

ibaPDA-SD-TDC Lite

Configuration Guide



Manual

Issue 2.2

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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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.

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1 About this manual

This manual describes the use of the software ibaPDA-SD-TDC Lite.

1.1 Target group

This manual addresses in particular those qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded 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 Basic knowledge

The following basic knowledge is required for operating the software:

- ☐ Basic knowledge of the Windows operating system
- ☐ Basic knowledge of dealing with ibaPDA
- ☐ Basic knowledge of dealing with SIMADYN D, SIMATIC TDC, CFC and D7-SYS

1.3 Designations

The following designations are used in this manual:

Action	Designations
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> + <Strg>
Buttons	<Button name> Example: <OK>; <Cancel>
File names, Paths	„File name“, "Path" „Test.doc“

1.4 Used symbols

If safety instructions or other notes are used in this manual, they mean:

DANGER

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

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

WARNING

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

CAUTION

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



Note

A note specifies special requirements or actions to be observed.



Important note

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



Tip

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



Other documentation

Reference to additional documentation or further reading.

2 System requirements

2.1 iba Hardware

- ☐ PCI card ibaFOB-TDC or ibaFOB-SD or
- ☐ PCI express card ibaFOB-TDCexp or ibaFOB-SDexp

2.2 iba Software

- ☐ ibaPDA basic license starting with V6.7.0 or ibaPDA V6.32.0
- ☐ Additional license ibaPDA-SD-TDC Lite
- ☐ For time synchronization in CFC:
iba function block library FBAPDA

2.3 Siemens Hardware

Interface for ibaFOB-SD/-SDexp:

- ☐ 1 free port on SIMADYN D – component CS12, CS13 or CS14
- ☐ 1 free port on SIMATIC TDC – component CP53

Interface for ibaFOB-TDC/TDCexp:

- ☐ 1 free port on the interface component CP51IO in the Global Data Memory

2.4 Siemens Software

- ☐ STRUC starting with V4.2.1
or
- ☐ CFC beginning with V6.0 with
D7-SYS beginning with V6.0

3 General information

3.1 Overview

iba AG offers the following solutions for access to Siemens SIMADYN D and SIMATIC TDC:

Target sys-tem	Interface	Transmission	iba Interface	Manual	License
SIMADYN D	CS12/13/14	FO	ibaFOB-SD ibaFOB-SDexp	TDC-/SD-Request	TDC-/SD-Request
				TDC-SD-Lite	TDC-SD-Lite
	ibaLink-SM64-SD	FO	ibaFOB-D	SM64-SD16	-
	CS7/SS52	Profibus	DPMS / L2B	-	-
SIMATIC TDC	CP53	FO	ibaFOB-SD	TDC-/SD-Request	TDC-/SD-Request
				TDC-SD-Lite	TDC-SD-Lite
	GDM		ibaFOB-TDC ibaFOB-TDCexp	TDC-/SD-Request	TDC-/SD-Request
				TDC-SD-Lite	TDC-SD-Lite
	CP50	Profibus	DPMS / L2B	FM/TDC-Profibus-Request	FM/TDC-Profibus Request
				-	-
	CP51	Ethernet	-	Interface TCPIP- UDP	Interface TCPIP-TDC

In this manual, the issues marked in green are dealt with.



Other documentaion

The request interfaces with a blue background are described in the "ibaPDA-Request-SD-TDC" manual. The request interface with a yellow background provides access to old SIMADYN D systems starting with STRUC V2.2. For this, see the "ibaLink-SM-64-SD16" description.

Other than the special iba interfaces, standard interfaces are available via Profibus and TCIP/IP or UDP. For this, see the corresponding manuals.



Note

In this document, all statements made about ibaFOB-SD- or ibaFOB-TDC-cards also apply to the PCI-express cards ibaFOB-SDexp and ibaFOB-TDCexp. Exceptions are mentioned explicitly.

3.2 Foundations

You can connect ibaPDA directly to SIMADYN D and SIMATIC TDC systems with the ibaFOB-SD and ibaFOB-TDC cards.

Communication protocols are implemented on these cards that facilitate direct connection to the Siemens rack links. From the perspective of a Siemens control, the ibaPDA computer acts like a connected Siemens rack.

In this document, all coupling components are designated as rack links that also facilitate connection of ibaFOB-SD or ibaFOB-TDC cards. They are:

- ❑ SIMADYN D: CS12, CS13 and CS14
- ❑ SIMATIC TDC: CP53 and GDM (Interface card CP52IO)

All CPUs of all frames that are connected by a rack link component can communicate with one another. If the ibaFOB-SD or ibaFOB-TDC is likewise connected to this rack link, then all these CPUs can in principle also communicate with ibaPDA or ibaLogic.

In practice the number of possible CPUs is limited by:

- ❑ Max. number of channels per FOB-SD/-TDC card and rack link component
- ❑ Limited data rate of ibaFOB-SD/-TDC cards
- ❑ Capability of the fiber optic connection

On an ibaPDA-PC 4 cards of every type can be operated (also mixed).

The cards differ as follows:

	ibaFOB-SD/-SDexp	ibaFOB-TDC/-TDCexp
FO Interface	ST technology	SC technology
Baud rate	96 Mbit/s	640 Mbit/s
Possible coupling partners	SIMADYN D: CS12 / CS13 / CS14	
	SIMATIC TDC: CP53	SIMATIC TDC: CP52IO (GDM)

	ibaFOB-SD/-TDC	ibaFOB-SDexp/-TDCexp
PC Interface	PCI	PCI express
Memory access	via CPU	DMS



Other documentation

For this, see the manuals of the ibaFOB-SD and ibaFOB-TDC components in the download area of our website www.iba-ag.com.

Special features of the CP53 component (available in SIMATIC TDC starting with D7-SYS V7.1):

The component can be configured as master or slave. In the master mode, one port can be used for connection of ibaPDA (ibaFOB-SD card) and the other for connection of a slave rack. The slave rack is either SIMADYN D with the CS22 component or SIMATIC TDC with the CP53 component (slave mode). In the slave mode, the 2nd port cannot be used.

For connection with SD under STRUC, the component has to be initialized in the STRUC mode. Then no ibaPDA access to the CFC-CPU is possible.

Special features of the CS12/13/14 components (SIMADYN D):

The components differ only in the number of optical fiber connections (1, 4 or 8). When CS14 is mentioned in what follows, the information also applies to CS12 and CS13. Any free port can be occupied on one of these components.

Special features of the Global Data Memory (GDM) (in SIMATIC TDC) :

The GDM is a complete frame in which there are only the CP52M0 memory component and max. 11 interface components (CP52IO). Each interface component makes four ports available. All ports have equal access.

3.3 Functional principle

In the measuring operation, numerical and digital signals are measured, i.e., variables are read out of the computer system and recorded. In defining the variables to be measured, two procedures are differentiated:

☐ **SD-TDC Lite**

All values that you want to measure with ibaPDA have first to be projected in process data telegrams.

To change the measurement scenario, you have to change the projection.

☐ **Symbolic Request:**

You do not define the variables to be measured in the control, but rather in ibaPDA.

The iba cards and ibaPDA both support both procedures, but on one card you can only configure one mode. If there are more cards and both licenses available, both procedures can be used at the same time in ibaPDA .

For one card, the following applies:

If at least 1 Lite channel is defined, a Request channel cannot be assigned to this card.

If a Request channel is assigned to this card, a Lite channel cannot be added.



Other documentation

You find a description of the "Symbolic Request" mode in the "ibaPDA-SD-TDC Request" manual.

3.4 Characteristics of the SD-TDC Lite interface

- ☐ No random access to the connectors in the control is possible with SD-TDC Lite. All data to be recorded must be projected on the control.
- ☐ On the Siemens side, max. 16 TDC-Lite transmission channels and 8 reception channels can be projected per rack link and per connection.

- ❑ Exactly 32 analog values (data type Real or NF) and 32 bits (a value of the data type DW or DI or V4 or I4) are to be projected in each channel.
- ❑ The data are transmitted in process data telegrams, as with a standard rack link. The names of the channels are established by iba.
- ❑ REFRESH is to be set as channel mode. Starting with ibaFOB-SD/TDC firmware version B3, MULTIPLE channel mode is also possible for the transmission channels.
- ❑ If you have set the MULTIPLE channel mode, then the transmission channels can be received in parallel by different receivers, e.g., by several ibaPDA systems or ibaPDA and ibaLogic.
- ❑ Projection of the SER04A and SER04B service function blocks and import of the address books into ibaPDA are not necessary.

Summary of the differences between SD-TDC Request and SD-TDC Lite

	SD-TDC Request	SD-TDC Lite
Number of SIMATIC TDC links per ibaPDA	4	4
Access procedure	Random connection	Fixed connection
Number of transmission telegrams per link and rack link	Max. 50 per FOB-SD/TDC	Max. 16
Number of reception telegrams per link and rack link	-	Max. 8
Channel mode: data channels	Refresh	Refresh or Multiple
Number of analog values per channel	Max. 32	Exactly 32
Number of binary values per channel	Max. 32	Exactly 32
Number of channels per link	Max. 50	Max. 16 output (→ ibaPDA) Max. 8 input (→ control)
Format of measurement values	REAL, INT, DINT, BYTE, WORD, DWORD	Only REAL
Technostring channel (unformatted ASCII-String)	PDA_ASCII	PDA_ASCII
Channel mode: Technostring	Handshake	Handshake
Projection on TDC	Service buding blocks SER04A/-B SER05A/-B	Standard transmission and reception function blocks CTV/CRV
Address books	Yes	No

4 Configuration on SIMADYN D / SIMATIC TDC

4.1 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 9: M8PDADAT
 - Channel 10: M9PDADAT
 - Channel 11: MAPDADAT
 - : :
 - Channel 16: MFPDADAT
- ☐ The data structure of the telegrams is established and cannot be changed (32 analog values and 32 binary values).
- ☐ The channels are to be projected as process data channels in the REFRESH or MULTIPLE channel mode.
- ☐ The channels can be on different processors. The CTS connectors of the transmission function blocks must indicate the rack link component to which ibaPDA/ibaLogic is also connected.
- ☐ The channels can be projected in different time slices.
- ☐ The "CTV" or "CTV_P" function blocks are to be used for transmission.



Note

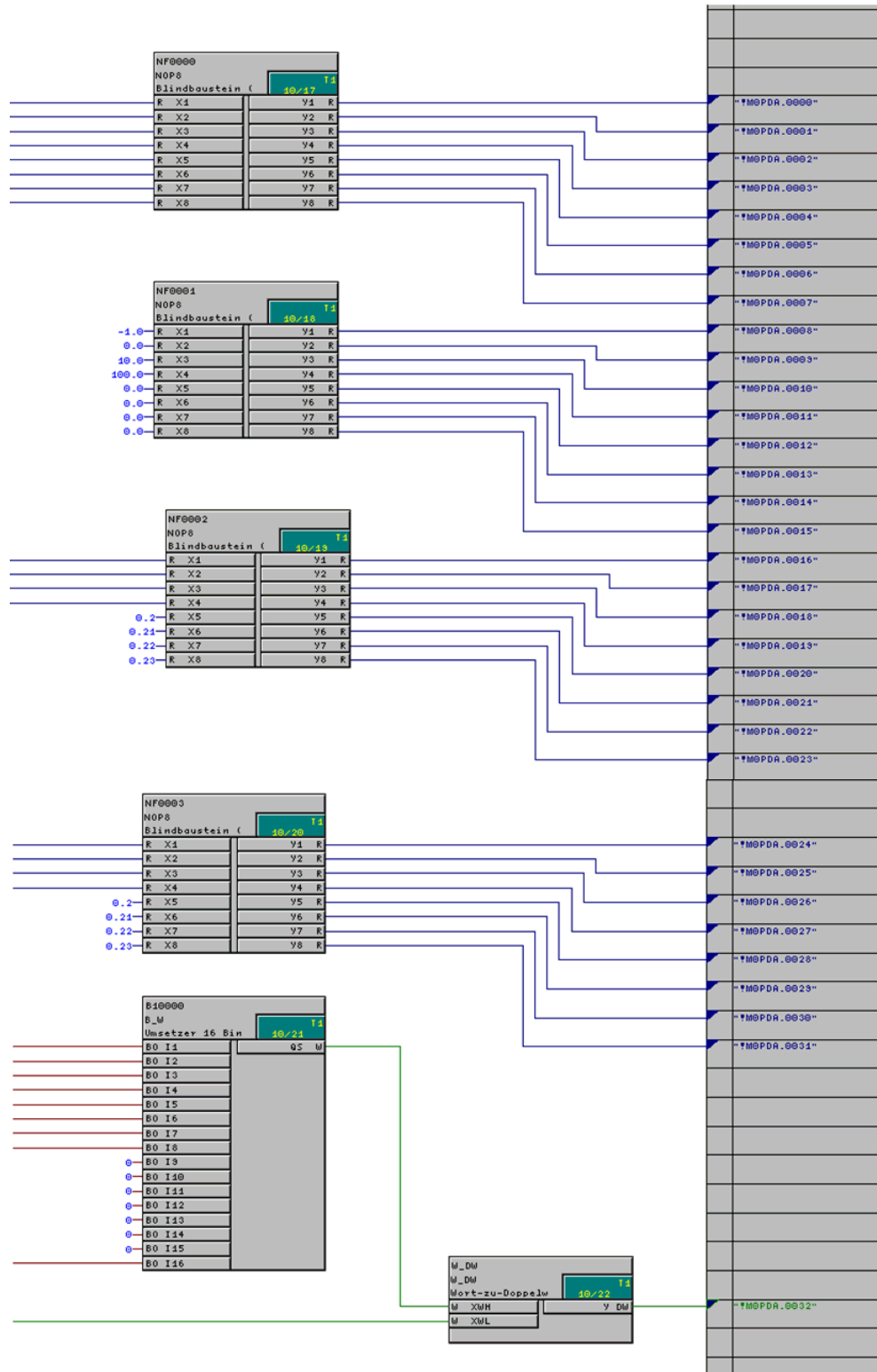
When using the CTV function block, you have to apply all telegram data to the virtual connection (see example below).

When using the CTV_P function block, you only have to enter the telegram length 132 bytes at the LEN connector.

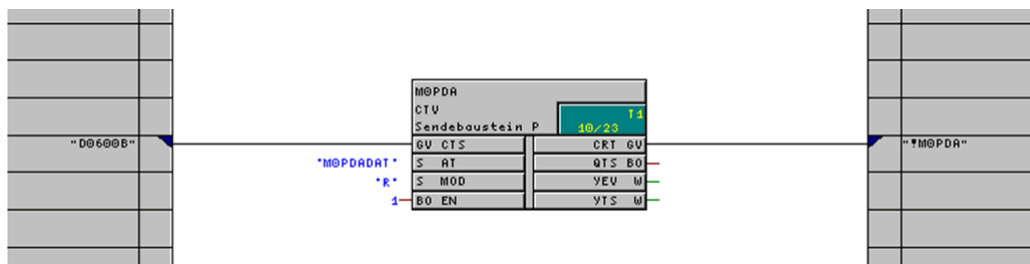
Example transmission channel with CTV (CFC)

1. Generation of telegram data:

32 analog values (data type: Real) and 32 bits (data type: DW), telegram name: !M0PDA



2. CTV transmission function block:



Description of the CTV connectors:

Connector	Value	Description
CTS	D0600B	Component name of CP52A0, connection to GDM
CRT	!M0PDA	Telegram name (virtual connection)
AT	M0PDADAT	Name of the transmission channel
MOD	R	REFRESH channel mode
EN	1	Transmits the cycle of the time slice

4.2 Reception channels



Note

Reception channels only make sense for ibaLogic applications.

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

- ☐ The names of the channels are established and should not be used elsewhere. The names of the max. 8 reception channels (from the perspective of the control) are as follows:
 - Channel 1: PDAM0DAT
 - Channel 2: PDAM1DAT
 - : :
 - Channel 8: PDAM7DAT
- ☐ The data structure of the telegrams is established and cannot be changed (32 analog values and 32 binary values).
- ☐ The channels are to be projected as process data channels in the REFRESH channel mode.
- ☐ The channels can be on different processors. The CTS connectors of the CRV reception function blocks must indicate the rack link component to which ibaPDA/ibaLogic is also connected.
- ☐ The channels can be projected in different time slices.
- ☐ The "CTV" or "CTV_P" function blocks are to be used for reception.

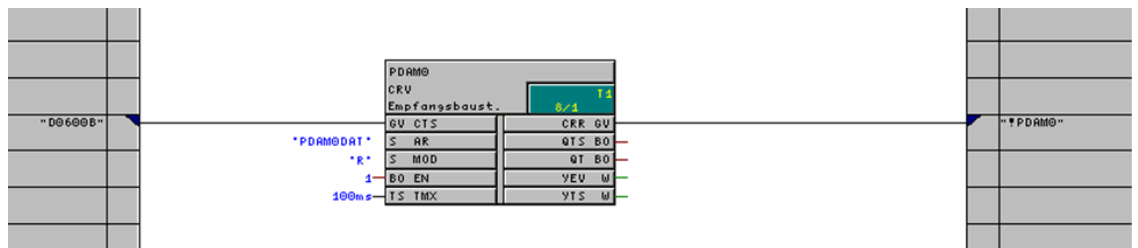
**Note**

When using the CTV function block, you have to apply all telegram data to the virtual connection (see example below).

When using the CTV_P function block, you only have to enter the telegram length 132 bytes at the LEN connector.

Example: reception channel with CRV (CFC):

1. CRV reception function block:

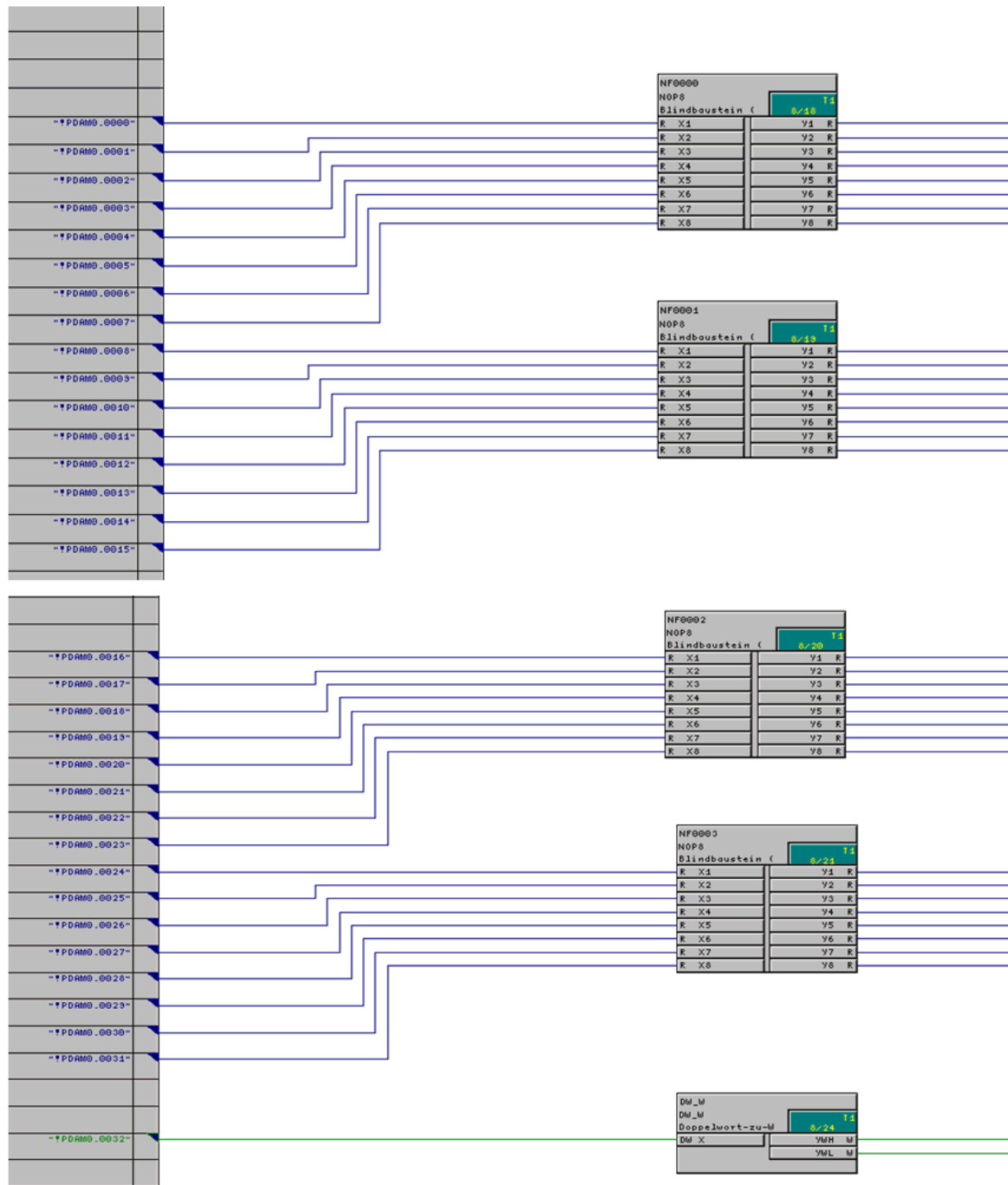


Description of the CRV connectors:

Connector	Value	Description
CTS	D0600B	Component name of CP52A0, connection to GDM
CRT	!PDAM0	Telegram name (virtual connection)
AT	PDAM0DAT	Name of the reception channel
MOD	R	REFRESH channel mode
EN	1	Transmits in the cycle of the time slice
TMX	100 ms	Timeout for reception telegrams

Application of the reception data:

32 analog values (data type Real) and 32 Bits ('Data type DW');
telegram name: PDAM0.



4.3 Technostring (TS)

The TS is a 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

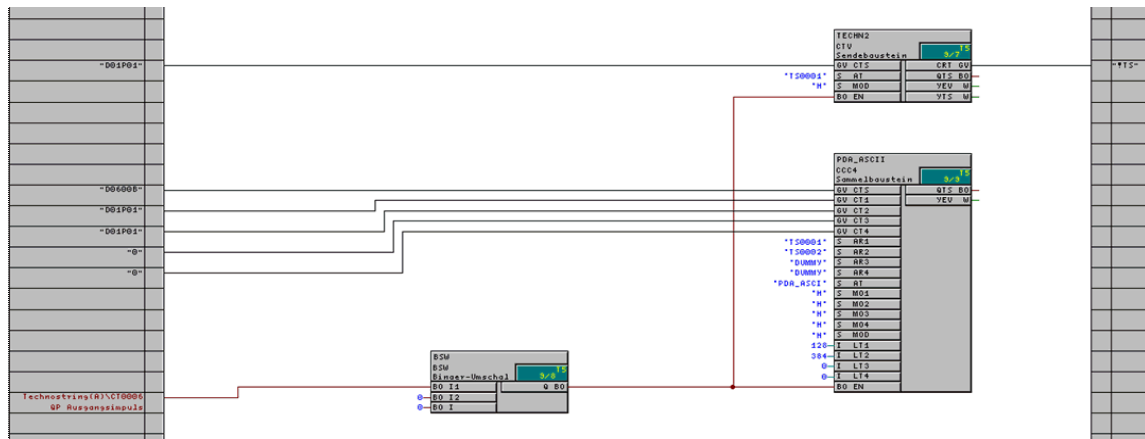
Example: transmission of technostring (CFC):



Note

When using the CTV function block, you have to apply all telegram data to the virtual connection or put the telegram together from 2 partial telegrams (see example below).

When using the CTV_P function block, you only have to enter the telegram length 512 bytes at the LEN connector.



Explanation

The "TECHN2" function block transmits the actually relevant ASCII string, length: 128 bytes, applied in "!TS", into an internal data channel (TS0001).

The "PDA_ASCII" function block receives this data channel and adds a second "empty" buffer (TS0002) to it in order to get the required end length of 512 bytes. This only serves to fill up the telegram to a length of 512 bytes.

The entire telegram is then transmitted as "PDA_ASCII" channel to the rack link component.

Description of the CCC4 connectors:

Connector	Value	Description
CTS	D0600B	Component name of CP52A0, connection to GDM for transmission
CT1	D01P01	Connection to its own CPU, for reception: part 1
CT2	D01P01	Connection to its own CPU, for reception: part 2
CT3	0	Not required
CT4	0	Not required
AR1	TS0001	Channel name: telegram part 1 (contains relevant TS data)
AR2	TS0002	Channel name: telegram part 2 (contains empty buffer)
AR3	DUMMY	Not required
AR4	DUMMY	Not required
AT	PDA_ASCII	Channel name of the transmission channel (complete Technostrng)
MOD1...4	H	HANDSHAKE channel mode
LT1	128	Length of telegram, part 1
LT2	384	Length of telegram, part 2 (yields total of 512)
LT3...4	0	Not required
EN		Transmission pulse

4.4 Time synchronization

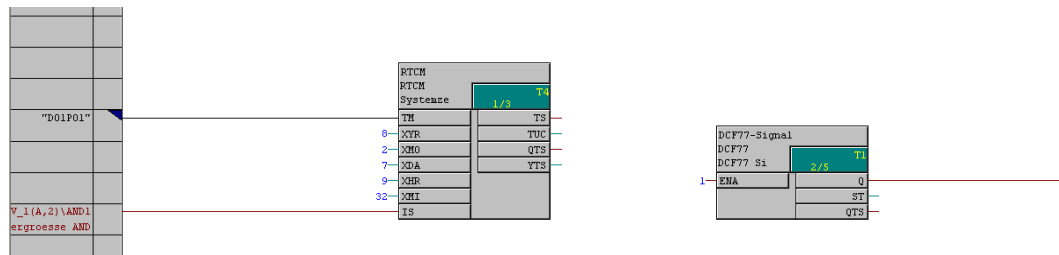
If you want to synchronize the time of the ibaPDA system with the Siemens control, then you have to project an **RTCM** function block that reads the system time from a source or generates it itself and distributes it on the frame. This time function block may only be projected once per frame.

Synchronization under CFC 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. Put it on a bit of a PDA Lite telegram.

The function block is contained in the FBAPDA function block library of iba AG.

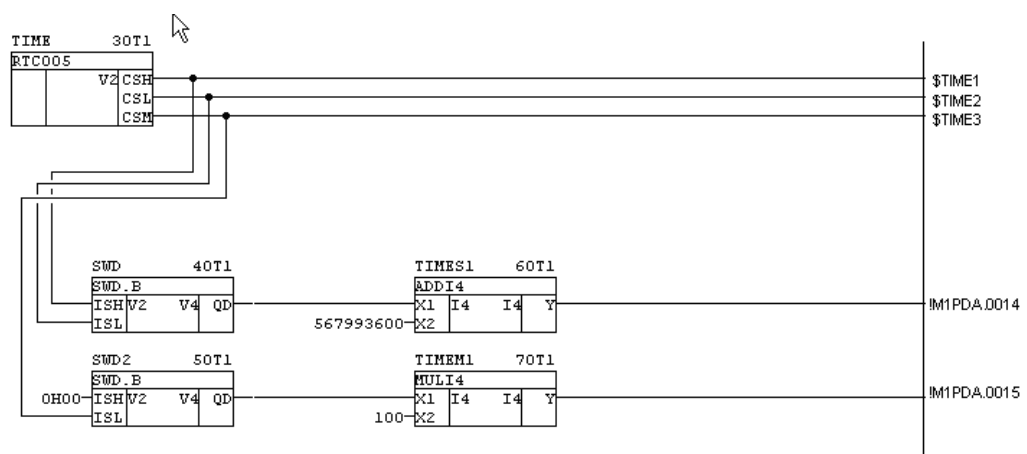
Interconnection



Synchronization under STRUC is done with a time signal consisting of a 32-bit value for the seconds starting with 1.1.1970 and a 32-bit value for the microseconds.

For this, add the number "567993600" to the seconds value which the RTC005 function block supplies (difference between 1.1.1970 and 1.1.1988 in seconds). Multiply the 1/10-millisecond counter by 100 to get the microsecond value.

You can enter both I4 values directly into the Lite telegram, e.g., !M1PDA.0014 and !M1PDA.0015.



5 Configuration in ibaPDA-V6

For configuration, we recommend adhering to the following sequence:

- ☐ ibaPDA – standard settings
- ☐ Apply data modules
- ☐ Mark the signals

5.1 ibaPDA standard settings



Other documentation

For settings of time basis, interrupt, etc. see ibaPDA-V6 manual.

5.2 Hardware interfaces ibaFOB-SD/ibaFOB-TDC

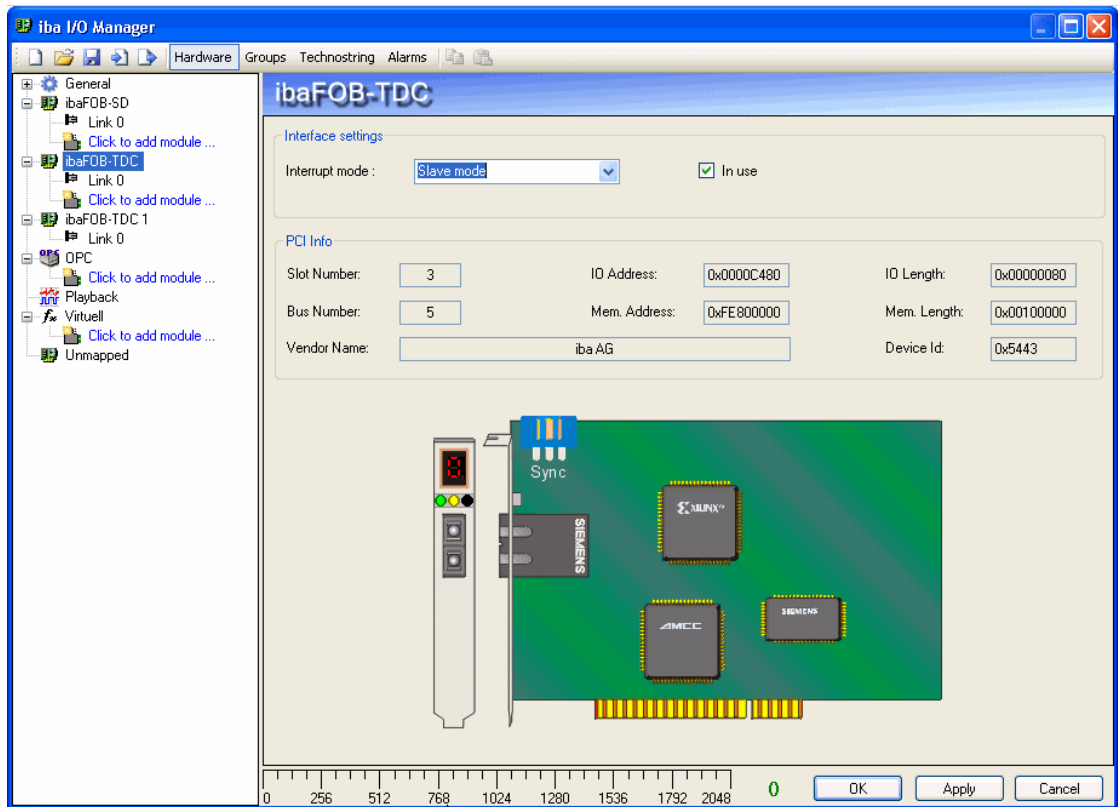
1. In the ibaPDA client, open the I/O manager and click on the "New configuration" icon. ibaPDA detects the installed components and the licensed data interfaces and represents them in the tree structure.

The iba components are schematically depicted in the dialog window if they are marked in the hardware tree.

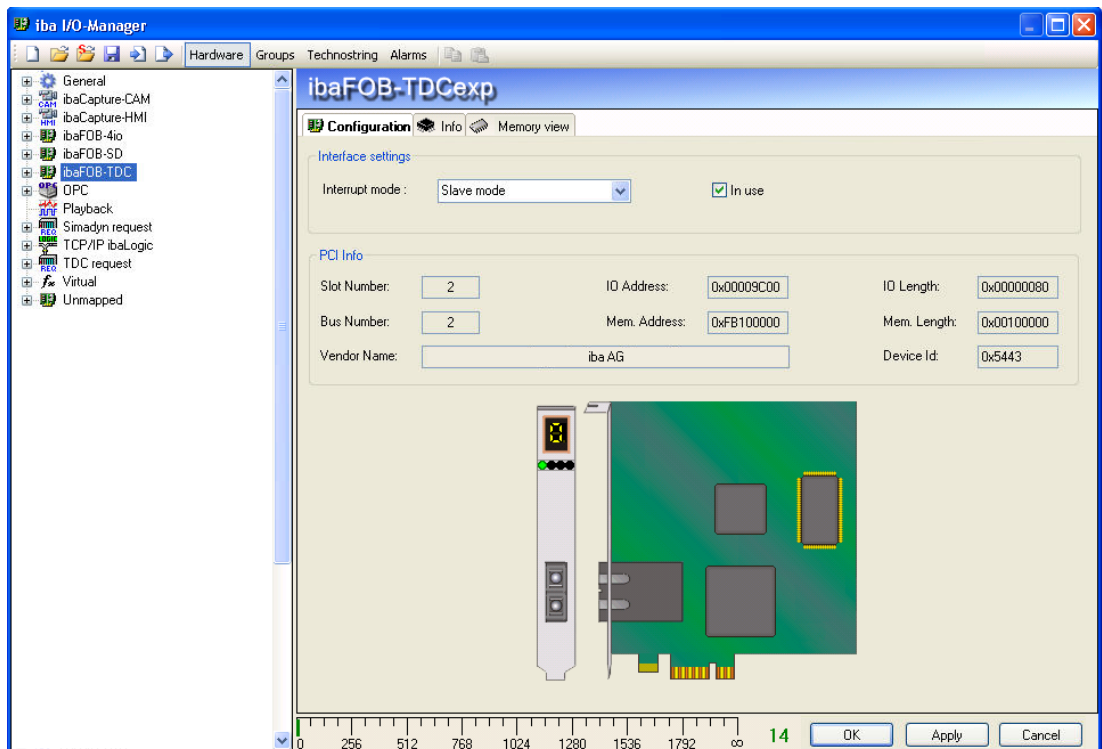
Since the ibaFOB-SD and ibaFOB-TDC are not functionally different, only the ibaFOB-TDC card is described in the following. This description also applies to the ibaFOB-SD card, unless something else is explicitly mentioned.

5.2.1 Schematic depiction of the iba cards

ibaFOB-TDC card:



ibaFOB-TDCexp card:



You get the following information in the dialog window:

☐ Interface settings

Set the interrupt mode and activate the "In use" check box.



Important note

Set the ibaFOB-SD or ibaFOB-TDC as interrupt master if you use aside from these only ibaFOB-ii-S or ibaComL2B-i/8.

☐ PCI info

You can find information about the PCI interface in the PCI info area of the dialog.

It is of interest only to developers.

☐ ibaFOB-SD-/TDC card display

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 also be seen on the card itself.

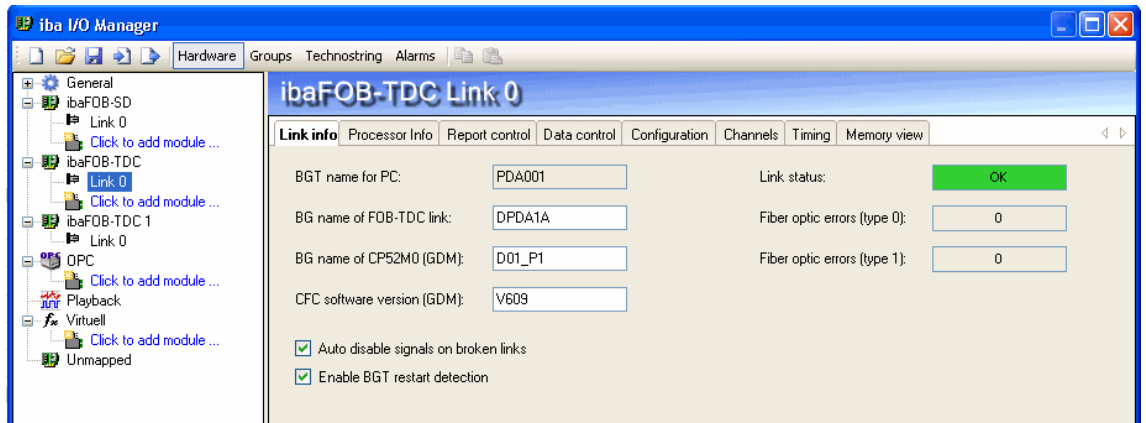
The displays and their meanings are summarized in the following table:

	Values/states	Meaning
7 segment display	0 ... 3 - 8	Card number of this type (0...3) → OK Card is not initialized → error Card does not start up (μ-processor stops) → error
Point in the 7 segment display	On Off	Card set-up: "Interrupt master / internal" Card set-up: "Interrupt slave"
Green LED (RUN)	Flashes Off or on (static)	Voltage applied, card is working μ-processor stops → error
Yellow LED (LINK)	On Off Flashes	connection to the coupling partner exists → ok No telegram traffic or no connection Connection ok, but partner not ready
White LED (only with -exp)	On Off	Data transfer active No data transfer
Red LED (ERR)	Off On	Normal state Internal component error

5.2.2 Link level

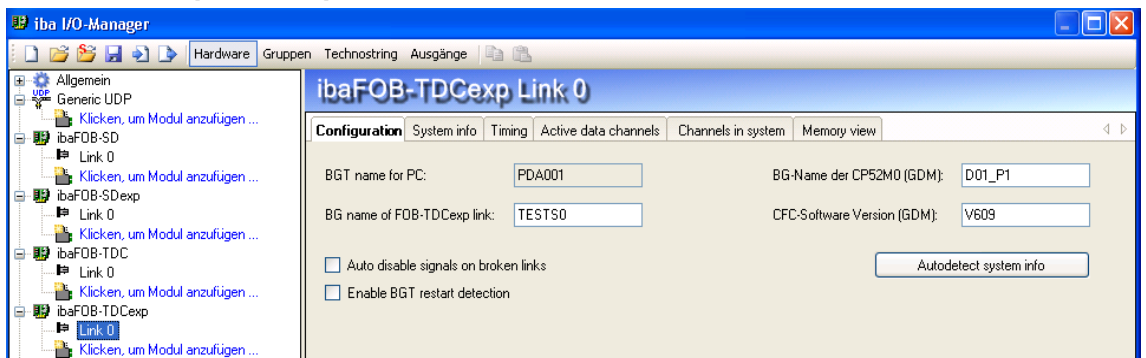
If you mark "Link 0" under the ibaFOB-TDC in the hardware tree, then the menus for diagnosis of the communication connection appear on the right side:

ibaFOB-SD/-TDC:



(Please see the diagnosis description in chap. 5.5)

ibaFOB-SDexp/-TDCexp:



(Please see the diagnosis description in chap. 5.6)

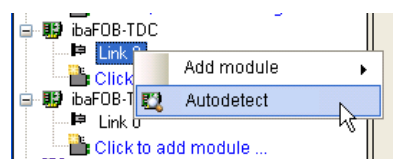
5.3 SD-/TDC Lite Module

Below the link level of the ibaFOB-SD/-TDC in the hardware tree, the "Click to add module" command is visible.

- Add a module for each channel to be received

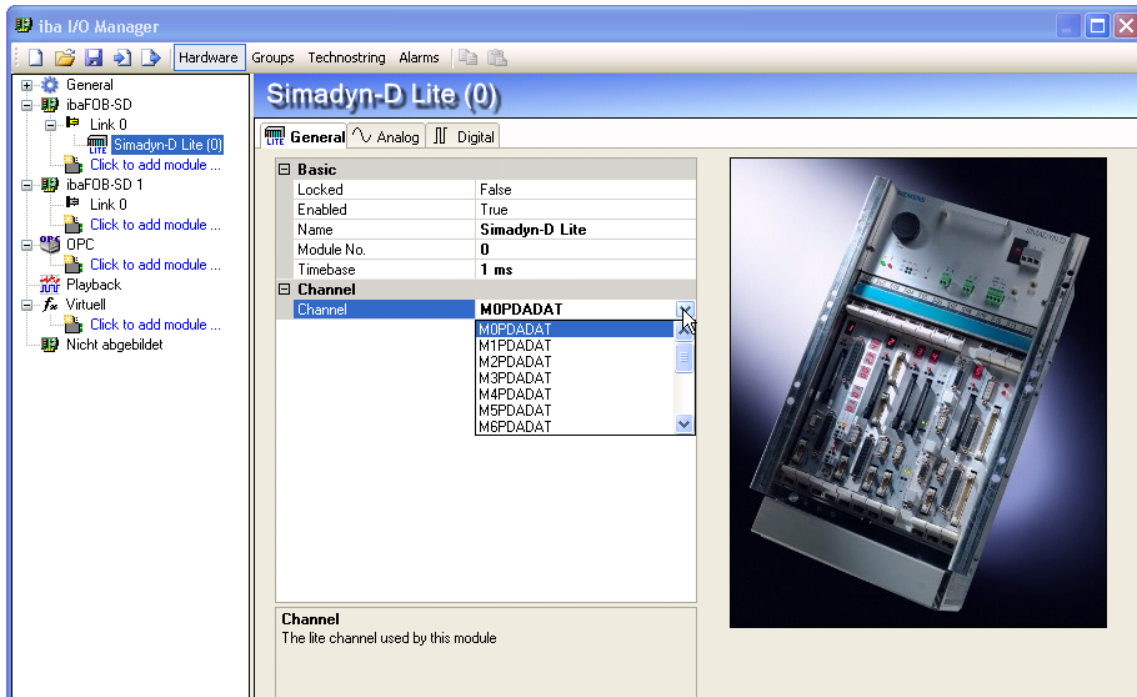
or

- Choose from the context menu (right mouse click on "Link 0") the "Autodetect" menu point



When a connection exists, a Lite module is created for every Lite channel projected in the control.

5.3.1 "General" tab



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

Locked	If you click on a field, then the description is displayed in the text field below the entry fields. For this, see also the general ibaPDA manual or online help: <F1>.
Enabled	
Name	
Module No.	
Time base	
Show gain and offset	
Channel name	Under Channel name a pull-down menu opens in which you can choose one of 16 channels. You thereby assign to this module an output channel projected in the control.



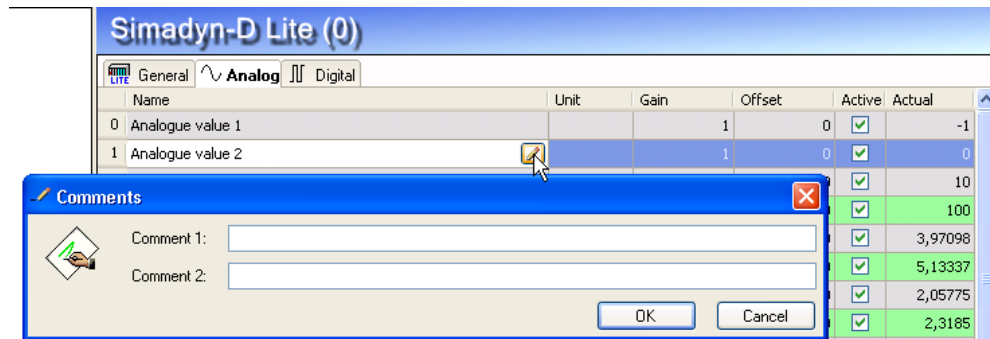
Note

Make sure that the channel selected is really projected on the control.

5.3.2 "Analog" and "Digital" signal tables tab

Enter the designations of the measurement values in the "Analog" and "Digital" signal tables.

By clicking on the symbol at the right edge of the field, the comment fields open in which you can enter two comments.



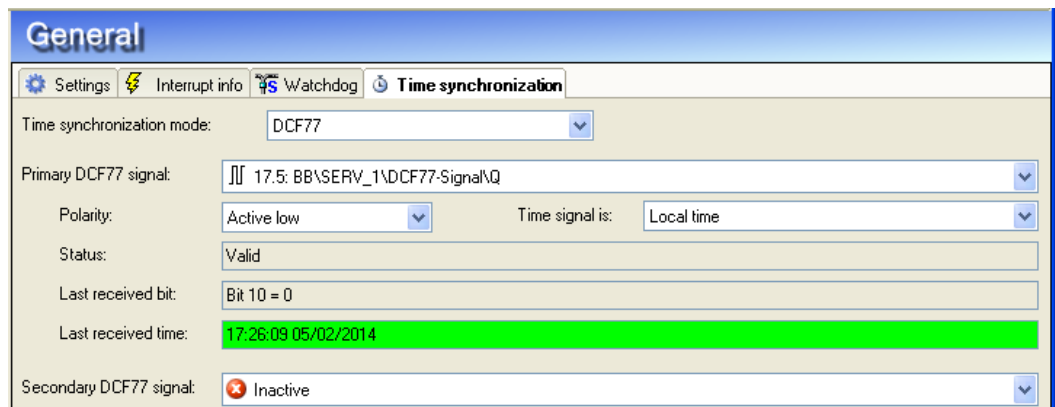
For analog values, there is the possibility of scaling the measured raw values. For this, the "Show gain and offset" option has to be activated in the "General" tab.

5.4 Time synchronization

There are two mechanisms available for time synchronization with the Siemens control. For this, see the projection instructions in chap. 4.4.

5.4.1 Synchronization with DCF77 signal (for CFC programs)

1. Choose the "General - time synchronization" menu in the ibaPDA I/O manager.
2. In the "Primary DCF77 signal" pick-list, select the DCF77 signal previously taken up in the measurement.
3. Set the polarity to "Log 0 = pulses active" (presetting).
4. In the "Local time" selection list, choose "UTC time" or "UTC time with DST".



- Apply the setting with <OK> or <Apply>. Initially, the "Last received time" field is shown in red. After two minutes the time is synchronized. Then the field has a green background. Time is now synchronized every minute, or every second if you have activated the "Synchronize every second" check box.

If the color is red, then the time is not synchronized. The DCF77 signal may be faulty or too inaccurate.

- ❑ To ensure the synchronization, you can specify a second source for synchronization. The secondary DCF77 signal only becomes active if the CPU on which you have projected the primary DCF77 signal fails.



Note

Make sure that the signal is as exact as possible, i.e., measured with the fastest possible acquisition time, ideally with 1 ms.

5.4.2 IEC time signal (for STRUC programs)

1. Choose the "Time synchronization" register from the "General" menu in the ibaPDA I/O Manager.
2. Select the time synchronization mode "IEC 1131"

3. In the "IEC 1131 time signal" dropdown menu, select the seconds signal previously taken up in the measurement.
4. In the "Microseconds signal" dropdown menu, select the microseconds signal previously taken up in the measurement.



Note

In the projection example given in chapter 5.2.2 those are the values 14 and 15 in the M1PDADAT telegram.

5. Select "Local time" or "UTC time" on the right side.
6. Apply the settings with <OK> or <Apply>.
You see immediately that the time is synchronized.



Note

Synchronization works only if you have set the "Use system time" option for data storage in the "Files" menu.

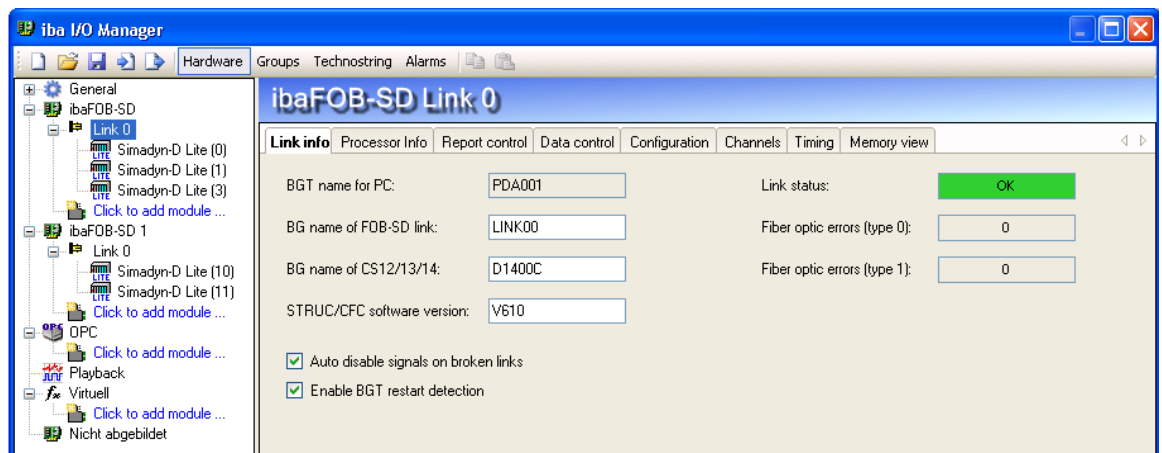
5.5 Diagnostics ibaFOB-SD/-TDC

On the link level in the tree structure, a number of diagnostic information items are displayed that refer to communication and the processors of the component.

Tab:

- ☐ Link info:
Set connection parameters and status
- ☐ Processor info:
Information about the DPR assignment interface, hardware and firmware version
- ☐ Log-in:
Information about the log-in in the PC coupling
- ☐ Data:
Information about the telegram traffic of the PDA Lite channels
- ☐ Configuration:
Information about the area in the rack link where all connected racks are registered
- ☐ Channels:
Information about all communication channels set up in the rack link
- ☐ Timing:
Information about utilization of the ibaFOB-TDC and access statistics
- ☐ Memory view:
Content of the DPR memory in ibaFOB-TDC

5.5.1 "Link Info" tab



Settings

- ☐ BGT name for PC:
With this name, ibaPDA logs in as BGT in the administration area of the PC coupling component.
Default setting: "PDA001" (from Registry)
- ☐ BG name of the FOB-xx-connection:
With this name, the ibaFOB-SD/-TDC logs in in the computer coupling.



Important note

The name of the connection needs to be unique within the rack link. If there are 2 connections established to a rack link in ibaPDA or 2 or more ibaPDA systems are connected to a rack link, you need to enter different names for the connections. Please make sure that the name complies with the Siemens directive, i.e. 6 signs A-Z, 0-9 and _.

- ☐ BG name of the rack link component:
Please enter the configured name of the CS14, CP53 or the GDM memory component (CP52M0) . Please take this name from the "BG name" field of the channel diagnostics, chap. 5.5.6
- ☐ STRUC/CFC Software Version:
Please enter here the version ID of the Siemens software. Please take this ID from the "Software version field" of the channel diagnosis, chap. 5.5.6
- ☐ Link status "OK" (green)/"Error" (red)
- ☐ FO error counter
Using the analysis of the error interrupt of the FO hardware driver, ibaPDA detects an interruption of the connection. In normal operation the counters need to remain constant. The long-term monitoring of the counter can provide additional information about the quality of the data transfer.

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 when e.g. a frame is switched off. At the next start, they are active again.
- ☐ Enable BGT restart detection:
If this option is activated, also during the measurement process is checked if missing CPUs become available again. If this is the case, the measurement is being stopped and restarted with the CPUs now available.



Tip

iba AG recommends to enable both options.



Note

These options are only visible if an SD- or TDC Request license is not available. In this case, the settings in the SIMADYN-Request or TDC-Request are valid.

5.5.2 "Processor Info" tab

Display of general information about card and firmware.

The screenshot shows the 'Processor Info' tab of the 'ibaFOB-SD Link 0' application. The interface is divided into two main sections: 'Command info' on the left and 'Processor Info' on the right.

Command info section:

- Reset command: 0xFF02
- Reset comm. timeout: 10 s
- General command: 0xFF0C
- General comm. timeout: 10 s
- Diagnose command: 0xFF58
- Diagnose comm. timeout: 20 s
- Interrupt cycle time: 1 ms

Processor Info section:

- Life counter: 85
- Address space size: 128 kB
- Micro clock: 24000
- Micro ID: C165
- Interrupt Control: Master, Generated internally, Interrupt is activated on PCI bus
- Hardware designation and version: FOB_SD-PCI_ H1.2
- iba standard designation and version: iba-FOB_SD_ S1.1
- Firmware designation and version: FOB_SD-PCI_ F2.5
- Version info: FSDB5 -V2.5 FOB_SD-PCI iba Fuerth / D.Kopp : 20.08.2008/2 C165 24.000MHz >BOTP< FSDB5.PRM: 283367:21.08.08/12.48dkopp iba fue -19.10.09/12.41.19?Z<?????????

"Command info" area

- ☐ Display of current values for commands and monitoring times

"Processor Info" area

- ☐ Its own life counter
- ☐ Processor information (type, clock rate, DPR size)
- ☐ <Reset processor> button for resetting the component (only visible if no recording is running)
- ☐ Interrupt information
- ☐ Information about hardware and firmware version

5.5.3 "Report control" tab

The log-in results in the rack link are displayed here.

ibaFOB-SD Link 0

Link info | Processor Info | **Report control** | Data control | Configuration | Channels | Timing | Memory view

Nr of valid PN:

Valid mask
 0000000000 00000000 00000000 00000000 00000000 00000000 1011

Ok mask
 0000000000 00000000 00000000 00000000 00000000 00000000 1011

Error mask
 0000000000 00000000 00000000 00000000 00000000 00000000 0000

PN: Info:

Mode:

BGT name of PC: STRUC/CFC software version:

BG name of FOB-SD link: BG name of CS12/13/14:

ZB connectors

CDM: <input type="text" value="0x00FF"/>	NCP: <input type="text" value="0x0001"/>	ENO: <input type="text" value="0x0000"/>	BZS: <input type="text" value="0x0008"/>
CDA: <input type="text" value="0x0000"/>	QTS: <input type="text" value="0x00FF"/>	EZU: <input type="text" value="0x0000"/>	KZS: <input type="text" value="0x0000"/>

- ☐ Number of valid PN from the processor list
- ☐ Bitmasks:
 - Valid mask: displays which processors were addressed
 - OK mask: displays processors that responded with OK
 - Error mask: displays processors that responded with Error

Only the 16 right-justified bits are relevant. The bits 0 through 15 (0 is completely to the right) correspond to the channels M0PDADAT through MFPDADAT.

If the slider is moved under the bitmasks with the mouse, the following associated data are displayed for the current processor:

- ☐ PN, info: PDA channel name and error info
- ☐ Mode: Request version / Lite version
- ☐ Connection data (as in link info, see chapter 5.2.2)
- ☐ ZB connectors
Diagnostic fields, initialization function block

5.5.4 "Data control" tab

The results of the measurement data transmission are displayed here:

The screenshot shows the 'Data control' tab of the 'ibaFOB-SD Link 0' application. The interface includes several sections:

- Link info:** A tab at the top left.
- Processor Info:** A tab at the top left.
- Report control:** A tab at the top left.
- Data control:** The active tab, showing measurement results.
- Configuration:** A tab at the top right.
- Channels:** A tab at the top right.
- Timing:** A tab at the top right.
- Memory view:** A tab at the top right.

Key data displayed in the 'Data control' tab:

- Nr of valid PN:** 3
- Valid mask:** A 32-bit mask showing 1s at the end of the bit sequence.
- Ok mask:** A 32-bit mask showing 1s at the end of the bit sequence.
- Error mask:** A 32-bit mask showing 0s at the end of the bit sequence.
- PN:** M0
- Info:** 0x0000
- Access counter:** 52446
- Timebase (ms):** 1
- Complete data transfers:** 44432
- Incomplete data transfers:** 8262
- % completed data transfers:** 94
- Reset counters:** A button at the bottom.

- ❑ Bitmasks: see chapter 5.5.3

If the slider is moved under the bitmasks with the mouse, the following associated data are displayed for the current processor:

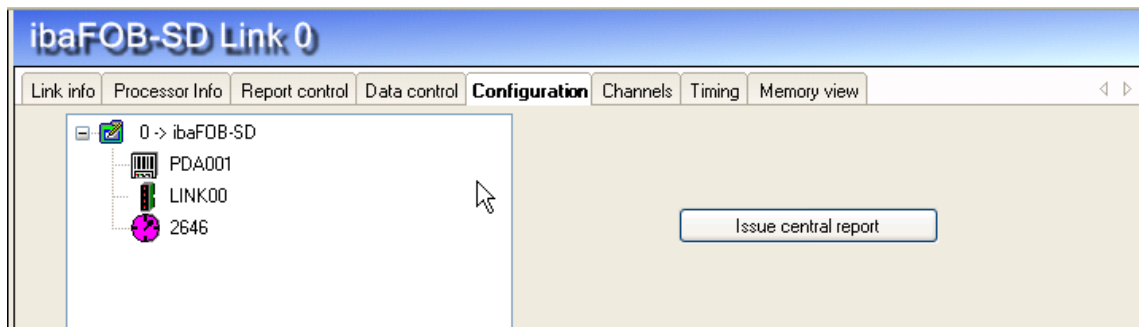
- ❑ PN, info: PDA channel name and error info

Access counter

- ❑ Access counter: number since the start of the measurement (overrun at 65535)
- ❑ Time base: access cycle (set acquisition time base)
- ❑ Data transfer rate: percentage since the last reset

5.5.5 "Configuration" tab

The data from the Report control area of the rack link are displayed here.



All racks logged into the communication memory of the rack link are displayed. The following data can be seen for each rack:

- ☐ BGT name of the logged-in rack (e.g., of the ibaPDA system)
- ☐ BG name of the connection (e.g., CS22, CP53, CP52A0 or connection name of the ibaPDA connection)
- ☐ The running life counter

5.5.6 "Channels" tab

Information from the data area of the computer coupling is displayed here:

Channel name	BGT name	PN	Length	Mode	Status
M0PDADAT			132	Refresh	Buffer voll
M1PDADAT			132	Refresh	Buffer voll
M2PDADAT			132	Refresh	Sender initialisiert
M3PDADAT			132	Refresh	Buffer leer
M4PDADAT			132	Refresh	Sender initialisiert

- ❑ By clicking on the <Search> button and entry field for the search term (with “?” wild card), the rack link is searched for telegrams that correspond to the search term; e.g.,
 with "M?PDADAT" you find all transmission telegrams (→ ibaPDA),
 with "PDAM?DAT" you find all reception telegrams (→ Siemens)
- ❑ BGT diagnostics:
 Log-in data read from the log-in area of the rack link:
 Error code: error number in the case of access error, see chapter 7.1.2
- ❑ List of channels found. For each channel, the following is displayed:
 - Channel name: telegram name
 - BGT name: empty
 - PN name: empty
 - Length: channel user data length in bytes: 132
 - Mode: (Refresh or Multiple)
 - Buffer state (initialized, buffer full, buffer empty)
 The status is only a snapshot and is not dynamic

The table can be sorted in ascending/descending order by clicking on a column heading.

5.5.7 "Timing" tab

A statistical analysis of all accesses is done in the firmware of the ibaFOB-SD/-TDC. This is primarily intended as support for software development and optimization. It is also accessible to the user for optimal configuration of TDC and ibaPDA.



Note

Some values cannot be reproduced exactly, since certain marginal conditions are not taken into account. However, as tendencies and benchmarks they are helpful for optimization and settings.

In order to correctly interpret the values, knowledge of the internal assignment and data transfer interface between ibaPDA and ibaFOB-SD/-TDC firmware is necessary.

Explanations

One basic sample time is set in the ibaPDA. It becomes the basic clock rate of an ibaFOB-TDC access cycle. At the beginning of the cycle, the sequence control starts the selecting processes for all reception channels. At the end of the cycle, the sequence control checks the results of the accesses. The following accesses are possible (no access errors):

The accesses on all processors were ended:

- ☐ New data were read.
- ☐ No new data were read.
Cause: transmission function block is slower than the ibaPDA measurement cycle, for example.
- ☐ Access to PN has not ended yet.
Cause: the ibaFOB-TDC is overloaded; the amount of data or processors cannot be processed within the cycle time.

Due to asynchronous events, e.g., incrementing the life counter in the rack link, reading the technostring channel or different time slices of the processors, the results vary within a certain bandwidth. The values for statistics are re-determined every 100 basic sample times.

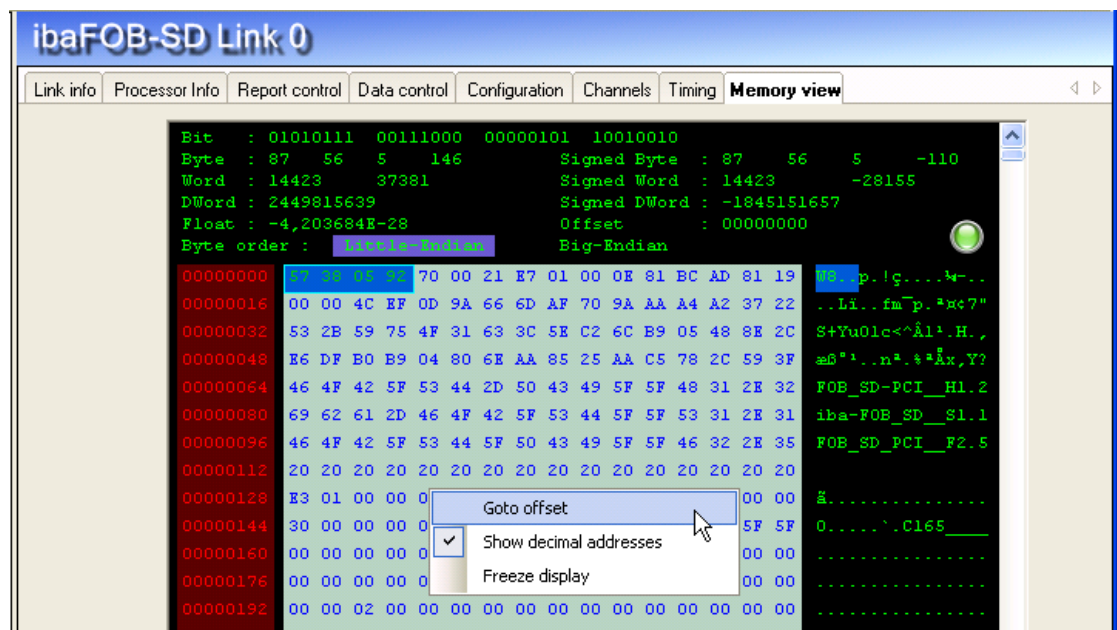
ibaFOB-SD Link 0		
Link info	Processor Info	Report control
Data control	Configuration	Channels
Timing	Memory view	
PDA cycle time [ms]:	1	Reset counters
Sampling efficiency:	99%	
PN Name	% of valid datatransfers	Valid datatransfer counter
0 M0	96	12392
1 M1	12	36902
2 ??	??	??
3 M3	3	9226
4 ??	??	??
5 ??	??	??
6 ??	??	??
7 ??	??	??
8 ??	??	??

The information in the "Timing" tab:

- ☐ PDA cycle time:
currently set ibaPDA basic cycle time.
- ☐ Sampling efficiency (load of FOB-SD/-TDC card):
portion of cycles that were completely processed, regardless of whether data were received in this cycle or not.
If a cycle was not fully concluded, it does not mean that no data was received in this cycle; instead, it only means that processing of at least one channel was not concluded.
Example:
The indication of 80% with 10 projected data channels states that:
at least 2% of the data are lost if one channel was not completely processed in the cycles not concluded, and max. 20% of the data are lost if no channel was completely processed.
For an effective measurement, a value between 75% and 100% is to be strived for.
- ☐ PN name: channel ID in ascending order (only 16 lines are relevant)
- ☐ % of valid data transfers
Portion of data accesses to this channel that actually supplied new data.
It is the ratio of ibaPDA sample time to channel cycle time, taking into account the cycles not concluded (due to overload).
- ☐ Valid data transfer counter
Number of successful data transfers since the last reset.

5.5.8 "Memory view" tab

The DPR memory on the ibaFOB-SD/-TDC card is displayed here:



The marked data are displayed in the upper area in various data formats.

The operating menu is opened by a right mouse click.

5.6 Diagnostics ibaFOB-SDexp/-TDCexp

On the link level in the tree structure, a number of diagnostic information items are displayed that refer to communication and the processors of the component.

Tabs:

- ☐ Configuration: Configured connection parameters
- ☐ System info: Information about the link status, system information of the coupling partner, log-in area in the rack link
- ☐ Timing: Information about the load of the ibaFOB-TDC and access statistics
- ☐ Active data channels: Overview of PDA channels, their time classes and access times
- ☐ Channels in system: Information about all communication channels configured in the rack link
- ☐ Memory view: Content of the DPR memory of the ibaFOB-TDC

5.6.1 "Configuration" tab

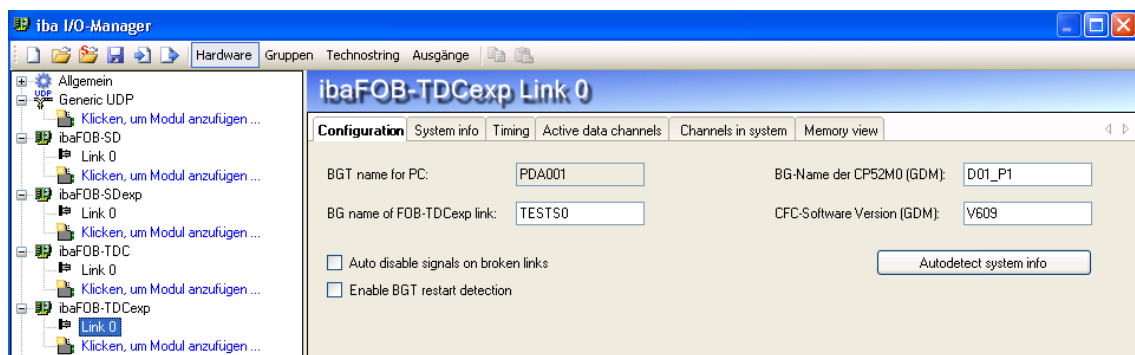


Fig. 1: Configuration data

On the "configuration" tab, you can enter the data that are required for the connection of ibaPDA to the SIMATIC TDC system.

- ☐ BGT name for PC:
With this name, ibaPDA logs in on the rack link component as BGT. The default setting is "PDA001".
- ☐ BG name of FOB-SD/-TDC link:
With this name, ibaFOB-SDexp/-TDCexp logs in on the rack link. The name has to be unambiguous, if there is more than one FO connection to the same coupling partner.
Changes are entered in the respective field in the connection list of the SD-/TDC-Request interface.
- ☐ BG name of the rack link:
Is read from the control by clicking on the button <Autodetect system info>.
- ☐ CFC Software Version of the control:
Is read from the control by clicking on the button <Autodetect system info>.

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 when e.g. a frame is switched off. At the next start, they are active again.
- ☐ Enable BGT restart detection:
If this option is activated, also during the measuring process is checked if missing CPUs become available again. If this is the case, the measurement is being stopped and restarted with the CPUs now available.



Tip

iba AG recommends to enable both options.



Note

The options are only visible if SD or TDC license is not available. In this case, the configurations on the SIMADYN or TDC request mask are valid.

5.6.2 "System info" tab

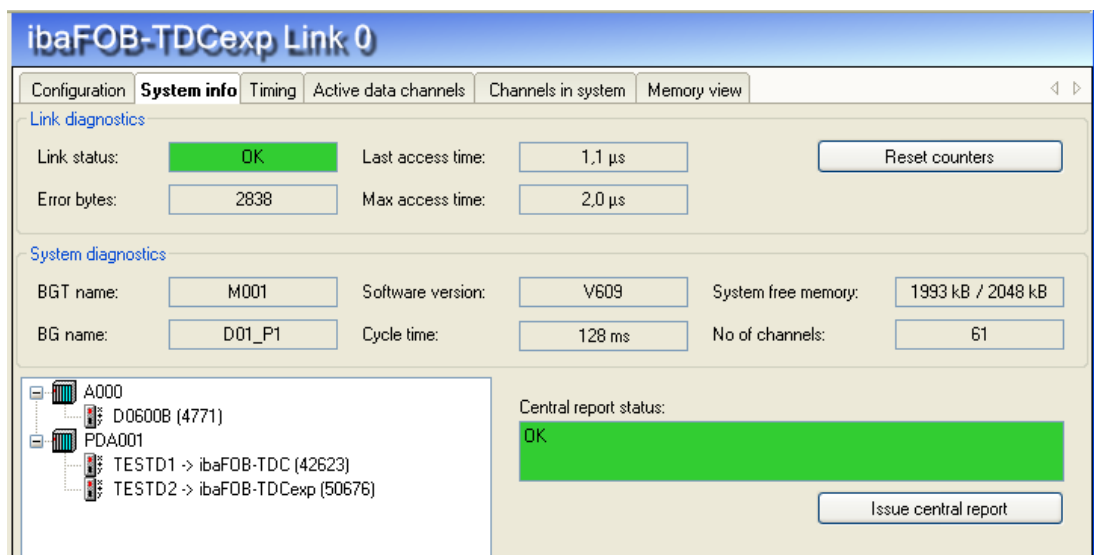


Fig. 2: System information

On the "System info" tab, you see information about the connection of ibaPDA and the SIMATIC TDC system.

- ☐ Link diagnostics
 - Link status "OK" or "Error".
 - Error bytes:
In normal operation, the counters need to remain constant. The long-term monitoring of the counters may provide information about the quality of the data transmission.
 - Last access time / Max. access time
Duration of the last access or the longest access since resetting.
 - Button <Reset counters>:
Resets the error counter and the max. access time.

- ❑ System diagnostics
 - BGT name, BG name, Software version of the coupling partner
 - Cycle time: time of monitoring the communication (task of the initialization module)
 - System free memory/ whole memory in the GDM / CP53 / CS13
 - No. of channels: number of configured channels in the communication memory
- ❑ Central report area

All racks logged in in the rack link incl. ibaPDA are displayed. For every rack, the following data are displayed.

 - BGT name of the rack logged in (e.g. of the ibaPDA system)
 - BG name of the connection, e.g. CS22 or name of the ibaPDA connection
 - Running life counter of the connection
- ❑ Central report status (OK or error number)
- ❑ Button <Issue central report>:

Log in of the ibaFOB-TDCexp in the coupling partner (Not necessary, as this is done automatically at the first start of the the acquisition by ibaPDA).

5.6.3 "Timing" tab

ibaFOB-TDCexp Link 0

Configuration System info **Timing** Active data channels Channels in system Memory view

Timing

☒ Manually set read cycle times

T1: 2,0 ms

T2: 4 x T1 8,0 ms

T3: 16 x T1 32,0 ms

T4: 64 x T1 128,0 ms

T5: 256 x T1 512,0 ms

	Actual read cycle time	% valid transfers
T1:	2,0 ms	100%
T2:	8,0 ms	100%
T3:	32,0 ms	100%
T4:	128,0 ms	100%
T5:	512,0 ms	100%

Current transfer duration: 43 µs

Max transfer duration: 608 µs

Dropped transfers: 239

Automatic channel initializations: 0

Image generation

Images processed at interrupt:

Actual: 1

Min: 1

Max: 1

Images in DMA buffer: 10

Images copied to interrupt buffer: 915501

DMA buffer empty: 0

Dropped images: 0

Image sample rate: 1 ms

Image size (bytes): 908

DMA buffer size: 4 MB

DMA buffer element size: 4 kB

Reset counters

Fig 3: Timing

On the "Timing" tab, information about the accesses of the card to the SIMATIC TDC CPUs and the accesses of the card to the data memory (DMA) are displayed.

**Note**

The SD-/TDC-Lite modules are generally read in the T1 time class. All information about the T2... T5 time classes only apply to the SD-/TDC-Request mode and are not relevant.

☐ **Timing**

- **Manually set read cycle times:**
Possibility of selecting manually the access times of the single time classes.
- **Actual read cycle time:**
Currently selected or automatically calculated access times.
- **% valid transfers:**
Proportion of the values that can be acquired within the "Actual read cycle time".
- **Current transfer duration:**
Current duration of the data transfer for a sample. By means of the ratio of "Current transfer duration" and the lowest "Actual read cycle time", you can see the capacity utilization of the ibaFOB-TDCexp.
- **Max. transfer duration:**
max. duration of a data transfer since the last <Reset counters>
- **Dropped transfers:**
Number of lost samples. Whenever the "Current transfer duration" is higher than the "Actual read cycle time", this counter is incremented.
- **Automatic channel initializations:**
Diagnostics counter for automatic actions.

Capacity utilization

You can see the current capacity utilization by having a look at the fields "Current transfer duration", "Max. transfer duration" and "Dropped transfers":

- As long as the "Max. transfer duration" is lower than the lowest cycle time, all samples are transferred without any losses.
- If the "Max. transfer duration" is higher, but the "Current transfer duration" lower, samples get sporadically lost. These samples are counted in "Dropped transfers".
- If the "Current transfer duration" lies near the cycle time or above, the card is overloaded.
- You can see the percentage of the lost samples in "% valid transfers".

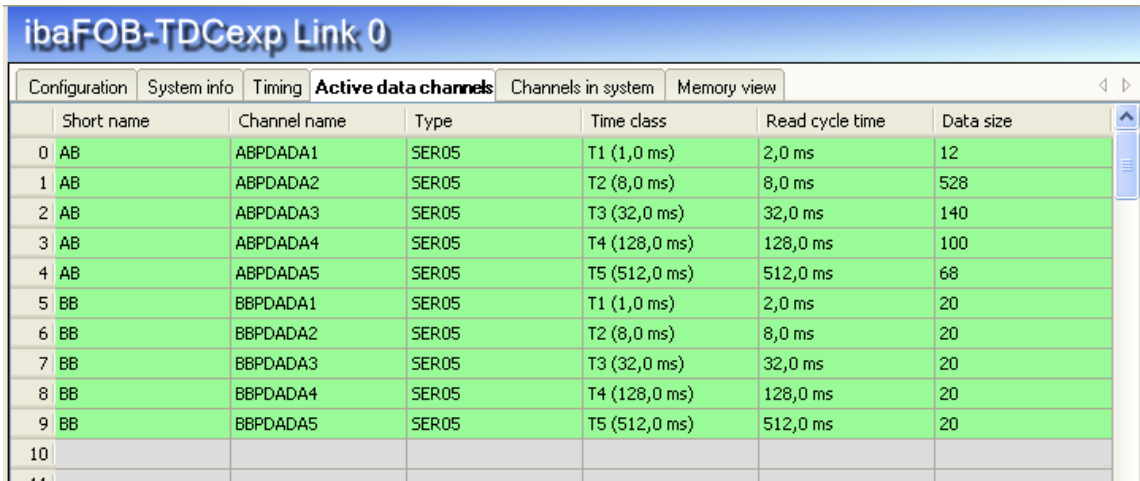
☐ **Image generation**

Diagnostic data for the DMA accesses to the ibaPDA data memory.

☐ **Reset counters**

Using this button, all counters are reset and the calculation of "% valid transfers" and "Max. transfer duration" are restarted.

5.6.4 "Active data channels" tab



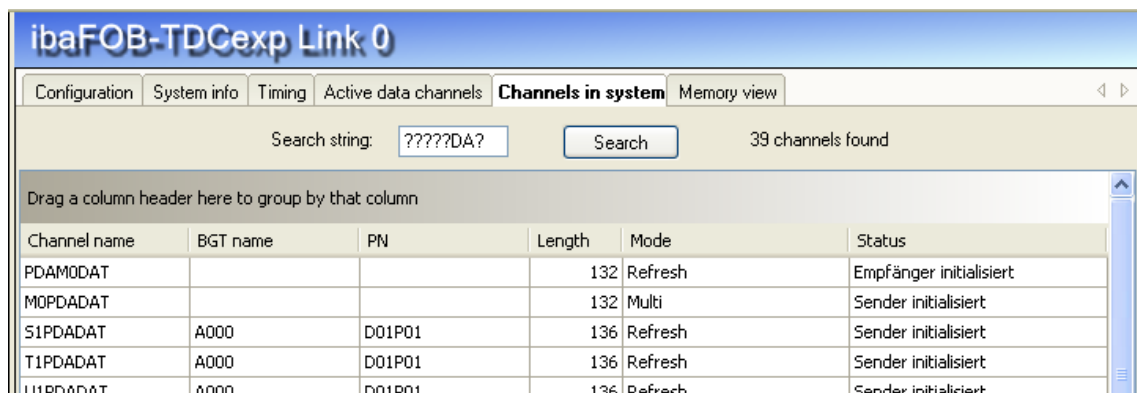
	Short name	Channel name	Type	Time class	Read cycle time	Data size
0	AB	ABPDADA1	SER05	T1 (1,0 ms)	2,0 ms	12
1	AB	ABPDADA2	SER05	T2 (8,0 ms)	8,0 ms	528
2	AB	ABPDADA3	SER05	T3 (32,0 ms)	32,0 ms	140
3	AB	ABPDADA4	SER05	T4 (128,0 ms)	128,0 ms	100
4	AB	ABPDADA5	SER05	T5 (512,0 ms)	512,0 ms	68
5	BB	BBPDADA1	SER05	T1 (1,0 ms)	2,0 ms	20
6	BB	BBPDADA2	SER05	T2 (8,0 ms)	8,0 ms	20
7	BB	BBPDADA3	SER05	T3 (32,0 ms)	32,0 ms	20
8	BB	BBPDADA4	SER05	T4 (128,0 ms)	128,0 ms	20
9	BB	BBPDADA5	SER05	T5 (512,0 ms)	512,0 ms	20
10						
11						

Fig. 4: Active data channels

On this tab, all data channels are displayed in a table providing information about the configured time class, the cycle time and the data volume.

By double-clicking on a line with an entry, the memory view of this data channel will be opened (chap. 5.6.6).

5.6.5 "Channels in system" tab



Channel name	BGT name	PN	Length	Mode	Status
PDAMODAT			132	Refresh	Empfänger initialisiert
MOPDADAT			132	Multi	Sender initialisiert
S1PDADAT	A000	D01P01	136	Refresh	Sender initialisiert
T1PDADAT	A000	D01P01	136	Refresh	Sender initialisiert
U1PDADAT	A000	D01P01	136	Refresh	Sender initialisiert

Fig. 5: Channels

On this tab, you find information about the coupling memory and the communication channels configured in this memory. In the search string, you can enter '?' as wildcard.

For example, you can display all SD-/TDC-Lite sending channels

The following data are displayed:

- Channel name: all communication channels in the memory
- Length: Length of all user data
- Mode: Channel mode: Refresh, Handshake, Select or Multiple
- Status: Receiver / Sender initialized, Channel in operation, Buffer empty/full
(Caution: the display is not dynamically, but only a snapshot at the time of access)

**Note**

BGT name and PN are empty for SD-/TDC-Lite modules.

They are only used in the SD-TDC-Request mode for the right assignment of the processors.

5.6.6 "Memory view" tab

On the "Memory view" tab, the DPR memory on the ibaFOB-TDCexp is displayed.

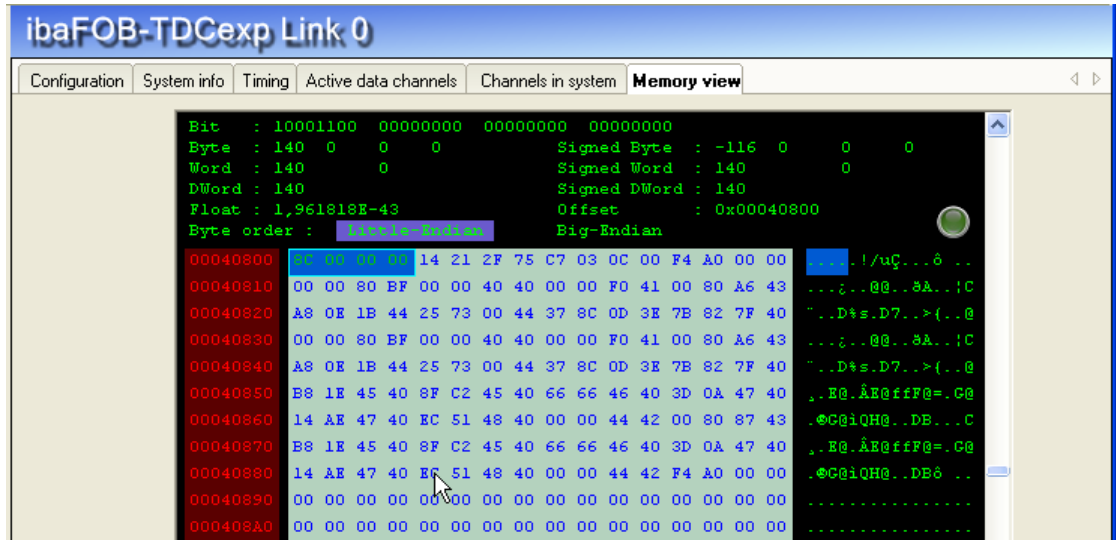


Fig. 6: Memory view

6 Configuration in ibaLogic



Note

The PCI express cards ibaFOB-TDCexp and ibaFOB-SDexp are not being supported by ibaLogic, yet.

6.1 I/O configurator

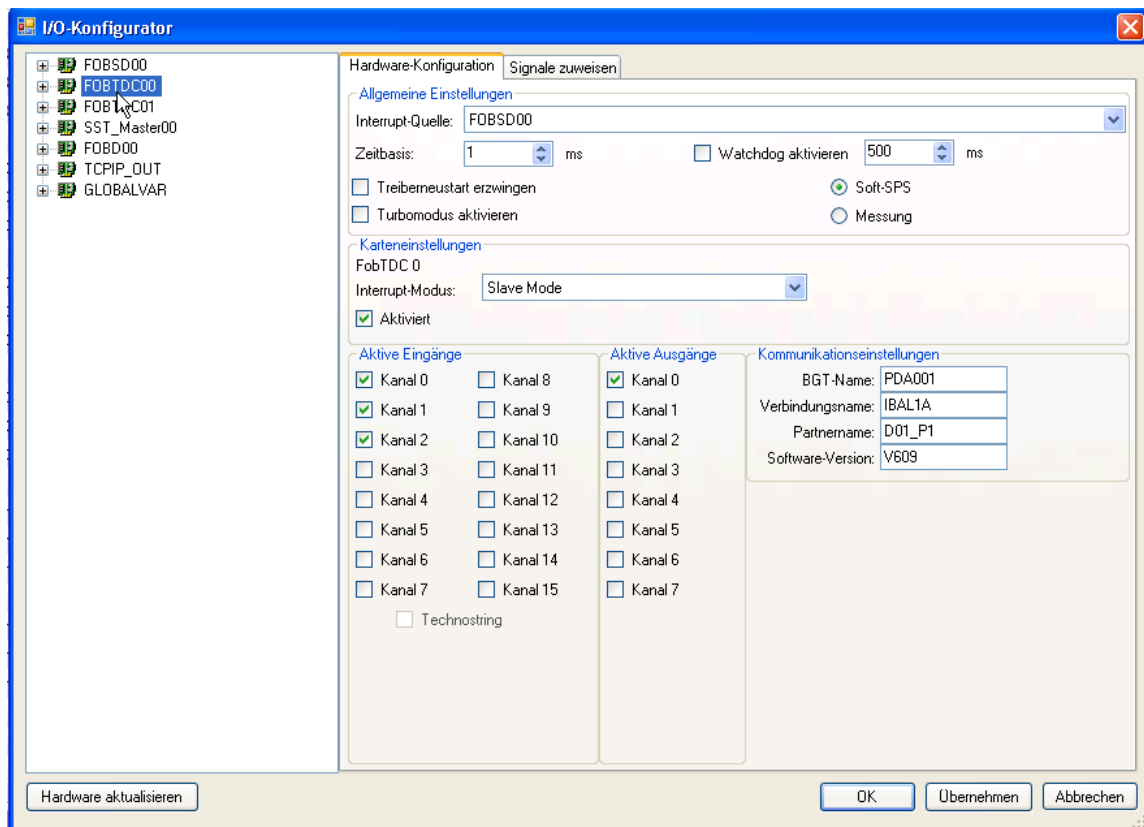
The resource tree is displayed with all available hardware on the right side in the I/O configurator.

The “Hardware configuration” and “Assign signals” tabs are on the right side.

6.1.1 "Hardware configuration" tab

If the cards are properly installed in the PC, then all cards are displayed as FOBSDnn or FOBTDCnn resources in the resource tree by clicking on <Update hardware>.

If you mark a card, the associated card information is displayed on the right:



“General settings” area

➤ See ibaLogic manual.

“Card settings” area

- ☐ Interrupt mode:
Set an ibaFOB-SD or ibaFOB-TDC as interrupt master if you use apart from these cards only ibaFOB-ii-S or ibaComL2B-i/8.

**Note**

Make sure that only one interrupt master is set. ibaLogic does not check this setting.

☐ **Activated:**

The card is automatically activated if you activate at least one input or output channel in the lower area.

“Communication settings” area

Enter the data required for log-in here:

☐ **BGT name of the PC:**

with this name, ibaPDA logs into the administration area of the rack link.
Default setting is "PDA001".

☐ **Connection name:**

with this name, ibaPDA logs into the administration area of the rack link.
Default setting is "IBAL1A".

**Important note**

The connection name must be unambiguous within the rack link. If you have two connections to a rack link in an ibaLogic, or two or more ibaLogic systems are connected to a rack link, then you have to enter different connection names. Make sure that the name is in accordance with the Siemens guideline, i.e., 6 characters A-Z, 0-9 and _.

☐ **Partner name:**

Enter the projected name of the CS14, CP53 or GDM memory component (CP52M0) here.

☐ **Software version:**

Enter the version identifier of the Siemens software here:

For STRUC: "V42x"

For CFC: "V6xx"

Active inputs and outputs area

The listed input channels 0 through 15 are firmly assigned to the telegrams M0PDADAT through MFPDADAT.

The output channels 0 through 7 are firmly assigned to the telegrams PDAM0DAT through PDAM7DAT.

Activate the input and output channels according to the projection on the SIMADYN D or SIMATIC TDC side.

The technosting channel is not yet implemented.

6.1.2 "Assign signals" tab



Important note

Please do not forget to apply the hardware configuration using the button <OK> or <Apply> before assigning signals.

➤ For this, see the description in the ibaLogic manual.



Tip

When assigning signals in the case of channels that only have an input or output side, select "Inputs only" or "Outputs only" in the group characteristics. You can thus avoid the following errors when using the signals.

6.2 ibaLogic – diagnostics

Currently ibaLogic does not include a diagnostic function.

Use the "**ibaDiag**" diagnostic tool to detect any errors in the configuration.



Important note

Make sure that ibaDiag does not overwrite the current version of the ibaWdmDriver installer when starting. Confirm the message box that opens up with "No"

With ibaDiag, you can call up the diagnostic functions that are described in chap. 5.5.

In the "Channels" register you can find:

- ☐ The data projected on the Siemens side which are necessary for log-in:
"Partner name" and "Software version"
- ☐ The input channels projected by "Search" with the "M?PDADAT" search mask
The output channels projected by "Search" with the "PDAM?DAT" search mask

You can find error messages for the configured channels in the "Report" and "Data" registers.

7 Appendix

7.1 Error of sequence control

7.1.1 Analyzing the error counters

The two "Optical fiber_error_0" and "Optical fiber_error_1" cells in the "Link info" register of the hardware interface include the states of two counters that monitor optical fiber communication on the lowest level. Some errors are always registered in the start-up phase. Afterwards the values have to remain stable.

With separation of optical fiber lines, one or both counters increment permanently. With systems in continuous operation, long-term observation of the counters can provide additional information about the quality of transmission.

7.1.2 Errors with diagnostic functions

When accessing the rack link memory, it is checked whether the data are plausible. Implausible data indicate connection errors, poor or damaged cables or errors in the rack link.

Error	Meaning	Explanation
0	No error	-
0x5000	Time-out with access	-
0x5010	Component name of rack link is faulty	No connection to rack link; malfunction of optical fiber
0x5011	BGT (rack) name faulty	"
0x5012	Version ID faulty	"
0x5013	Sampling time faulty	"
0x5014	Channel name faulty	"
0x5015	Number of channels faulty	"
0x5016	Number of racks faulty	"

7.1.3 Timeout error in ibaPDA

The firmware on the ibaFOB-SD/-TDC card is state-controlled. The ibaPDA commands are only processed in certain states. If a command is not processed by the firmware due to a coordination error, then ibaPDA generates a timeout error message with the command code as error number.

Error correction

- ☐ Restart ibaPDA acquisition and while doing so activate the "Restart driver" option (in the I/O Manager – "General" register).
- ☐ Check whether ibaFOB-SD/-TDC is running (green LED must flash).
- ☐ Check whether connection is OK (yellow LED must shine).

Error	Meaning	Explanation
0x04	Timeout with channel log-in	-
0x08	Data request with assignment	-
0x0C	Data reading with assignment	-
0x1C	Technostring reading with assignment	-

7.1.4 Timeout errors of sequence control

The interface within the firmware between the sequence control and the driver for access to the communication memory in the rack link is similar.

The sequence control generates an error message here if the driver is not ready to accept new transmission/reception assignments.

Error correction

- ☐ Restart ibaPDA acquisition and while doing so activate the "Restart driver" option (in the I/O manager – "General" register).
- ☐ Check whether connection is OK (yellow LED must shine).
- ☐ Check whether the optical fiber error counters are constant (see chap. 5.2.2)

Error	Meaning	Explanation
0x7000	No connection	-
0x7001	TO with ZB log-in	No RS after ZB log-in (step 5)
0x7002	TO with channel log-in	No RS after channel log-in (step 7)
0x7003	TO with assignment telegram	No RS after assignment telegram (step 11)
0x7004	TO with acknowledgement telegram	No acknowledgement telegram (step 11)
0x7005	TO with data telegram	Driver not ready for assignment: read data (step 13)
0x7006	TO with data telegram	No RS after start: read data (step 14)
0x7008	TO with data telegram	No RS with cyclical reading (interrupt routine)
0x700A	TO with assignment telegram	No RS with assignment: address book request
0x700B	TO with address book telegram	No RS with reading address book telegram

TO = Time out

RS = Return signal

7.2 Errors of the TDC driver

7.2.1 Error classes

Depending on the cause of the error or the necessary reaction on the ibaPDA-/ibaLogic side, the error messages of the SD-/TDC driver can be divided into various classes:

- ☐ Temporary status messages, no error;
if error permanently present, then error of class 2 or 3 has occurred
- ☐ Programming error in the ibaFOB-SD/-TDC firmware; please notify iba AG
- ☐ Error due to inconsistent data, access error via optical fiber to the rack link
- ☐ Projection error on Siemens side
- ☐ Projection on Siemens side does not match iba projection
- ☐ Projection or programming error on ibaPDA side or error in SER04 function blocks



Important note

The error codes 0x6000...0x6FFF listed in the following sections correspond to those in the SIMADYN D / SIMATIC TDC manual "Diagnostics" section.
More precise descriptions and causes can be found there.

7.2.2 Errors with ibaPDA log-in in the computer coupling



Note

The most frequently occurring projection errors are “bolded.”

Error	CI	Meaning	Explanation	Remedy
0		Not an error, log-in OK; the connectors have the following states: CDM = 0x00FF: coupling OK CDA = 0x0000: coupling released NCP = 0x0001...n no. of connected CP52A0 (incl. ibaPDA) QTS = 0x00FF: coupling initialized BZS = 0x0008: life counter monitoring released ENO = 0x0000: no error		-
#0		Log-in termination with error; the connectors have the following states: - CDM = 0x0000: coupling disrupted - CDA = 0x00FF: coupling blocked - NCP = 0x0000: no. of connected TDC racks (incl. ibaPDA) - QTS = 0x0000: coupling not initialized - BZS = 0x0000: function block switched off - ENO = 0xnxxx: error number, see table		-
0x6AA0	6	Multiple projection	The connection name is already entered in the computer coupling log-in area. Several connected ibaPDA systems have the same link name.	Change the component name of the connection in the "Link info" menu (chap. 5.2.2)
0x6AA1	2	CIP name known, but CIP not addressable	-	-
0x6AA2	5	CIP name unknown	Names of the rack link components in the Siemens projection and the ibaPDA projection do not match.	Check the component name of the rack link component (Chapter 5.2.2)
0x6AA3	2	Impermissible function value of the zbak_cip_suche [search] function (*)	The connector EZU contains the unknown value	-
0x6AA5	3	Too many racks logged in	With CS14: 8 slave racks With GDM: 44 TDC racks	-
0x6AA6		Component name of the rack link component is unknown	Names of the rack link component in the Siemens projection and the ibaPDA projection do not match.	Check the component name of the rack link component (Chapter 5.2.2)
0x6AA7	2	Impermissible function value of the _CS2_anmeldung [log-in] function	The connector EZU contains the unknown value	-
0x6AA8	2	Unknown operating state (*)	The connector EZU contains the unknown value	-
0x6AA9	2	SAVE memory too small		-
0x6AAA	2	SAVE area unknown		-
0x6AAB	2	FOB-SD/-TDC in impermissible sampling time (larger than 2 * @CS1 sampling time)	Since it is fixedly set in the FOB firmware at 64 ms, the error cannot occur with @CS1 sampling time >32 ms.	Check projection with central function block @CS1 or @SRACK
0x6AAC	2	No exception memory present	-	-
0x6AAD	2	No reorganisation memory present	-	-
0x6AAE	2	Impermissible function value of the zp_fb_init function (*)	The connector EZU contains the unknown value	-
0x6AAF	2	Faulty call of the bsspvw_korrekturwert [correction value] function	-	-
0x6AB0	2	Faulty call of the ampi_asop function	-	-
0x6AB1	2	Wrong coupling type		
0x6AB2	2	3 CS21 already present		

0x6AB3	5	Software version incompatible	Version of the Siemens software does not match the version of the connected racks.	Change the SW version in the "Link info" menu (see Chap 5.2.2).
0x6AB4	4	Memory sizes do not match	FOB-TDC expects CP52M0 with 2MBytes	Check TDC projection

7.2.3 Errors with channel log-in

Error	Cl.	Meaning	Explanation	Remedy
0		No error, log-in OK	-	-
0x0031	2	Log-in previously not possible	-	-
0x0032	2	Error with provision of memory	-	-
0x0033	2	Wrong transmission/reception identification	-	-
0x0034	2	Too much partial information	-	-
0x0035	2	Target information not identifiable	-	-
0x0036	2	Target information faulty	-	-
0x0037	2	Channel name too long	-	-
0x0038	2	Address level 1 too long	-	-
0x0039	2	Address level 2 too long	-	-
0x003A	2	Wrong address string	-	-
0x003B	2	@Ziel [target] rack name too long	-	-
0x003C	2	Length of target component name wrong	-	-
0x003D	2	Length of target interface wrong	-	-
0x003E	2	Target interface information wrong	-	-
0x6031	1	CIP entry found	No connection	Check optical fiber connection
0x6032	1	Coupling for initialization released	No connection	Check optical fiber connection
0x6033	3	Coupling release missing	CP52M0 memory is currently being reorganized or is blocked due to access error	New ibaPDA log-in
0x6034	1	DEXDO3 released		
0x6035	3	DEXDO3 release missing	CP52M0 memory is blocked due to access error	New ibaPDA login; check optical fiber connection
0x6036	1	Coupling free, initialization running	-	-
0x6037	1	Semaphore was blocked	-	-
0x6038	1	Semaphore already blocked	-	-
0x6039	1	Channel name known	-	-
0x603A	1	Search not yet concluded	-	-
0x603B	3	Channel name unknown	Subsequent error	-
0x603F	1	Channel initialization concluded in faulty manner	-	-
0x6040	3	Data inconsistent	Access error	Check optical fiber connection
0x6050	3	Buffer status invalid	-	Check optical fiber connection
0x6051	3	Channel status invalid	-	Check optical fiber connection
0x6052	3	Buffer semaphore already blocked	-	Check optical fiber connection
0x6053	1	No more space in ZCVWL list	Internal list is full, since with each channel log-in list spaces are occupied but are no longer released. (CIP3 concept!)	Activate ibaPDA "Driver restart" and restart acquisition
0x6054	2	No more memory space in ZCDAT area	-	-

Error	Cl.	Meaning	Explanation	Remedy
0x6055	2	CIP name known, but CIP not addressable	-	-
0x6056	5	CIP name unknown	Component name of the rack link component in the Siemens configuration does not match the ibaPDA configuration.	Check TDC configuration and ibaPDA configuration
0x6057	2	Unknown zbak_cip_suche [search] function value	-	-
0x6058	2	ZINI bus identification invalid	-	-
0x6059	4	Too little memory space	Channel no longer fits in memory	Check TDC configuration
0x605A	2	Wrong channel mode	Channel mode is fixedly set in firmware and service function blocks	-
0x605B	2	Wrong user data structure	Fixedly set in firmware and service function blocks	-
0x605C	4	User data length too short	Possibly after switching STRUC <-> CFC	Activate ibaPDA "Driver restart" and restart acquisition
0x605D	4 6	Wrong service type	With TDC Lite: PROCESS DATA With TDC symbolic request: SERVICE	Check TDC configuration

7.2.4 Errors with data transfer

Error	Cl.	Meaning	Explanation	Remedy
0x6000		No error, data transfer OK	-	-
0x6001	5	Transmitter not ready to start	No transmission channel projected with this name	Check SD/TDC configuration
0x6002	5	Receiver not ready to start	No reception channel projected with this name	Check SD/TDC configuration
0x6003	5	No assignment, i.e., buffer empty	Transmitter is too slow or not released	Check SD/TDC configuration (sampling time)
0x6004	5	Buffer full (with transmitter, handshake)	Receiver is too slow or not released	Check SD/TDC configuration (sampling time)
0x6005	3	DEXDO3 release missing	Initialization function block @CS1 / @SRACK missing	Check SD/TDC configuration
0x6006	1	Coupling free, initialization running	-	-
0x6007	1	Semaphore was blocked	-	-
0x6FF0	2	Buffer pointer = 0	-	-
0x6FF1	2	Data length = 0 with writing	-	-

7.3 Abbreviations

BG	board, component
BGT	rack
CFC	continuous flow chart, graphic programming language
CIP	communication interface for SD and TDC
CP52M0	GDM memory component
CP52IO	GDM interface component
CP52A0	TDC interface component for GDM
CP53	TDC/SD rack link can be configured as master and slave
CS14	SIMADYN D rack link master
CS22	SIMADYN D rack link slave
DPR	dual port RAM, interface ibaPDA <--> FOB TDC
FOB	fiber optical board, optical fiber interface component
GDM	global data memory, central communication memory in the TDC system
OF	optical fiber
PDA	process data acquisition
PN	SIMATIC TDC processor component, CPU
RK	rack link, component CS12, CS13, CS14, CP53, GDM
SD	SIMADYN D
STRUC	graphic programming language for SIMADYN D
TDC	SIMATIC TDC
TS	Technostring
ZB	central function block, initialization function block for communication

8 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.