ibaBM-DPM-S

Profibus-Sniffer

Manual

Issue 2.11

Measurement and Automation Systems

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

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Certification

The product is certified according to the European standards and directives. This product meets the general safety and health requirements.

Further international customary standards and directives have been observed.

$C\epsilon$

Issue	Date	Revisions	Chapter/pages	Author	Version HW/FW
V2.10	04/22/2012	Shield connector	6.1, 7.2.14	st, ko	

Inhaltsverzeichnis

1   About this manual

This manual describes the construction, the use and the operation of the device ibaBM-DPM-S. If you plan to use the device in DPM-S-64 mode (for replacing an old ibaBM-DPM-64 device), please refer to the manual of ibaBM-DPM-S-64.

For further information concerning the system integration and software configuration please refer to the corresponding engineering manuals and / or software documentation of our software products used in conjunction with this device.

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:

Menu command	Menu "Logic diagram"
Calling the menu command	„Step 1 – Step 2 – Step 3 – Step x" Example: Select the menu "Logic diagram - Add - New function block".
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Button name> Example: <Ok>; <Cancel>
Filenames, paths	„Filename", „Path" Example: „Test.doc"

1.3   Used symbols

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

⚠ DANGER

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

- By an electric shock!

- Due to the improper handling of 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 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 Introduction

As a member of the bus monitor family ("ibaBM-.."), the ibaBM-DPM-S device is used by the iba process data acquisition or control systems as an interface for logging data on the PROFIBUS DP ("...DPM.."). It belongs to a new generation of devices ("...-S") with a modular construction, which, among other things, permits a higher rate of data transmission to ibaPDA systems.

The device can also be used as a replacement for its predecessor ibaBM-DPM-64. The corresponding mode of operation can be activated in the web interface of the device. The behavior then is exactly the same like of the new ibaBM-DPM-S-64. To get more information about this mode of operation please refer to the manual of the ibaBM-DPM-S-64. In the following only the ibaBM-DPM-S functions are described.

In contrast to its predecessor, the ibaBM-DPM-64, the new device provides two basic modes of operation which can be used alone or simultaneously: the so-called "sniffer" mode and the active slave mode.

Both modes can also be used for operation of the ibaBM-DPM-S on the redundant PROFIBUS with SIMATIC S7-400H controls.

Sniffer mode

In sniffer mode you can use the device to read all data sent on a PROFIBUS without requiring a special PROFIBUS configuration and without the device itself being an active station on the bus.
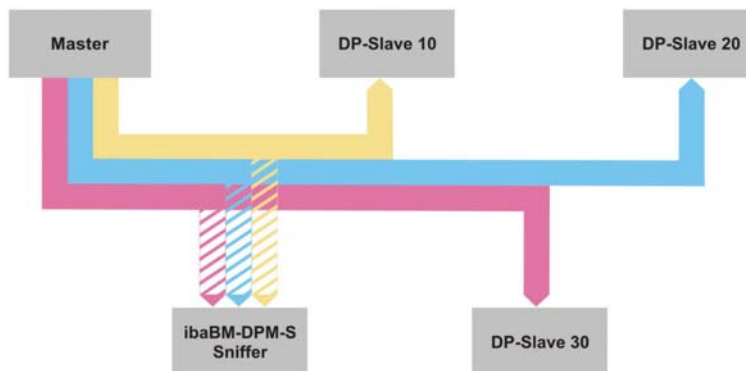
Fig. 1: Principle of operation in sniffer mode

Mode as active slave

In active slave mode, by contrast, the device provides up to eight DP slaves and is therefore an active station on the PROFIBUS (for example like a Siemens ET200). This means that it can be seamlessly integrated into an existing PROFIBUS DP network with a standard DP master. Only the appropriate slave addresses are required in the PROFIBUS configuration, and the device must be provided with data.
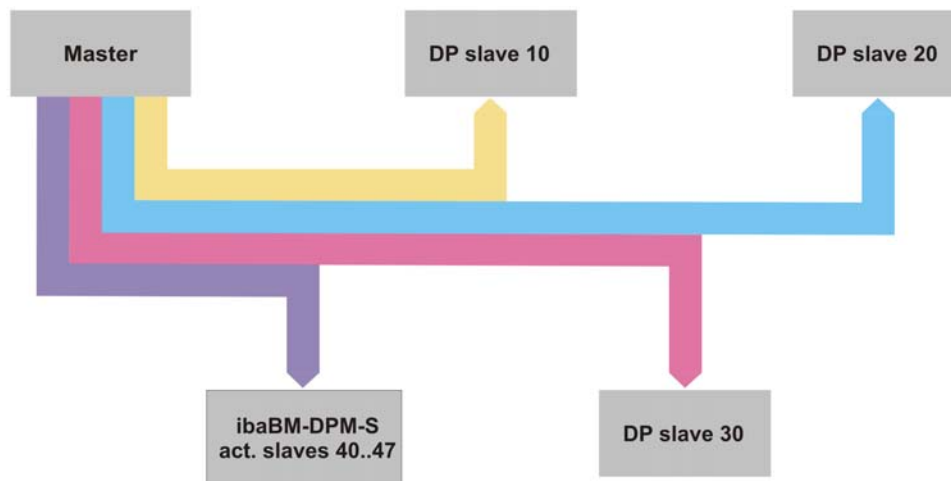
Fig. 2: Principle of operation as active slave

The two modes of operation can also be combined. In this case the ibaBM-DPM-S reads data that is specifically targeted for the device as well as data for other DP stations.

Operation on the redundant PROFIBUS

For using the redundant mode, a supplementary license is needed. Being used in the redundancy mode, ibaBM-DPM-S can read and capture data from redundant PROFIBUS strings of S7-400H controls. The device can be used in both modes, the sniffer mode and the active slave mode.

ibaBM-DPM-S monitors the telegram traffic on both PROFIBUS lines. The device decides individually for each slave, from which line data are taken.

The device can be operated either in redundancy or in normal mode. A combination of modes is not possible.

Integration in a DP network

For integrating the device in an existing DP network, no major physical changes have to be made. Due to its size and the mounting panel, the ibaBM-DPM-S device can be mounted between master and network. Due to the FO connection, the PROFIBUS data can be transferred over long distances and across areas with high electromagnetic fields.

Overview of the most important features:

❑ 2 PROFIBUS connectors for the connection of 2 DP lines or for looping through to one line.

❑ Both lines can be terminated separately.

❑ PROFIBUS interface with up to 12 Mbit/s

❑ A total of up to 8 own DP slaves, distributable over one or both lines. Fast ibaNet fiber optic interface with 32 Mbit/s

❑ Logs up to 512 analog signals (up to 1984 bytes) and 512 digital signals in 1 ms

❑ Slot for CompactFlash® cards for configuration data

❑ USB and Ethernet interfaces for configuring the device from your PC

❑ Windows CE® operating system

❑ Request-S7 and Request-FM458 available with ibaPDA-V6, version 6.17.0 or higher, Request-TDC available with ibaPDA-V6, version 6.22.0 or higher

❑ Automatic slave collision detection

❑ Enhanced diagnostic functions with ibaPDA-V6 (6.19.0 or higher)

❑ Smart value selection for sniffer mode

❑ Redundancy mode for use on the redundant PROFIBUS (S7-400H) with ibaPDA-V6 (6.26.3 or higher)

3 Scope of delivery

An ibaBM-DPM-S delivery contains the following components:

❑ ibaBM-DPM-S

❑ ibaBM-DPM-S manual

❑ USB cable (A/B) for connecting ibaBM-DPM-S and a computer

❑ CD-ROM with

- GSD file (for "active slaves")

- USB driver

- Empty parameter files

- Application example

4   Safety instructions

> ⚠ **CAUTION**
>
> The device should not be operated at voltages exceeding +24 V DC! An overly high operating voltage destroys the device and may result in death or serious injury.

> ⚠ **CAUTION**
>
> The PROFIBUS cable should be connected after proper completion of the active slave configuration only.
>
> Please, see also chapter 9.4.4.2 "Active Slaves" tab (Defining the slave addresses)" and 11.2 „Active slave operating mode".

> **Important note**
>
> Do not open the device!
>
> There are no serviceable parts inside the device.
>
> Opening the device will void the warranty.

> **Note**
>
> Cleaning
>
> To clean the device, use a dry or slightly moistened cloth.

5   System requirements

5.1   Hardware

For operation:
❑ 24 V DC, 1 A power supply

To set the device's parameters:
❑ Ethernet or USB connection to a PC or
❑ CompactFlash® card with CompactFlash® card reader

For measuring:
❑ IBM-compatible PC with the following minimum requirements:
- 1 GHz Pentium III or better
- At least one free PCI slot (PC)
- At least 512 MB RAM
- 4 GB free memory on the hard drive for measurement values

For further information on PC requirements, visit our homepage http://www.iba-ag.com.

❑ At least one fiber optic input card of type ibaFOB-D
❑ One ibaNet fiber optic patch cable for connecting ibaBM-DPM-S and ibaPDA-PC.
❑ PROFIBUS DP network

Operation in redundancy mode:
❑ ibaBM-DPM-S firmware beginning with version B4 supports the redundancy mode
❑ Moreover, you need to get a license that is activated via the ibaBM-DPM-S Web interface.

Note

Please contact iba AG for getting a license key for the redundancy mode.

5.2   Software

❑ Any automation system with DP master function can send data to ibaBM-DPM-S.

❑ ibaPDA-V6, ibaQDR-V6 beginning with version 6.10.2 on the non-redundant PROFIBUS or ibaLogic-V4 for measuring and recording data.

❑ ibaPDA-V6 / ibaQDR-V6 beginning with version 6.26.3 for measuring and recording data on the redundant PROFIBUS.

Note

The following request access procedures can be done with ibaBM-DPM-S beginning with version 6.17.0 of ibaPDA-V6:

- ibaPDA-Request-S7

- ibaPDA-Request-FM458.

Beginning with version 6.19.0, also the ibaPDA-Request-TDC request access procedures can be done.

For further information, please read the product manuals.

Note

In redundancy mode, the request access procedure can not be done.

6   DIN rail mounting/dismounting

6.1   Mounting

1. Locate the DIN rail mounting clip on the rear side of the device. Slowly push down and in so that the bottom part of the mounting clips snaps onto the bottom part of the rail and firmly fixes the device to the DIN rail.

2. If there is a rule to ground the device, connect the device to the ground (shield connector X29).

3. Once fixed, connect the 24 V DC power supply to the termination shown on the device. Ensure that the polarity is correct prior to applying power. Then install the other connections like:

    ▪ FO cable to the ibaPDA system

    ▪ Network connection via Ethernet TCP/IP or

    ▪ USB connection to a PC with Web browser.

⚠ CAUTION

Connecting the PROFIBUS cable

Do not connect the PROFIBUS cable until the configuration of the "active slaves" has been done correctly.

Please see also chapter 9.4.4.2 "Active Slaves" tab (Defining the slave addresses)" and 11.2 „Active slave operating mode".

Note

If needed, you can activate the PROFIBUS terminating resistor by operating switch S4 or S5.

6.2   Dismounting

1. Disconnect all external connections from the device.

2. Grasp the device with one hand firmly on the top side. With your free hand, grasp the bottom of the device and push it lightly down.

3. After that pull the device and lift it up. With this action, the device should free itself from the DIN rail.

7 Device description

7.1 Communication interfaces

Fig. 3 shows the integration of the device via its communication interfaces in a measurement assembly:

❑ Via the PROFIBUS interfaces, up to 2 PROFIBUS DP strings are connected for data capturing.

❑ ibaBM-DPM-S sends the captured data via the FO interface to ibaPDA-V6.

❑ Parameters are usually transferred via the network interface of ibaPDA-V6. Alternatively, it can also be done via the USB interface or a CF card.

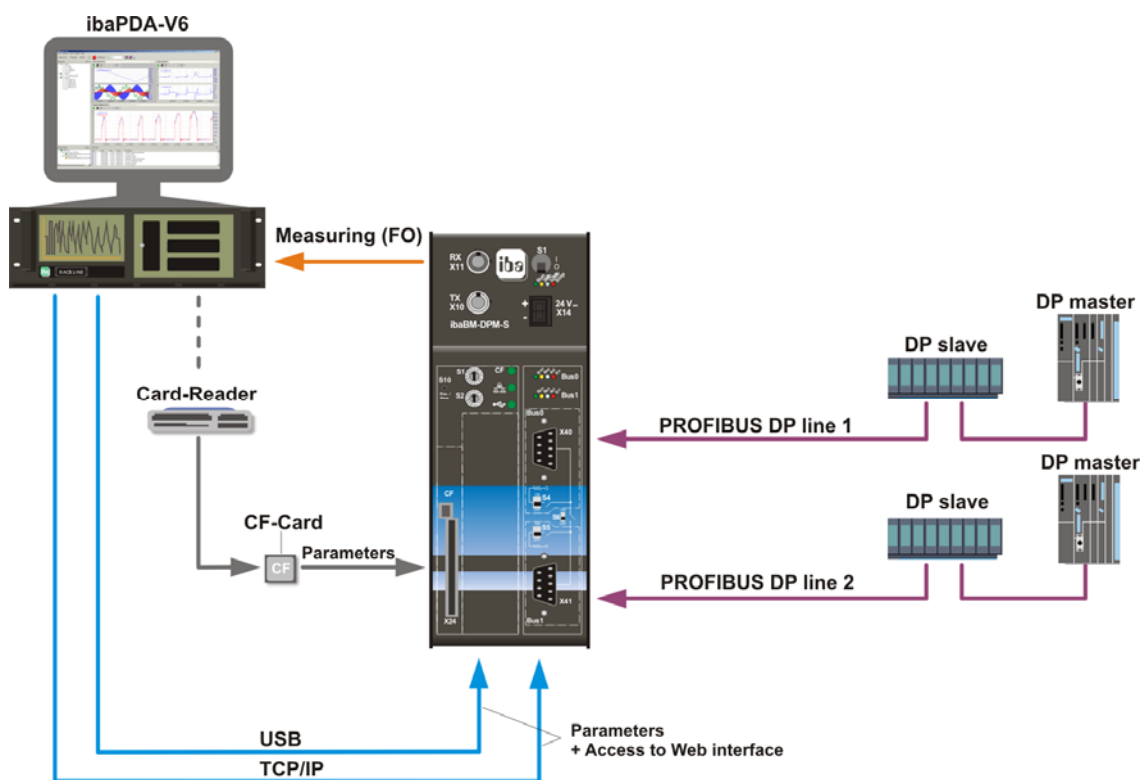❑ The Web dialogs are accessed via a USB or a TCP/IP interface.

Figure 3: Communication interfaces

7.2   Views of device, control elements and connections

Front view   **Top view**

❶ Fiber optic input (RX) X11
❷ On / off switch S11
❸ Operating state display
❹ Fiber optic output (TX) X10
❺ Power supply terminal (24 V) X14

❻ CF, LAN, USB status LEDs
❼ PROFIBUS status LEDs Bus0
❽ PROFIBUS status LEDs Bus1
❾ Rotary switch S1
❿ Rotary switch S2

① DP connector Bus0 X40

② Pushbutton S10

Bottom view

③ CF card slot
④ DP terminal Bus0 S4
⑤ DP bridge S6
⑥ DP terminal Bus1 S5

⑦ DP connector Bus1 X41

⑧ Shield connector X29

⑨ USB connector X23

⑩ LAN connector X22

Front view can be different from the one shown!

Rear view
Type plate

Device name
iba article number

Serial number
CE mark

MAC address

Hardware and software versions
(e.g.: HW A1, SW A2)

Figure 4: Device views

7.2.1.1 Fiber optic cable connectors RX / TX ❶

RX: 32 Mbit/s FO reception without function yet.

TX: 32 Mbit/s fiber optic transmission interface for direct data transmission to an ibaPDA-V6 or ibaLogic system.
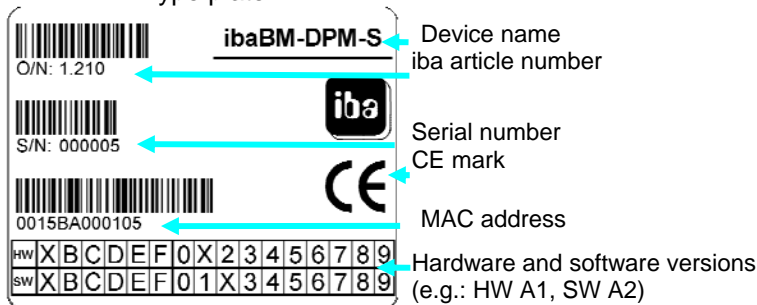
Your ibaPDA-V6 or ibaLogic system requires an ibaFOB-D card to receive data.

7.2.2 On / Off switch S11 ❷

Note

Devices from the first series up to no. 500 still have the (incorrect) designation S1 here.

Use this switch to turn the device on and off.

Turning the device on and off has no effect on the PROFIBUS, i.e. other PROFIBUS communication will continue without disruption when the device is switched off.

When you turn the device off and then restart it, it is rebooted. This is useful for instance when a fatal error has occurred (Error LED) or if you want to load new device parameters.

7.2.3 Operating status display (status LEDs) ❸

LED	Status	Description
Run (green)	Blinking (approx. 1 Hz)	Device is working; irregular blinking rate indicates device is overloaded
	On or off	Controller ok, device has "crashed"
3.3 Mbit/s (yellow)	off	No communication 3.3 Mbit/s
	blinking	Data transfer rate 3.3 Mbit/s (send only); only DPM-S-64 mode
	on	Data transfer rate 3.3 Mbit/s (send and receive); only DPM-S-64 mode
32 Mbit/s (white)	off	No communication 32 Mbit/s on TX
	on	Data transfer rate 32 Mbit/s on TX OK
Stop (red)	off	Normal, everything OK
	blinking	Defect, start-up error
	on	Defect, device-internal applications not running (possibly non valid parameters or corrupt parameter file)

Table 1: Status LEDs

7.2.4   24 V Power supply ❺

The ibaBM-DPM-S device requires an external 24 V DC power supply (unregulated) and should be operated at a maximum of 500 mA. The operating voltage should be run through the provided 2-pin Phoenix threaded coupling connector. If desired, you can order DIN rails or plug-in power supply units from iba.

7.2.5   Status LEDs on the communications interface ❻

LED	Status	Description
CF	Off	No CF card inserted
	Green	Card detected (card may also be empty), driver loaded; LED flickers during data transfer.
	Red	Error CF card, e.g. incorrect card type or start-up phase.
Ethernet	Off	Ethernet cable not connected
	Green	Driver loaded, LAN ready; LED flickers during data transfer
	Red	Defect; driver not loaded
USB	Off	Normal if nothing is connected
	Green	Connected device detected, driver loaded, LED flickers during data transfer
	Red	Defect or communication setup

Table 2: Status LEDs of communication interfaces

7.2.6   Rotary switches S1 and S2❾ ❿

These switches provide some special functions.

7.2.6.1   Transmission of configuration data from CF disk to flash memory

1. Set S1 and S2 to position „3".

2. Plug in the CF card (containing the configuration data), press the push button S10 and hold it when you switch on the device. During the boot procedure, the configuration will be loaded from the CF card into the internal flash memory. Over this way (CF card) you may transfer a configuration which was created with ibaPDA into the device even if no Ethernet or USB connection.

7.2.6.2   Reset to default settings

1. Turn switch S1 to "6" and S2 to "9".

2. Push and hold push button S10 and switch device off and on with switch S11. The status LEDs blink for approximately 10 s with 1 Hz.

3.   As soon as the LEDs start blinking, release the push button S10.

4. The device restores the default settings and restarts automatically.

Important note

We recommend setting back the hex switches on „0".

Now all customized settings are deleted and set back to default settings, i. e. also specific settings for TCP/IP or USB are reset, incl. passwords. Saved settings of signal parameters (*.csv) and the activated number of active slaves remain.

7.2.7   Pushbutton S10 ②

Reset to default settings, see chapter 7.2.6. "Rotary switches S1 and S2❾ ❿".

7.2.8   CompactFlash® card slot X24 ③

❑ Standard card slot for CompactFlash® cards

❑ Works with CF, CF+, Type I and Type II cards. There is no speed-up advantage when using faster cards (CF+).

❑ There may be minor occurrences of data loss when using very slow cards, seen only with Ultron CompactFlash 128 MB yet. Please do not use this CF card with our device.

The CompactFlash®-card is also used as storage and transport medium for the configuration files. If you want to look up how to use CF cards, please see chapter 9.2 "Transferring the configuration with the CompactFlash® card" and chapter 9.4.4 "Settings".

Note

The CompactFlash® card must not be removed during startup or during write access. This could damage or destroy data. When you remove the card, ensure that the "CF" LED is not blinking either green or red. When inserting or removing the card, you do not have to switch off the device.

7.2.9   TCP/IP interface (bottom) ❿

The device can be connected to a PC or a network over a TCP/IP interface.

The interface has a unique MAC address and is used for transferring configuration files (device parameters).

Note

For connecting the device directly to a PC, please use a cross-over cable. For further information, see chapter 9.3.1 "Ethernet TCP/IP".

7.2.10   USB interface (bottom) ❾

❑ The device can be connected to a PC over a USB interface. It can be used for parameterize the device.

❑ The interface conforms to the USB 2.0 standard.

For further information, see chapter 9.3.2 "USB".

7.2.11   LEDs for PROFIBUS Bus0, Bus1 ❼ ❽

PROFIBUS LED	Status	Description
Run (green)	Blinking	PROFIBUS controller active and OK
	Off	Error in the CPU of the DP controller
Bus (yellow)	Off	No PROFIBUS found or no communication
	Blinking fast (appr. 0.1 s)	At least one master active in the DP, but no slave
	Blinking slowly (appr. 0.8 s)	At least one master and at least one slave are active in the DP, but not all slaves that were configured
	On	All configured master and slaves are active in the DP
Act (white)	Blinking	No communication with DP or transmission rate is still being detected. Default values are being sent to ibaPDA. (only in DPM-S mode)
	On	Transmission rate detected and set. Values are read in the DP and sent to ibaPDA (only in DPM-S mode)
		When the device is working in DPM-S-64 mode, the white LED has no function and is off.
Error (red)	Off	Normal state
	On	DP-line error or boot phase, incorrect parameterization or error while starting
	Blinking (short lighting appr. 0.125 s)	Sporadic errors in the DP

Table 3:   LEDs for PROFIBUS Bus0, Bus1

7.2.12   PROFIBUS DP connectors X40 (Bus0) and X41 (Bus1) ①, ⑦

Standard PROFIBUS DP connector (Sub-D 9):

❑ These connectors can each accommodate one PROFIBUS line.

❑ You can use connectors with incoming and outgoing wires as well as end plugs with only incoming lines.

Important note

Ensure that the S4, S5 and S6 switches are set correctly!

See also chapter 7.2.13 "PROFIBUS switches S4, S5, S6 ④, ⑤, ⑥".

7.2.13   PROFIBUS switches S4, S5, S6 ④,⑤,⑥

For all switches:

ON = Switch closed

OFF = Switch open.

Note

Before connecting a PROFIBUS network, please carefully check the switch position with regard to bus termination. We recommend that you first set all switches to OFF as termination is often provided in the connector.

❑ Switch S4 is used to switch the terminating resistor for Bus0 on and off.

❑ Switch S5 is used to switch the terminating resistor for Bus1 on and off.

❑ Switch S6 is used to disconnect or connect both lines Bus0 and Bus1.

Important note

In redundancy mode, the S6 switch has to be set to OFF, as the both redundant PROFIBUS strings must be connected separately.

The following switch positions can be chosen:

Connection configuration/operating mode	S4	S5	S6
Bus0 and Bus1 are to be operated separately. (a different PROFIBUS line is connected to each connection)			OFF
ibaBM-DPM-S is not the last device on Bus0	OFF		OFF
ibaBM-DPM-S is not the last device on Bus1		OFF	OFF
ibaBM-DPM-S is the last device on Bus0	ON		OFF
ibaBM-DPM-S is the last device on Bus1		ON	OFF
ibaBM-DPM-S is to be looped into a PROFIBUS line, whereby only two cable ends with end plugs of the same line are available.	OFF	OFF	ON
Bus0 and Bus1 are monitored simultaneously in redundancy mode, the device is not the last one in the line.	OFF	OFF	OFF
Bus0 and Bus1 are monitored simultaneously in redundancy mode, the device is the last one in the line.	ON	ON	OFF

Table 4: Switch combinations S4, S5 and S6

7.2.14   Shield connector ⑧

Socket for connecting the protective ground. Depending on the control cabinet configuration it may be necessary to connect the Profibus cable shields to the X29 connector.

If the Profibus cable shields are already connected to the protective ground of the control cabinet, connect the X29 connector also to the protective ground of the control cabinet.

8   System integration

8.1   ibaBM-DPM-S in the ibaPDA environment

In the following examples, only ibaPDA-V6 is referred to as the receiving system. The topologies apply analogously to ibaLogic. The following also applies to ibaLogic: data can be received with the ibaBM-DPM-S from the PROFIBUS.

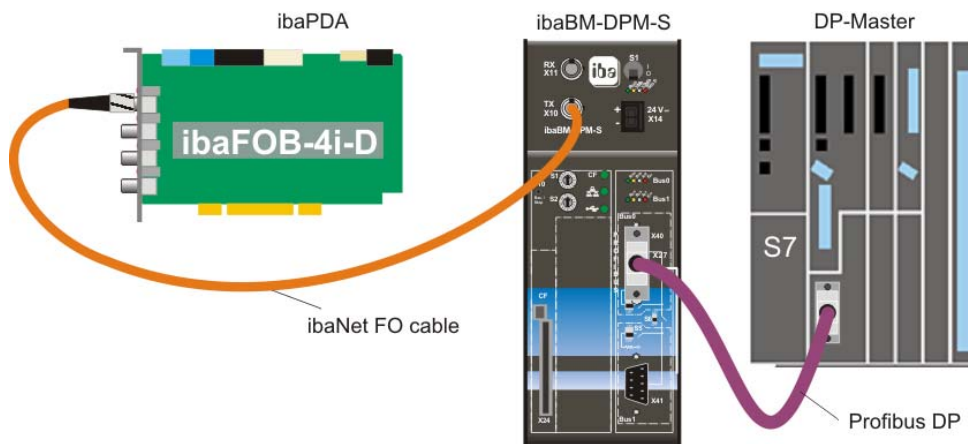### 8.1.1   Connection to the DP-Master (unidirectional)

Figure 5: ibaBM-DPM-S connected to the DP master and ibaFOB-4i-D in the measuring PC

The configuration shown above illustrates the ibaBM-DPM-S device connected to a DP Master device (for example the SIMATIC S7). The measured values can be logged with a stationary ibaPDA-V6 PC using an ibaFOB-4i–D card.

If the device happens to be the last device on the DP line, as shown in Figure 5, the corresponding terminating resistor must be activated. (In the above example, switch S4 is set to ON)

8.1.2 Connection to the DP master and other DP slaves (unidirectional)
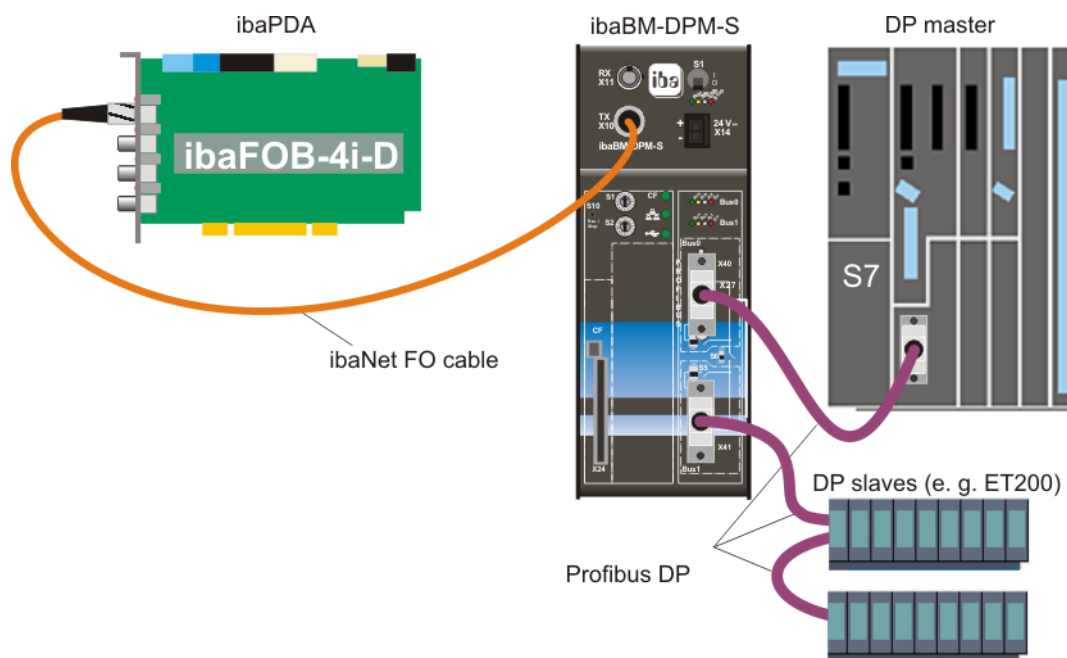
Figure 6: ibaBM-DPM-S connected to DP master, further DP slave devices and measuring PC

ibaBM-DPM-S can be inserted anywhere into an existing PROFIBUS DP network. Various cases are conceivable.

❑ The PROFIBUS cable has two cable ends with end plugs at the point where the device is to be installed. One end is connected to the Bus0 connection, and the other end to the Bus1 connection. The switch S6 must then be closed (ON); the terminating resistors (S4, S5) must be switched off (OFF)!

❑ The PROFIBUS cable has a plug and incoming and outgoing wires at the point where the device is to be installed. The plug can then be plugged onto one of the connections Bus0 or Bus1. The switch S6 must be opened (OFF)!

❑ The PROFIBUS cable has two neighboring plugs with incoming and outgoing wires at the point where the device is to be installed. Both plugs can be plugged onto the connectors Bus0 and Bus1. S4, S5, and S6 must be open (OFF).

8.1.3 Connection to the DP master and other DP slaves on the redundant PROFIBUS
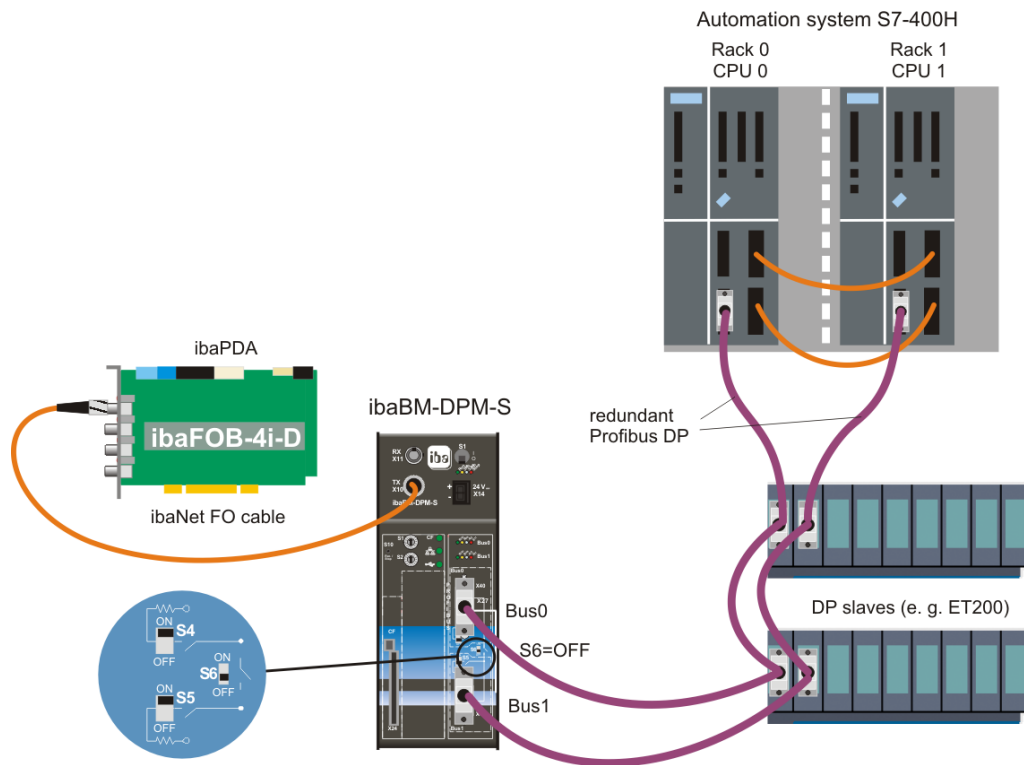

Figure 7:   ibaBM-DPM-S connected to the redundant PROFIBUS and measuring PC as last device on the strings

The highly available S7-400H automation system offers two parallel redundant PROFIBUS strings. ibaBM-DPM-S is looped into the two lines by the two DP connections Bus0 (X40) and Bus1 (X41).

In redundancy mode, the S6 switch needs to be open (OFF). The Bus0 (X40) connection is connected to the DP string of the CPU0 and the Bus1 (X41) connection to the DP line of the CPU1. The device can be looped at any place in the line.

If the device is looped in at the end of the line, the terminating resistor has to be switched on (in the above example switches S4 and S5 are switched ON).

If the device is looped into the line directly after the CPUs (as shown in the next figure), the terminating resistors need to be switched off (switches S4 and S5 to OFF).

Note

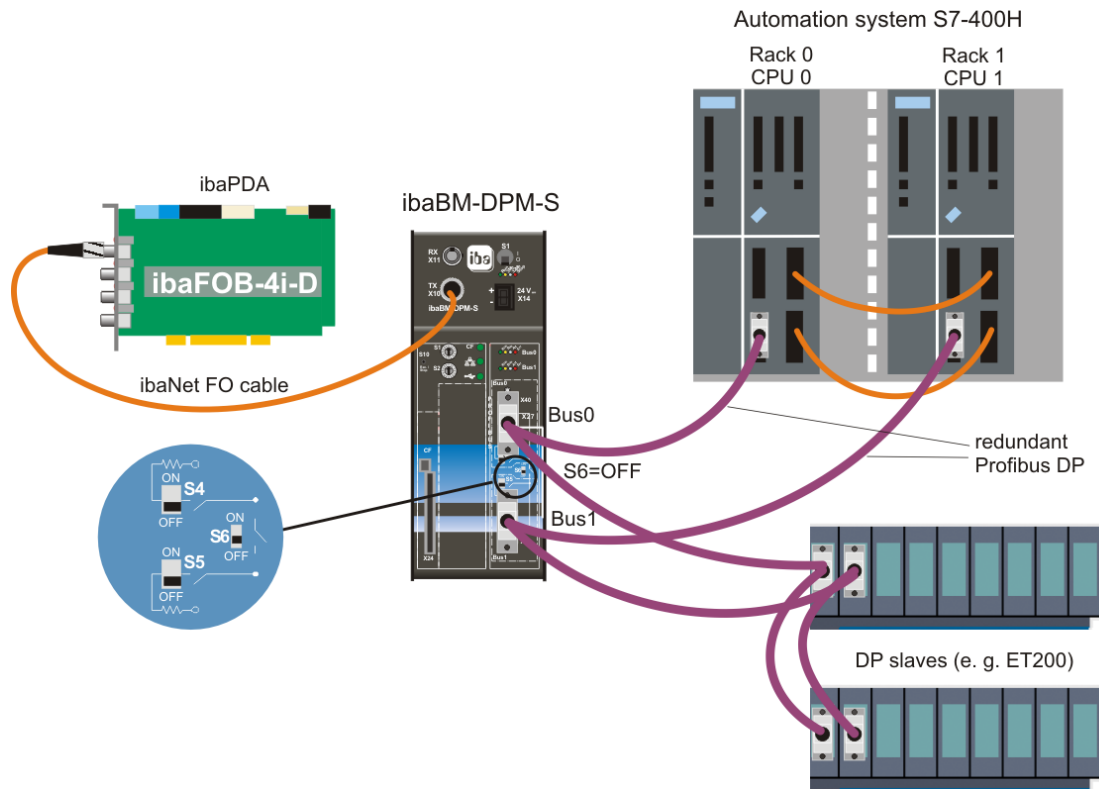On the redundant PROFIBUS, ibaBM-DPM-S can only be used with ibaPDA-V6 and not with ibaLogic!

Figure 8: ibaBM-DPM-S connected to redundant PROFIBUS and measuring PC

9 Configuring and setting up the device

9.1 Basic principles

The device is always configured with a number of text files that must be in the CSV format. In the configuration files, the PROFIBUS specific communication parameters, like address ranges and slave numbers are set. Furthermore, the signals to be measured are defined.

The configuration files can be transferred to the ibaBM-DPM-S device in three different ways:

1. Direct configuration of the device via Web interface, see chapter 9.4 "Configuration of the device via the Web interface". Then, please make sure that the configuration of the program (ibaPDA-V6, ibaLogic-V4) is in accordance with the device configuration. ibaPDA-V6 can read the configuration out of the device, provided that the device is online.

2. The device is configured in the ibaPDA-V6 I/O manager or in an editor. A CF card is used as a means of transportation, see chapter 9.2 "Transferring the configuration with the CompactFlash® card".

3. The device is configured in the ibaPDA-V6 I/O manager. The parameters are transferred directly to the device via TCP/IP (USB or Ethernet).

If you use ibaPDA, and a TCP/IP connection is established between PC and ibaBM-DPM-S, we generally recommend the 3rd way of configuration. This way, both, ibaPDA and the device are configured, and you can be sure that both work with the same parameters. Parameters are then transferred automatically when the configuration is done (with <OK> or <Apply>).

⚠ CAUTION

When changing the slave configuration of the ibaBM-DPM-S device during operation (adding or removing slaves, or transferring slaves to another bus), the slave is temporarily decoupled from the PROFIBUS. The communication to the DP master is interrupted. In case the PLC (e.g. SIMATIC S7) is not safeguarded by OBs, the PLC stops operating!

In case you change addresses and data of defined slaves, the PROFIBUS communication is not disturbed!

⚠ CAUTION

Please, only define active slaves if those are identical to the ibaBM-DPM-S. Never use slave numbers of other devices as active slaves! This disturbs communication on the PROFIBUS.

9.2   Transferring the configuration with the CompactFlash® card

The configuration files need to be transferred by means of a CF card, if ibaPDA has no TCP/IP access to the ibaBM-DPM-S device, or ibaLogic-V4 is used.

The following prerequisites are needed: the PC has a card reader/writer or card slots.

Please, proceed as follows:

1. The CF card has to be formatted FAT or FAT32.

2. Create a „DPMS" folder on the storage card in the main directory and copy the four empty configuration files (*.CSV) from the supplied CD to this folder.

3. Please configure the parameter data in the ibaPDA I/O manager and save the data in the DPMS folder on the CF card. Choose "Write configuration in file" (see chapter 10.2.1.1 "General" tab) or create the configuration by means of an editor in the given format of parameter files on the CD and copy them to the CF card.

4. Although the cards are protected against reverse polarity, please insert the card slowly and carefully into the CF slot and press it down firmly.

5. Set the rotary switches S1, S2 to the positions "3, 3", push the button S10 and switch on the device (see chapter 7.2.6.1). Please keep the button pressed until the values have been transferred from the CF card (ca. 20 sec).

6. The parameter files are copied into the internal folder. Then, you can remove the CF card.
    For removing the card, push the button above the slot. This way, the card is taken from its firm position and can be removed.

9.3   Establishing communication connections

Important note

For configuring the device on the PC, you need a TCP/IP connection via Ethernet TCP/IP or USB.

9.3.1   Ethernet TCP/IP interface

The Ethernet TCP/IP interface at the bottom of the device is used for configuring device parameters.

Each ibaBM-DPM-S device has a unique MAC address that allows to identify the device in the network.

Tip

You can find the MAC address on the type label on the back of the device.

Moreover, every device has a name. This way, the device can be identified and addressed in the network.

The name is made up of the following components: **dpms_*nnnn***

nnnn stands for the last four digits of the MAC address.

Example: The device with the 0015BA000101 MAC address carries the name dpms_0101.

An IP address can be defined via the Web interface (see 9.4.3 „Network – configuration data "). You can choose if you want to use DHCP (dynamic assignment of IP addresses) or the defined IP address. In case there is a DHCP server in the local network, we recommend the DHCP default setting. If the device is set for a dynamic IP address, or is registered on a name server, it can always be addressed by its unique name. Having connected the device to an active network, a DHCP server is searched for (if the DHCP option is activated), for getting an IP address („Auto-IP"). This can take up to two minutes.

First configuration of a TCP/IP connection

If you connect a new ibaBM-DPM-S device for the first time to a PC via cross over cable, because there is no network available, please complete the following steps.

1. Please make sure that the PC gets its IP address automatically (see TCP/IP features of the PC´s network connection).

2. As there is no DHCP server available, the PC and the ibaBM-DPM-S device get automatically an IP address after appr. one minute (Auto-IP). This address should look as follows: 169.254.x.x.

3. Now, you can communicate with the ibaBM-DPM-S device, by entering dpms_nnnn in the Web browser. Nnnn stands for the last four digits of the MAC address (see type label on the device).

4. If wanted, the IP address can be changed later via the Web interface (http://dpms_nnnn) of the device.

   (For further information, see chapter 9.4.3 „Network – configuration data ".)

9.3.2   USB Interface

The USB interface is located on the bottom side of the device, too, and can also be used for configuration data. The procedure is basically the same like described for the Ethernet TCP/IP interface.

As soon as the PC or laptop computer is connected for the first time over the USB interface by a standard USB cable (A/B), the "Found New Hardware Wizard" will show up.
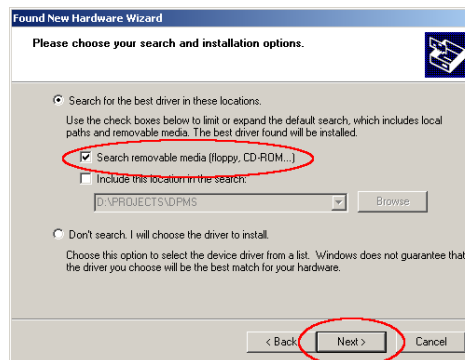
1. Choose "No, not this time" in the dialog box and click on „Next".

2. In the following dialog choose "Install from a list or specific location.." and click on „Next".
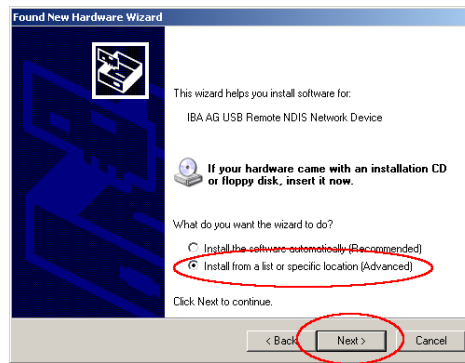
3. Choose "Search for the best driver in these locations" and check „Search removable media...". Insert the delivered CD-ROM into your CD drive and click on "Next".
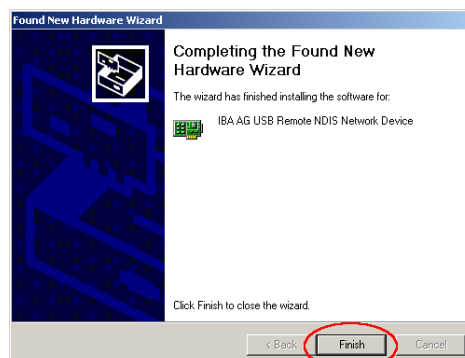

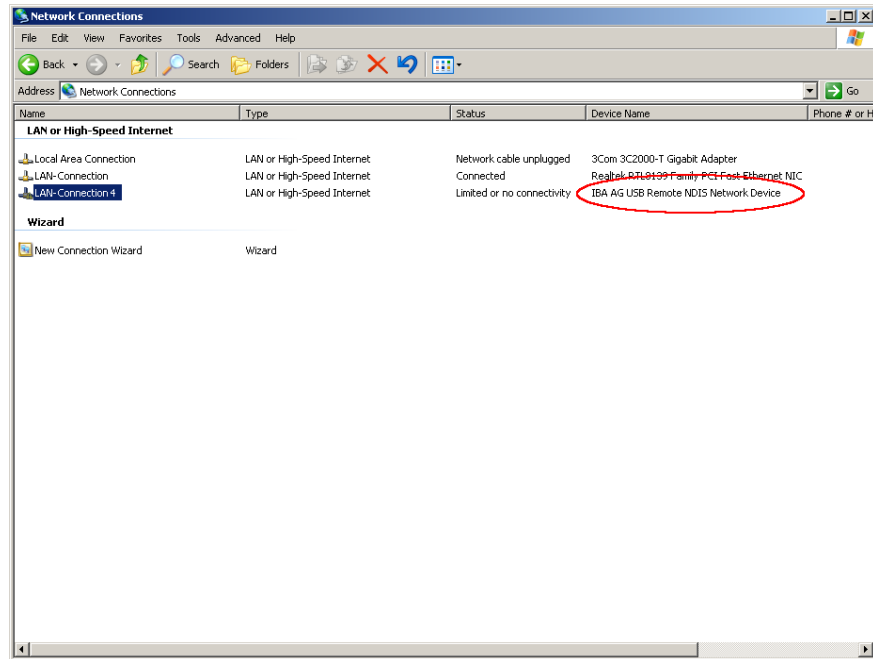The driver for "IBA AG USB Remote NDIS Network Device" will be found.

4. The message box which points out that "The software you are installing... has not passed the Windows Logo testing.." is typical and can be closed by click on "Continue Anyway" because it's not dangerous.
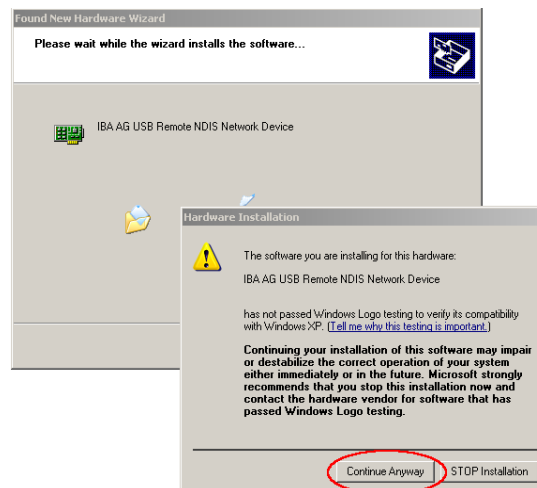

5. After copying the required files click on "Finish".

Now, the USB interface is available as an additional Ethernet interface to the device. You should now configure the interface in order to establish a communication to the device over the USB cable. Therefore, choose "Settings" in the Windows Start menu and then "Control Panel". There open "Network Connections" to see a list of available network connections.

6. There, in section "LAN or High-Speed Internet" you'll find a LAN connection with the device name "IBA AG USB Remote NDIS Network Device". Highlight this line and select "Properties" from the "File" menu. A new dialog box "LAN-connection... Properties" will open.
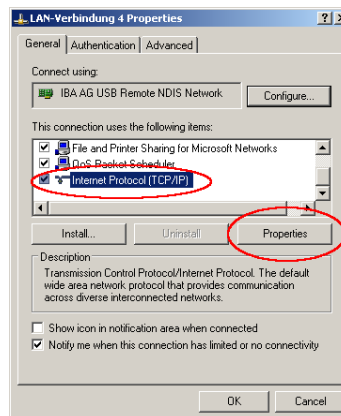
7. Look for entry "Internet Protocol (TCP/IP) and highlight it. Click on "Properties". A new dialog box "Internet Protocol (TCP/IP) Properties" will open.
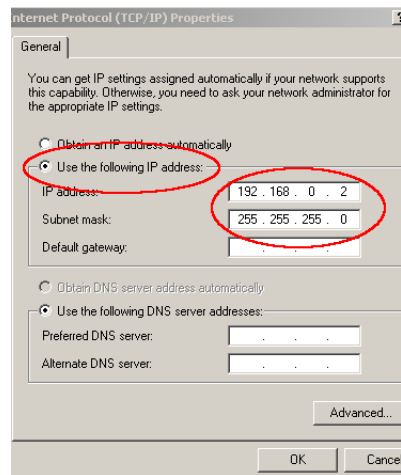
8. Choose "Use the following IP address" and enter the address "192.168.0.2" into the field "IP address" and the value "255.255.255.0" into the field "Subnet mask". Then close this dialog and the previous one by click on "OK".

9. Now you can parameterize the device over USB.

9.4   Configuration of the device via the Web interface

To assist you during parameterization, the device has its own web server. Once the Ethernet connection between the device and the PC has been established, you can access the device from your Internet browser (Internet Explorer, Mozilla Firefox etc.). Suitable web pages for parameterization are stored in the device.

Tip

Once, the basic settings (operational mode, network, passwords) have been done over the web interface, we recommend to make the further settings of the data to be measured in the I/O manager of the ibaPDA system. For clarity reasons it makes sense to choose one way of configuration and keep it for the general configuration activities.

By means of the ibaPDA system, you may always restore a backed up IO configuration in the device. Vice versa this is only possible in parts because, for example, no signal names are stored in the ibaBM-DPM-S device. By using ibaPDA consequently for signal configuration you can guarantee the consistency of the signal configuration in ibaPDA and the device.

For further information on configuring measuring signals in ibaPDA-V6, please read chapter 10.1 "First steps in ibaPDA-V6".

Note

In redundancy mode, activation and configuration are done with ibaPDA-V6.

9.4.1   Starting the Web interfaces

1. After having connected the PC to ibaBM-DPM-S via Ethernet or USB, please start the Internet Explorer.

2. Type in the Internet address of the device in the address line (URL)

| If connection via …	then URL …
USB interface	http://192.168.0.1
Ethernet TCP/IP-interface (with DHCP server in LAN)	http://dpms_nnnn nnnn = last four digits of the MAC-address (see device label)

Important note

When working under Windows 7, you might get no access to the Website, although a con-nection is established. Please check or change the following parameters in the Windows security settings:

Path: Local Security policy "Security settings - Local policies - Security options"

Parameter: Network security: LAN manager authentication level

Value: "Send LM & NTLM responses"
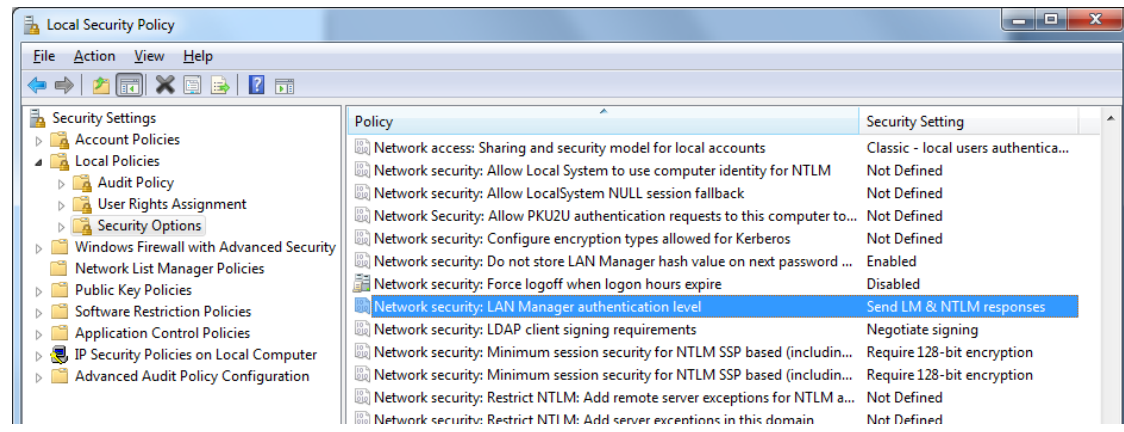
Tip

Depending on the security level settings of the Internet Explorer it might be necessary to add the address http://dpms_nnnn/diag to the trusted sites

The first time you access the Web interface you will be prompted to enter a username and password to prevent unauthorized access.

Figure 9: User name Web interface

The device recognizes two users for operating the web interface:

User	Rights	User name	Password
Normal user	Makes settings for analog and digital values as well as active slaves and operational mode of device.	dpms	dpms
Administrator	In addition to the above mentioned: change the network parameters and the passwords of the two users, execute firmware updates and change the number of active slaves, if applicable[1]. As administrator , you can also activate the redundancy mode [2] .	admin	dpms

The „admin" user should only be assigned to experienced users. As network parameters might be changed accidentally, access to the device via Ethernet would no longer be possible. You would have to reset the configuration to default values. Please change the password for the „admin" user as soon as possible.

Tip

You can reset the passwords to default values, e.g. if you have forgotten the password. For further information, see chapter 7.2.6 "Rotary switches S1 and S2❾ ❿".

After login with the user name mentioned above, the home page opens.

---

1 An increased maximum number of slaves is an optional license which can be purchased from iba AG. Such an upgrade can only be released after approval of compliance to the existing installation by iba AG.
2 The release of redundancy mode is an optional license which can be purchased from iba AG.
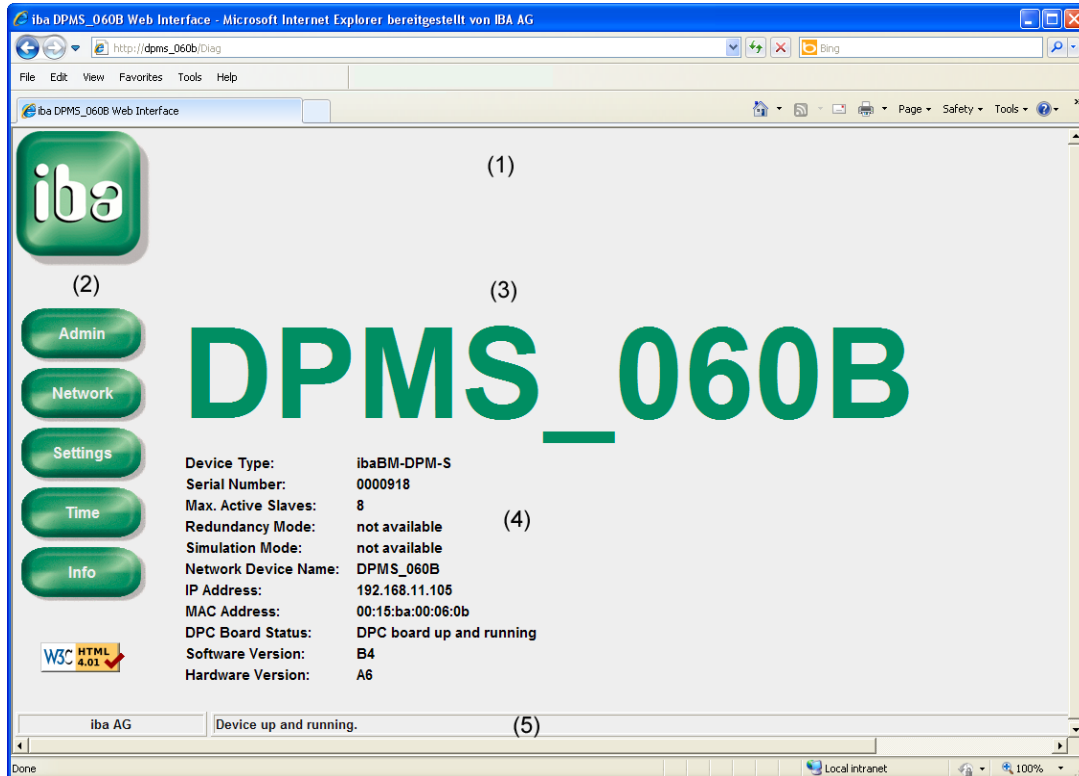
9.4.2   Info – homepage

Figure 10: Homepage of the device

The Web pages all have the same basic layout:

(1)   The header section on the upper part of the page contains information about the currently selected page.

(2)   The navigation section provides buttons for selecting the individual web pages.

(3)   The pages information section provides the desired information of the selected web page and permits data entry whenever necessary.

(4)   The home page provides additional information about the device:

- Device type
- Serial number
- Maximum number of active slaves, supported by the device
- Redundancy mode
- Simulation mode (function in preparation)
- Device name in the network (required for automatic network address assignment by DHCP server)
- IP address of the device
- MAC address (hardware network address) of Ethernet access
- Status of PROFIBUS DP controller board
- Software version
- Hardware version

(5)   The status line provides you with information about the device status and the actual device time. Due to the system, the status information is not actualized continuously, but only with every new loading of the Website.

You can go to the homepage from any other website by clicking the <Info> button.

9.4.3   Network – configuration data

Clicking the <Network> button in the navigation section takes you to the configuration data of the network accesses.

You must be logged in as "admin" in order to change network settings.

Figure 11: Page with network settings

This page shows the two network adaptors of the device. The upper interface "SMC LAN91C111 Ethernet" describes the settings of the X22 LAN interface, the lower "TCP/IP over USB" interface describes the settings of the X23 USB connection.

The following settings can be chosen for each adapter:

(1)   The IP address

(2)   The „Subnet Mask" for the network

(4)   The „Default Gateway"

(3)   Here, you can choose if a DHCP server is to be used

(5)   With the <submit> button, the entries for the network adapter are stored in the device.

(6)   With the <reset entries> button, the entries are deleted.

(7)   The network settings only become valid if the device is restarted. The device can be restarted by switching on/off or by clicking on the <restart> button.

Tip

In case of wrong entries, it may occur that you lose access after restart!

You can reset the network parameters to default settings. For further information, see chapter 7.2.6 „Rotary switches S1 and S2❾ ❿".

Note

Due to the simple point-to-point connection and the considerable slower establishing of a connection, we recommend avoiding the use of DHCP in conjunction with USB.

9.4.4   Settings

By clicking on the <Settings> button in the navigation panel, you choose the page for signal settings. This page is divided into several subpages that can be chosen by clicking on tabs. The page is segmented like follows:
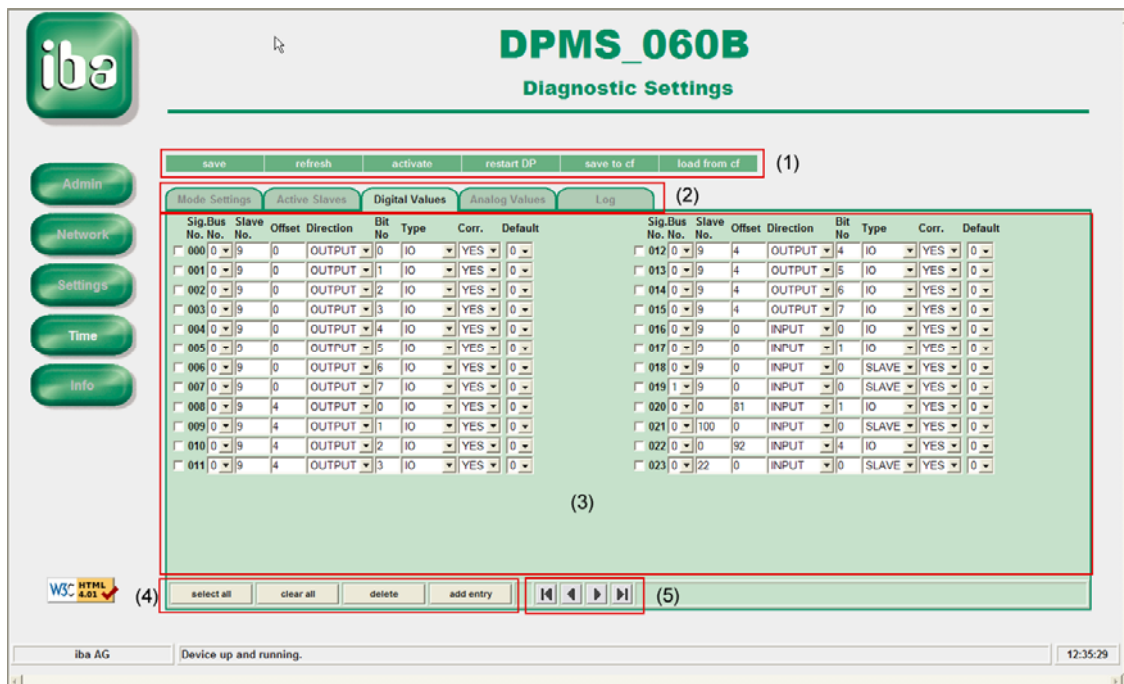

Figure 12: Page with signal settings (digital values)

The buttons in section (1) apply to all diagnostic values. Here, you can select the following functions:

Working with the current configuration:

❑   <save>: saves the current settings.

❑   <refresh>: Refreshing the chosen tab

❑   <activate>: activates the current values. The values are stored.

❑   <restart DP>: saves all parameters and values; restarts the device.

The <save>, <refresh> and <activate> buttons always refer to the currently displayed tab.

The current configuration can be found on the internal Flash of the device. The configuration is made up of all (4) CSV files. The configuration can only be recognized if all files exist.

Working with a CompactFlash® card:

❑   <save to cf>: Copies the internal CSV files to the CompactFlash® card into the DPMS directory.

❑   <load from cf>: Copies the CSV files from the CompactFlash® card into the internal file system. Thus, you can import the configuration permanently from the memory card into the device, enabling the device to operate without memory card later.

With the tabs in field (2), you can change between the different types of setting values.

You can choose between the following options:

❑ Mode Settings: Setting of the device mode and the DPM-S-64 parameters

❑ Active Slaves: Defining slave addresses

❑ Digital Values: Defining digital values for capturing

❑ Analog Values: Defining analog values for capturing

❑ Log: Status information about last activation

The tabs (3) meet all configured values at your disposal.

With the buttons (4), you can change the current values (3). The changes are true for all values that are ticked on the left hand side of the value. With <select all> you can choose all values on this page, with <clear> you can deactivate all markings. With <delete>, all marked values are deleted on the current page. <Add entry> adds a new value at the end of the page. Here, the view goes to the last possible page, for the new value can be processed immediately.

With the buttons (5) you can choose subpages of the single tabs. The number of the displayed values is limited to 24. If there are more values, these are distributed on several subpages. The buttons in the middle allow scrolling to the previous/ to the next page. The buttons on the edge jump to the first/last page.

9.4.4.1 „Mode Settings" tab (setting the device mode)

The device mode can be chosen via the Webservice interface. You find the "Mode settings" tab under the diagnostic data and the settings. Here you can switch between the "DPMS Sniffer / Active Slave Mode" device mode and the "DPM-S-64-Mode".

❑ DPMS Sniffer / Active Slave Mode

In this mode, the device can be operated as sniffer and/or with active slaves.

❑ DPM-S-64 mode

In this mode, the device exactly behaves like the ibaBM-DPM-S-64 device or like the predecessor ibaBM-DPM-64 with a maximum of two slaves and up to 64 analog and 64 digital signals. Sniffer operation is not possible. For more information about how to configure the device in DPM-S-64 mode, please read the ibaBM-DPM-S-64 device manual.
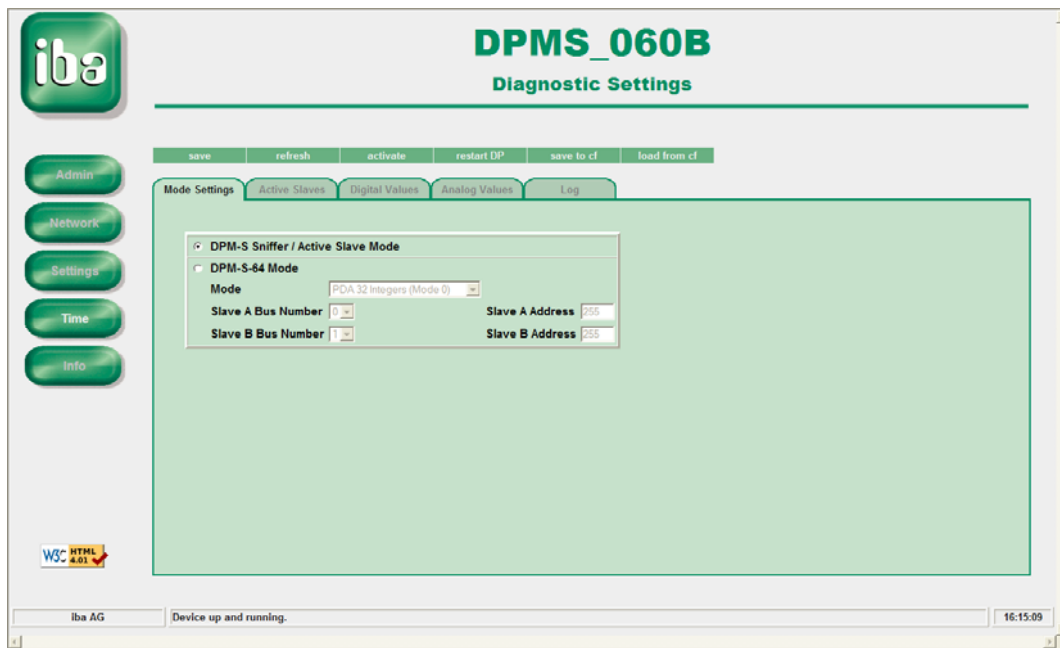
Figure 13: Setting operating mode (Mode Settings)

Note

If the redundancy mode license is activated, the "DPMS Sniffer / Active Slave Mode" shows if the redundancy mode is chosen in ibaPDA-V6.

In the DPM-S-64 mode, the needed parameters can be set on this tab:

❑ Operating modes for analog input and output signals

❑ PROFIBUS interface (bus), by which the DP slave can be accessed

❑ Address of the DP slave

9.4.4.2 "Active Slaves" tab (Defining the slave addresses)

On this tab, you can choose the slaves for each PROFIBUS connection. Moreover, addresses can be assigned to the slaves.
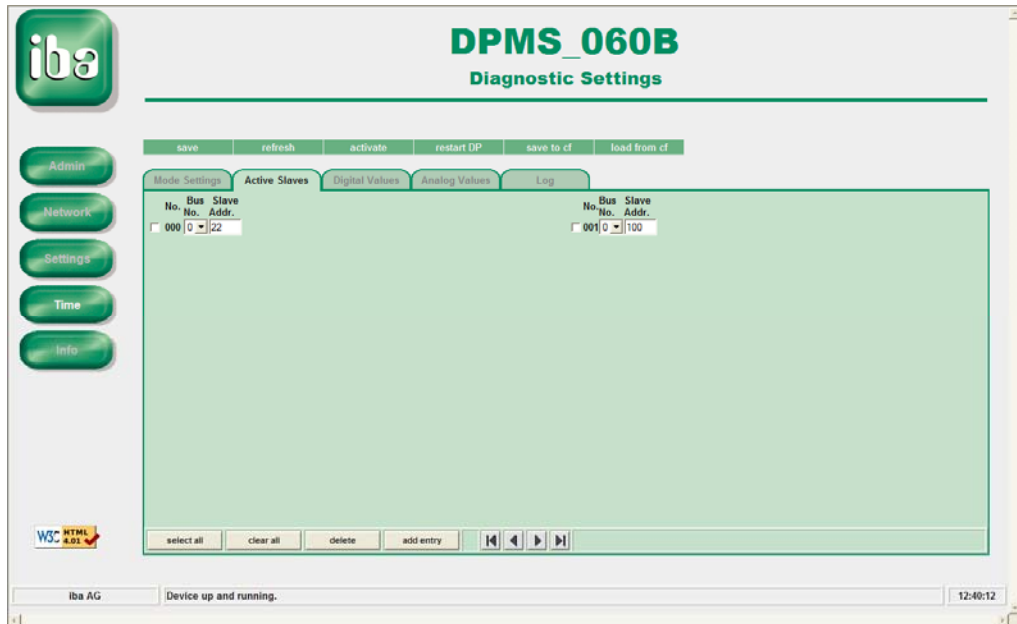
Figure 14: "Active Slaves" tab

You can define a maximum of eight slaves. In case, not all eight slaves are listed, yet, you can add further slaves by clicking the <add entry> button. As participant numbers for the slaves, the values 0 … 126 can be assigned to.

Each slave has to be activated. You need to choose the bus no. for each slave corresponding to the physical connection (0 or 1).

When entering the slave addresses, please consider that no slave address must be defined twice.

Note

You can also do these settings in ibaPDA and transfer them to the device.

Please only create active slaves in redundancy mode with ibaPDA.

⚠ CAUTION

Connecting the PROFIBUS cable

Please do not connect the PROFIBUS cable until the configuration of the „active slaves" has been done via Web interface or in ibaPDA-V6. This way, you make sure that no slave number exists twice.

If there exist more than one slave with the same number, this can lead to a complete breakdown in communication on the PROFIBUS and hence, a complete machine downtime!

9.4.4.3 "Digital Values" tab (digital signals)

For a detailed overview of this tab, please read chapter 9.4.4 "Settings".

Figure 15: "Digital values" tab

Some of the parameters can be selected also in the ibaPDA-V6 I/O manager. For the names of the columns in ibaPDA-V6, please have a look at the brackets.

The columns and their meaning:

❑ Check box
For choosing a signal to be changed in the button bar, please tick the box by a mouse click (e.g. deleting with <Delete>).

❑ Sig. No.
Sequential number, no changes possible

❑ Bus No. (ibaPDA: Bus)
By this option, you can define the physical bus connection of the device, the signal is to be measured on.

❑ Slave No. (ibaPDA: Slave)
Here, you can define the slave address, the signal to be measured has been configured for. Value range: 1 … 126.

❑ Offset (ibaPDA: Address)
The digital signals are administered by bytes and identified by a Byte offset and the bit number. The „Offset" parameter describes the Byte offset of the byte where the wanted signal bit can be found.

❑ Direction (ibaPDA: I/O)
Here, you can define if it is an input or an output signal

  ▪ OUTPUT = Signal from PROFIBUS master to slave

  ▪ INPUT = Signal from slave to PROFIBUS master

❑ Bit No. (ibaPDA: Bit no.)
Here, you can enter the bit number of the signal within the byte.

❑ Type (ibaPDA: I/O)

  ▪ IO: Default setting, should always be used.

  ▪ RAM, DPR, TIME: only for service purposes

  ▪ SLAVE: shows the status of the slave that is defined under "Slave No." All other settings are not relevant (TRUE: slave OK, FALSE: slave not OK).

❑ Corr.
Switches on/off correction in case of downtime; Default setting „YES"; this means when losing contact to the PROFIBUS, the default value is sent.

❑ Default
Here, you can enter a default value which is sent in case no PROFIBUS connection has been detected or established.

9.4.4.4　"Analog Values" tab (analog signals)

The structure of this tab corresponds to the structure of the digital signals.
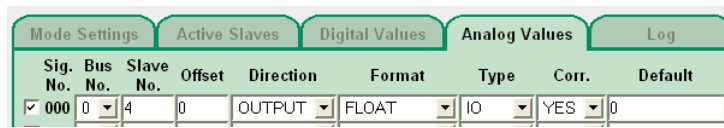

Figure 16: „Analog Values" tab

Some of the parameters can be set in the ibaPDA-V6 I/O manager.

The meaning of the following columns is the same as for the digital signals:

❑　Check box, Sig. No., Bus No., Slave No., Direction, Bit No., Type, Corr., Default

The following columns have another meaning as for the digital signals:

❑　Offset (ibaPDA: Address)

The offset is always to be considered with regard to the data format of the analog value. The "Offset" parameter describes the byte offset of the value. Depending on the data format of a value (see format column) the offset for sequential values has to be incremented in different step sizes e.g. 1 for Byte and 4 Byte for Float.

❑　Format

In this field, you can choose the wanted data type from a combo box.
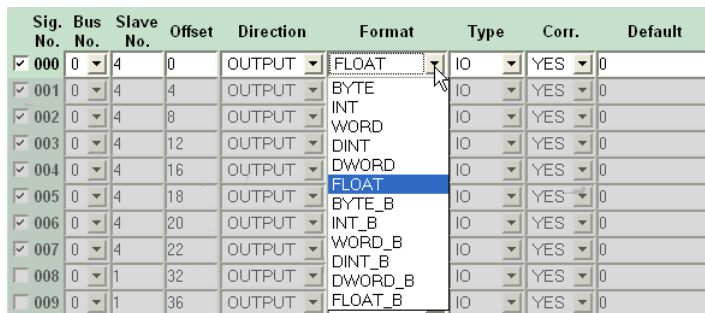
Figure 17: Choosing data types for analog signals

Data type		Description	Value range
Big Endian	Little Endian		
BYTE	BYTE	8 Bit without positive or negative sign	0 … 255
INT_B	INT	16 Bit with positive or negative sign	-32768 … 32767
WORD_B	WORD	16 Bit without positive or negative sign	0 … 65535
DINT_B	DINT	32 Bit with positive or negative sign	-2147483647 … 2147483647
DWORD_B	DWORD	32 Bit without positive or negative sign	0 … 4294967295
FLOAT_B	FLOAT	IEEE754; Single Precision; 32 Bit floating point	$1.175 \cdot 10^{-38}$ …$3.403 \cdot 10^{38}$

Table 5: Data types/Data formats for analog signals

9.4.4.5   „Log" tab

Here, the logbook of the last new configuration of ibaBM-DPM-S is given out (only for service purposes).

9.4.5   Administrator functions

On the administrating page, passwords can be changed and firmware updates can be loaded into the device. This page can only be used by the „admin" user.

Figure 18: Administrating page

(1)   Here, you can change the "admin" password.

(2)   This option allows you to change the "dpms" (default user) user password.

You need to enter the old password and the new password twice for security reasons. "dpms" is the default setting for both passwords. By clicking on the <submit> button, the password is transferred to the device.

(3)   Loading Firmware updates:

The firmware updates are edited by iba, whenever technical innovations or improvements require an update of the device firmware.

If iba has sent you a firmware update, choose the update file in the "browse" dialog. Usually, this file has a ".CAB" ending, e.g. "update.SH4.CAB".

For submitting the update, please click on <submit>. The update is then loaded to the device, unpacked and installed.

Note

The installation might take several minutes. Please do not switch off the device, as this would interrupt the procedure.

(4) Activate number of active slaves:

In the same window, you can change the maximum number of active slaves. This number comprises the slaves of both connections X40 and X41. Please enter two numeric keys, we send you on request. Then, the device detects automatically, how many slaves can be initialized at max. This limit prevents an overload of the PROFIBUS sniffer with a number of slaves, not tested, yet.

Upgrade Device (Maximum Number of Active Slaves)

Upgrade Key 123456789   **Upgrade Id** 0987654321   submit

(5) Please enter the license keys for the redundancy mode in the "Key 1" and "Key 2" fields. We send you the keys on request. The license is valid for eight active slaves on a PROFIBUS line. You need to reboot the device.

Activate simulation or redundancy mode

Key 1 12345678   **Key 2** 98765432   submit

Note

The upgrade keys in the figure above are just an example.

9.4.6   Define the time

On the "Time" page, you can define the system time. After having entered the time parameters, you can transfer the current time to the device by clicking on the <submit> button.

Change time:

Year	2003	YYYY
Month	1	MM
Day	1	DD
Hour	12	HH
Minute	43	MM
Second	11	SS
	submit	

Figure 19: Setting the time

10   Configuration in ibaPDA-V6

For measuring or recording data via ibaBM-DPM-S, you need ibaPDA-V6 version 6.10.2 or higher.

For measuring and recording data via ibaBM-DPM-S in redundancy mode, you need ibaPDA-V6 version 6.26.3 or higher.

For using Request-S7 or Request-FM458, you need version 6.17.0 or higher.

For using Request-TDC, you need version 6.22.0 or higher.

10.1   First steps in ibaPDA-V6 configuration

By means of the following instruction, you learn how to integrate ibaBM-DPM-S step by step into ibaPDA-V6 and how to configure measuring signals.

Note

In a first step, you should define over the Web interface the main device settings like operating mode, network settings, passwords, firmware etc.

With ibaPDA-V6, you can define the PROFIBUS slave addresses and configure analog and digital measuring signals.

Note

If you use the redundancy mode, you need to enter the license key in the Web interface.

Please read the description on the special features you need to consider when configuring ibaPDA-V6 and on PROFIBUS configuration in redundancy mode in chapter 12 .

1. Connect the device to a voltage source and switch it on (see chapter 7.2.4 „24 V power supply")

2. Connect the PC to the device (USB or TCP/IP, see chapter 9.3). The configuration from ibaPDA-V6 is transferred over this connection.

3. Establish an FO connection from the TX connection of the device to a free RX input of an ibaFOB-D input card.

4. Start the ibaPDA-V6 client and open the I/O manager .

5. On the left hand side of the I/O manager, you find the system interfaces. Choose the correct ibaFOB-D input card and mark the link ibaBM-DPM-S is connected to.
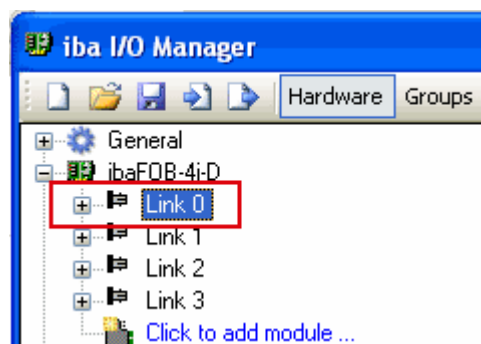
6. Click with the right mouse button on the link and choose the „Add module – ibaBM-DPM-S" option in the context menu.
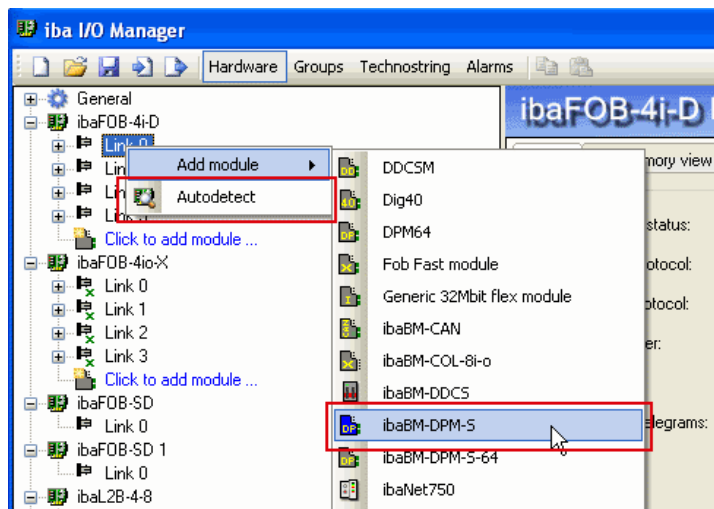
You can also start an automatic detection of the device.

7. Choose on the "General" tab the parameters of the ibaBM-DPM-S. The following parameters are important:

- Name: Choose a meaningful name for the device.

- Time base: Set the timebase, the data of the ibaPDA-V6 device are to be captured with.

- IP address: Enter the IP address of the device or the name of the device in the dpms_nnnn format (see chapter 9.3.1. "Ethernet TCP/IP"). This address is used for communicating with ibaBM-DPM-S.
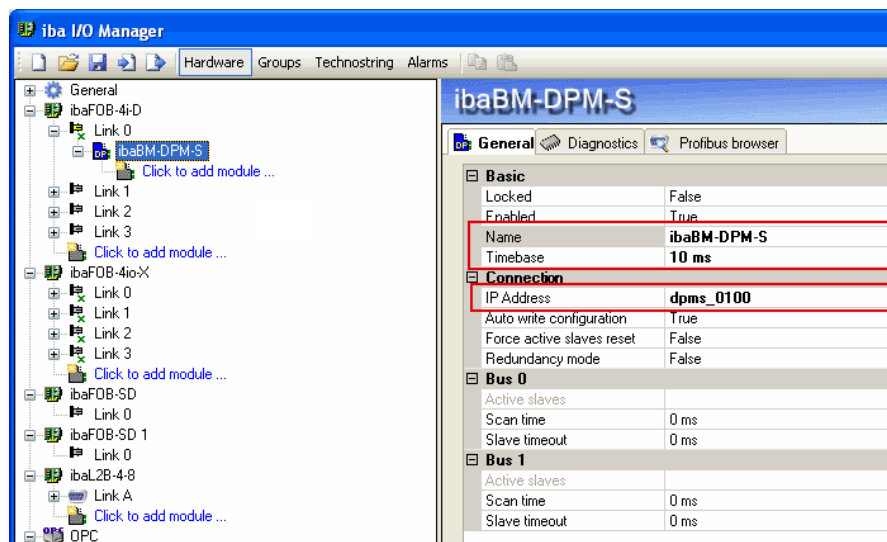
Note

When using the automatic detection, the device name is entered automatically.

8. Please decide, if you want ibaBM-DPM-S to work with active slaves or just as sniffer. In case, you want the device to participate on the bus with one or more active slaves, you first need to do PROFIBUS configuration for the control for defining the slave numbers

of the devices´ active slaves (see chapter 11.2 „Active slave operating mode"). More-
over, you need to enter the PROFIBUS parameters of all the participants for which data
are to be measured (slave no., memory area and data types). You also need these
data for the sniffer operating mode.

9. Please add a module under the ibaBM-DPM-S device module. Click with the right
    mouse button on the ibaBM-DPM-S device module and choose the „Add module" op-
    tion in the context menu. Here, you can choose the module you wish to add.
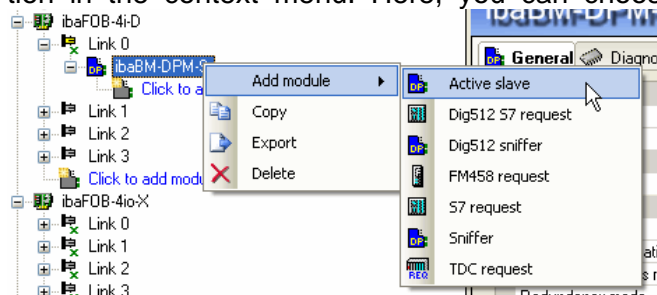
You can do the same procedure also by clicking on the blue „Click to add module…"
command. Depending on the license, you have got up to seven modules at your dis-
posal :

•   Active slave, Dig512 S7 request, Dig512 sniffer, FM458 request, S7 re-
    quest, Sniffer, TDC request

For all request modules, you need a supplementary license. For further information
on these modules, please read the product manuals.

The „Active slave", „Dig512 sniffer" and „Sniffer" modules are always there to be
chosen. We describe the modules in the following.

10. **Active slave („Active slave" module)**
    With this module, you generate a single active slave on ibaBM-DPM-S. The master
    of the PROFIBUS line can send data directly to this slave. Enter the address of the
    slave on the "General" tab under "slave number" (as in the controls´ configuration).
    Define the PROFIBUS line (0: connector X40, 1: X41) the active slave runs on un-
    der "bus number".
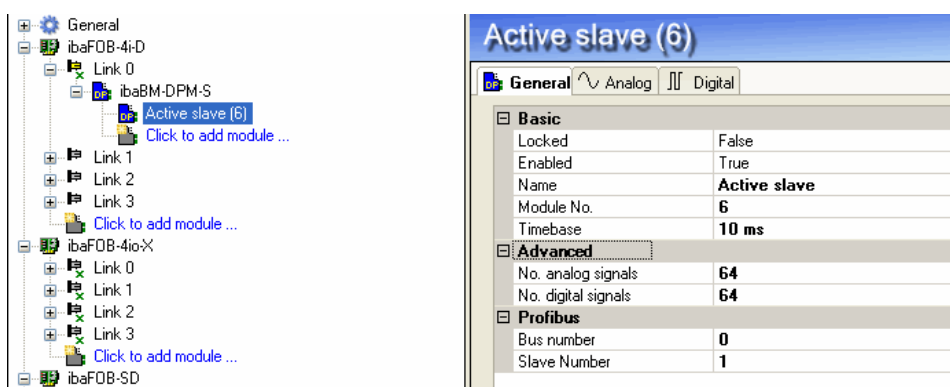
If you want to run more than one active slave, then add more modules of the "active
slave" type.

Note

The default settings limit the number of slaves to a maximum of eight. If you define more
than these eight slaves, an error message will appear. If you need more than eight active
slaves, please do not hesitate to contact the iba support.

⚠ **CAUTION**

Only define addresses for the active slaves, which are not defined on the PROFIBUS line, yet. You can use exactly the addresses that you have defined in the controls´ configuration (e.g. SIMATIC Step7 hardware configuration) for the active slaves. If you do not apply to these rules, communication will be disturbed if two slaves exist with the same address!

⚠ **CAUTION**

Connecting the PROFIBUS cable

Please do not connect the PROFIBUS cable until the configuration of the „active slaves" has been done via Web interface or in ibaPDA-V6. This way, you make sure that no slave number exists twice. If there exists more than one slave with the same number, this can lead to a complete breakdown in communication on the PROFIBUS and hence, a complete machine downtime!

11. Please enter now the "number of analog signals" and the "number of digital signals" in the "Active slave" module on the "General" tab. The default value is 64. You can define a maximum of 512 analog and 512 digital signals. The length of the signal tables on the "Analog" and "Digital" tabs depends on this value.

12. Enter on the „General" tab the signals to be recorded in the sequence you want. Give a name to each signal („Name" column) and define in the „I/O", „Address" and „Data type" column the information where the signal can be found in the interface of the slave.

I/O	Please define, if the signal is an input or an output signal (viewed from the PROFIBUS master) (In: input, Out: output).
Address	Offset of the signal within the input or output data telegram of the slave.
Data type	Please define the data type of the signals. In table 5, you can find the data types.

Tip

If you enter the signals of a slave sequentially, you need to set the data types for all signals. This way, the byte addresses of all signals can be calculated automatically. Enter the correct byte address only for the first signal of the slave in the "Address" column and click on the head of column. Departing from the first address (where the cursor is) and regarding the data types, the addresses of the following signals are filled in automatically.

13. If needed, you can define a scale value of the signals in the „Gain" and „Offset" columns, for the signals can be converted into physical units.

14. For digital signals on the "Digital" tab, please proceed as shown above. You do not need to enter a data type. The address offset is given in 1 byte steps. The signals are addressed by the bit numbers 0 … 7.

15. **Sniffing on PROFIBUS („Sniffer" module)**

   With this module, you generate a sniffer that is able to record the existing telegram traffic between master and slave within a PROFIBUS system.

16. Now, enter on the „General" tab the „Number of analog signals" and the „Number of digital signals" . 64 is the default value. As a maximum, 512 analog and 512 digital signals can be defined. The length of the signal tables on the "Analog" and "Digital" tab depends on this value.

17. The signals on the "Analog" and "Digital" tab are configured in an analog way to the "Active slave" module. Please enter in the "Bus" and "Slave" columns which slave the data is to be captured from and by which PROFIBUS system the slave can be reached.
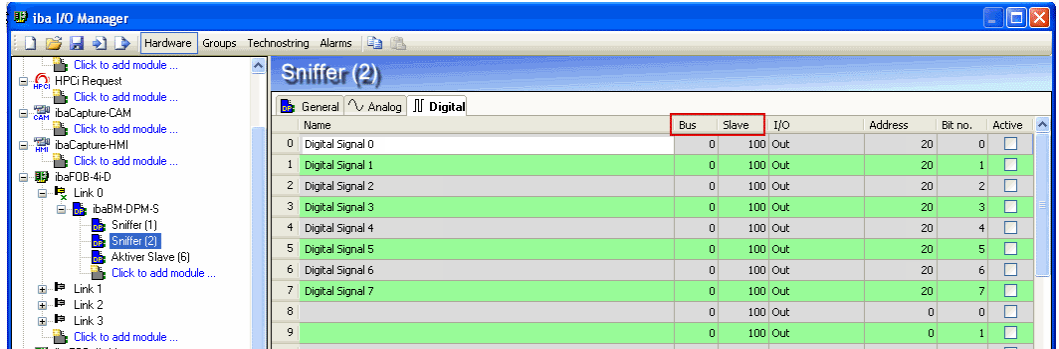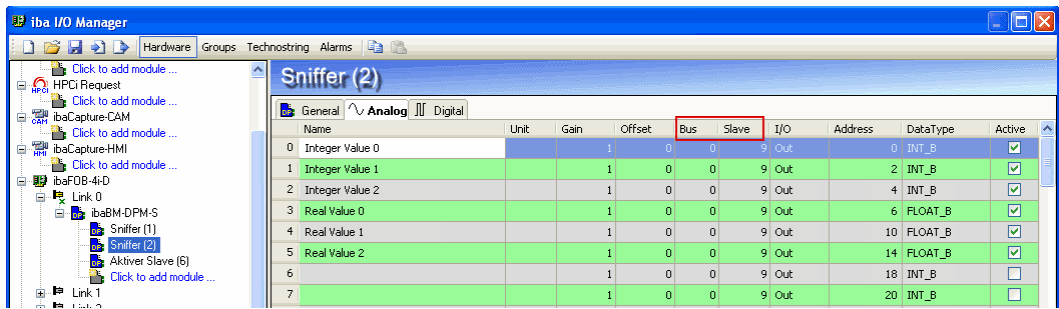
18. If required, please define a scale value of the signals in the „Gain" and „Offset" column for the signals can be converted into physical values. For sniffing, in general a scaling is needed, as the data are transferred in a standardized way over the PROFIBUS to the   slave.
For example for a SIMATIC ET200 AO module, a +/- 10V signal with the value range −27648 … 27648 (equals -10V … +10V) is transferred. You find the physical meaning in the control program.

19. Active slaves for „Sniffer" module
For generating slaves on an ibaBM-DPM-S device, you can not only use the "Active slave" module, but also the "Sniffer" module. Please enter under "Active slaves" ("General" tab of the "Sniffer" module) the slave addresses for each bus connection (Bus0: X40, Bus1: X41).
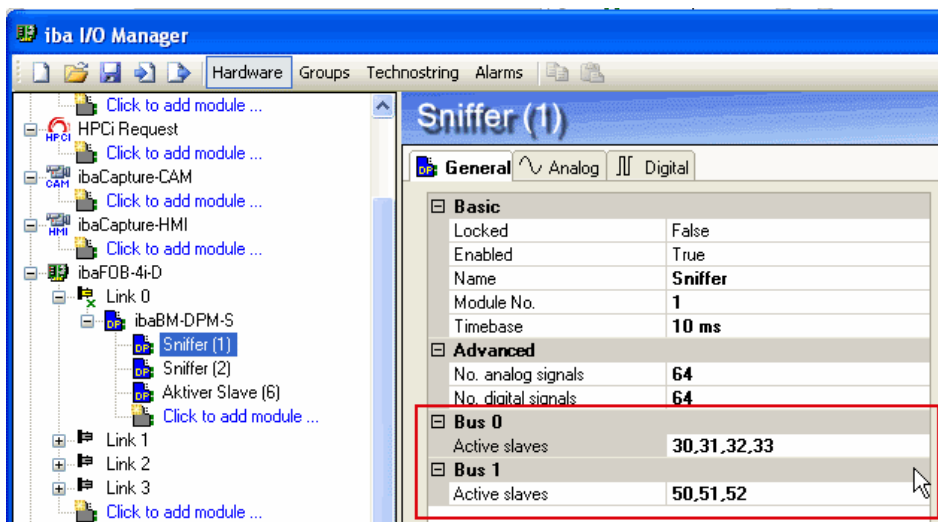
This way, you can generate with a "Sniffer" type module more than one active slave at a time. In the example above, you can also use seven single "Active slave" type modules with the following slave addresses: 30, 31, 32, 33, 50, 51 and 52.
Just enter the slave addresses under Bus 0 or Bus 1 and separate the addresses by a comma. The addresses can also be defined in a dialog box. A zero value means that no active slave has been chosen.
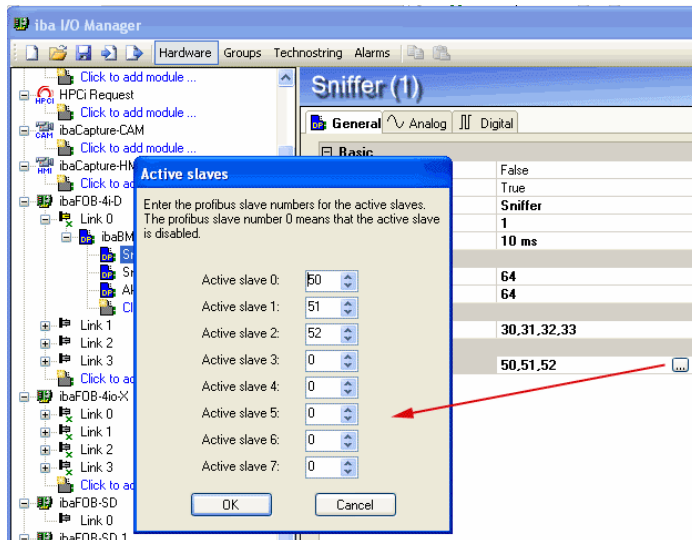
If you have entered active slaves in the "Sniffer" module, you can use the sniffer functionality - recording data - (configuration of signals on the "Analog" and "Digital" tab) for the slaves you have defined on your own in the "Sniffer" module.

20. If you want to capture larger amounts of digital signals (e.g. status or control words of a large number of drives), the „Dig512 sniffer" module is a good solution. For a detailed description, see chapter 10.2.4 „„Dig512 sniffer".

21. When all signals have been configured, please activate the configuration by clicking on <OK> or <Apply>. In course of the following validation, the configuration is transferred to ibaBM-DPM-S. <OK> closes the I/O manager, provided that no warning or error messages have appeared during the validation process.
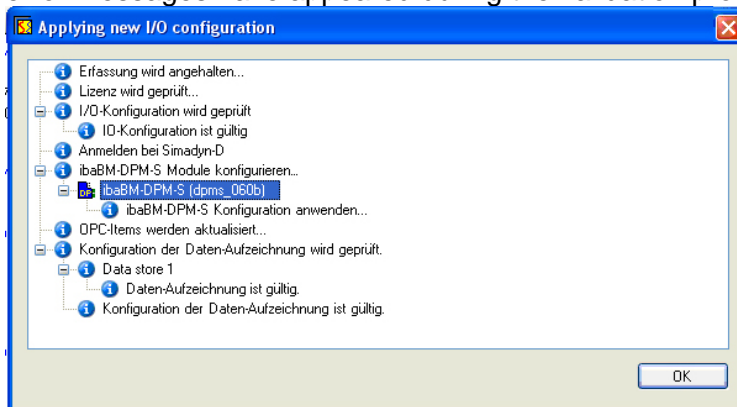

Of course, you can do the configuration step by step and hence check the validity of the current configuration.

22. ibaBM-DPM-S meets a wide variety of diagnosis features for PROFIBUS systems at your hands. The "Diagnostics" tab in the device module is very helpful. On this tab, the

detected masters and slaves and their status are shown for both PROFIBUS systems.
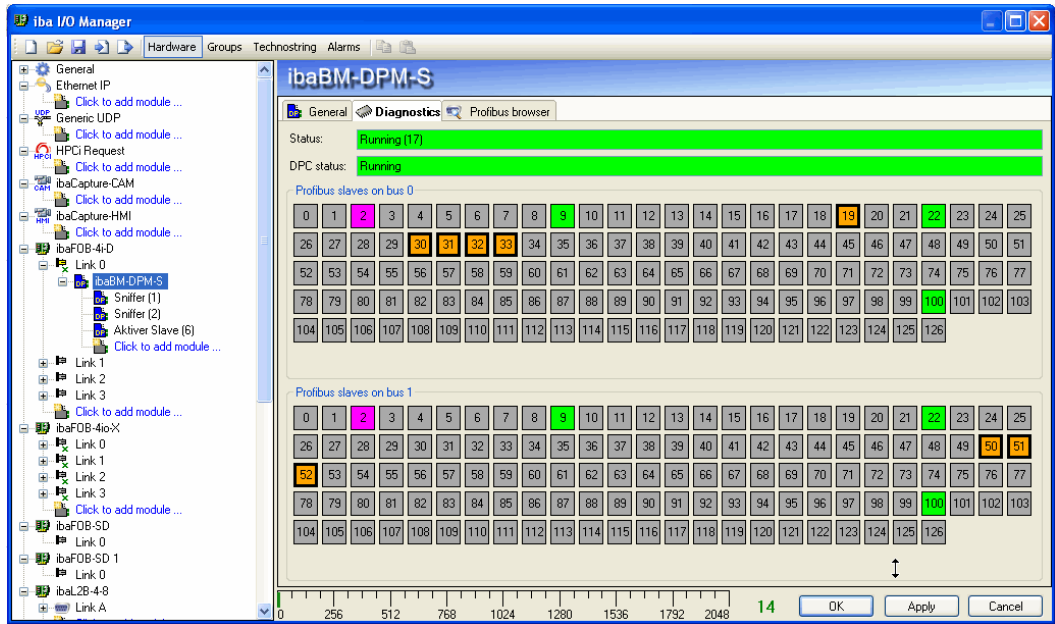
The PROFIBUS browser tab shows detailed information about both PROFIBUS systems (e.g. bus rotation time) and about the input and output areas of each slave.
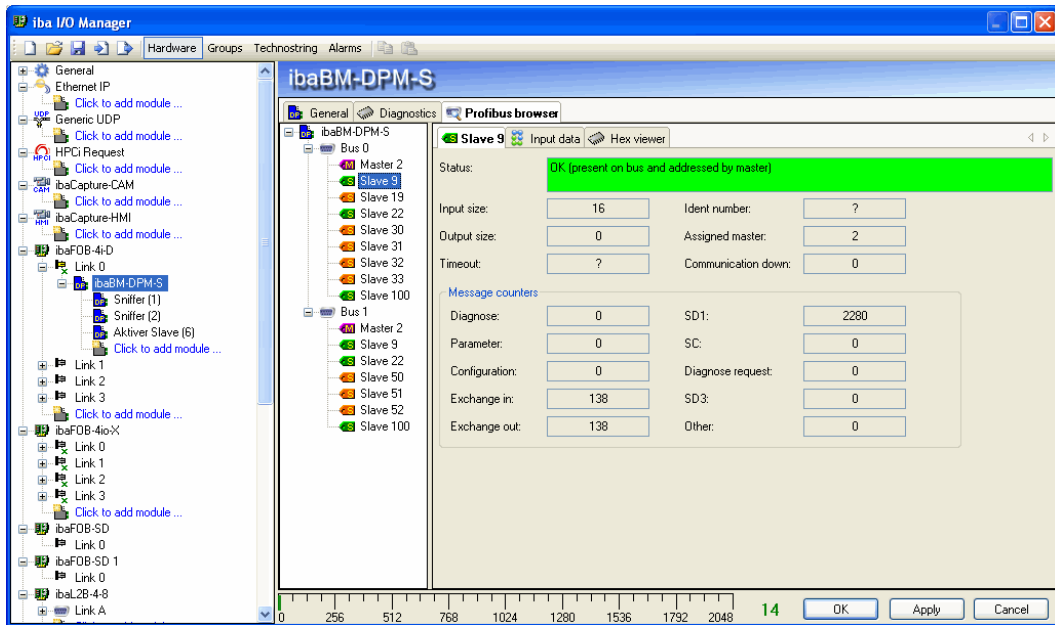
For detailed information on the diagnosis functions, please read chapter 10.3 „Diagnosis".

Manual   ibaBM-DPM-S

10.2   Device modules and modules in the I/O-Manager

If you want to use ibaBM-DPM-S with ibaPDA-V6, you have to set up the device in the ibaPDA-V6 I/O manager. Please proceed according to the step by step instruction in chapter 10.1 "First steps in ibaPDA-V6".

On the following pages, we describe the "ibaBM-DPM-S" device module and the "Active slave", "Sniffer" and "Dig512 sniffer" modules.

10.2.1   "ibaBM-DPM-S" device module

The "ibaBM-DPM-S" device module offers five tabs. The "General", "Diagnostics" and "PROFIBUS Browser" tab are compulsory. With the "Analog" and the "Digital" tab, you have an online view on the analog and digital signals captured by the device. These two tabs are not shown until you have added modules and transferred the configuration to the device.
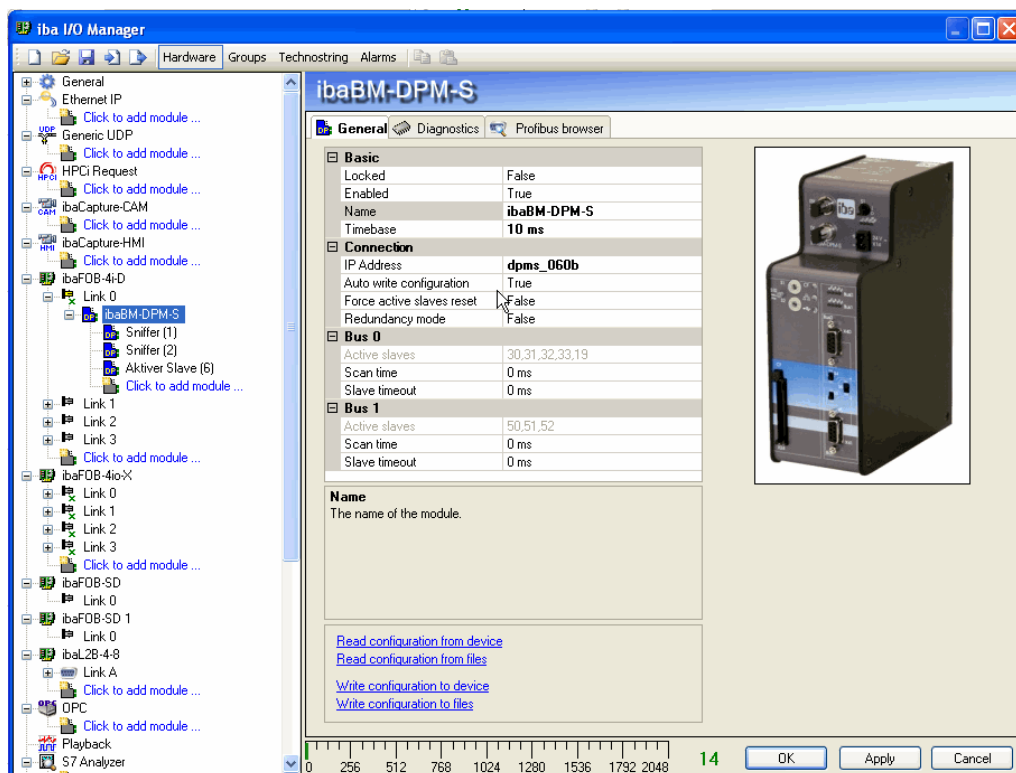
10.2.1.1   „General" tab

Figure 20: "ibaBM-DPM-S" module – "General" tab

Basic settings

❑ **Locked**
    A locked module can only be changed by an authorized user.

❑ **Enabled**
   Here, you can activate data capturing for this module.

❑ **Name**
   Name of the module.

❑ **Timebase**
   Timebase that is used for the device, given in ms.

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Connection

❑ **IP Address**
Enter the IP address or the device name of the ibaBM-DPM-S. The device name is made up of the last four digits of the Mac address with a "dpms_" in front, e.g. "dpms_060b". Via this IP address/device name, the configuration is read from the device or transferred to the device.

Note

When choosing the wrong settings, you possibly configure another device in the network.

Beginning with version V6.26.3 of ibaPDA-V6 and the ibaBM-DPM-S B4 firmware it is checked when transferring the configuration if the device connected via FO cable to the link corresponds to the device configured in the I/O manager.

❑ **Auto write configuration**
The configuration is transferred to the device, every time ibaPDA-V6 is started. If there is no online connection established to ibaBM-DPM-S, please set the option on FALSE.

❑ **Force active slaves reset**
If this option is deactivated, active slaves are only reset if the slave configuration has been changed. Setting back an active slave, leads to a bus error at the PROFIBUS master.

❑ **Redundancy mode**
By this option, you activate the redundancy mode. The device then treats both PROFIBUS lines like a redundant PROFIBUS line. For further information about operating the ibaBM-DPM-S on the redundant PROFIBUS, please read chapter 12.

Bus 0/1

❑ **Active slaves (only display)**
Number of active slaves on the bus.

❑ **Scan time**
The scan time defines the time in milliseconds during which the device scans for slave collisions before it activates own slaves. Please set this value on 0 for using an automatic time span derived from the transmission rate.

❑ **Slave Timeout**
If a PROFIBUS slave does not respond within this time span, all measured values of this slave are set on 0. Please set this value on 0 for using an automatic timeout derived from the transmission rate.

Commands for reading/writing the configuration

❑ **Read configuration from device/ Write configuration to device**
By means of these commands, you can read the configuration from the device or write the configuration to the device.

Note

In this case, the I/O manager does not validate the configuration (Click on <OK> or <Apply>). Therefore, we recommend that you do the configuration always by using the operating buttons <OK> or <Apply> of the I/O manager.

❑ **Read configuration from file/ Write configuration to file**
By means of these commands, you can read an ibaBM-DPM-S configuration from a file or write a configuration to a file. This is useful if a device is operated without a network connection (due to a missing network infrastructure). In this case, please write the configuration into a file and transfer this file to the device via a CF card.

10.2.1.2 „Analog" tab

If analog signals are configured in the modules, and the configuration has been transferred to ibaBM-DPM-S, an overview of all captured analog signals with an online view of the actual signals is shown.
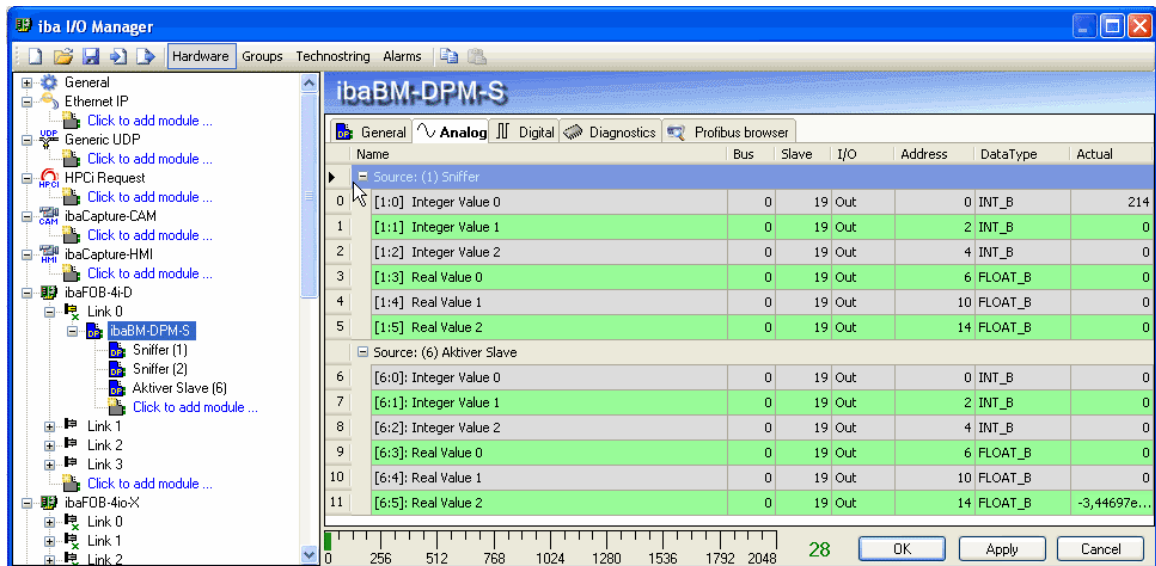
Figure 21: „ibaBM-DPM-S" module – „Analog" tab

10.2.1.3 „Digital" tab

If digital signals are configured in the modules, and the configuration has been transferred to ibaBM-DPM-S, an overview of all captured digital signals with an online view of the actual signals is shown.
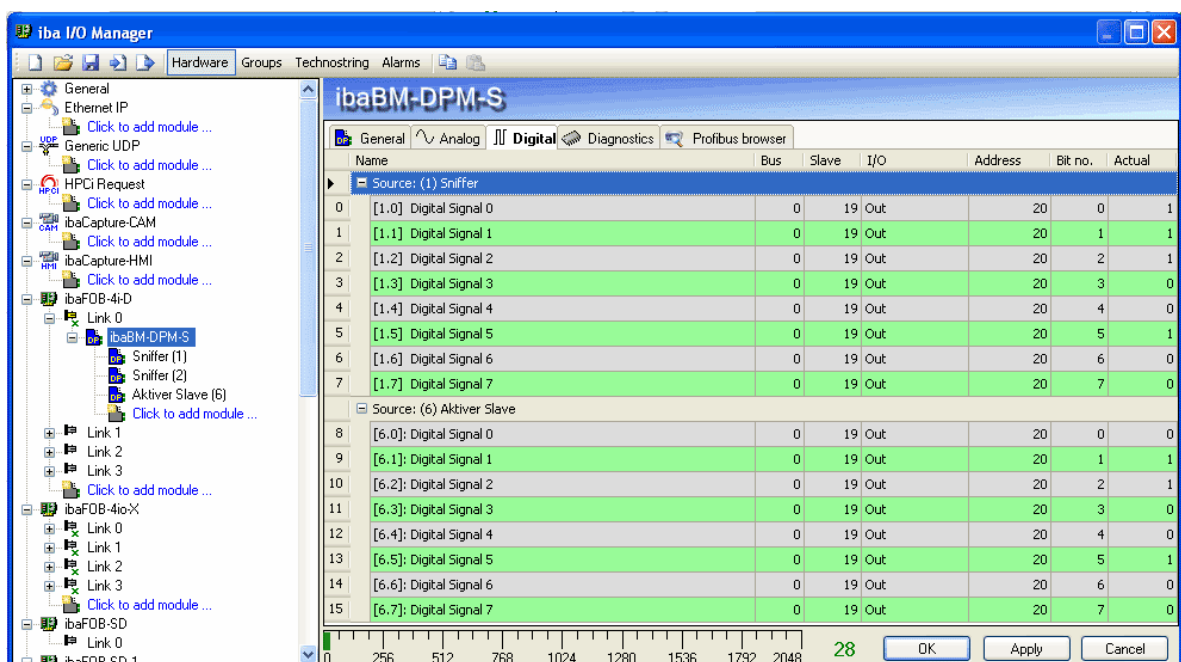
Figure 22: „ibaBM-DPM-S" module – „Digital" tab

10.2.1.4 „Diagnostics" tab

On this tab, the detected masters and slaves and their status for both PROFIBUS systems are shown. Depending on the ibaPDA-V6 version and the ibaBM-DPM-S firmware, you have got a standard or an extended diagnosis at your disposal.

For a description of the diagnosis functions, please read chapter 10.3 "Diagnostics".

10.2.1.5 „PROFIBUS Browser" tab

Depending on the ibaPDA-V6 version and the ibaBM-DPM-S firmware, you have got a standard or an extended diagnosis at your disposal.

The "PROFIBUS Browser" tab is part of the extended diagnosis functions and shows detailed information about both PROFIBUS systems (e.g. bus rotation time) and the input and output areas of each slave.

For a description of the diagnosis functions, please read chapter 10.3 „Diagnostics".

10.2.2 „Sniffer" module

The "Sniffer" module can be added to an ibaBM-DPM-S device module. You can use this module if you want to "listen" to the signals from an existing master/slave communication.

Moreover, you can generate active slaves in the "Sniffer" module. This is not compulsory (for step by step configuration, please read chapter 10.1 "First steps in ibaPDA-V6").
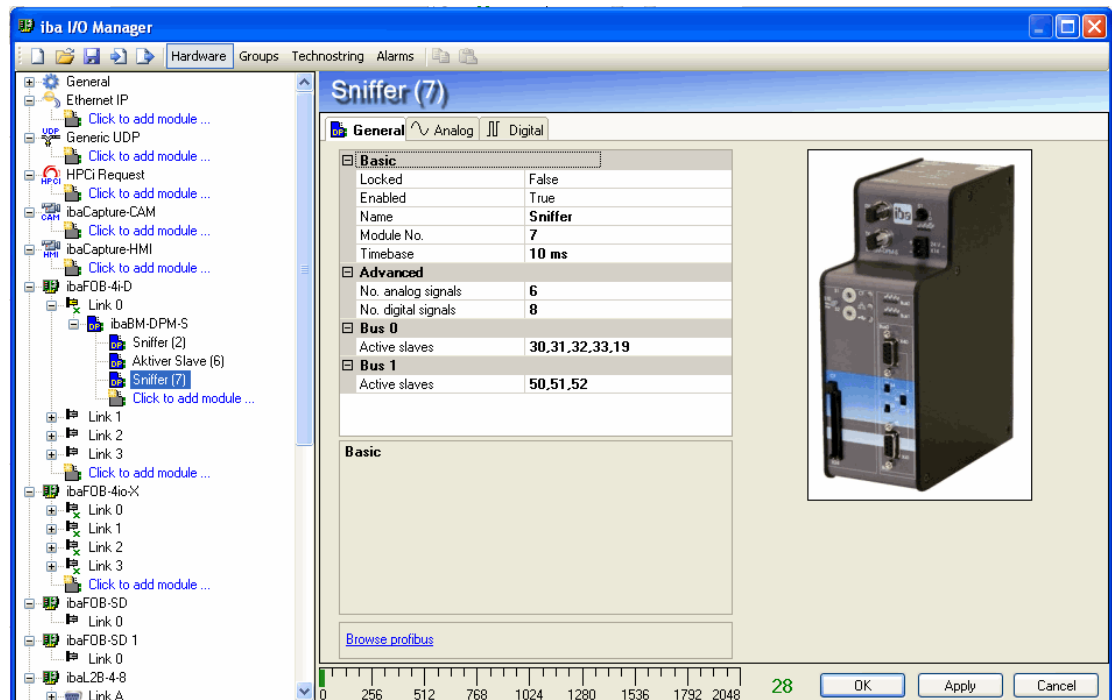
10.2.2.1 „General" tab

Figure 23: "Sniffer" module – "General" tab

Basic settings

❑ **Locked, Enabled, Name, Timebase**
   see chapter 10.2.1.1 "General tab"

❑ **Module No.**
   Logic module number for clear referencing of signals e.g. in ibaAnalyzer.

Advanced

❏ **No. analog signals**
Defining the number of analog signals for this module (min. 0, max. 512).

❏ **No. digital signals**
Defining the number of digital signals for this module (min. 0, max. 512).

Bus 0 / 1

❏ **Active slaves**
Here, you can define the addresses of the active internal ibaBM-DPM-S PROFIBUS slaves.

Command for browsing the PROFIBUS

❏ **Browse PROFIBUS**
When using this command, a special version of the PROFIBUS browser is opened (for a detailed description, please see chapter 10.3.2). With this browser, signals from the input and output data range of the slaves can be added to the analog and digital signals.

Note

The default settings limit the number of slaves to a maximum of eight. If you define more than these eight slaves, an error message will appear. If you need more than eight active slaves, please do not hesitate to contact the iba support.

Note

Only define addresses for the active slaves that are not defined on the PROFIBUS line, yet. If you do not apply to these rules, communication will be disturbed if two slaves exist with the same address!

⚠ CAUTION

Connecting the PROFIBUS cable

Please do not connect the PROFIBUS cable until the configuration of the „active slaves" has been done via Web interface or in ibaPDA-V6. This way, you make sure that no slave number exists twice. If there exists more than one slave with the same number, this can lead to a complete breakdown in communication on the PROFIBUS and hence, a complete machine downtime!
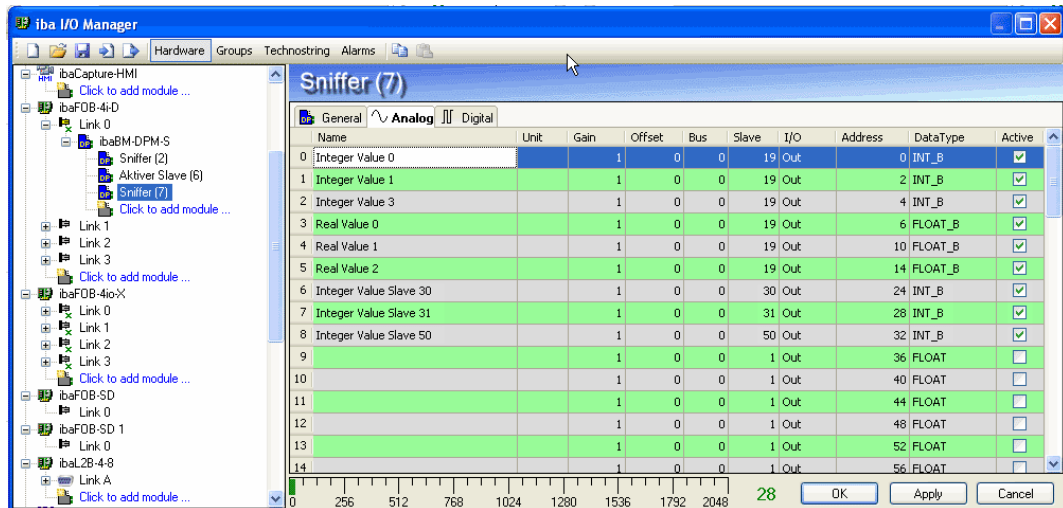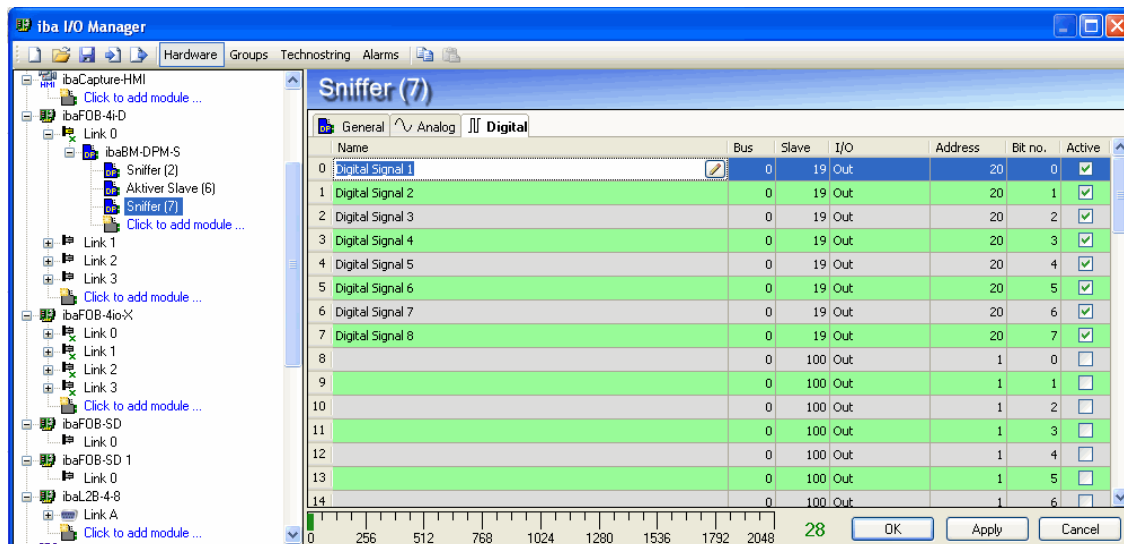
10.2.2.2 „Analog" tab

Figure 24: "Sniffer" module – "Analog" tab

Please enter here the analog signals to be recorded sequentially. The columns in the signal list have got the following meaning:

❑ **Name**
Assign a meaningful name to each signal.

❑ **Unit**
Here, you can enter the physical unit of the analog value.

❑ **Gain / Offset**
Gradient (Gain) and y axis intercept (Offset) of a linear equation. You can convert a standardized value transferred without a unit into a physical value.
Example: For a SIMATIC ET200 AI/AO module, a +/-10V signal with a value range of −27648 … 27648 (equals -10V … +10V) is transferred. Within the control program, the transferred value has a physical meaning (e.g. temperature 50°C … 500°C). You can choose by Gain/Offset a conversion of the value. The value is then recorded with the physical unit.
For making the calculation of Gain/Offset easier, an auxiliary dialog appears when clicking on the co-ordinate cross in the „Gain" or „Offset" field. In this dialog, you only enter two points in the line equation. Gain and offset are then calculated automatically.
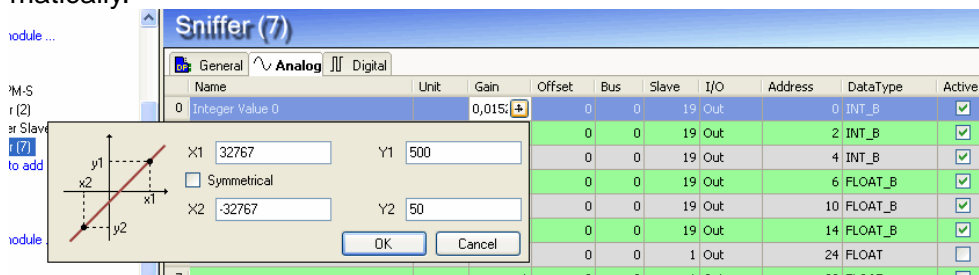
❑ **Bus**
Please enter the bus system (Bus 0 / 1), the signal is to be captured for.

❑ **Slave**
Enter the slave address, the signal is assigned to. Here, you can enter unknown slaves that are participants on the bus line. You can also enter own active slaves. It does not matter, if these slaves have been generated in the Sniffer module (see "General" tab) or in another module of the "Sniffer" or "Active slave" type.

❏ **I/O**
  Choose the I/O type of the signal:
  In: input signal (from the masters point of view)
  Out: output signal (from the masters point of view)
  DP RAM: only for service purposes (Support)

❏ **Address**
  The byte address of the signal within the input or output data range of the slave.
  The address range begins with the 0 address.

Note

The "Address" column in ibaPDA corresponds to the „Offset" column in the configuration dialog of the Web interface.

❏ **Data type**
  Data type of the signal. You will find the data types in table 5.

❏ **Active**
  Only if you tick the box, the signal is captured and considered when checking the licensed signals.

❏ You can show or hide more columns via the context menu (click with the right mouse button in the headline).

10.2.2.3 „Digital" tab

Figure 25: "Sniffer" module – "Digital" tab

Please enter here the analog signals to be recorded sequentially. The columns in the signal list have got the following meaning:

❏ **Name**
  Assign a meaningful name to each signal.

❏ **Bus**
  Please enter the bus system (Bus 0 / 1), the signal is to be captured for.

❑ **Slave**
Enter the slave address, the signal is assigned to. Here, you can enter unknown slaves that are participants on the bus line. You can also enter own active slaves. It does not matter, if these slaves have been generated in the Sniffer module (see "General" tab) or in another module of the "Sniffer" or "Active slave" type.

❑ **I/O**
Choose the I/O type of the signal:
In: input signal (from the masters point of view)
Out: output signal (from the masters point of view)
Status: Shows the status of the slave defined with "Bus" and "Slave"
 (TRUE: Slave is OK, FALSE: Slave is not OK).
Aktiver Bus: Only relevant in redundancy mode
                (see chapter 12)
DP RAM: Only to be used for service purposes (Support)

❑ **Address**
The byte address of the signal within the input or output data range of the slave. The address range begins with the 0 address.

❑ **Bit No.**
Please enter here the Bit No. within the Bytes defined with "Address".

❑ **Active**
Only if you tick the box, the signal is captured and considered when checking the licensed signals.

❑ You can show or hide more columns via the context menu (click with the right mouse button in the headline).

10.2.3   „Active Slave" module

The "Active Slave" module can be added to an ibaBM-DPM-S device module. With the "Active Slave" module, you generate a single slave on ibaBM-DPM-S. A master can send data for recording directly to that slave (see also step by step configuration in chapter 10.1 "First steps in ibaPDA-V6").
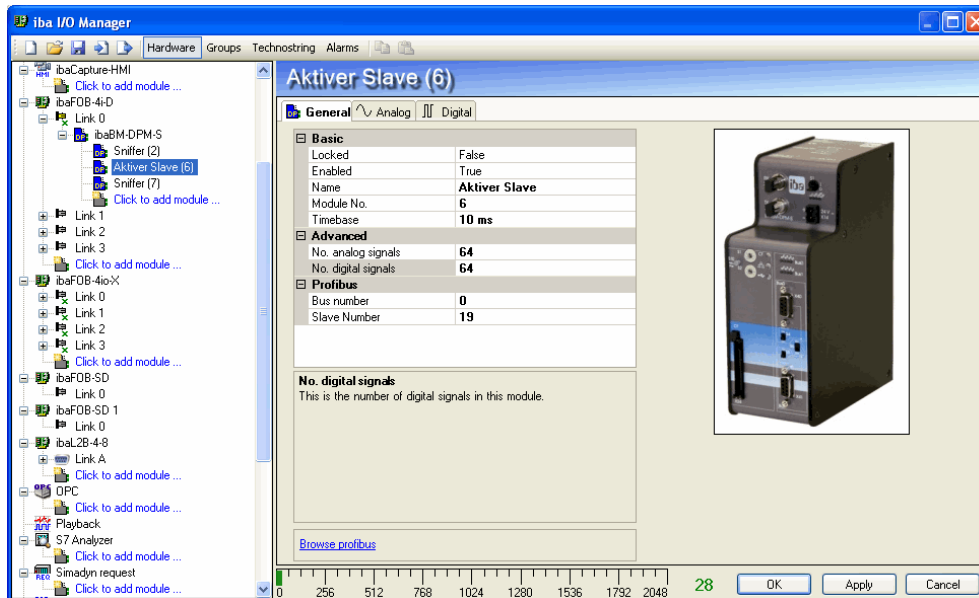
10.2.3.1 „General" tab

Figure 26: "Active slave" module – "General" tab

Basic settings

❑ **Locked, Enabled, Name, Timebase**
see chapter 10.2.1.1 "General tab"

❑ **Module No.**
Logic module number for clear referencing of signals e.g. in ibaAnalyzer.

Advanced

❑ **No. analog signals**
Defining the number of analog signals for this module (min. 0, max. 512).

❑ **No. digital signals**
Defining the number of digital signals for this module (min. 0, max. 512).

PROFIBUS

❑ **Bus number**
Please define here, on which bus system (Bus 0: X40, Bus 1: X41) the active slave
is to be generated.

❑ **Slave number**
Please define here the address of the active ibaBM-DPM-S slave.

Command for browsing the PROFIBUS

❑ **Browse PROFIBUS**
When using this command, a special version of the PROFIBUS browser is opened
(for a detailed description, please see chapter 10.3.2). With this browser, signals
from the input and output data range of the slaves can be added to the analog and
digital signals.

> **Note**
>
> The default settings limit the number of slaves to a maximum of eight. If you define more than these eight slaves, an error message will appear. If you need more than eight active slaves, please do not hesitate to contact the iba support.

> **Note**
>
> Only define addresses for the active slave, that are not defined on the PROFIBUS line, yet. If you do not apply to these rules, communication will be disturbed if there exist two slaves with the same address!

⚠ CAUTION

Connecting the PROFIBUS cable

Please do not connect the PROFIBUS cable until the configuration of the „active slaves" has been done via Web interface or in ibaPDA-V6. This way, you make sure that no slave number exists twice. If there exist more than one slaves with the same number, this can lead to a complete breakdown in communication on the PROFIBUS and hence, a complete machine downtime!

10.2.3.2 „Analog" tab
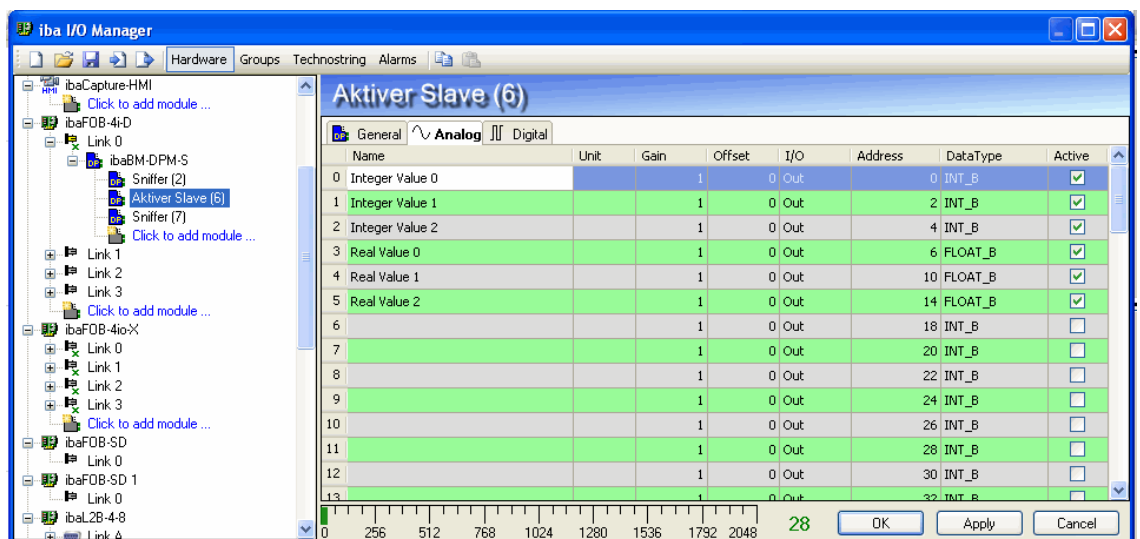
Figure 27: "Active slave" module – "Analog" tab

Please do the settings as for the "Sniffer" module (see 10.2.2.2 „Analog" tab). You can not define a bus or set a slave number as these already exist on the "General" tab. This means that all defined signals apply to the slave of this module.

10.2.3.3 „Digital" tab
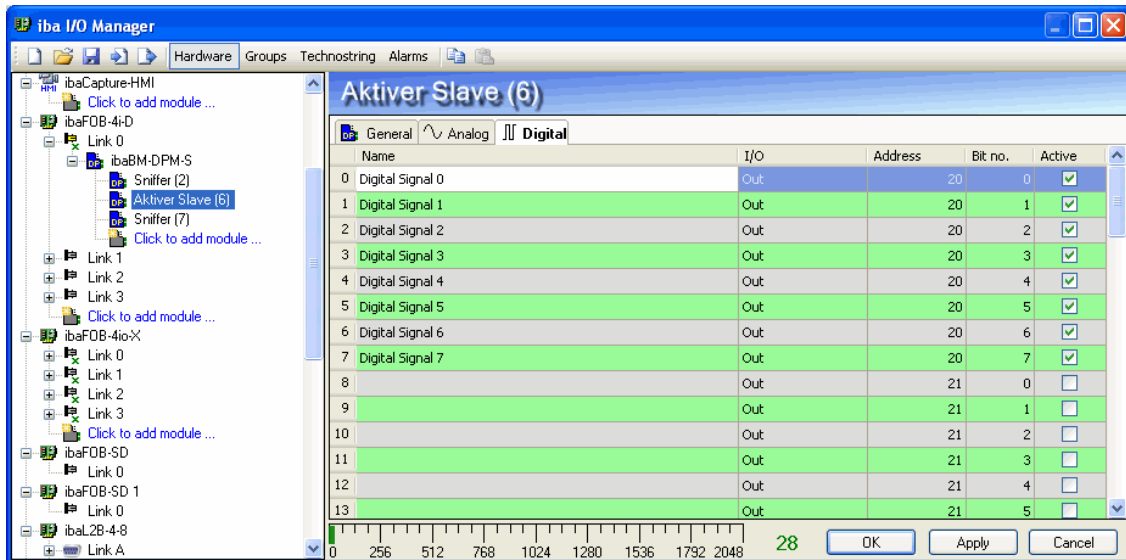
Figure 28: "Active slave" module – "Digital" tab

Please do the settings as for the "Sniffer" module (see 10.2.2.3 „„Digital" tab). You can not define a bus or set a slave number as these already exist on the "General" tab. This means that all defined signals apply to the slave of this module.

10.2.4   „Dig512 sniffer" module

The "Dig512 sniffer" module can be added to an "ibaBM-DPM-S" device module. With the "Dig512 sniffer" module, you can capture large amounts of digital signals that can be found on the PROFIBUS as words (e.g. status words of drives).

As for the "Sniffer" module, you can define additional internal active slaves. This is not compulsory.

10.2.4.1 „General" tab
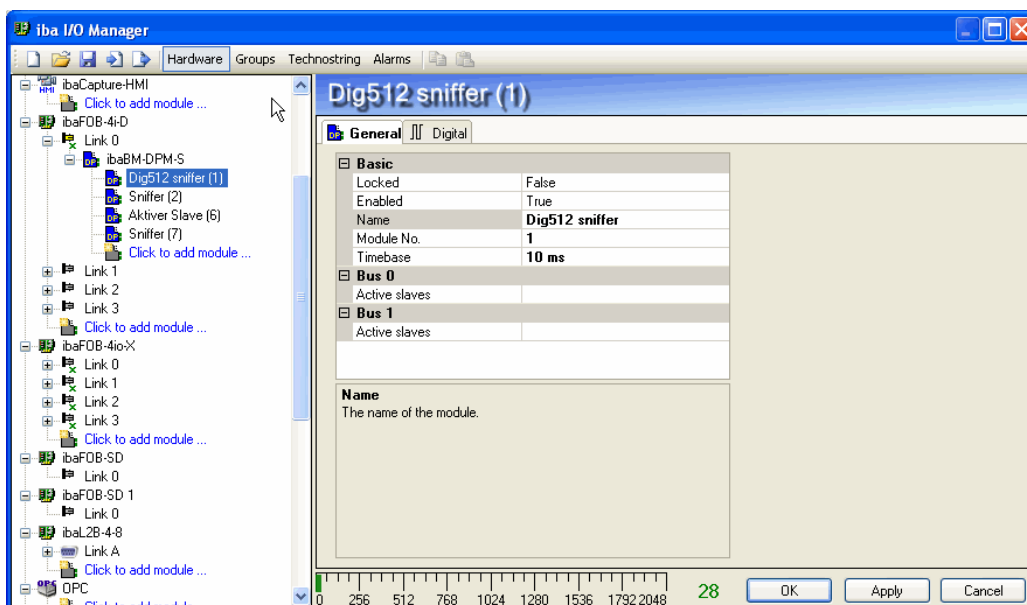
Figure 29: "Dig512 sniffer" module – "General" tab

Basic settings

❑ **Locked, Enabled, Name, Module No., Timebase** (only display)
    see chapter 10.2.1.1 „„General" tab"

Bus 0 / 1

❑ **Active slaves**
    see chapter 10.2.2.1 „„General".

10.2.4.2 „Digital" tab

The digital signals are declared in two steps. First, please define the words which are to be captured as source of the digital signals.
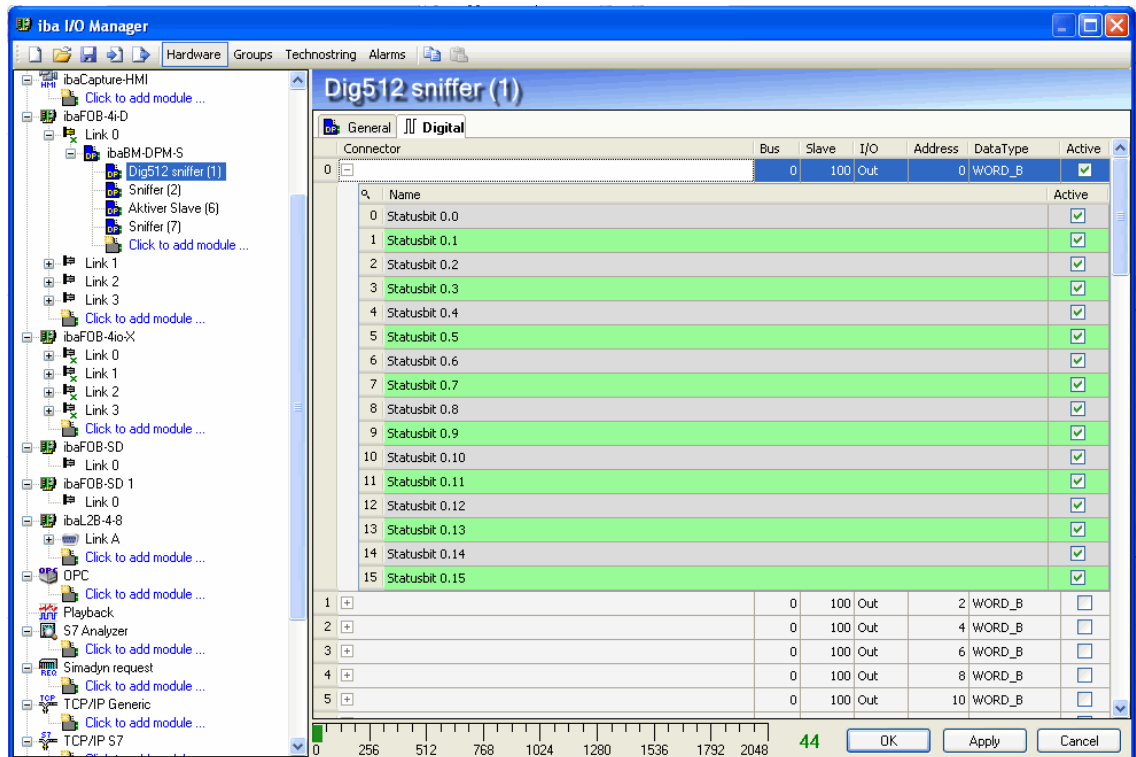
Figure 30: „Dig512 sniffer" module – „Digital" tab

Enter the word signals that contain the digital signals sequentially. The columns have the following meanings:

❑ **Connector**
    Assign a meaningful name to the source word.

❑ **Bus**
    Enter the bus systems (Bus 0 / 1) which the source word is to be captured for.

❑ **Slave**
    Enter the slave address, the signal is assigned to. Here, you can enter unknown slaves that are participants on the bus line. You can also enter own active slaves. It does not matter, if these slaves have been generated in the Sniffer module (see "General" tab) or in another module of the "Sniffer" or "Active slave" type.

❏ **I/O**
Choose the I/O type of the signal:
In: input signal (from the masters point of view)
Out: output signal (from the masters point of view)

❏ **Address**
The byte address of the signal within the input or output data range of the slave.
The address range begins with the 0 address.

❏ **Data Type**
Data Type of the signals. Here, you can just set the WORD and WORD_B types
(see table 5).

❏ **Active**
In case you have ticked the box, the source signal is captured with its 16 digital sig-
nals and also considered when checking the number of licensed signals. You can
deactivate single digital signals.
You can open a list of 16 digital signals for each source word by clicking on the
plus. Here, the single bits of the source words are defined.

❏ **Name**
Assign a meaningful name to the digital signal.

❏ **Active**
Only if you tick the box, the signal is captured and considered when checking the li-
censed signals.

10.3   Diagnostic functions

10.3.1   Standard Diagnosis

When using an ibaPDA-V6 version < V6.19.0 or an ibaBM-DPM-S firmware ≤ A7 you have got a simple standard PROFIBUS diagnosis at your disposal.

On the "Diagnostics" tab of the "ibaBM-DPM-S" device module, for each DP line of the device the slave status are shown for all possible addresses.

Masters and slaves that are "OK", are marked green. Masters that do not exist or are disrupted, are marked in red.
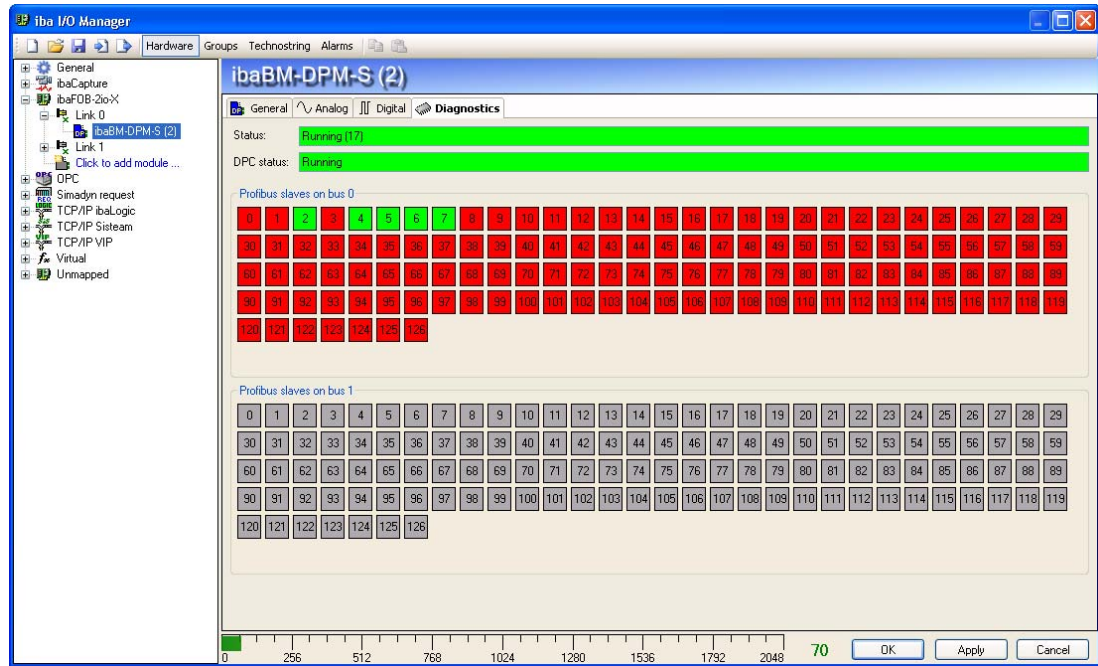
Figure 31: „ibaBM-DPM-S" module – „Diagnostics" tab

For standard diagnostics, the "PROFIBUS Browser" tab in the device module does not exist, yet (see chapter 10.3.2).

10.3.2   Extended diagnosis

ibaPDA-V6 version 6.19.0 provides enhanced diagnostic functions while it is connected via network with the ibaBM-DPM-S device. Firmware (software) version A8 or higher is required for the device.

ibaPDA-V6 automatically tries to connect to the new diagnostics service of the ibaBM-DPM-S. If it can not be connected, the new diagnostic features are deactivated. You have still got access to the standard diagnosis (see chapter 10.3.1 "Standard Diagnosis").

On the "Diagnostics" tab in the ibaPDA-V6 I/O manager, the operating status of each slave and all possible addresses on the devices both DP lines are shown.
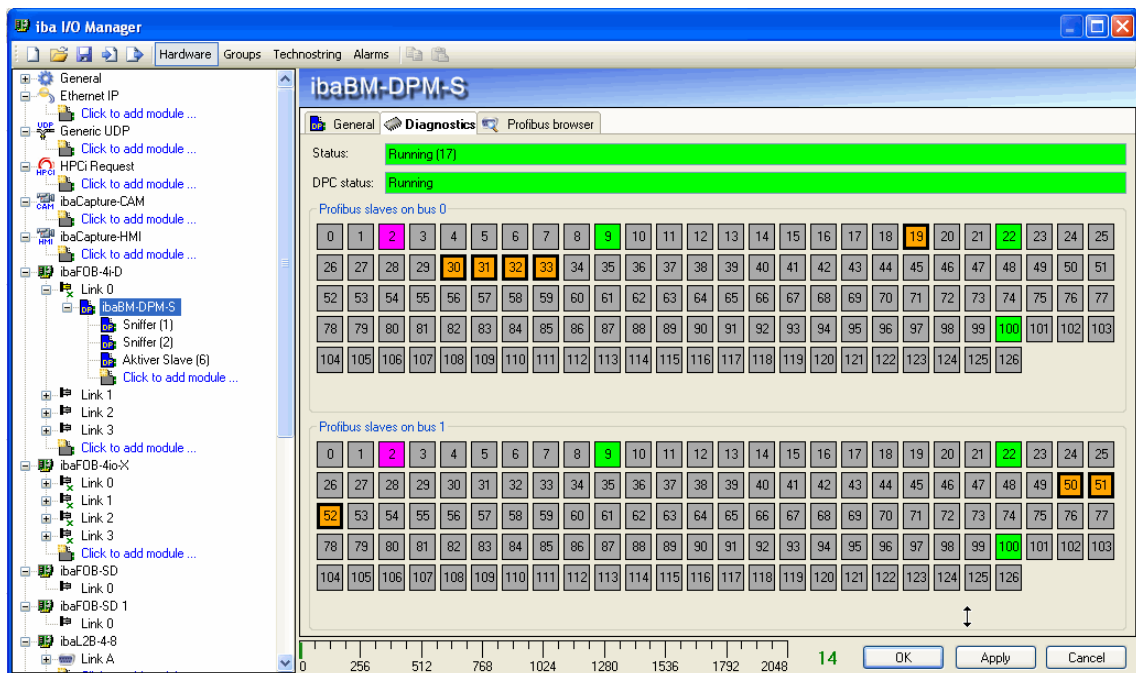
Figure 32: PROFIBUS diagnostics

The different status of the slaves are marked in different colors:

Status	Color	Slave on bus?	Accessed by master?	Comment
OK	Green	YES	YES	This slave is ok.
Missing	Red	NO	YES	This will result in a bus fault on the master.
Phantom	Orange	YES	NO	This means that the slave is not configured on the master.
Inactive	Gray	NO	NO	
Master	Purple	YES	YES	This is a master.

Table 6:   Meaning of the diagnostics colors

A slave that is not assigned directly to the device, is surrounded by a broad edge. In the figure above, this is true for slave 19 and the slaves 30 … 33.

Moreover, the device supports a detection of collisions. Before ibaBM-DPM-S activates own slaves, the device makes a check if there exists a slave with the same number on the bus, yet. If there exists a slave with the same number, there will be a collision, anyway. If ibaBM-DPM-S detects a collision, it does not activate its own slave.

Note

 A slave that is in danger of colliding is blinking in the bus overview.

The status of the slave is shown in the Tooltip if you touch it with the mouse. You can click on a slave symbol and are lead directly to this slave in the PROFIBUS browser.

The PROFIBUS browser supplies you with information on the PROFIBUS connected to ibaBM-DPM-S. If you mark the main node in the browser tree structure, you get information about the device (see figure below).
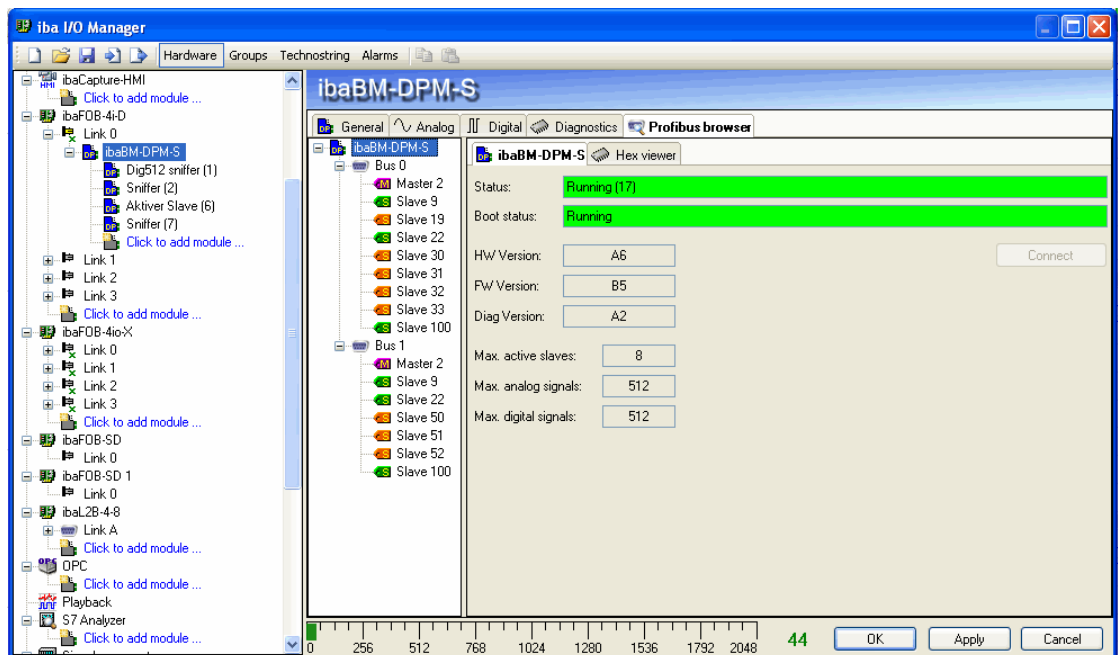
Figure 33: PROFIBUS Browser

Tip

There are different ways to open the PROFIBUS Browser:

- In case, you have marked the ibaBM-DPM-S device in the I/O manager tree structure,

    - Please click on the "Diagnostics" tab. When clicking on the slave symbol in the overview, the PROFIBUS browser is changed and the slave preselected.

    - Then, please click on the "PROFIBUS browser" tab.

- If you have chosen the "General" tab of an "Active slave" or "Sniffer" module in the I/O manager, please click on the „Browse profibus" command marked in blue (see fig. 10.2.2.1 "General" and 10.2.3.1 "General" tab). The PROFIBUS browser is then opened as an additional window. In this window, you can also choose PROFIBUS data on the "Analog" and "Digital" tab.

If the bus node is marked in the browser, you can have a look at PROFIBUS information like transmission rate, cycle time and number of slaves.
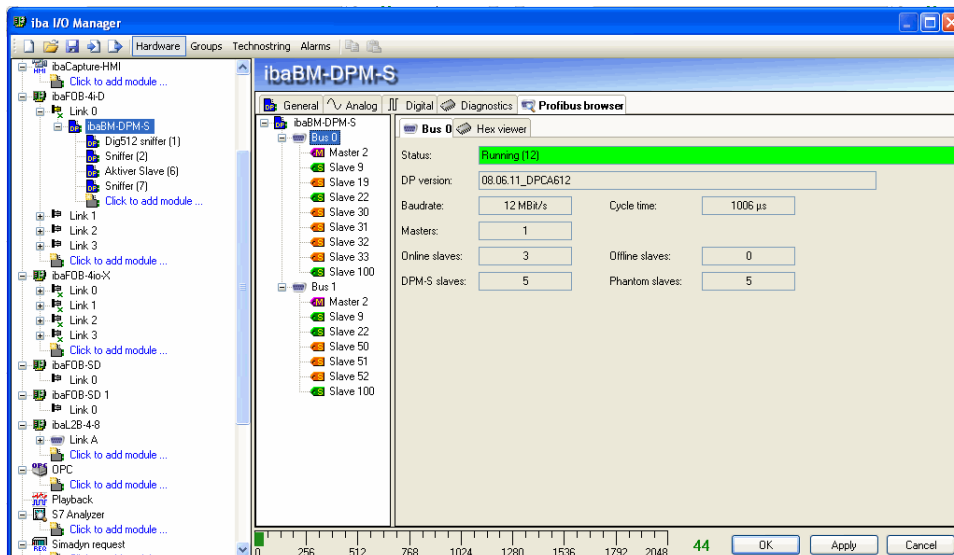
Figure 34: PROFIBUS Browser – information about bus

If the node of a bus participant (slave or master) is marked, you are given information about this participant, e.g. status, telegram counter and actual values (output/input).
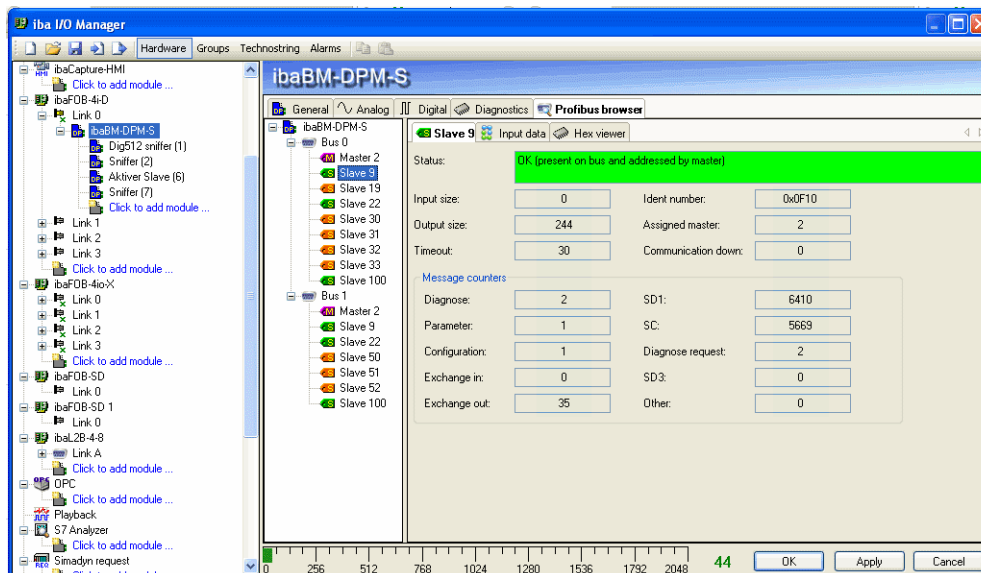
Figure 35: PROFIBUS Browser – information about slave

Choosing signals via PROFIBUS Browser

You can use the PROFIBUS Browser for choosing signals for a "Sniffer" or "Active slave" module. Please open the PROFIBUS Browser on the "General" tab of the "Sniffer" or "Active Slave" module.
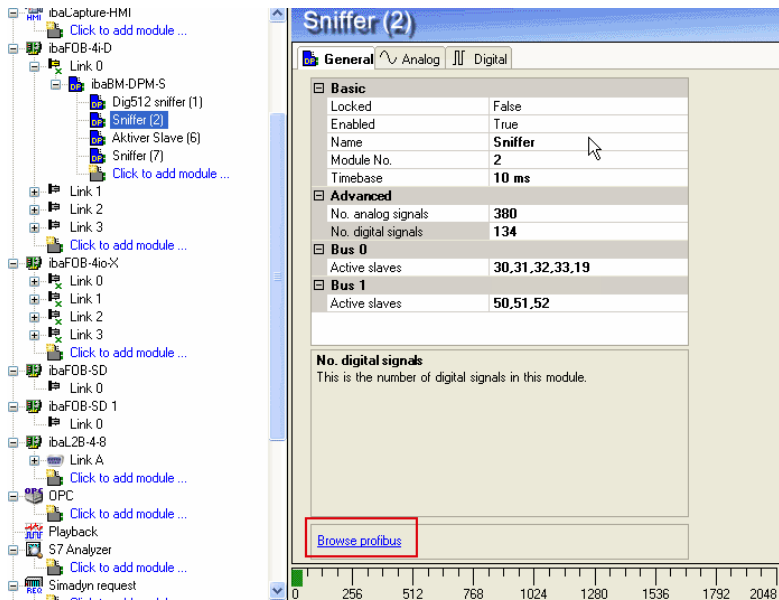
Figure 36: PROFIBUS Browser on the "General" tab

Please mark the node of the participant (slave).
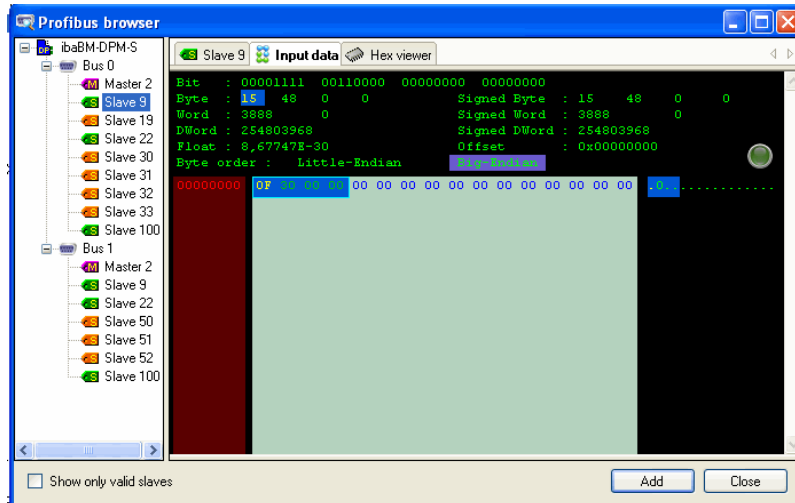
Figure 37: PROFIBUS Browser – Slave marked and input data chosen
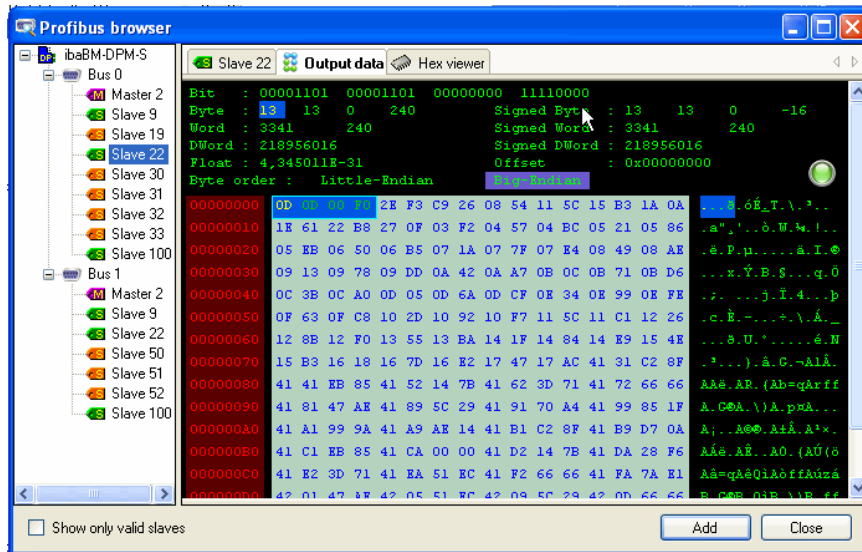
Figure 38: PROFIBUS Browser – Slave marked and output data chosen

If a slave has input and/or output data, (e.g. ET200 station with input and/or output signals), the data are shown on two tabs, the „Output data" and the „Input data" tab. You can interpret the binary data by means of the Hex viewer.

In the figures above, slave no. 9 only has got input data, slave no. 22 only output data.

In the upper part of the Hex viewer, the value of a chosen byte sequence is shown (interpreted for different data types) in the lower part. You can switch between „Big Endian" and „Little Endian". If you have identified the chosen byte sequence as signal value, please mark the correct value in the upper part of the dialog. Then, you can add the signal by clicking on the <Add> button to the signal table on the Sniffer (or "Active slave" module). Bus number, slave number, direction, offset and data type are entered automatically. After having added the signal, the marked choice automatically jumps to the next value of the same data type. You can also transfer a signal to the signal table by double clicking on the correct value.
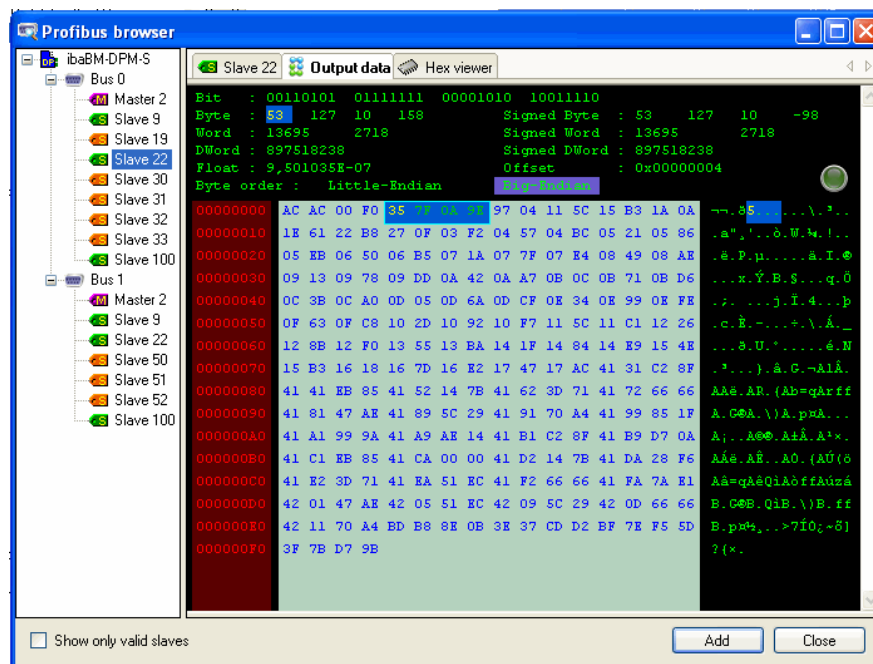
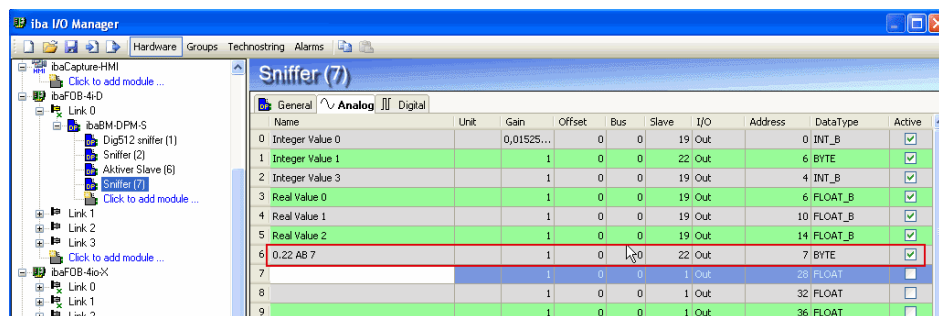Figure 39: PROFIBUS Browser – view of output values

Figure 40: PROFIBUS Browser – transfer of signal

11   PROFIBUS configuration

11.1   Sniffer operating mode

No GSD file and no special configuration (for example in the SIMATIC Manager) are required for the device.

The telegrams on the PROFIBUS must be known, in order to enter the data to be measured in the configuration files of the device or in ibaPDA-V6. The following signal information must be known:

❑ The slave on which it is to be logged (line no. and slave no.).

❑ If it is a signal that is sent from the DP master to slave (OUTPUT) or from the slave to the master (INPUT).

❑ Where the signal is located in the telegram or where the range of values for several signals starts (byte offset) and what type of data is involved. The byte offset is the offset within the payload data.

11.2   Active slave operating mode

For operating as active slave, one or several slave addresses (max. total of 8) must be assigned to the device. These slave addresses must be entered in the PROFIBUS configuration (e.g. in the SIMATIC manager of the control) as well as in the configuration files of the device (e.g. by using „Active slave" modules in ibaPDA-V6).

⚠ CAUTION

Connecting the PROFIBUS cable

The PROFIBUS cable should only be connected after proper completion of the active slaves configuration via ibaPDA or web interface. This is to make sure that no slave number has been used twice. A conflict of several slaves with the same number may cause a complete breakdown of the communication on the PROFIBUS and may finally lead to a line stop.

Setting up active slaves only makes sense if data are not sent anyway on the PROFIBUS are to be recorded by the device.

To configure the slaves on the PROFIBUS, the GSD file of the device must be installed in the DP master of the iba-DPM-S device

In contrast to the ibaBM-DPM-64, there are no longer several GSD files for each module or data type; instead, there is only one GSD file that needs to be installed on the DP master.

The "ibaDPMSi.gsd" GSD file is supplied with the device. The device is then shown as "ibaBM-DPM-S/DP monitor" in the device selection of the PROFIBUS configuration (e.g. SIMATIC Step7 HW config catalog) .

With this GSD files, the slaves can be defined freely concerning offsets and data types. The file contains some predefined templates for being able to configure certain signal groups. "Output" represents the output signal group (from the master´s perspective). "Input" is an input signal group.

The prepared templates in figure 41 appear in the tree structure in the right-hand window. Apart from the hierarchical display of input and output signals, several prepared modules

for using the ibaPDA-Request-S7 are available. For further information, please see the "ibaPDA-Request-S7" manual.

In the example in fig. 41, the ibaBM-DPM-S device has been assigned 112 bytes of source data (from master to slave). These source data are combined by three templates (64 bytes, 32 bytes and 16 bytes).

Figure 41: PROFIBUS configuration and GSD files in SIMATIC HW configuration.

Note for S7-CPUs

The following S7-CPUs are considered to be "older": S7-400 CPUs with firmware < V3.0 and S7-300 CPUs with firmware < 2.0 or CPUs, where no firmware version is indicated in the hardware configuration.

In general S7-CPU of the older type do not support long slots with the setting "Consistent over total length". When configuring those slots, **no** error message is generated in Step7.

In this case use the universal module with the setting "Consistent over unit" for the ibaBM-DPM-S configuration.

When using CP443-5, there are also restrictions regarding the max. slot length when "Consistent over total length" is set. For further information refer to the according module manuals.

When using S7-CPUs of the older type, the max. slave address length may also lead to restrictions. Some models support only a maximum slave length of 122 Bytes. Usually an error message occurs when the device is being configured.

12   Redundancy mode

Note

The following description provides you with general information on the operation of the ibaBM-DPM-S device in redundancy mode. You will find detailed information about differences and special features in comparison to operation on the normal PROFIBUS.

For understanding the following description, we suppose that you have basic knowledge in using the ibaBM-DPM-S device.

The redundancy mode of ibaBM-DPM-S and ibaPDA-V6 is required if you want to capture data of redundant PROFIBUS systems of a SIMATIC S7-400H control.

Without the redundancy mode, data can also be captured. The disadvantage is that data have to be captured by each of the both PROFIBUS systems. When analyzing data, the user has to decide which of the two data sets is valid.

In the redundancy mode, ibaBM-DPM-S decides automatically and dynamically for each slave, which PROFIBUS system sends the valid data sets. Only valid data are sent to ibaPDA-V6 for recording.

ibaBM-DPM-S recognizes situations like the passage of a S7-400H CPU to STOP, the failure of a slave connection (e.g. IM153-2 for a redundant ET200) or a broken cable. It then changes dynamically the bus system used for data capturing.

In case, valid data are recognized on both bus systems, the 0 bus system (connected to the X40 plug) is preferred.

In the redundancy mode, „Sniffing" an existing Master/Slave communication can be done. You can also use active slaves in ibaBM-DPM-S for sending internal data of the control directly to ibaPDA-V6.

Note

Concerning the connection of ibaBM-DPM-S to the redundant PROFIBUS, please take account of the notes in chapter 8.1.3 "Connection to the DP master and other DP slaves on the redundant PROFIBUS".

⚠ CAUTION

When using active slaves on ibaBM-DPM-S, you have to take measures in the program of the S7-400H CPU, for preventing an eventual failure of an active slave (e.g. over OB85). This is necessary for preventing negative influences on the rest of the program.

Note

Due to the system, for some cycles zero values or „frozen" values might be recorded when changing the active bus system (e.g. when a S7-400H CPUs passes to the STOP status) .

Note

ibaBM-DPM-S is set back when the transmission rate of the redundant PROFIBUS is changed.

If you use active slaves on ibaBM-DPM-S, the S7-400H CPU will show a bus failure until a successful setback.

For a setback, you can either switch off and switch on again the device, or transfer in ibaPDA-V6 the I/O configuration with the „Force active slaves reset" = TRUE (Register „General" in the „ibaBM-DPM-S" device module) setting.

The coupled S7-400H CPUs start one after another when reloading the hardware configuration (depending if loading was done in STOP or RUN). Only if on both CPUs the green LED RUN is on, the new transmission rate in the CPU is active. If ibaBM-DPM-S is set back too fast (before both CPUs are on RUN), eventually on one bus the old transmission rate is recognized. In this case, setback of ibaBM-DPM-S has to be repeated.

For using the redundancy mode, you need an additional license. Please contact the iba AG support team. The license is activated via the administrator functions in the Web dialog of ibaBM-DPM-S (see chapter 9.4.5 „Administrator functions").

After having activated the license in the Web dialog, the „Info" page shows „available" for the redundancy mode.

Figure 42: Webinterface homepage with redundancy mode

Note

ibaBM-DPM-S can be either operated in normal mode or in redundancy mode. Mixed operation is not possible.

The redundancy mode is switched on/off only via ibaPDA-V6.

For using the redundancy mode, you need to choose in the Web dialog on the "Mode Settings" the "DPM-S Sniffer / Active Slave Mode" setting. After this setting, you find in brackets the note if the redundancy mode is switched on or off by ibaPDA-V6. If no license is activated for the redundancy mode, this note is missing.
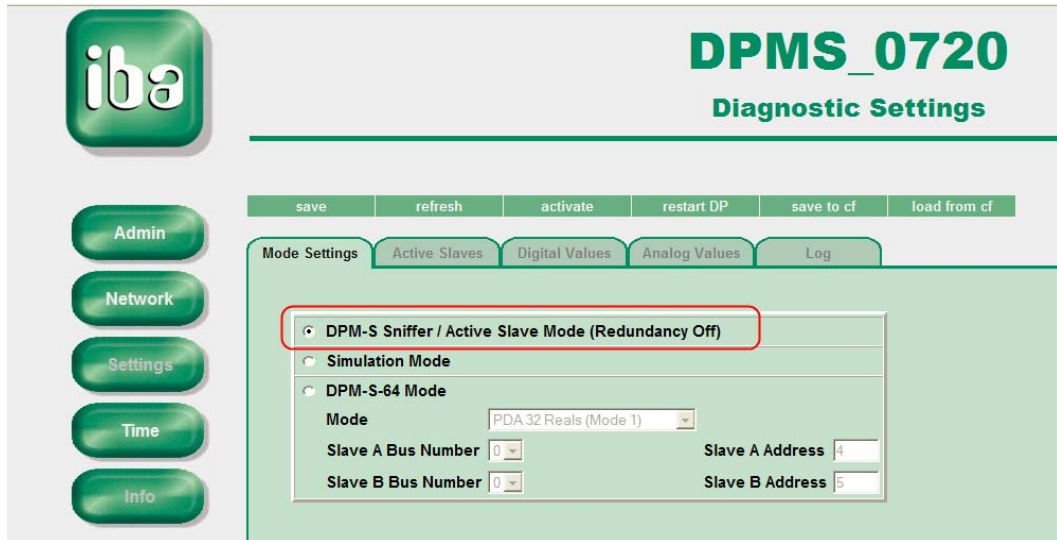

Figure 43: Display of active/ non active redundancy mode

12.1   Configuration with ibaPDA-V6

Connect the ibaBM-DPM-S to a free link of a ibaFOB-D input card. In the I/O manager, add a device module „ibaBM-DPM-S".

Set the redundancy mode on TRUE on the „general" tab. The redundancy mode, being switched on now, is shown by an orange colored symbol of the device module.
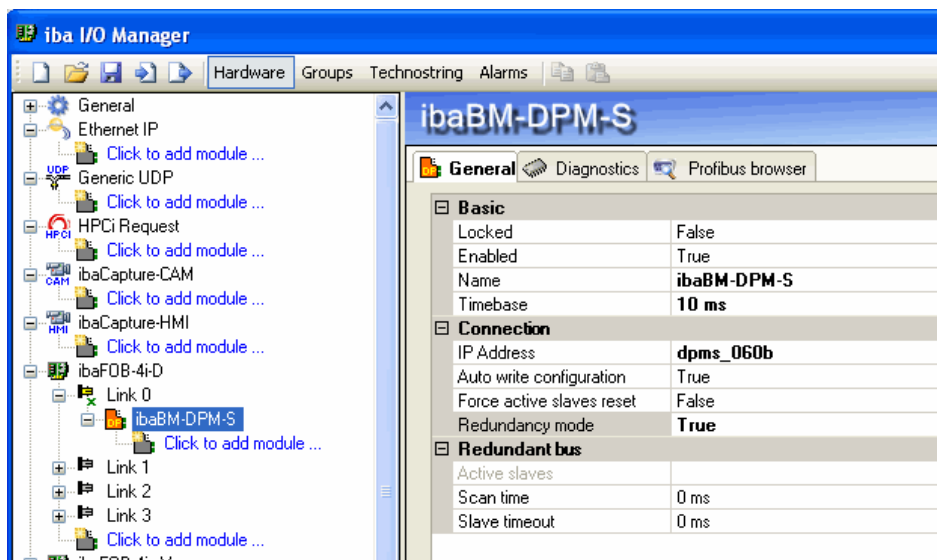
Figure 44: Activate the redundancy mode in ibaPDA

As on the redundant PROFIBUS both bus systems (0 and 1) are operated in parallel, on the "General" tab, there are only settings for the "Redundant bus".

In redundancy mode, you can only use the following modules:

❑ Active Slave

❑ Sniffer and

❑ Dig512 sniffer

In case other modules are projected (e.g. FM458 request), when the redundancy mode is configured, these modules are deactivated automatically as soon as the redundancy mode is activated.
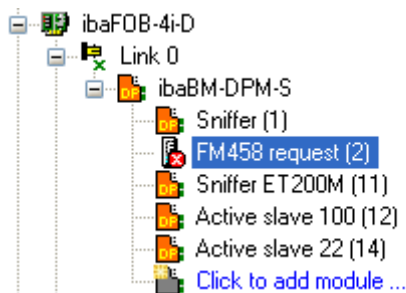
Note

In the redundancy mode, you do not have access to the request functionality.

12.1.1   Notes on the „Sniffer" module

In redundancy mode, there is only the „Redundant bus" option on the „General" tab. The bus 0 and bus 1 settings do not appear. If you configure active slaves, they are generated automatically and simultaneously on both buses.

Each of the both S7-400H CPUs sends data to the slave on an own PROFIBUS system. This is why an active slave always needs to be found on both PROFIBUS systems.
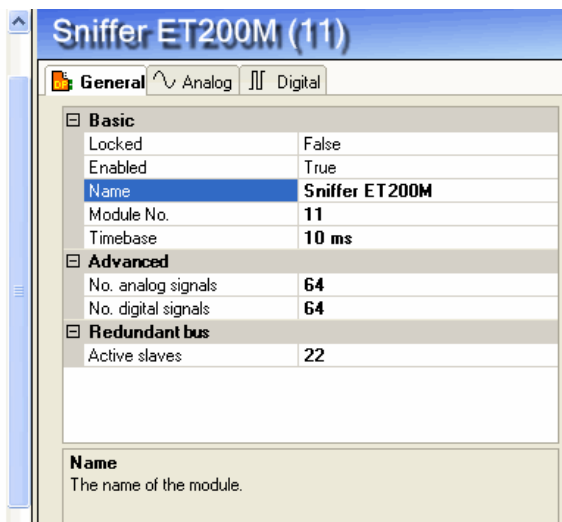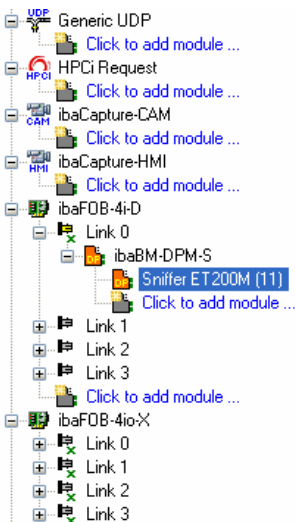

Figure 45: „General" tab – Redundant bus

On the „Analog" and the „Digital" tab, you can define the signals to be captured, like you are used to do. There is just one special feature:

As ibaBM-DPM-S „decides" in redundancy mode which PROFIBUS system data are sent over, the setting in the „bus" column is not relevant. Hence, this column is blocked in redundancy mode.
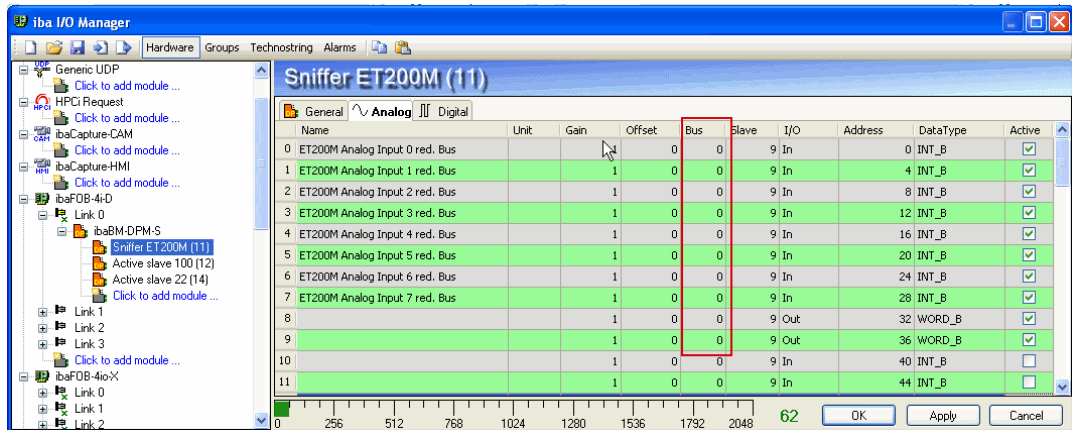

Figure 46: „Analog" tab – display of bus in redundancy mode

12.1.2   Notes on the "Active slave" module

In redundancy mode, you only find one „Redundant PROFIBUS" group on the „General" tab. Here, you can define the slave number. You can not choose a bus number, as the active slave in redundancy mode is always generated on both buses at the same time.

Each of both S7-400H CPUs sends data to the slave on an own PROFIBUS system. This is the reason why an active slave always needs to be found on both PROFIBUS systems.
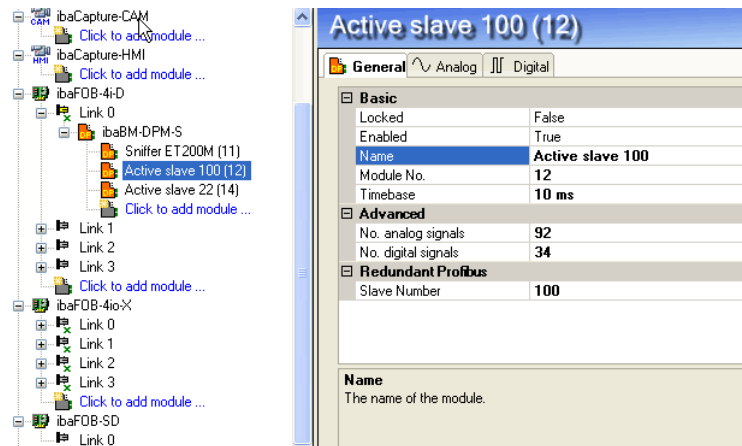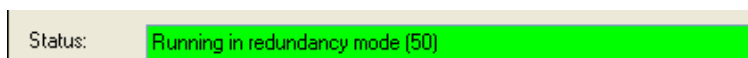

Figure 47: „General" tab – redundant PROFIBUS

12.1.3   Notes on diagnosis

Diagnosis shows that ibaBM-DPM-S runs on redundancy mode. The current operating status is shown in the upper „Status" line on the „Diagnosis" tab. In redundancy mode, the following message appears:

In the figure above in chapter 12.1.1 "Notes on the „Sniffer" module" and 12.1.2 "Notes on the "Active slave" module", slaves with the addresses 22 and 100 are generated by the "Active slave" and "Sniffer" modules.

Looking at the diagnosis, you will see that both slaves have been generated on both bus systems (a thick outline means that this slave is assigned to the chosen ibaBM-DPM-S device). Moreover, an "external" slave – in this case an ET200 station – is displayed with the address 9. The master (address 2) (each a S7-400H CPU) is displayed on both bus systems in magenta.
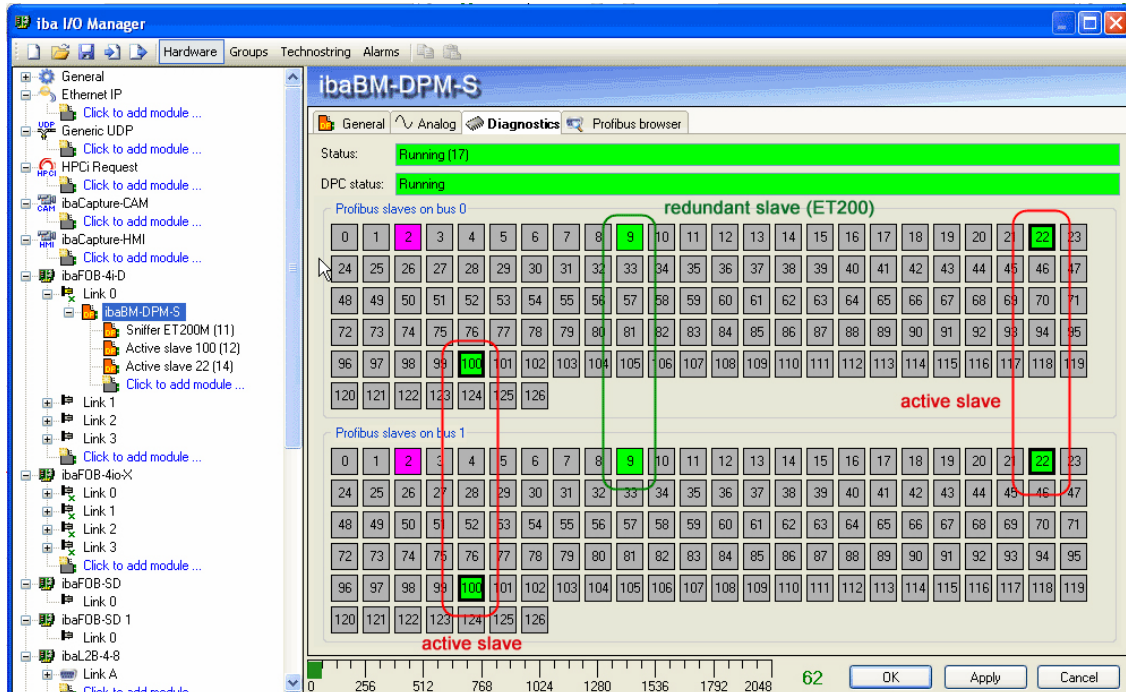

Figure 48: Diagnosis in redundancy mode

12.1.4   Special features I/O types

In redundancy mode ibaBM-DPM-S "decides" for each slave which bus the valid information is sent on.

You have got an additional "Active bus" I/O type (see chapter 10.2.2.3 "Digital" tab) at your disposal. For digital signals, you get information about which bus the signals of a certain slave are being captured by ibaBM-DPM-S.
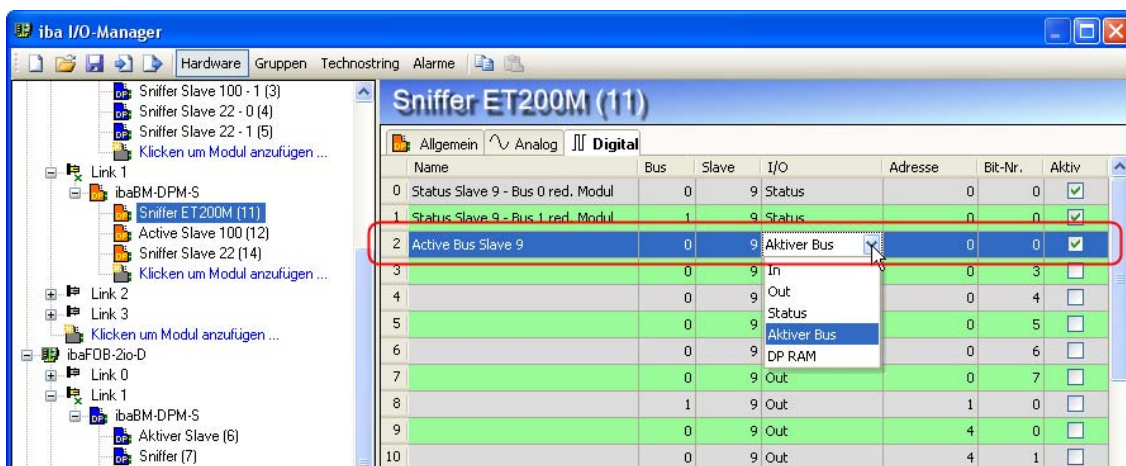

Figure 49: Special I/O types

In the „Slave" column, you can define the slave for which you want to get information via the currently valid bus.

Due to the way ibaBM-DPM-S works, in general, in the redundancy mode for analog and digital signals, no bus system has to be chosen. The I/O type "Status" is an exception for the digital signals.

As there is an independent redundant slave (e.g. ET200) on both bus systems (see system design chapter 8.1.3 "Connection to the DP master and other DP slaves on the redundant PROFIBUS"), the status can be requested with regard to the bus system:

"Sniffer" module

If you choose for the digital signals the I/O type "Status", in this line the "Bus" field is active and changes can be made in this field.
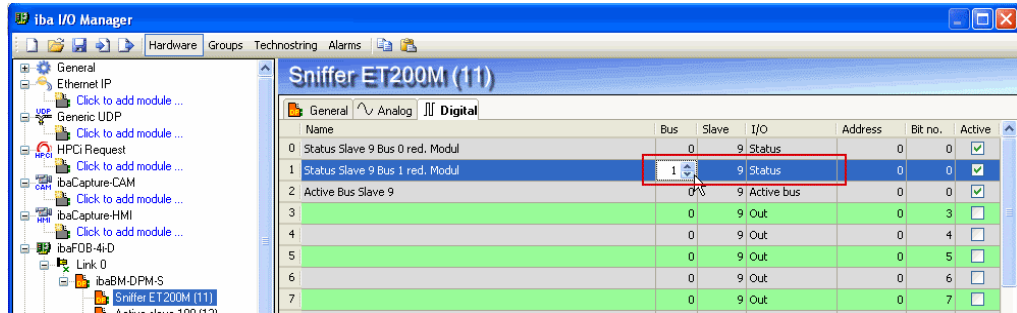

Figure 50: I/O type „Status"

„Active slave" module

As the "Active Slave" module does not offer a column for the bus system, in the redundancy mode, the I/O types "Status bus 0" and "Status bus 1" are displayed.
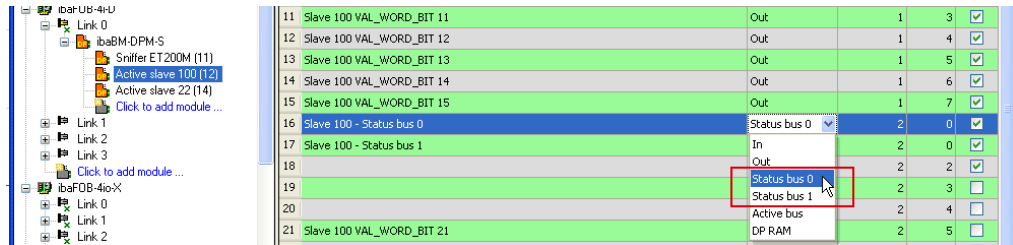

Figure 51: I/O type "Status bus n"

Tip

Please define in the PROFIBUS system for each slave digital signals of the I/O type "Status" und "Active bus". When analyzing the data, you can analyze the status of the slaves.

12.2   PROFIBUS configuration

12.2.1   Sniffer mode of operation on the redundant PROFIBUS

For this device, no GSD file and no separate configuration (e.g. in the SIMATIC manager) are needed.

For entering the measuring data in ibaPDA-V6 in the lists of analog and digital signals, the telegrams on the PROFIBUS must be known. The following criteria have to be known of a signal:

❑   On which slave the signal is to be captured (only slave no.).

❑   If the signal is sent from DP master to slave (OUTPUT) or from slave to master (INPUT).

❑   Where in the telegram the signal can be found, where the value range for more than one signal begins (Byte offset) and which data types exist. The Byte offset is the offset within the usage data.

12.2.2   Operation as active slave on the redundant PROFIBUS

If you want to send internal data from the S7-400H to an an ibaBM-DPM-S active slave, you need to add the active slaves in the S7-400H hardware configuration under SIMATIC.

For this procedure, you need the "ibaDPMSi.gsd" GSD file. You find this file on the CD.

Import the GSD file in the "HW config" tool under Step7. In the catalog of the available modules, you now find the "ibaBM-DPM-S/DP Monitor" device under „PROFIBUS DP – Additional Field Devices – General".
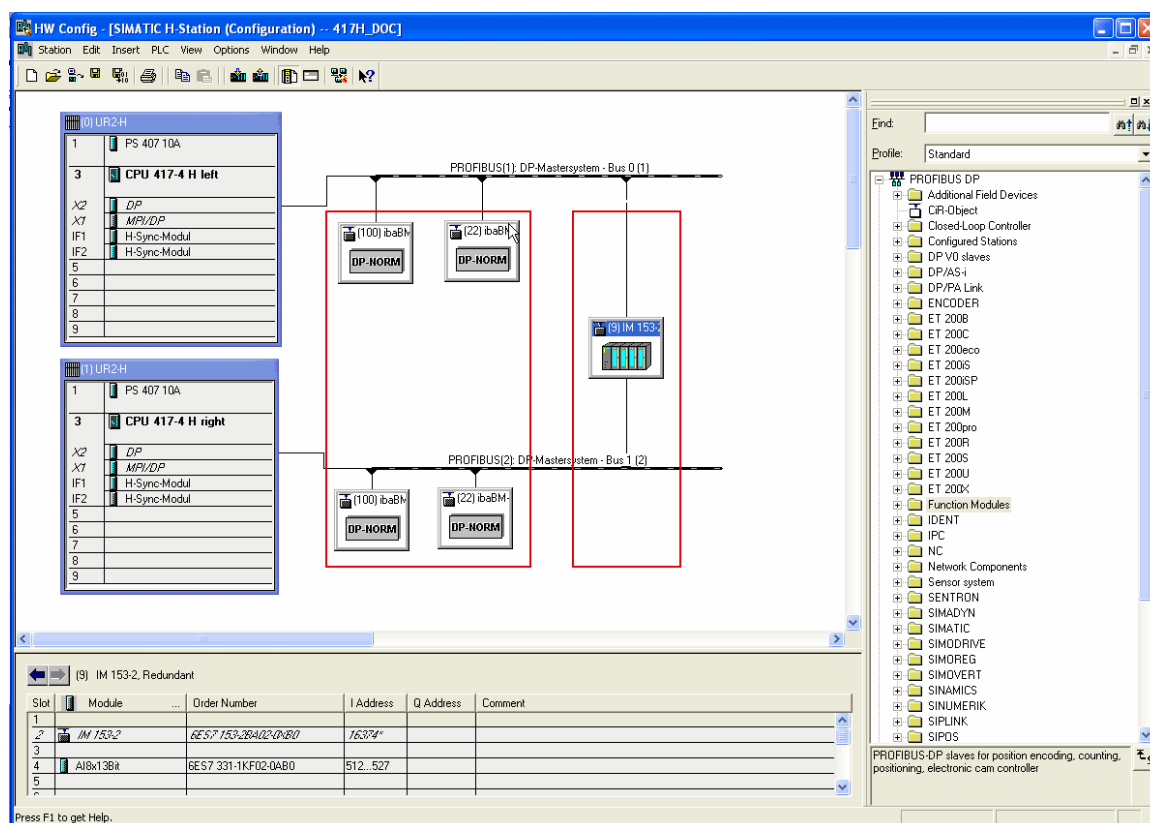

Figure 52: ibaBM-DPM-S/DP monitor module in the S7-400H hardware configuration

A normal redundant slave (e.g. ET200) is shown with two connections in the hardware configuration that are connected to the both PROFIBUS systems. This redundant slave has a single I/O address range (see figure above).

In contrast to that, an active slave of the ibaBM-DPM-S has to be configured **on both bus systems**. In both bus systems, the slave has to get the **same PROFIBUS address**.

This way, the configured slaves have each an own I/O address range. You can combine the address range for each slave from the submodules in the hardware catalog. A PROFIBUS slave can have a maximum usage data length of 244 bytes. This is why you should use two submodules of the "output 122 BYTES" type.

Example

In the figure above, two active slaves have been configured (addresses 22 and 100) The following address ranges have been assigned to:

Slave 22 – Bus 0

- output 122 BYTES: 1024…1145
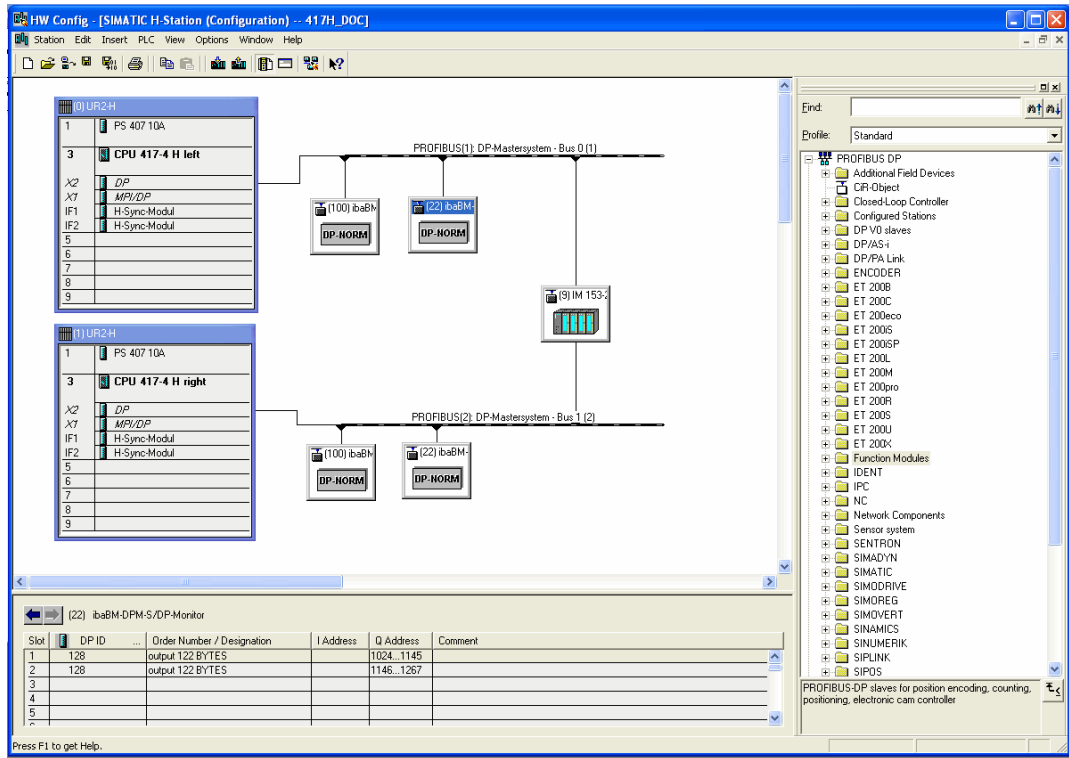- output 122 BYTES: 1146…1267

Figure 53: Slave 22 – Bus 0 address range

Slave 22 – Bus 1

- output 122 BYTES: 1268…1389
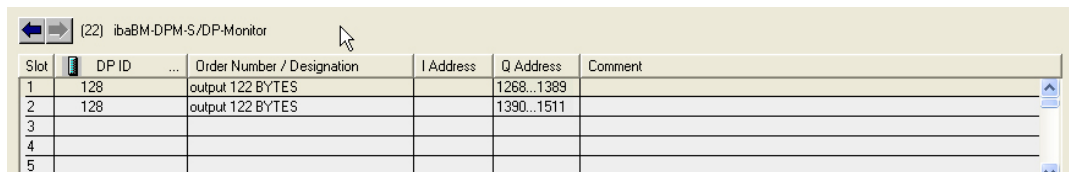- output 122 BYTES: 1390…1511

Figure 54: Slave 22 – Bus 1 address range

Slave 100 – Bus 0

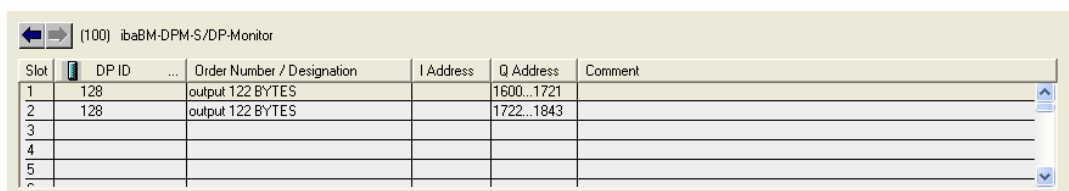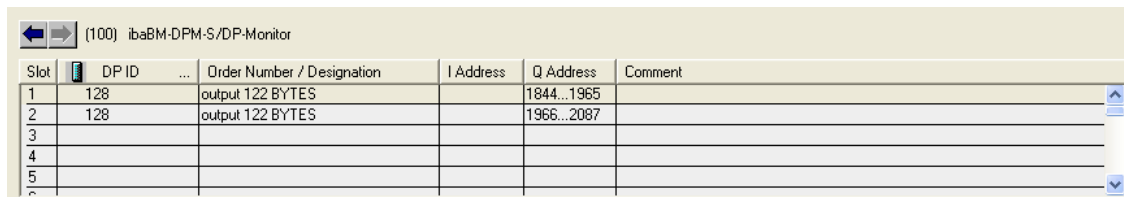- output 122 BYTES: 1600…1721
- output 122 BYTES: 1722…1843

Figure 55: Slave 100 – Bus 0 address range

Slave 100 – Bus 1

- output 122 BYTES: 1844…1965

- output 122 BYTES: 1966…2087
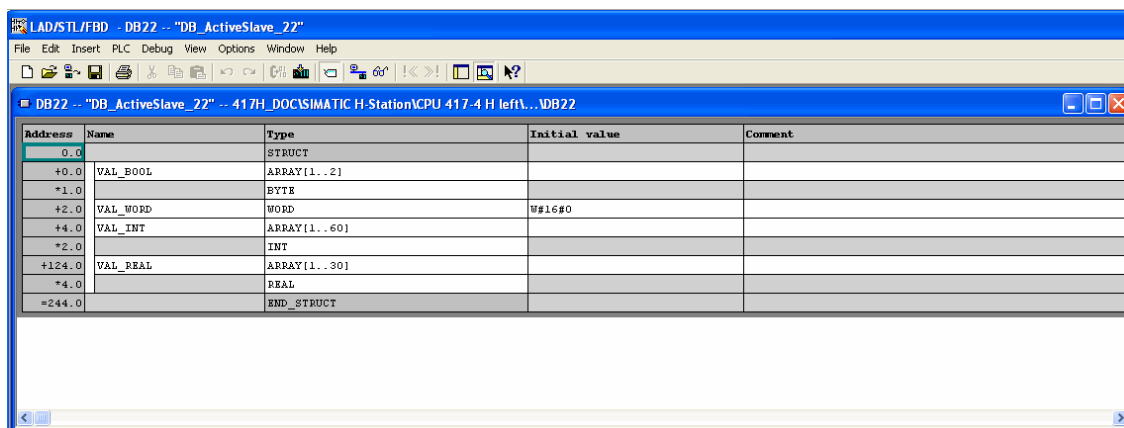

Figure 56: Slave 100 – Bus 1 address range

In the PLC program of the S7-400H, you need to give the data you want to record with the active slave always to the two slaves belonging together (e.g. Slave 22 on Bus 0 and Slave 22 on Bus 1).

For this, you generate in your PLC program for each slave a data block (DB), in which you store the data cyclically. You can customize the DB structure according to your individual demands. The length of the DB has to correspond to the length of the output data range of the active slave (hence, max. 244 Bytes).

In our example, the interface DB (DB22) looks as follows:

Figure 57: Example interface data block

When calling up SFC15 (DPWR_DAT) several times, data are given out. When calling up the SFC15 twice in network 3 (figure below), all 244 bytes of the interface _DBs DB22 for Slave 22 – Bus 0 are given out. In network 4, with two more SFC15 call ups the same data are given out on slave 22 – bus 1.

More SFC15 call ups are needed as the address range must not overlap the address range of the single submodules of the slaves in the hardware configuration. The maximum length of a submodule is 128 Bytes.

For further information about the use of SFC15, please read the SIMATIC Step7 manuals.
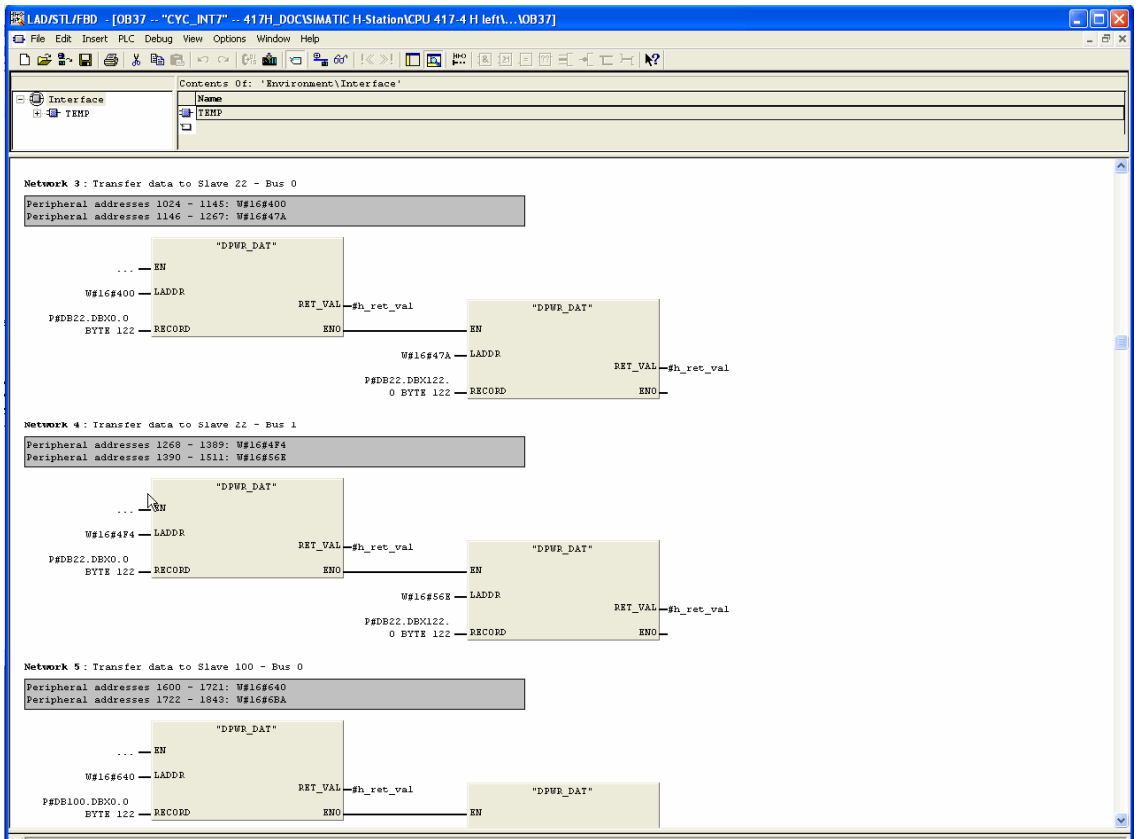
Figure 58: Transferring data to an active slave with SFC15

Note

Data should be exclusively given out to the active slave by SFC15 (DPWR_DAT). Data output by charging/transfer commands leads to a much higher cyclic load in the CPU.

⚠ CAUTION

When using active slaves on ibaBM-DPM-S, you have to take measures in the S7-400H CPU program for preventing an eventual downtime of an actual slave (e.g. over OB85) for there are no negative consequences for the rest of the program.

13   Technical data

Order number	13.121000
Manufacturer	iba AG, Germany
Mechanical properties	DIN IEC 68-2-6 (if properly assembled and with DIN rail)
Operation temperature	0 °C to 50 °C (32 °F to 122 °F)
Storage temperature	-25 °C to 70 °C (-13 °F to 158 °F)
Transport temperature	-25 °C to 70 °C (-13 °F to 158 °F)
Cooling	Natural cooling
Assembly	Snapped onto a DIN rail
Humidity rating	F, no moisture condensation
Protection class	IP20
Voltage supply	DC 24 V ±10 % non stabilized
Power consumption	Max. 500 mA
FO cable FO coupling	62.5/125 µm ST Lean
Maximum fiber optic cable length without repeater	2000 m (6561 ft.)
Dimension (width x height x depth)	69.5 mm x 189 mm x 142 mm (incl. DIN rail clip) 2.74" x 7.44" x 5.59"
Weight (incl. packaging and manual)	1000 g

13.1   Connections/indicators

Basic device

Fiber optic cable connectors	2 ST plug connectors	
Rotary switch	Special functions	
Voltage supply	2-pin Phoenix terminal plug (black)	
Voltage switch	On/off switch for complete device	
LEDs	ibaNet communication	Run (green); 3.3 MBit/s (yellow); 32 MBit/s (white); Error (red)
	Interface status	CompactFlash® (green/red) Ethernet (green/red) USB (green/red)
Other interfaces	Bottom of the device	Ethernet (parametrization access) USB (parametrization access) Ground socket

PROFIBUS module

| PROFIBUS-DP	2 x 9-pin D-Sub socket		
Terminating switch	S4: Terminator network for Bus0 S5: Terminator network for Bus1		
LEDs	Status	Bus0	Run (green); Bus (yellow); Active (white); Error (red)
		Bus1	Run (green); Bus (yellow); Active (white); Error (red)

13.2   Data transmission

Main circuit board

Data transfer rate (ibaNet FO cable)	32 MBit/s 3.3 MBit/s (DPM-S-64 mode)
Logging rate	1 ms
Data volume	512 analog signals (max. 1984 bytes) + 512 digital signals per ms 64 analog signals + 64 digital signals per ms (DPM-S-64 mode)
Ethernet	1/10/100 MBit/s
USB	2.0
CompactFlash®	CF and CF+ cards; type I and type II **Warning!** Very slow PIO 0 cards can cause errors during data transmission. As a result, a configuration may be read incorrectly. For this reason, please check the log file. Cards with readout errors: Ultron 128 MB. These cards have no partition table. Cards that have been tested error free: Kingston 1 GB Fujifilm „Microdrive™" 4 GB

PROFIBUS module

PROFIBUS transmission rates	187.5 kBit/s 500 kBit/s 1.5 MBit/s 3 MBit/s 6 MBit/s 12 MBit/s
Number of physical PROFIBUS channels	1 or 2 (switch selectable)
Number of DP slaves	Max. 8, distributable over one or two lines Upgrade on request

13.3   Dimension sheet
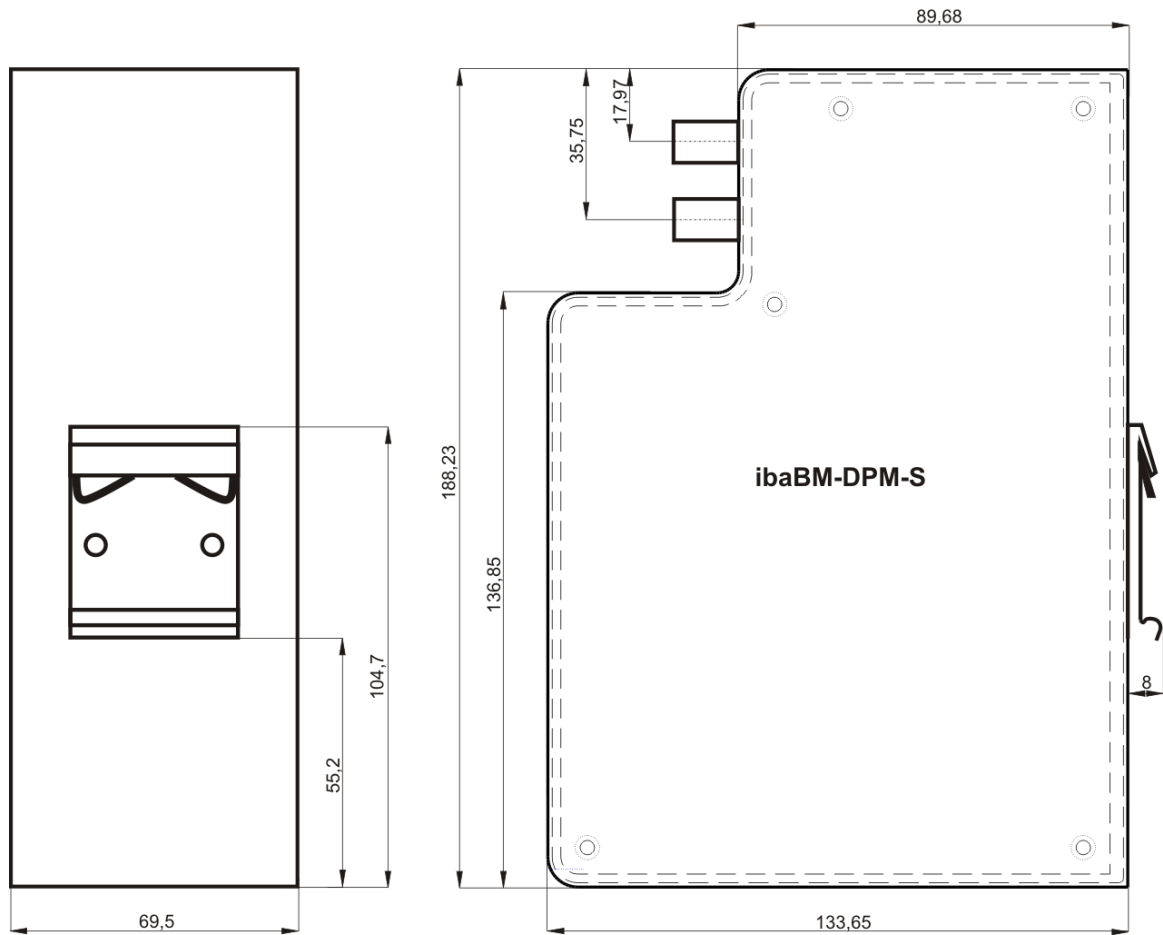
Dimensions given in mm

Figure 59: Dimension sheet

14 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.

Contacts

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

www.iba-ag.com.