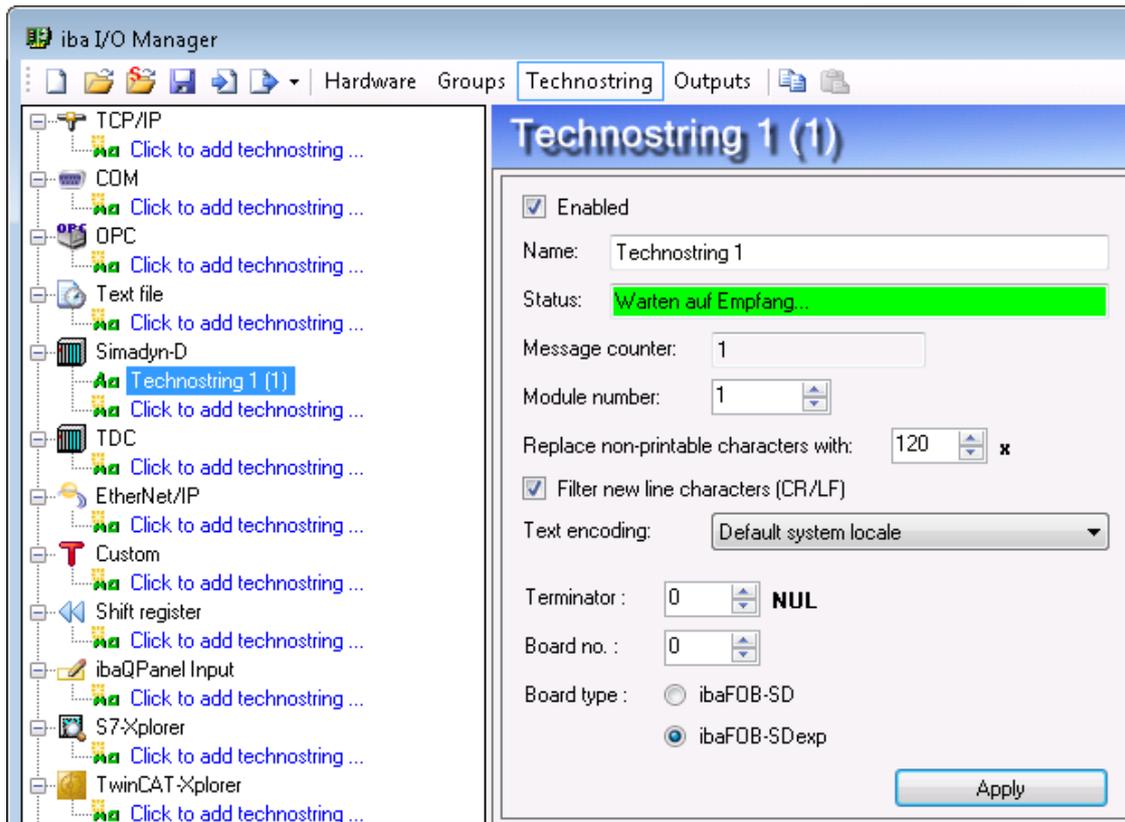


Figure 13: ConfigurationTechnostring



Other documentation

For a more detailed description of the Technostring configuration, please refer to the general ibaPDA manual.

7.2.5 Time synchronization

If you want to synchronize the time with a SIMATIC TDC-CPU or a SIMADYN D-CPU, the following actions are necessary:

Synchronization with DCF77 signal:

- ❑ On the control side, configure the DCF77 time signal and put the bit in the binary scope of a SD-TDC-lite channel, see chapter 7.1.4 “ Time synchronization“
- ❑ Choose the time synchronization with DCF77 signal in the ibaPDA I/O manager.
- ❑ Select the digital DCF77 signal previously taken up in the measurement and set the polarity to “Log. 0”.

After two minutes the time of ibaPDA and the time of the SIMATIC-TDC resp. SIMADYN D system is synchronized.

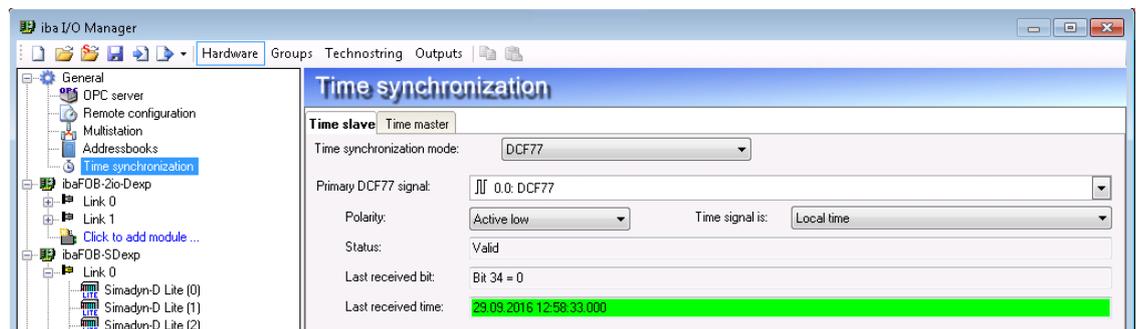


Figure 14: Time synchronization with DCF77-signal

If required, you can specify an additional DCF77 signal on a CPU of another rack. This secondary signal only becomes active if the CPU on which you have projected the primary DCF77 signal fails.

Synchronization with IEC 1131 time signal:

- ❑ Configure the relative time stamp, convert the values to REAL data type and put them in a SD-TDC-lite telegram.
- ❑ Calculate the IEC time signal (relative to 01/01/1972) from the SIMADYN D time stamp (relative to 01/01/1988) by means of virtual signals:
 - Add “567993600” to the seconds
 - Multiply the 1/10 milliseconds with “100”.

Virtuell (99)		
fx General Analog Digital		
	Name	Expression
0	Seconds high	fx [RTCREL.CSH]
1	Seconds low	fx [RTCREL.CSL]
2	1/10 Milliseconds	fx [RTCREL.CSM]
3	Seconds since 1988	fx DWORD([Seconds low], [Seconds high])
4	IEC time seconds	fx [Seconds since 1988] + 567993600
5	IEC time microseconds	fx [1/10 Milliseconds] * 100
6		fx

Figure 15: Calculation of the IEC 1131 time signal

- ❑ Select the time synchronization with IEC 1131 in the ibaPDA I/O manager.
- ❑ In the pick-lists “IEC 1131 time signal” and “Microsecond signal”, select the calculated virtual signals “99:4 IEC time seconds” and “99:5 IEC time microseconds”.

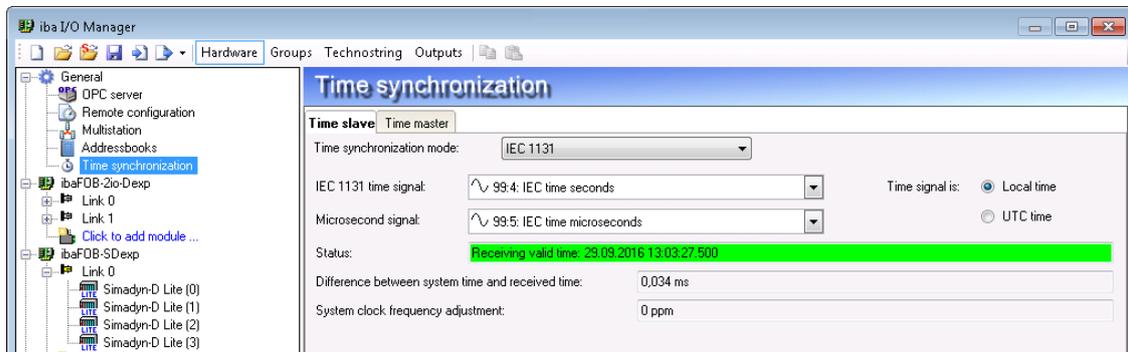


Figure 16: Time synchronization with IEC 1131 time signal

8 Diagnostics

The essential tools for diagnostics are integrated in the I/O manager of ibaPDA.

8.1 General card diagnostics

If you click on the data interface in the tree structure, the image of the card with essential information appears in the right part of the dialog window.

8.1.1 “Configuration” tab

➤ Representation of the card, see chapter 7.2.1 “Card configuration”.

In this tab you will find details on the interface settings and the following information:

PCI bus information:

Name of vendor and device ID, slot and bus number, IO and memory address, IO and memory length are displayed here.

If these fields are empty or contain implausible data, the card is not properly plugged into the PCI slot.

Schematic depiction:

The graphic depiction of the card is dynamic, i.e. the 7-segment display with the card number and the LEDs for the connection status reflect the same status that can be seen on the card itself.

➤ The displays and their meanings are summarized in chapter 5.6 “Indicators”.

8.1.2 “Info” tab

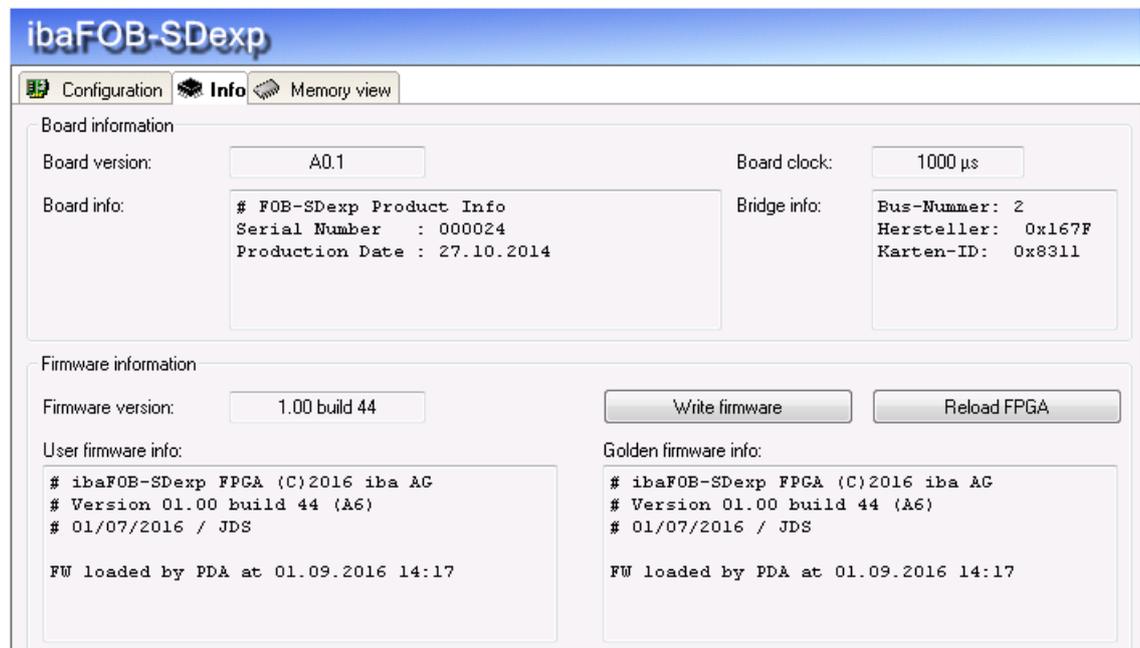


Figure 17: Information

Here you will find information about the card and the current firmware. Service and support features are also integrated, e.g. the reload of the FPGA and the firmware update.

By clicking on the button <Write firmware> a dialog box is opened and the relevant file can be selected.



Important note

An update of the firmware should only be executed after consulting the service and support department of iba AG.

8.1.3 “Memory view” tab

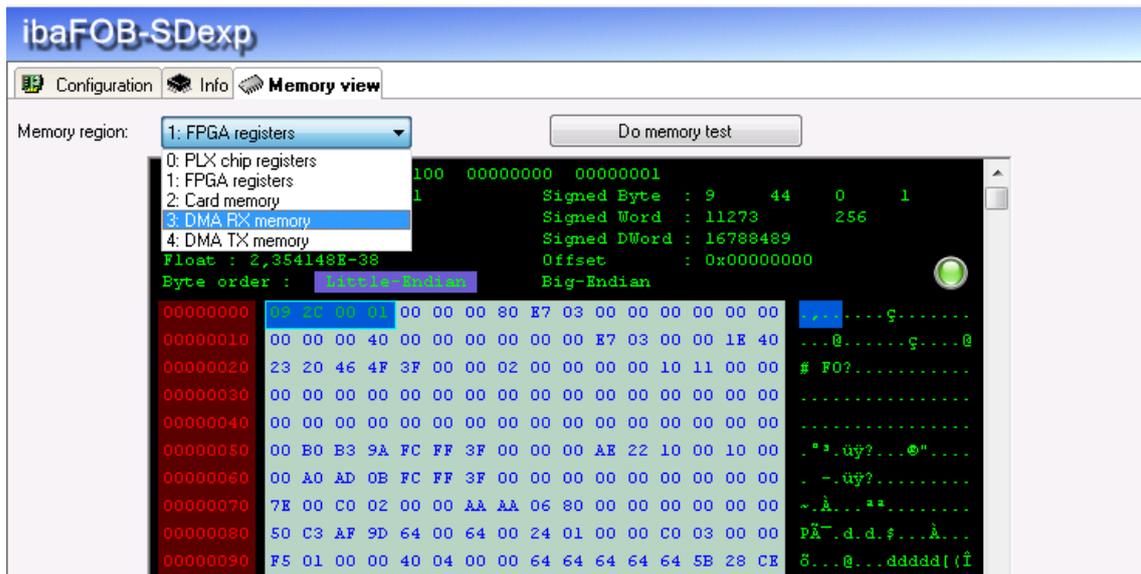


Figure 18: Memory view

Here five different memory regions of the ibaFOB-SDexp card are displayed as hexadecimal codes and strings. The relevant memory region can be selected in the pick-list “Memory region”.

In the context menu (opened by a right mouse click) you can enter the memory address as a decimal or hexadecimal number and you can freeze the display.

8.2 Link diagnostics



Other documentation

For a more detailed description of the following card diagnostics dialogs, please refer to the ibaPDA-Request-SD-TDC manual.

8.2.1 “Configuration” tab

On the “Configuration” tab, you can enter the data that are needed for the connection of ibaPDA to the control.

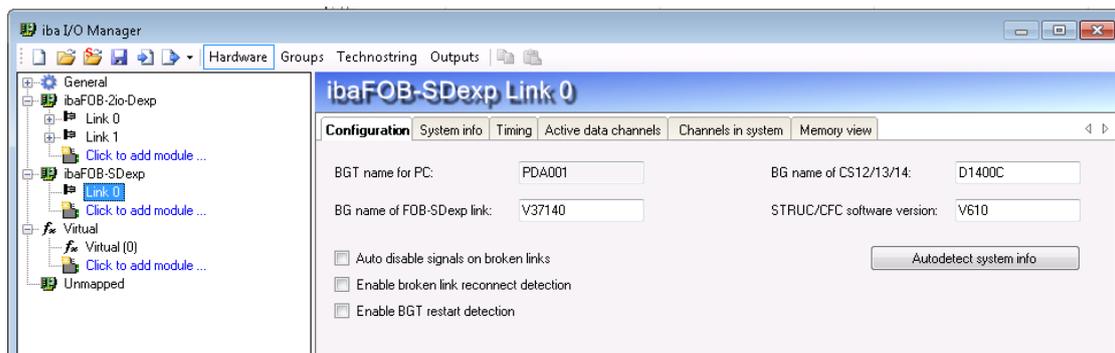


Figure 19: Configuration data

When the link to the control is established, you can read system data from the system by a click on <Autodetect system info>.

➤ For more details, please refer to chapter 7.2.2 “Link configuration”.

8.2.2 “System-Info” tab

The “System info” tab provides information about the link from ibaPDA to the control.

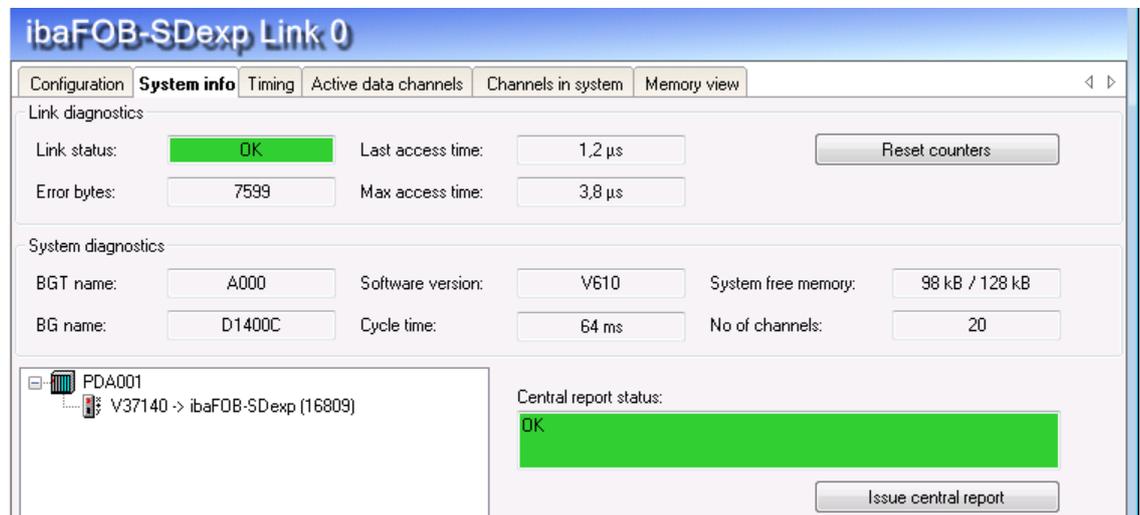


Figure 20: System information

❑ Link diagnostics

shows link status (OK, Error), Error counter, last and max. access time. A click on the <Reset counters> button resets error counter and max. access time.

❑ System diagnostics

shows system information (BGT name, BG name, software version), memory allocation of the coupling partner and the number of channels specified in the memory of the frame coupling. The displayed cycle time is the time, the link is monitored on the ibaFOB-SDexp side and the life counter of the frame coupling registration is incremented.

❑ Registration area

includes BGT and BG names of the connected racks (including links to ibaPDA) and the registration status. Using the button <Issue central report> the ibaFOB-SDexp card can be registered on the control. However, this is not necessary, because it is automatically done by ibaPDA with the first start of the acquisition.

8.2.3 “Timing” tab

Here you'll find information about access of the card to the SIMADYN D CPUs and the access of the card to the memory (DMA).

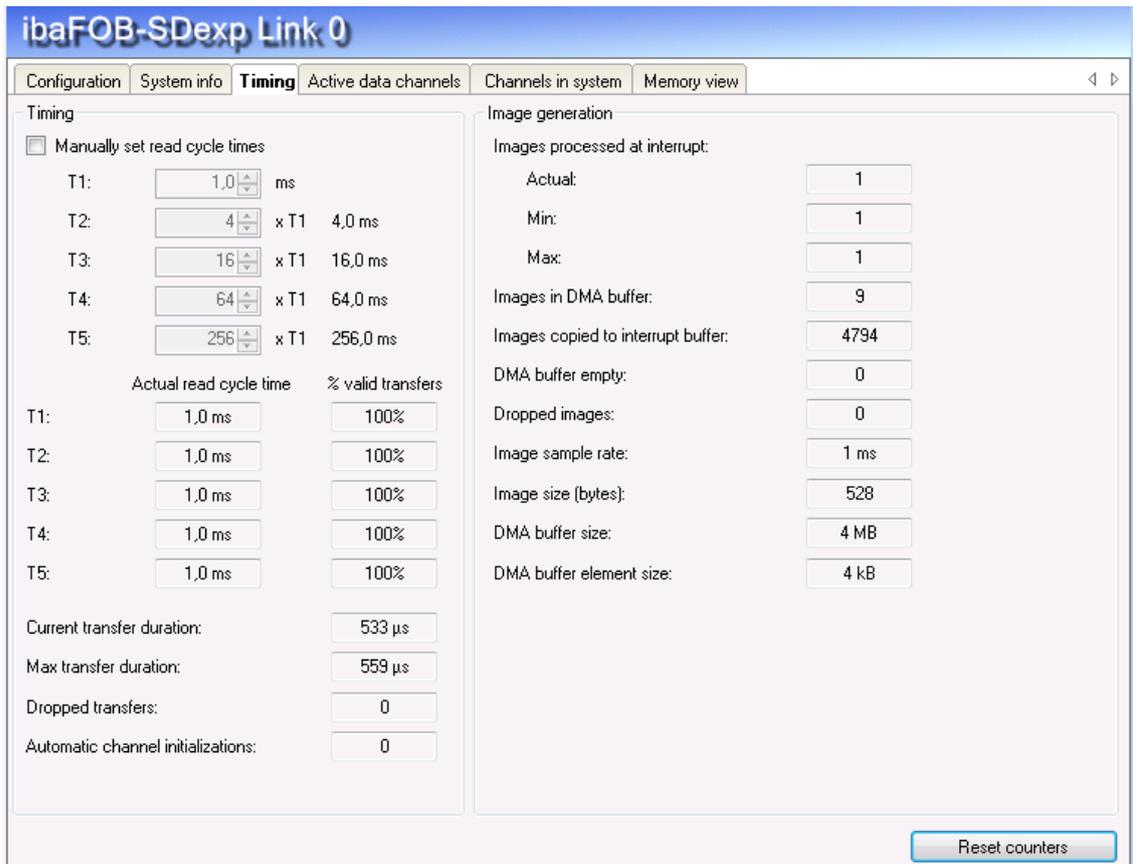


Figure 21: Timing

Timing

These settings apply to the cycle times which are only relevant for the SD-TDC Request system. For SD-TDC-lite cards all channels are assigned to cycle time T1 corresponding to the ibaPDA time base.

The following fields provide essential information:

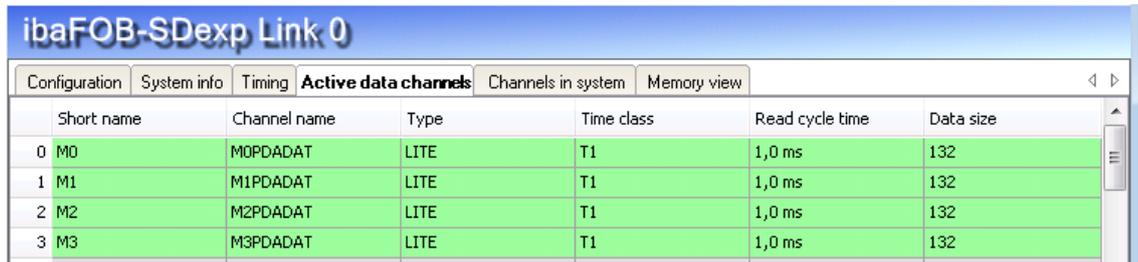
- **Current transfer duration:**
Duration of the transfer of one sample. The ratio of the “Current transfer duration” to the smallest “Actual read cycle time” gives information about the load factor of the ibaFOB-SDexp card.
- **Max. transfer duration:**
Maximum duration of a data transfer since the last reset of the counters.
- **Dropped transfers:**
Number of dropped samples since the last reset of counters.
- **Automatic channel initializations:**
Diagnostic counter for automatic actions.

Image generation

Diagnostic information of DMA access to the ibaPDA memory.

8.2.4 “Active data channels” tab

Here you'll find a table with all data channels, showing information about the configured time class, the access time and the data size.



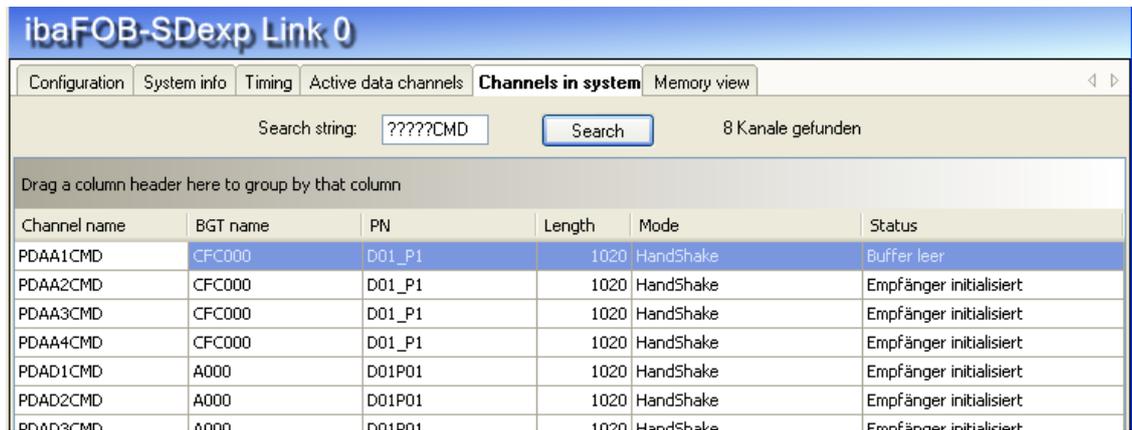
Short name	Channel name	Type	Time class	Read cycle time	Data size
0 M0	M0PDADAT	LITE	T1	1,0 ms	132
1 M1	M1PDADAT	LITE	T1	1,0 ms	132
2 M2	M2PDADAT	LITE	T1	1,0 ms	132
3 M3	M3PDADAT	LITE	T1	1,0 ms	132

Figure 22: Active data channels

A double-click on a row with data opens the memory view for this channel (see also chapter 8.2.6 “Memory view” tab).

8.2.5 “Channels in system” tab

Here you'll get information about the CS 14 card and the configured communication channels. You may enter ‘?’ as wildcard in the search string.



Channel name	BGT name	PN	Length	Mode	Status
PDAA1CMD	CFC000	D01_P1	1020	HandShake	Buffer leer
PDAA2CMD	CFC000	D01_P1	1020	HandShake	Empfänger initialisiert
PDAA3CMD	CFC000	D01_P1	1020	HandShake	Empfänger initialisiert
PDAA4CMD	CFC000	D01_P1	1020	HandShake	Empfänger initialisiert
PDAD1CMD	A000	D01P01	1020	HandShake	Empfänger initialisiert
PDAD2CMD	A000	D01P01	1020	HandShake	Empfänger initialisiert
PDAD3CMD	A000	D01P01	1020	HandShake	Empfänger initialisiert

Figure 23: Channels

The table can be structured hierarchically by moving column headers per drag & drop to the free section above.

Channel name	PN	Mode	Status
BGT name:			
BGT name: A000			
Length: 532			
Length: 1020			
BGT name: CFC000			
Length: 128			
A1PDAACK	D01_P1	HandShake	Sender initialisiert
A2PDAACK	D01_P1	HandShake	Sender initialisiert
A3PDAACK	D01_P1	HandShake	Sender initialisiert
A4PDAACK	D01_P1	HandShake	Sender initialisiert
Length: 136			
A1PDADAT	D01_P1	Refresh	Sender initialisiert
A2PDADAT	D01_P1	Refresh	Sender initialisiert

Figure 24: Channels, grouped by columns

8.2.6 “Memory view” tab

The memory region “1: FPGA registers” of the ibaFOB-SDexp card is shown in the “Memory view” tab.

For more details, please refer to chapter 8.1.3 “Memory view” tab.

9 Synchronization of iba cards

9.1 Important information



Important information

A bad or missing sync-connection may lead to inconsistent data blocks. This would affect the data integrity and data correlation.

Every delivered card comes with a synchronization cable (sync cable) for connecting up to 6 cards. Unused plugs of the cable can left unconnected and must not be terminated.

If you plug in or unplug cards this may change the configuration of the PC. This can affect the signal or I/O configuration of the system because the ID of the boards may change.

In that case move the fiber optic cables to the correct card.

Always save your system configuration before changing hardware components.

9.2 Procedure

You should perform the following steps after you've installed the card:

1. Connect all iba cards with the synchronization cable using the blue plugs.

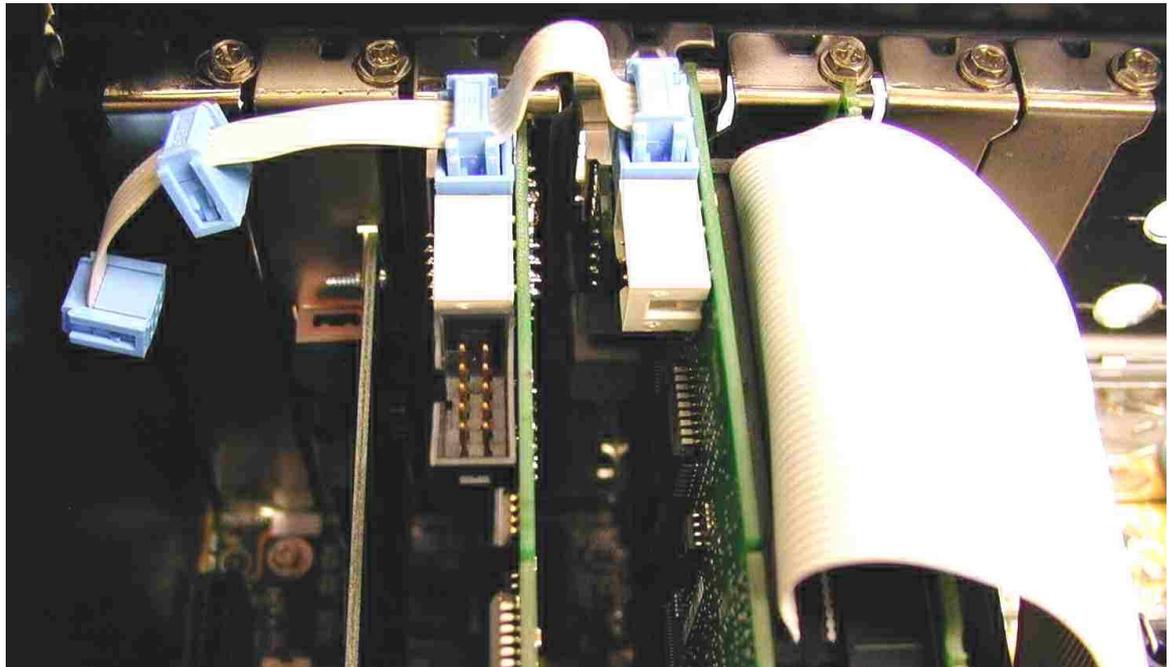


Figure 25: Connecting multiple iba cards by sync cable

2. Close the PC.
3. Plug in the power line.
4. Switch on the power supply of the PC.
5. Start the PC.

10 Technical data

10.1 Main data

Order No.	11.112701
Format/size	PCI Express card
Operating Temperature	From 32 °F to 122 °F (from 0 °C to 50 °C)
Storage Temperature	From -13 °F to 158 °F (from -25 °C to 70 °C)
Transport Temperature	From -13 °F to 158 °F (from -25 °C to 70 °C)
Cooling	Passive
Power Supply	Via PCIe 1.0-x1-compatible slot
Current consumption SLM	Up to 950 mA
FO cable	62.5/125 µm
Coupling	ST Lean
Distance between 2 devices	Up to 1,312 ft. (400 m) without repeater
Weight (incl. Packaging and Documentation)	0.44 lb (200 g)
Number of SD connections	1 (duplex)
Data transmission rate	96 Mbit/s
Fastest sample time	1 ms

10.2 Performance

Extract from a test protocol

ibaFOB-SDexp is connected to CP53M0.

All channels are configured to CPU 555 in time slice T1 = 1ms.

Sample time = 1ms	No. of channels	No. of measured values	Act. duration [µs]	Max. duration [µs]	Duration per MW	Max. duration per MW
Measuring	1	33	140	165	4,24	5,00
	2	66	260	298	3,94	4,52
	3	99	380	430	3,84	4,34
	4	132	500	560	3,79	4,24
	5	165	630	695	3,82	4,21
	6	198	760	820	3,84	4,14
	7	231	900	952	3,90	4,12
Overload	8	264	1030	1085	3,90	4,11

Legend:

Green	FOB load is OK
Orange	FOB overload

The overload range of the card is reached with 7 channels or more (224 analog values [REAL] and 224 digital values) in 1ms.

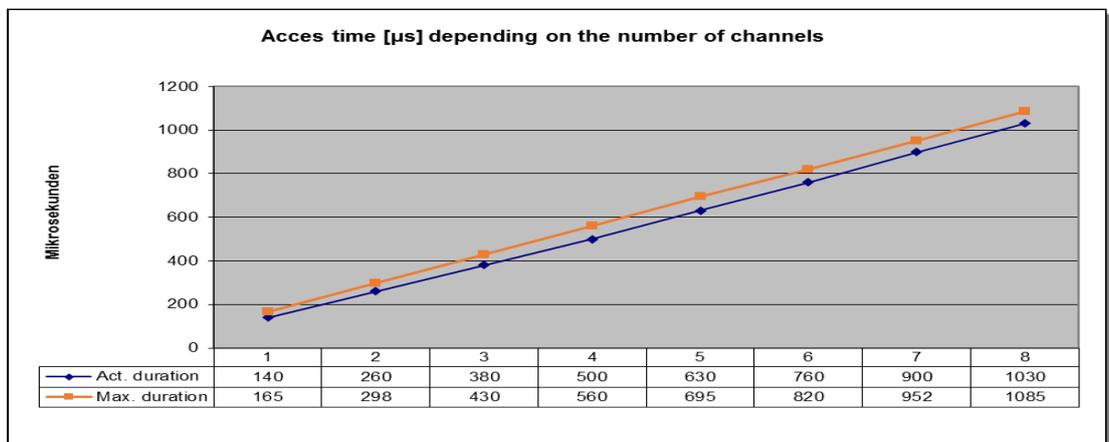


Figure 26: Relation between sample time and number of channels

11 Support and Contact

Support

Phone: +49 911 97282-14

Fax: +49 911 97282-33

E-Mail: support@iba-ag.com



Note

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

Contact

Headquarters

iba AG

Koenigswarterstr. 44

90762 Fuerth

Germany

Phone: +49 911 97282-0

Fax: +49 911 97282-33

E-Mail: iba@iba-ag.com

Contact: Mr. Harald Opel

Regional and Worldwide

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

www.iba-ag.com.