

# Configuration and setup of FB-DP... and FB-HS... with ProfiTrace

User manual



# User manual

# Configuration and setup of FB-DP... and FB-HS... with ProfiTrace

			2015-07-13
Revision: A			
This user manual is valid for:			
Designation	Version	Order No.	
FB-HS		2316370	
FB-HSB		2316379	
FB-HSC		2316371	
FB-DP-RPTR		2316373	
FB-DP-RPTR/SC		2316374	
FB-PA/SC		2316375	

# Please observe the following notes

#### User group of this manual

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- Qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

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This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

- **DANGER** This indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** This indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION** This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



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# 1 FB-HS... system

# 1.1 Introduction

PROFIBUS coupler/link products transparently convert PROFIBUS DP to PROFIBUS PA while providing detailed network diagnostics. Advanced configuration and diagnostics of these products is accomplished through an onboard web server.



Basic configuration can be accomplished using DIP switches without the need to connect to the web server.

Different levels of monitoring capability are provided through the different head stations.

- The FB-HSA does not provide any monitoring capability.
- The FB-HSB provides diagnostic monitoring of one network.
- The FB-HSC provides diagnostic monitoring of up to four networks simultaneously.

Configuration of modules other than the FB-HS... can be accomplished through the FB-HS..., including other devices on the PROFIBUS network that use compatible FDT/DTM protocols.

## 1.2 Connecting a PROFIBUS/PA segment

The bottom of the FB-PA/SC module has two identical connections for the PROFIBUS/PA trunk. These are connected one-to-one. The integrated termination is activated when power is connected to the PA module, which means that the FB-PA/SC is always the start of a segment. The automatic termination cannot be disabled. Most installations will use only one connector. In that case it does not matter which connector is chosen.

### 1.2.1 Cable specifications

Use the correct cable for your project. The table below shows the cable specifications for PROFIBUS PA. If a cable is not compliant with these specifications, the reliability of the installation may become unstable.

Table 1-1 PROFIBUS cable specification
--

Characteristic	Specification
Cable design	Twisted pair, shielded
Maximum conductor cross section (nominal)	0.8 mm <sup>2</sup> (AWG 18)
Loop resistance (direct current)	44 Ω/km
Impedance (31,25 kHz)	100 Ω ±20%
Attenuation (39 kHz)	3 dB/km
Capacitive asymmetry	2 nF/km
Max. propagation delay change (7.9 to 39 kHz)	1.7 μs/km
Max. shield coverage	90%
Cable length	1900 m

#### Spur lines

The trunk line on the PA module can have up to 32 spur lines with the following lengths:

Number of spur lines	Length of the spur (Non-Ex)
25 to 32	Max 1 meter
19 to 24	30 meter
15 to 18	60 meter
13 to 14	90 meter
1 to 12	120 meter

# 1.3 Connecting a PROFIBUS/DP segment

The PROFIBUS cable should be wired to the repeaters according to the PROFIBUS guidelines with suitable cable for the application.

Regular and SCOPE repeater modules are equipped with both a screw terminal connector and a D-SUB 9 connector for the bus connection. The connectors are linked with each other, but it is not recommended to use them both.



Figure 1-1 Repeater connection topologies

#### 1.3.1 Screw terminals

Pin layout of the screw terminals:

- A Green wire
- B Red wire
- SH Cable shielding (direct)<sup>1</sup>
- I Cable shielding (capacitive)<sup>2</sup>
  - <sup>1</sup> Direct shielding is recommended when connecting all shields
  - <sup>2</sup> Capacitive shielding connects the shields through a capacitor in cases where not all shields are connected to separate the different potential levels

#### 1.3.2 D-SUB 9 connector

The D-SUB 9 connector offers an alternative connector for standard 9-pin PROFIBUS plugs (one-to-one with the screw terminals).

When the D-SUB 9 connector is utilized and located at the end of the segment, it is recommended to use the termination on the D-SUB 9 connector rather than on the repeater module.



Use a 2.5 mm (0.4 mm maximum) screwdriver to connect the PROFIBUS cable to the repeater modules.

#### 1.3.3 Termination switch

A two-position switch, located on the bottom of the FB-DP-RPTR(/SC) modules, activates the built-in termination capability. Termination should be activated for modules located at the end of network segment.



The built-in termination provides resistances of 390/220/390  $\Omega$  between the conductors.

#### 1.4 Modes

The FB-PA/SC module allows two modes of operation. The mode selection is determined by the switch on the FB-PA/SC.

- Link mode (switch to the right) provides power to the PROFIBUS PA network.
- Coupler mode (switch to the left) allows the device to monitor a PROFIBUS PA network without controlling or powering it.



#### 1.4.1 Link mode

Set the third switch to on (to the right). Connect a power source to the connector on top of the module. The DC voltage offered to the FB-PA/SC module is the same as the output on the PROFIBUS PA side. The minimum is 11 V DC, maximum is 28 V DC.

This module is now a fully functional PROFIBUS PA link/coupler combination. It is semitransparent on all baud rates, and it also sends FDL status requests onto PROFIBUS PA. It supports connection of up to 32 devices that can take up to a total of 500 mA from the bus.

To receive telegrams from a PLC or DCS in Link mode, you need to install another module in the backplane. This module can be any PROFIBUS DP interface card. Set this DP card to the same network as the PA module.

#### 1.4.2 Coupler mode

Set the LINK switch to off (to the left). Connect a power source to the connector on top of the module. The DC voltage offered to the FB-PA/SC module is the same as the output on the PROFIBUS PA side. The minimum is 11 V DC, maximum is 28 V DC.



When using an external PROFIBUS PA power supply, do not apply power to the top power connector. The FB-PA/SC module must be set to operate in Coupler mode.

The module is now a fully functional PROFIBUS PA coupler. It is totally transparent up to 1.5 Mbps, and it sends FDL status requests onto PROFIBUS PA networks. It supports connection of up to 32 devices that can take up a total of 500 mA from the bus.

# 1.5 Configuring repeater modules

The repeaters can be configured using the DIP switches located at the front of the module or by using the web server.

#### 1.5.1 Customizing the PROFIBUS network (NW0/NW1)

Set these DIP switches to the following positions to customize a network number for a specific PROFIBUS network.

NW0	NW1	Network
LEFT	LEFT	1
RIGHT	LEFT	2
LEFT	RIGHT	3
RIGHT	RIGHT	4

1

When using software for configuration, the DIP switches do not have to be set.

#### 1.5.2 Redundancy (RED)

Set this DIP switch to enable the redundancy group for the channel.

RED	Redundancy
LEFT	OFF
RIGHT	ON

**i** 

When using software for configuration, the DIP switches do not have to be set.

#### 1.5.3 Hardware or software settings (H/S)

Set this switch to enable hardware (DIP switches) or software settings.

H/S	Settings
LEFT	Hardware
RIGHT	Software



When software is enabled, all switch settings are overruled. The settings are saved in the internal memory of the FB-HS... module.

#### 1.5.4 Testing and commissioning

If the channel recognizes valid PROFIBUS messages from one or more connected devices, the RX LED of this channel should flash and the ER LED should be off.

When the termination of a specific channel is set to on, the SWx LED should be on.

# 2 Web server

## 2.1 Login

A browser application running on a PC is required. The minimum versions of the following browser applications are:

Mozilla <sup>®</sup> Firefox <sup>®</sup>	2.0
Internet Explorer <sup>®</sup>	6.0
Google <sup>®</sup> Chrome™	1.0

i

A PC is required to access the web server. Using a smart phone or tablet-type product will not work.

To access the web server:

- 1. Open the browser application and enter the IP address in the "Address" field. The default IP address is **192.168.1.254**.
- 2. If the server is configured for a password, enter it at the prompt.

i

Initial login will not require a password. The password requirement can be configured using the web server (see "Password" on page 17).

The initial view of the web server shows the status screen with all system devices.

The web server page has three areas: the header, page list for navigation, and information/configuration screen.





- Header: This provides general information about the device to which the web server is connected.
- Information/configuration: This section shows detailed information based on the page selected. Some fields are editable, and some are for informational purposes only. Editable fields can be boxes for text or numbers, check boxes to select or turn on an item, or drop-down menus to select from a predetermined list of options. Links to other sections of the web server are also available. These are typically indicated by underlined blue text. Clicking on an image of another device may also take you to that device.
- Page list: The list of available pages is determined by the capability of the connected device. Not all pages are available for all devices.

### 2.2 Status

#### 2.2.1 System status

The "Status" page appears upon login. The page gives an overview of the attached modules, with descriptions, serial numbers, and version numbers. Modules can be installed and removed during operation. Any changes in the modules will be immediately visible on the "Status" page.

← → C 🗋 192.168.1.254	ŧ								
	IP addre	ss: 192.16	8.1.254	MAC addres	s: 9C:B2:00	:00:0A:36			
	System	uptime: 0 d	lays, 0:38:02		Site:				
• Status	Temper	ature: 38°C	System	time: 1-Jan-2	010 0:38:0	2			
• System log	Compar	ıy:							
• <u>System log</u>	Country								
ProfiTrace OE:									
• Live list	Stat	us							
• <u>Statistics</u>	Slot	Status	Module				Vendor	Serial #	Hw Rev
• <u>Channel list</u>	0	ок	Head Station Typ	pe 18			Phoenix Contact	002614	V1.9
Message recording	1	ок	1 Channel RS485	5 Repeater Typ	<u>e 1</u>		Phoenix Contact	001958	V1.7
• <u>Network event log</u>	2	ок	1 Channel PA-co	upler 500mA T	vpe 1		Phoenix Contact	000761	V1.4
• Event config									
• Tag-name config	Connec	ted clients					Service		
Profibus Modules:	192.168	.1.100					WEB (port 80)		
• Oscilloscope images									
Oscilloscope errors									

Figure 2-2 "Status" page

The top of the "Status" page displays network and site information in the header. A custom user message can be displayed (see "General configuration" on page 15).

### 2.2.2 Module status

Each name in the list of connected modules is a link that opens the status page for that particular module.

<b>IPHŒNIX</b>	IP address: 192.168.1.254	MAC address: 9C:B2:06:00:0A:36
CONTACT	System uptime: 0 days, 0:39:04	Site:
tus	Temperature: 39°C System tir	ne: 1-Jan-2010 0:39:04
tem log	Company:	
Trace OF:	Country:	
list	Head station statu	S
tistics	Head station info	
annel list	Vendor:	Phoenix Contact
ssage recording	Module type:	Head Station Type 1B
twork event log	Serial number:	002614
ent config	Software revision:	V1.282
g-name config	Hardware revision:	V1.9
fibus Modules:	MAC address:	9C:B2:06:00:0A:36
cilloscope images	IP address:	192.168.1.254
cilloscope errors	Device name:	
graph images	Power supply 1:	Connected
measurements	Power supply 2:	Not connected
illoscope config	Micro SD-card present:	Yes
	Micro SD-card capacity:	Total: 976.63 MB (free: 966.41 MB, used: 10.22 MB)
figuration:	Current consumption (ref: 5.75V):	0.67A @ 5.74V
	Temperature:	39°C
work config	Uptime:	0 days, 0:39:04
onfig	Attached modules:	2
sword config	System status:	ок
nail account config	I/O status:	ок
ice management		
put control config		
r message		
gged in.		
in		

# 2.3 System log

The "System log" page displays system-level events with a date and time stamp.

← → C 🗋 192.168.1.254	4	
	IP address: 192.168.1.254	MAC address: 9C:B2:06:00:0A:36
LICONTACT	System uptime: 0 days, 0:40:16	Site:
• <u>Status</u>	Temperature: 39°C System	time: 1-Jan-2010 0:40:17
• System log	Company:	
Dur ETurne OF	Country:	
ProfiTrace OE: • Live list	System log	
Statistics	Descending Pages: 1	
<u>Statistics</u> <u>Channel list</u>		
	# Date & Time	Message
Message recording	4 1-Jan-2010 0:01:16	Module added in slot 2: 1 Channel PA-coupler 500mA Type 1 (sn:000761)
<u>Network event log</u>	3 1-Jan-2010 0:00:16	Module added in slot 1: 1 Channel RS485 Repeater Type 1 (sn:001958)
<u>Event config</u>	2 1-Jan-2010 0:00:14	System startup (00)
• <u>Tag-name config</u>	1 12-Sep-2014 8:32:52	System startup (00)
Profibus Modules:		
Oscilloscope images	Download Clear Last update	: 1-Jan-2010 0:40:17 (4 lines, 20 lines per page)
Oscilloscope errors		
• Bargraph images		
PA measurements		
Oscilloscope config		
Configuration:		
<u>General config</u>		
<u>Network config</u>		
• <u>IP confiq</u>		
Password config		
• E-mail account config		
Device management		
Output control config		
• <u>User message</u>		
Not logged in.		
Login		
Figure 2-4 "S	System log" pag	е

The "System log" page will update when the page is being viewed. If power is removed from the FB-HS..., the system log is saved. The system log is not editable.

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A SecureDigital  $\ensuremath{^{(\! B)}}$  (SD) card must be installed in the SD card slot for the system log to function.

Click the "Download" button to save the system log as a .txt file on the SecureDigital  $^{\textcircled{B}}$  (SD) card.

The system log will continue to save events until it runs out of memory, which is approximately 1000 events. At that point, the oldest events are overwritten. The system log can also be cleared. Click the "Clear" button to delete all currently saved events.

# 3 Configuration

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## 3.1 General configuration

The basic settings are customized on the "General configuration" page. For optimal use of ProfiTrace OE, it is important that the time is synchronized and the site info is sufficiently filled in. If the system is connected to the Internet or a local NTP server, use the NTP server synchronization for automatic date and time update. If the system clock differs more than ten seconds from the NTP clock, a line is added to the system log.

The automatic time update occurs when the set interval has passed. The maximum interval that can be set is 1440 minutes, which corresponds to 24 hours.

Note that there is no option for Daylight Saving Time (DST) as this is typically not used in factory automation. When an NTP server is used, the time is always assumed to be standard time.

TPHŒNIX	IP address: 192.168.1.2	54 MAC address: 9C:B2:06:00	D:0A:36	
CONTACT	System uptime: 0 days,	0:47:03 Site:		
atus	Temperature: 39°C	System time: 1-Jan-2010 0:47:03		
/stem log	Company:			
ofiTrace OF:	Country:			
ve list	General con	figuration		
atistics	Date & time synchroniz	-		
hannel list	Synchronize time:	PC time: 17-Apr-2015 14:37:43	Time: 1-lan-2010 0:47:03	Sync now
essage recording				
etwork event log	Set time manually:	date: 1 - 1 - 2010	time: 0 : 46 : 59	Set now
vent config	Use NTP Server:	Interval (min): 60	Server: 0.europe.pool.ntp.org	
ag-name config				
ofibus Modules:	Date & time settings			
scilloscope images	Time zone:		GMT +0	•
scilloscope errors	Time display format:		24H	•
argraph images				
A measurements	Site info			
scilloscope config	Company:			
nfiguration:				
eneral config	Country:			
etwork config	Site name:			
config	Device name:			
assword config	Contact:			
mail account config				
evice management	Display			
utput control config	Automatic refresh:			
ser message	Update interval (seconds):		1	
logged in.	Website start page:		Main status	•
gin	Website preferred network		1 (Network 1)	<b>T</b>
	website preferred network	a	T (Network T)	
	Language			
	Preferred language:		English	Info

Figure 3-1 "General configuration" page

Set the "Update interval (seconds)" field to match the bandwidth of the network. The default is 1 second. If the bandwidth is limited, it is recommended to increase this time or uncheck the "Automatic refresh" box.

Click the "Website start page" drop-down menu to select the initial page displayed when browsing to the Head Station IP address. The options are:

Main Status

- System Log
- Live List
- Statistics
- Channel list
- Message Recording
- Network Event log

Click the "Website preferred network" drop-down menu to select the initial network viewed when first opening the web browser.

The interface language can be changed in the "Preferred language" drop-down menu.

#### 3.2 Network

The "Network configuration" page configures the network names and the assignment of the repeater. For optimal use of ProfiTrace OE, it is important that correct and understandable network names are defined. The network names are used in multiple components: ProfiTrace Live List, event e-mails, message recording, etc.

Each of the four available Live Lists (using the FB-HSC module) can be individually set up to a different time-out. The default is five seconds. The time indicates how long a slave is displayed as green when communication to the master is lost. After the time expires it the device LED will turn yellow if it has no communication anymore.

The network assignment of the repeater modules is also displayed and can be adjusted if software settings are enabled. It is possible to assign a module to Network 1 to 4, or to disconnect it from the backplanes. This makes it possible to create a multiplexed system, or temporarily remove certain slaves from the PROFIBUS network.

DIP switch settings are always primary to software settings.

PHENIX	IP ac	ddress: 192.168.1.25	54 1	AC address: 9C:B	2:06:00:0A	:36					
CONTACT	Syst	em uptime: 0 days, 0	):48:11	Site:							
tatus	Tem	perature: 39°C	System tim	e: 1-Jan-2010 0:	48:12						
ystem log	Com	ipany:				]					
	Cour	ntry:									
ofiTrace OE:	No	twork cor	figura	tion							
<u>ve list</u>			ingura						_		
atistics	Nets	work #		Name					Live	list timeout (s	ec)
iannel list	Netw	ork name 1:		Network 1					5		
essage recording	Netw	ork name 2:		Network 2					5		
etwork event log	Natu	(ork name 3:		Network 3					5		
vent config											
ag-name config	Netw	rork name 4:		Network 4					5		
ofibus Modules:											
cilloscope images	Slot	Module			Channel	Set by		etwork: t/Sw-Sett	ing	Options Current/Sw-	
cilloscope errors									_		
irgraph images	1	1 Channel RS485 Re	peater Type 1		Ch 1	Dipswitch	1	/ 1	۲	Redundancy:	Off/ L
Ameasurements	2	1 Channel PA-couple	r 500mA Type	1	Ch 1	Dipswitch	1	/ 1	•	Link:	On/
scilloscope config	~	A STRUCTURE COMPLEX		•		orportion	-	- A.	-	Link!	010 0
nfiguration:	3	Empty									
eneral config	4	Empty									
twork config	5	Empty									
config	6	Empty									
	7	Empty									
ssword config	8	Empty									
mail account config	9	Empty									
vice management	10	Empty									
tput control config											
	Sav	e Save & Apply no	ow								
er message											



## 3.3 IP address

The "IP configuration" page configures the IP address and network configuration for the Ethernet network.

HŒNIX	IP address: 192.168.1.254 MA	C address: 9C:B2:06:00:0A:36	
ONTACT	System uptime: 0 days, 0:03:50	Site:	
	Temperature: 26°C System time	8-Jan-2010 2:06:44	
q	Company:		
e OE:	Country:		
e or.	<b>IP</b> configuration		
	IP addresses	Set value	Current value
ist	Enable DHCP:		DHCP not active
recording	IP address:	192,168,1,254	192,168,1,254
event log	Netmask:	255,255,255,0	255.255.255.0
ifiq			
e config	Default gateway:	192.168.1.1	192.168.1.1
Modules:	DNS server:	208.67.222.222	208.67.222.222
pe images			
pe errors	Link		
images	Notification link:		
ements	*		
pe config	*) Please provide a hyperlink (starting with	http://) which directly leads to this website. It wil	I be sent along with notifications to the u
	such as E-mails, and allows easy access to t	his device.	
ation:			
	Sava		
nfig	Save		
nfiq	Save		
nfiq onfiq	Save		
onfiq onfiq confiq	Save		
onfiq confiq confiq ount config	Save		
<u>nfiq</u> onfiq unt confiq agement	Save		
ttion: onfig onfig ount config nagement ntrol config age	Save		
nfig onfig config punt config pagement ttrol config	Save		
nfig onfig ount config uagement trol config	Save		

Figure 3-3 "IP configuration" page

In addition to the IP address, the netmask, default gateway, and DNS server may be manually entered.

A hyperlink may be entered to allow easy access to the device from any other device on the network.

#### 3.4 Password



Passwords are not activated by default or when reset, ensuring that all menu options are accessible and configurable.

The FB-HS... supports two password levels:

- Admin password: Provides full access to the web server. This must be set before the user password can be set.
- User password: Limited to read-only information.

Access to	Factory default administrative password only	User-configured administrative password	User-configured user password
Login required for web server access	No	No	Yes
Visit web pages	Yes	Yes	Yes
Clear system log	Yes	Yes	Yes
Restart the device using web server	Yes	Yes	Yes
Output control	Yes	Yes	Yes
Change password	Yes	Yes	No
Adjust any other configuration set- tings	Yes	Yes	No

Table 3-1 Password-based access rights

Passwords must be between one and 16 characters.





Enter the desired password in the "New password" field and then again in the "Re-enter new password" field. Click the "Save" button. If they do not match, you will be prompted to enter them again.

If more than one person has access to the network, configure the Admin password. Follow recommended password best practices:

- Activate the passwords immediately after installation.
- Use different passwords at the administrator and user levels.

- Never share passwords with anyone.
- Always use strong passwords.
- Change passwords immediately if they may have been compromised.
- If a password must be written down, store it in a secure location and destroy it when it is no longer needed.
- Be careful when entering passwords. Some dialog boxes and browsers may offer to remember passwords. This is not recommended as it poses a potential security risk.

#### **External protocols**

For some external protocols, login information may be required. If prompted, you must enter a login name (User or Admin) and password. If no password has been configured, the FB-HS... will accept any password.

#### **Clearing passwords**

There are three ways to restore the system to the default passwords (none):

- On the "Password config" page, delete all characters from both password fields and then click the "Save" button. The Admin login is required.
- Click the "Restore factory defaults" button on the "Device management" page. The Admin login is required.
- Press the factory reset button on the FB-HS... module.

## 3.5 E-mail account

E-mail account information must be entered to receive notice of signal events by e-mail.



The "Event config" page (see "Events" on page 30) must also be configured to send event notifications by e-mail. Simply entering an e-mail address will not result in e-mail notifications.



The SMTP server must support unencrypted connections as the FB-HS... does not support encrypted connections, such as SSL/TLS. The DNS address must be modified according to the DNS addresses of your Internet provider.

PHŒNIX	IP address: 192.168.1.254	MAC address: 9C:B2:06:00:0A:36	
LCONTACT	System uptime: 0 days, 0:55:20	Site:	
Status	Temperature: 40°C Syst	em time: 1-Jan-2010 0:55:21	
System log	Company:		
	Country:		
rofiTrace OE:	E-mail account	configuration	
<u>ive list</u>		comgaration	
<u>Statistics</u>	Account settings		
<u>Channel list</u>	To recipient E-mail address:	*	
lessage recording			
letwork event log	CC recipient E-mail address:	*	
vent config	From E-mail address:		
ag-name config			
ofibus Modules:	E-mail subject:		
Scilloscope images	SMTP-Server address:		
Scilloscope errors	SMTP-Server port:	25	
argraph images	SMTP-Username and password:	•	
A measurements	SMTP-Username:		
scilloscope config	SMTP-Password:		
onfiguration:			
General config	*) Can contain up to 3 E-mail addre	sses, separated by a semicolon (;) or a comma (,).	
letwork config			
P config	Alive e-mail		
assword config	Enable alive e-mail:		
-mail account config	Alive interval (days, hours):		1 0
evice management	Anve muervar (days, nours):		
utput control config	Save Send test E-mail with s	aved settings	
ser message			



Enter the information in the appropriate fields. When finished, click the "Save" button. To verify correct setup, click the "Send test E-mail with saved settings" button.



Always click the "Save" button before sending a test e-mail.

E-mail is not instantaneous. It may take a few minutes before you receive the e-mail. If you do not receive the e-mail, check to ensure that it was not blocked by a spam filter.

#### Alive e-mail

The FB-HS... can send a periodic e-mail to the configured e-mail address to verify that the system is still functioning when no events have been triggered.

The Alive e-mail can be configured to send an e-mail at any interval from one hour to one day.

#### E-mail troubleshooting

- Verify that the FB-HS... has access to the Internet.
- Compare the DNS settings with the requirements of the e-mail server being used.
- Make sure the e-mail server supports unsecured connections.
- Check the e-mail settings and generate a test e-mail. Enter only one e-mail address in the "To" field when troubleshooting.
- If the test e-mail works, verify that the "Event configuration" page is correctly enabled and an event has been triggered.

## 3.6 Device management

The "Device management" page allows a user to manage the location and transfer of the configuration.

← → C □ 192.168.1.254	4		
PHŒNIX	IP address: 192.168.1.254	MAC address: 9C:B2:06:00:0A:36	
L'ICONTACT	System uptime: 0 days, 0:01:41	Site:	
Status	Temperature: 25°C System	time: 1-Jan-2010 0:01:42	
System log	Company:		
	Country:		
ProfiTrace OE: • <u>Live list</u>	Device manageme	ent	
Statistics	Backup or restore settings		
Channel list	Backup settings from internal memory	to SD-card	Backup settings to SD-Card
Message recording	Restore settings from SD-card to inten	nal memory	Restore settings from SD-Card
Network event log			
Event config	Factory defaults		
Tag-name config			
Profibus Modules:	Restore settings to factory defaults:		Restore settings to factory defaults
Oscilloscope images			
Oscilloscope errors	Restart device		
Bargraph images	Restart the device (soft-reset):		Restart the device
PA measurements			
Oscilloscope config			
Configuration:			
General config			
Network config			
IP config			
Password config			
E-mail account config			
Device management			
Output control config			
User message			
Not logged in. Login			

Figure 3-6 "Device management" page

The configuration can be transferred from the internal memory of the FB-HS... to a SecureDigital<sup>®</sup> (SD) card or transferred from the SD card to internal memory. Note that any existing configuration will be overwritten.

Click the "Restore settings to factory defaults" button to reset the FB-HS... to the factory defaults.

Click the "Restart the device" button to perform a soft restart, which does not require the need to physically reapply power.

# 3.7 Output control

NPHŒNIX 🛛 📼	address	:: 192.168.1.254 MAC a	ddress: 9C:B	2:06:00:0A:3	6	
	stem u	ptime: 0 days, 0:09:29	Site:			
Ter	mperat	ure: 32°C System time: 1-	Jan-2010 0:	09:30		
cem log	mpany					
Trace OE:	untry:					
	uto	ut control				
istics	acp			Current		
nnel list	ontrol	Slot/module	I/O Point	state	Action	
						Station lost
sage recording						
work event log	1	Headstation relay 24V/0.254 V	RelC V	• off	Profibus ever V	Network 1 (Network 1)
it comig	1	riedustation relay 24470.237	intere •	• 01	T TOIDUS EVEL 1	Active high pulse
-name config						Pulse hold time (sec): 1
ibus Modules:						
lloscope images	2	None •	None 🔻	Unknown	None •	
illoscope errors	3	None •	None 🔻	Unknown	None 🔻	
graph images	4	None •	None 🔻	Unknown	None 🔻	
neasurements						
lloscope config	5	None •	None 🔻	Unknown	None 🔻	
iguration:	6	None •	None 🔻	Unknown	None 🔻	
-	7	None •	None 🔻	Unknown	None 🔻	
work config	8	None	None 🔻	Unknown	None •	
onfig						
sword config	9	None •	None 🔻	Unknown	None 🔻	
ail account config	10	None •	None 🔻	Unknown	None 🔻	
ce management						
Sa Sa	ave					
message						
ged in.						
iged in.						



The ten outputs are displayed in a table format, with each output having its own settings. Each column/field uses a drop-down menu for configuration of the specified output.

In the output number row, click the "Slot/module" drop-down arrow to select the desired head station module. The next column allows selection of the I/O point. The status of the specific I/O point is displayed as either On or Off.

In the "Action" column, select "Profibus event", and then select the criteria required to trigger the event.

# 3.8 User message

A custom user message can be entered and viewed when logged into the FB-HS... "Status" page.

PHENIX	IP address: 192.168.1.254 MAC address: 9C:B2:06:00:0A:36
CONTACT	System uptime: 0 days, 0:14:13 Site:
us	Temperature: 34°C System time: 1-Jan-2010 0:14:14
em log	Company:
Trace OE:	Country:
list	User message
istics	Message from user:
nnel list	
sage recording	
work event log	
nt config	
name config	
bus Modules:	
lloscope images	
lloscope errors	
traph images	
<u>iraph images</u> neasurements	/*
	Characters left: 1000
neasurements lloscope config	Characters left: 1000 *) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements	
neasurements Iloscope config iguration:	
neasurements Iloscope config iguration: eral config	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Illoscope config iguration: eral config work config	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Illoscope config iguration: eral config work config enfig	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Iloscope config iguration: eral config work config anfig aword config	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Illoscope config iguration: eral.config work.config anfig word.config ail.account.config	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Illoscope config iguration: eral.config anfig work.config ail.account.config ail.account.config ce.management	*) This message will be displayed on the status page, and it is also sent with E-mails.
neasurements Illoscope config iguration: eral config anfig anfig anfig word config ail account config ail account config tee management uut control config	*) This message will be displayed on the status page, and it is also sent with E-mails.

Figure 3-8 "User message" page

FB-HS...

# 4 ProfiTrace OE

ProfiTrace OE is a web-based version of ProfiTrace 2 embedded within the FB-HS.... It offers the basic functionality of regular ProfiTrace 2, including; Live list, statistics, and message recording.

# 4.1 Live list

The "Live list" page displays a matrix that continuously lists all the available devices. A color code provides a quick, visible status of each device's condition. The color codes are:

- Green: Device is in data exchange
- Yellow: Device is lost
- Red: Parameter fault
- Purple: Configuration fault
- No color: On the bus but not in data exchange

The "Live list" page can generate the product name of a device when a diagnostic message is captured (synchronized with the GSD library).



GSD files describes the capabilities of a device, and is shipped with each device. They can also be downloaded from the <u>www.profibus.com</u> website or from the device manufacturer's website.

The "Display Legend" dialog box appears explaining the meaning of the colors in more detail.

PHENIX		ess: 192.1			Caddress: 90	:B2:06:00:0A	:30				
			days, 0:06:4		Site:						
<u>Status</u>		rature: 29º	C Sy	stem time:	1-Jan-2010	0:06:45					
System log	Compa										
rofiTrace OE:	Country	/:									
Live list	Live	list									
Statistics		Netv	vork 1		Netwo	rk 2	Net	twork 3		Network	< 4
Channel list	Raudes	te: 1.5 Mb		1 -					-		
Message recording		y legend	Model Na	]	Rese	t Live list					
Network event log	Displa	0	1	2	3	4	5	6	7	8	9
Event config	0	0	1	2	3		E+H ITEMP	6	7	8	9
Tag-name config			-		-	TMT84	TMT84				
rofibus Modules:	10	10	11	12	13	14	15	16	17	18	19
Oscilloscope images	20	20	21	- 22	23	24	25	26	27	- 28	29
Oscilloscope errors	30	30	31	32	33	34	35	36	37	38	39
Bargraph images	40	40	41	42	43	44	45	46	47	48	49
PA measurements	50	50	51	52	53	54	55	56	57	58	59
Oscilloscope config					-						
onfiguration:	60	60	61	62	63	64	65	66	67	68	69
General config	70	70	71	72	73	74	75	76	77	78	79
Network config	80	80	81	82	83	84	85	86	87	88	89
IP config	90	90	91	92	93	94	95	96	97	98	99
Password config	100	100	101	102	103	104	105	106	107	108	109
E-mail account config				-							
Device management	110	110	111	112	113	114	115	116	117	118	119
Output control config	120	120	121	122	123	124	125	126			
User message											

Figure 4-1 "Live list" page

#### 4.1.1 GSD library

The GSD library provides information about each device. It is provided by a device manufacturer and is available from the vendor's website.

#### Updating the GSD file library

As devices are developed and updated, the GSD file library may require updates for new devices. To update the GSD file library in the FB-HS... :



The transfer of GSD files to the FB-HS... is accomplished through the use of the SD card slot. Any PC used to download a GSD file must have the ability to read/write an SD card.

Transfer any new GSD files by copying them onto an SD card and inserting the SD card into the FB-HS... head station. When the head station is rebooted, the new GSD files will be recognized and replace any existing files.

#### 4.2 Statistics

The "Statistics" page displays various data from the device that can be used to analyze the condition of a device. This page is typically used by a maintenance technician to look at things such as the number of retries, communication drops, diagnostic messages, etc.

<b>ATPHOENIX</b>	IP addr	ess: 192.1	68.1.254	MAC	address: 9C:	B2:06:00:0A	:30				
<b>D</b> PHŒNIX CONTACT	System	uptime: 0	days, 0:07:3	4	Site:						
itatus	Temper	ature: 30°	C Sy	stem time: 1	-Jan-2010 0	:07:35					
ivstem log	Compar	ny:									
	Country	n -									
ofiTrace OE: .ive.list	Stat	istic	s								
itatistics		Netv	vork 1		Networ	'k 2	Ne	twork 3		Netwo	'k 4
hannel list	Baudrat	e: 1.5 Mb	DS.	, "							
lessage recording	Syncs			u et this statis	No. Depet	all statistics					
letwork event log		7 h a	r of messages				in the next in	un nunda			
vent config	Synca.								-	-	
ag-name config		0	1	2	3	4	5	6	7	8	9
ofibus Modules:	0			90151	90151	2524	2524				
scilloscope images	10										
Scilloscope errors	20										
argraph images	30										-
A measurements	40										
scilloscope config											
onfiguration:	50										
General config	60										
letwork config	70										
P config	80										
assword config	90										
-mail account config											
Device management	100										
utput control config	110										
lser message	120										
			1			1					1

Figure 4-2 "Statistics" page

The "Statistics" page provides a quick view into the data without the need for a detailed examination of messages or difficult operations to ensure the quality of the installation.

# 4.3 Channel list

The "Device channel list" page provides a graphical view of all stations in the network. Similar to a logical topology scan, the page also shows the network connected to each station.



Figure 4-3

"Device channel list" page

## 4.4 Message recording

Messages can be triggered based on status changes and any diagnostic data that exceeds the user-set limits.

Because the FB-HS... is intended for permanent monitoring applications, it automatically starts recording a message when an event is detected. The following event automatically starts a message recording again.

When the unit is first purchased or reset to the defaults, it automatically triggers the "Lost" statistic. The user can change the settings during operation.

PHENIX	IP address: 192.168.1.2	4 MAC addres	s: 9C:B2:06	:00:0A:36			
	System uptime: 0 days, 1	:01:13	Site:				
tatus	Temperature: 40°C	System time: 1-Jan-2	010 1:01:1	3			
vstem log	Company:						
(TT 0.7	Country:						
ofiTrace OE:	Message rec	ordina					
<u>ve list</u>							
atistics	Network 1	Ne	etwork 2		Network 3		Network 4
<u>nannel list</u>	Trigger settings *						
essage recording	Lost:			tot disc	(RS & RR):		
etwork event log							
<u>ent config</u>	Syncs:			Ext. diag:			
ig-name config	Repeats:			* Diag whil	e in Dx:		
ofibus Modules:	Illegals:						
scilloscope images	Message count before trigg	er:	4000	Message	count after trigge	571	4000
scilloscope errors							
argraph images	*) To modify these values, **) At least 2 messages be				to apply the ne	w values.	
A measurements	/ Acrease 2 messages be	ore the trigger are require	a for this trig	ger type.			
scilloscope config							
	Capture status						
ofiguration					e recording	Auto re-trigger	
nfiguration:	Start capturing:		[	start messag	o root only		
eneral config	Start capturing: Stop capturing:		]	stop message			
eneral config	Stop capturing:			stop messag	e recording		
eneral config etwork config config					e recording		
eneral config etwork config (config essword config	Stop capturing:			stop messag	e recording		
ineral config itwork config iconfig issword config mail account config	Stop capturing: Capture status: Total files: 0	Message coun	it T	stop messag Waiting for trig	e recording ger	Tile data e **	Delete all
eneral config etwork config config ussword config mail account config evice management	Stop capturing: Capture status:	Message coun (before/after trig	it T	stop messag	e recording	File date & tin	1e Delete all
eneral config etwork config (config essword config	Stop capturing: Capture status: Total files: 0	Message coun (before/after trig	it T	stop messag Waiting for trig	e recording ger	File date & tin	Telete all

The recorded files can be opened with an offline ProfiTrace 2 (no license required).

Figure 4-4

"Message recording" page

The file name is created using the MAC address of the FB-HS..., the network number, and a sequential number between 1 and 999.

i

The automatic triggering can generate 1000 Profitrace (.ptc) files per network. After 1000 files are generated, the next event deletes the oldest file, replacing it with the most recent event. The .ptc files are stored on the SD card.



The .ptc files can be opened with ProfiTrace 2.5.3 and higher.

## 4.5 Network events

The network event log shows all the processor activity of the head station and network and records any status changes. The event log can be viewed using a web browser.

	ddress: 192.168.1.254	MAC address: 9C:B2:06:00:0A:3	6	
NTACT Syst	em uptime: 0 days, 0:11:20	Site:		
Tem	perature: 32°C System	n time: 8-Jan-2010 2:14:14		
Com	pany:			
Cour	itry:			
DE: Ne	twork event lo	na		
		-	Mahurada 0	Natural 4
	Network 1	Network 2	Network 3	Network 4
	cending Pages: <u>1</u>			
erding #	Date & Time	Message		
nt log 3	8-Jan-2010 2:03:06	System startup (00)		
2	1-Jan-2010 0:00:14	System startup (00)		
nfiq	12-Sep-2014 8:32:52	System startup (00)		
dules:				
	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	per page)	
images Dow	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	s per page)	
images Dow	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	s per page)	
images Dow	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	; per page)	
images Dow errors ages	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	s per page)	
images Dow errors ages ments	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow errors neets config	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow errors ages ments config	vnload Clear Last update	e: 6-Jan-2010 2:14:14 (3 lines, 20 lines	: per page)	
images Dow errors ments config on: ig	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	n per page)	
images Dow errors ments config on: ig	nload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow errors ages ments config on: is fig	vnload Clear Lest update	e: 6-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow errors sates config on: ig fig ofig	vnload Clear Last update	e: 6-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow errors ages ages config ag fig ag ant config	mload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i þer þage)	
images Dow errora states config a fig a config a ann: a a b a config a annent a a config a	vnload Clear Last update	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	
images Dow strors ages config config in fig ant config gement	vinload) Clear Lest update	e: 6-Jan-2010 2:14:14 (3 lines, 20 lines	: per page)	
images Dow errora states config a fig a config a ann: a a b a config a annent a a config a	mload Clear Last updat	e: 8-Jan-2010 2:14:14 (3 lines, 20 lines	i per page)	

Figure 4-5 "Network event log" page

#### 4.6 Events

The "Event configuration" page sets the events which are monitored and determines how the event information is distributed, for example, e-mail or log tracking.

IP address: 192.168.1.2	54 MAC address	: 9C:B2:06:00:0A:36	
System uptime: 0 days,	1:02:17	lite:	
Temperature: 40°C	System time: 1-Jan-2	010 1:02:18	
Company:			
Country:			
Event config	guration		
System events		E-mail	Log
Enable:			0
Redundant power changes		Off 🔻 🛛	Off 🔻 🖯
System error:		Off T	Off 🔻 🗆
All to:			
		Off Once Interval	Off Once Interval
S: Notification interval (days	, hours, minutes):	0 2 0	0 2 0
Save			
Network 1 events		E-mail	Log
Enable:		E-mail	Lõg
Station lost:			Off T
Syncs:		Off 🔻 🗎	Off 🔻 🗎
Repeats:		Off 🔻 🗆	Off 🔻 🗆
Illegals:		Off 🔻 🗎	Off 🔻 🗐
fig Internal Diagnostics:		Off 🔻 🗆	Off 🔻 🗆
External Diagnostics:		Off 🔻	Off 🔻 🗉
fig Diagnostics while in DX:		Off 🔻 🗆	Off 🔻 🗆
fig         Diagnostics while in DX:           Master lost:         Master lost:			Off <b>v</b>
Diagnostics while in DX:			
Diagnostics while in DX: Master lost:	n):	• 10	Off 🔻 🗉
Diagnostics while in DX: Master lost: Baudrate change:	n);		
Diagnostics while in DX: Master lost: Baudrate change: Low/High signal (bargraph	n):	Off   Off  Off  Off  Off  Off  Off  Off	
Diagnostics while in DX: Master lost: Baudrate change: Low/high signal (bargraph Redundancy fail:		• 10     • 10     • 10     • 10     • 10	

Figure 4-6

"Event configuration" page

To control the number of events monitored, each event can be individually set to **Off**, **Once**, or **Interval**. When set to **Interval**, the event is recorded once during the specified time. When the time is expired, the next occurrence of that event is recorded.

A check box allows each event to be independently configured to be either sent to an e-mail account or listed in the log file.

The Interval time can be set from one minute to 365 days.

Check boxes allow all events to be selected or deselected.

## 4.7 Tagging devices

To organize the devices in a network, every module and every station in every network can be tagged with a name on the "Tag-name configuration" page.

• • •	1.254	
PHŒNIX	IP address: 192.168.1.254 MAC address: 9C:B2:06:00:0A:36	
CONTACT	System uptime: 0 days, 1:04:07 Site:	
	Temperature: 40°C System time: 1-Jan-2010 1:04:08	
log	Company:	
	Country:	
ace OE:	Tag-name configuration	
	rag-name configuration	
<u>15</u>	Tag names for modules	Values
list		1:
e recording	Fill in the tag names in the edit box on the right.	2: 3:
k event log	Each tag must be in this format: Slot:Name	4:
onfig	The Slot should be a value from 1 to 32.	5: 6:
ne config	The Slot should be a value from 1 to 32. Each Name is limited to 16 characters. Colon (1) and guote (\" or 1) characters are not allowed.	7:
s Modules:		9: 10:
cope images		
cope errors	Save	
<u>h images</u>	dire	
surements		
surements	Livelist tag names for network 1	Values
cope config	Livelist tag names for network 1	0:
ration:	Livelist tag names for network 1 Fill in the tag names in the edit box on the right.	
ration:	Fill in the tag names in the edit box on the right.	0: 1: 2: 3:
iration: Iconfig Iconfig		0:
cope config iration: iconfig k config g	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address:</b> should be a value from to to 126. Each <b>Name</b> in limited to 15 demarters.	0: 1: 2: 3: 4: 5: 6:
cope config iration: iconfig k config g rd config	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address</b> should be a value from 0 to 126.	0:  1: 2: 3: 4: 5: 6: 7: 8:
cope config iconfig k config g d config cccount config	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address:</b> should be a value from to to 126. Each <b>Name</b> in limited to 15 demarters.	0:  1: 2: 3: 4: 5: 6: 7:
cope config iration: iconfig & g rd config iccount config management	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address</b> : should be a value from 0 to 126. Each <b>Address</b> : should be a value from 0 to 126. Colon (:) and quote (\` or ') characters are not allowed.	0:  1: 2: 3: 4: 5: 6: 7: 8:
cope config iration: iconfig 4 rd config ccount config management ccontrol config	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address:</b> should be a value from to to 126. Each <b>Name</b> in limited to 15 demarters.	0:  1: 2: 3: 4: 5: 6: 7: 8:
cope config iration: iconfig & g rd config iccount config management	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address</b> : should be a value from 0 to 126. Each <b>Address</b> : should be a value from 0 to 126. Colon (:) and quote (\` or ') characters are not allowed.	0:         1           2:         3           3:         4           5:         6           7:         8:
cope config iration: iconfig 4 rd config ccount config management ccontrol config	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address</b> : should be a value from 0 to 126. Each <b>Address</b> : should be a value from 0 to 126. Colon (:) and quote (\` or ') characters are not allowed.	0:  1: 2: 3: 4: 5: 6: 7: 8:
cope config iration: iconfig & a rd config iccount config management control config issage	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>Address:Name</b> The <b>Address</b> should be a value from 0 to 126. Each <b>Address</b> inlinited to 15 demarcters. Colon (:) and quote (\" or ") characters are not allowed. Save	0:           1:           2:           3:           4:           5:           6:           7:           8:           9:
cope config iration: iconfig & a rd config iccount config management control config issage	Fill in the tag names in the edit box on the right. Each tag must be in this format: Address.Name The Address should be a vulue from 0 to 126. Each Name is limited to 16 characters. Colon (i) and quote (\" or ') characters are not allowed. Save Livelist tag names for network 2	0:         11           12:         32           3:         34           4:         45           6:         71           8:         9:           Values         0:           1:         1:
cope config iration: .config & a rd config .ccount config management control config .csage	Fill in the tag names in the edit box on the right. Each tag must be in this format: <b>AddressName</b> Tre <b>Address</b> should be a statement to 126. Each Marse a linuid be a statement to 126. Colon (i) and quote ((''or') characters are not allowed. Save <b>Livelist tag names for network 2</b> Fill in the tag names in the edit box on the right.	0:         1:           1:         2:           3:         3:
cope config iration: .config & a rd config .ccount config management control config .csage	Fill in the tag names in the edit box on the right. Each tag must be in this format: Address:Name The Address: should be a value from 0 to 126. Each American initiated to 126. Each American initiated to 126. Colon (r) and quote (V or ) characters are not allowed. Save Livelist tag names for network 2 Fill in the tag names for network 2 Fill in the tag names in the edit box on the right. Each tag must be in this format: Address:Name	0:         1:           1:         2:           3:         4:           5:         6:           6:         6:           6:         0:           9:         9:           Values         0:           1:         2:           3:         4:
cope config iration: .config & a rd config .ccount config management control config .csage	Fill in the tag names in the edit box on the right. Each tag must be in this format: Address:Name The Address should be a value from 10 to 126. Each Tame in limited to 15 demarkers. Colon (:) and quote (" or ") characters are not allowed.  Save  Livelist tag names for network 2  Fill in the tag names in the edit box on the right. Each tag must be in this format: Address:Name The Address should be a value from 10 to 126. Each tag must be in this format: Address:Name The Address should be a value from 10 to 126. Each tag must be in this format: Address:Name The Address should be a value from 10 to 126. Each tag must be in this format: Address:Name The Address should be a value from 10 to 126. Each tag must be inthe formation address the tag	0:         1:           1:         2:           3:         4:           5:         6:           0:         1:           2:         3:           4:         5:
cope config iration: .config & a rd config .ccount config management control config .csage	Fill in the tag names in the edit box on the right. Each tag must be in this format: AddressName Two Address should be a value from 0 to 126. Each Name is limited to 15 baracters. Colon (r) and quote ((" or ") characters are not allowed.  Save Livelist tag names for network 2 Fill in the tag names in the edit box on the right. Each tag must be in this format: AddressName The Address should be a value from 0 to 26.	0:         11           1:         2:           3:         3:           4:         5:           6:         7:           8:         9:           9:         2:           0:         11:           12:         3:           4:         5:

Figure 4-7 "Tag-name configuration" page

The first block of tag names is used to assign tags to the FB-HS... modules. Each tag must have the format **slot:name**, where slot is the slot number. The tag names are limited to 16 characters. The colon (:) and quote (' or ") characters cannot be used.

The second to the fifth block of tag names are used to assign tags to individual stations in each network. The tag names are visible in the "Channel list" page, if hovering over a module or station address. It is also possible to display the tag names on the "Live list" page.

Module tag names are also displayed in drop-down menus to modules and in tables on the following pages:

- Oscilloscope images
- Oscilloscope error images
- Oscilloscope configuration
- Bar graphs
- PA measurements
- Network configuration
- Output control configuration

FB-HS...
# 5 **PROFIBUS modules**

The transparent FB-PA/SC coupler enables seamless high-speed integration to PROFIBUS PA. It powers the attached PROFIBUS PA devices and fully emulates them as PROFIBUS DP devices on the backplane. Adjusted bus parameters are not required and, therefore, suitable for all DCS and PLC systems, even when running on 12 Mbps networks.

The combined internal ProfiTrace and oscilloscope make this product extremely useful for remote maintenance over Ethernet. Jitter, noise, DC current, DC voltage, bar graph, and oscilloscope, it is all there and easy to access. The free CommDTM (available at <u>phoenixcontact.com</u>) allows access for asset management tools over Ethernet.

The FB-DP-RPTR coupler is able to carry nine PROFIBUS PA links and an RS-485 module. It can also be a customized mix of PROFIBUS PA modules with other communication modules. The FB-PA/SC coupler provides 500 mA current on a customizable bus voltage. The integrated PROFIBUS PA termination is automatically activated when the module works as a link or coupler. It is switched off in the monitoring mode.

It does not require configuration and operates the same way as regular PROFIBUS repeaters. In the web server, the behavior of the PROFIBUS PA side can be set, like retries (default 5) and the watchdog (default three seconds). This product can directly replace third-party non-Ex PA coupler/links and can be used as a monitor behind existing third-party non-Ex PA couplers.



The FB-HS..., FB-DP-RPTR, FB-DP-RPTR/SC, and FB-PA/SC modules are not suitable for use in Ex environments unless a barrier is used between the PA module and the Ex zone. An approved external fieldbus power supply must also be used to power a PROFIBUS PA segment in an Ex zone.

## 5.1 Oscilloscope images

The FB-HSB and FB-HSC head stations and FB.../SC modules have an integrated oscilloscope to measure the signal quality of the telegrams. The oscilloscope has an interface with the web server to display the signals from the devices connected to its channel. After opening the web page, all oscilloscope signals are displayed and updated live.

The benefits of the Phoenix Contact devices with a built-in oscilloscope are:

- You do not have to touch the installation.
- Works automatically.
- Oscilloscope data is never mistaken with the wrong segment.
- No probe wiring.
- No spur lines.

← → C 🗋 192.168.1.25	54
TAPHENIX	IP address: 192.168.1.254 MAC address: 9C:B2:06:00:0A:30
LICONTACT	System uptime: 0 days, 0:08:14 Site:
• Status	Temperature: 30°C System time: 1-Jan-2010 0:08:15
• System log	Company:
ProfiTrace OE:	Country:
Live list	Oscilloscope images
• Statistics	Only stations which are active on the selected oscilloscope module will be displayed.
Channel list	Select oscilloscope module: Slot 2 V
Message recording	Select image type: Last
Network event log	
Network event log     Event config	Reset the images: Reset oscilloscope images Total stations: 3 Measurement method: PA Signal level
• Tag-name config	Pages: 1
Profibus Modules:	
Oscilloscope images	<u>────────────────────────────────────</u>
<u>Oscilloscope errors</u>	
• Bargraph images	Address: 4 (slave)
PA measurements	Address: 4 (slave) L E Address: 5 (slave) L E Address: 5 (clove Repeater L E Timestamp: 1-Jan-2010 0:08:08 Timestamp: 1-Jan-2010 0:08:12 Timestamp: 1-Jan-2010 0:08:14
Oscilloscope config	Timestampi 1-Jan-2010 0106106 Timestampi 1-Jan-2010 0106112 Timestampi 1-Jan-2010 0106114
Configuration:	
General config	
• Network config	
• IP config	
Password config	
E-mail account config	
Device management	
Output control config	
• User message	
Not logged in.	
Login	
Figure 5-1 "	'Oscilloscope images" page

Click on the oscilloscope waveform image of a device to display the device's signals in a new page. This opens/creates a new web page.



The FB-HSB and FB-HSC head stations and FB.../SC modules are limited to differential measurements.

### 5.2 Oscilloscope errors

Whenever an illegal message is seen on the PROFIBUS network, and if the message occurred on a module with an integrated scope, an image of the signal error will be displayed. It captures the exact moment of a communication failure when troubleshooting is necessary. This makes it easy to prove out EMC issues and also issues with cabling.

Figure 5-2 "Oscilloscope error images" page

Up to 16 error messages can be stored in the head station memory. If there are more than 16 error images, click the "Refresh error images" button to update the view.

### 5.3 Bar graphs

The "Bargraph images" page illustrates the average signal strength from all available connected devices behind a specific SCOPE repeater. It is a helpful utility to get an impression of the overall signal quality of the network.

The average amplitude should be around 5 V for PROFIBUS DP networks and between 0.25 and 1 V for PROFIBUS PA networks. When there are bus problems, the graph displays different voltage levels and the colors of the bars change. The bar graph feature is also helpful for detecting issues with segment termination.

PHŒNIX IP address: 192.1	68.1.254	MAC address: 9C:	32:06:00:0A:30			
ONTACT System uptime: 0	days, 0:05:20	Site:				
Temperature: 33°	C System ti	ime: 1-Jan-2010 0	:16:50			
Company:						
Country:						
ce OE: Bargrapi	n image					
		Slot 2 V				
-						
list Select sorting type			_	Normal sort orde	er 🔻	
recording Reset the bargraph		Reset bargraph				
	ations: 3	Measuremer	nt method: PA Sig	nal level		
nfia Volts						
e config						
Modules:						
ope images 1.50						
ope errors 1.25-						
himages 1.00						
urements 0.75	0.79 0.78					
ope config 0.50						
ration: 0.25						
config 0.00 4	5 SCOPE					
config	<sup>5</sup> Repeater					
d config						
count config						
anagement						
ontrol config						
ontrol config ssage						
ssage						
2 C C C C C C C C C C C C C C C C C C C						

Figure 5-3 "Bargraph image" page

### 5.4 PA measurements

The PA measurements page shows a static scope image; it is not an actual scope measurement. The blue arrow illustrates the measured value of the amplitude and the jitter. The values are displayed in the corresponding boxes.





#### Amplitude

The amplitude is the difference between the highest and the lowest measured value of the AC signal (the actual data). The displayed result is measured by taking samples from all the bits in a telegram. Not the entire bit is measured, but only a small part to filter out irregularities such as overshoots.

#### Jitter

Jitter is described as "zero-crossing point deviation," which means that the changing of a bit does not occur at the intended time. This is acceptable within the limit of 3200 ns, positive or negative. Causes for high jitter times can be wiring mistakes, EMI, cable cross talk, or device problems.

#### Polarity

This is not the polarity of the bus wiring, but the internal communication signal. In some products it is possible that the polarity is switched. This does not affect the communication.

#### DC noise

The DC noise indicates how much the voltage of the signal varies. If the noise is too high, it can influence the communication; it should not exceed 100 mV.

# 5.5 Oscilloscope configuration

The "Oscilloscope" page allows customizing of the oscilloscope functions.

HŒNIX 💵	ddress: 192.168.1.254	MAC address: 9C:B	2:06:00:0A:30			
	tem uptime: 1 days, 20:31:5	7 Site:				
Tem	perature: 39°C Syst	em time: 2-Jan-2010 20	):43:28			
Con	npany:					
	ntry:					
OE: Os	cilloscope co	nfiguration				
Gen	eral oscilloscope settings					
t Max	imum number of images per p	age:			9	•
	color:				Purple	•
vent log Erro	r images buffer type:				Ring b	uffer 🔻
Ed.	2 11					
config 1 Cl	nannel RS485 SCOPE Repe	ater Type 1				
lodules:	nination min level (mV):				700	-
e images	nination max level (mV):				1300	
Durg	graph OK limit (mV):				2500	
ements						
e config Oth	er SCOPE Repeater setting	s (these settings will b	e saved in the mod	ules themselves)		
- Oth	er SCOPE Repeater setting Module		e saved in the mod Variable	ules themselves) Current value	Lower limit	Upper limit
- Oth				Current value	Lower limit	Upper limit
tion: Slot			Variable Bargraph level	Current value min: 782 mV max: 804 mV		1000
tion: Slot	Module	Ch.	Variable Bargraph level Jitter level	Current value min: 782 mV max: 804 mV 875 nS	200	1000 3200
tion: Slot nfig onfig config 2	t Module	Ch.	Variable Bargraph level	Current value min: 782 mV max: 804 mV		1000
tion: Slot nfig onfig config 2 aunt config	Module	Ch.	Variable Bargraph level Jitter level	Current value min: 782 mV max: 804 mV 875 nS	200	1000 3200
tion: Slot nfig onfig config 2 zunt.config pagement	t Module	Ch.	Variable Bargraph level Jitter level DC voltage	Current value           min: 782 mV           max: 804 mV           875 nS           23498 mV	200	1000 3200 32000
tion: slot anfia anfia confia 2 aut.confia asagement tirol confia	t Module	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100
tion: Slot nfig onfig config 2 zunt.config pagement	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100
tion: Slot nfig anfig config config config aut config assement trol config	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100
tion: Slot nfig config config aunt.config assement troi.config asse	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100
tion: Slot nfig config config aunt.config assement troi.config asse	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100
tion: Slot nfig config config aunt.config assement troi.config asse	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	3200 32000 100
tion: Slot nfig config config aunt.config assement troi.config asse	1 Channel PA-coupler 500m Set to defa	Ch.	Variable Bargraph level Jitter level DC voltage DC noise	Current value           min: 752 mV           max: 804 mV           875 nS           23496 mV           38 mV	200	1000 3200 32000 100

The termination voltage limits can be adjusted, as well as the limits for PA segment alarming.

## 5.6 **ProfiTrace statistics summary**

Table 5-1 contains a description of the items listed in the statistics and events.

 Table 5-1
 Summary of statistics and events monitored by ProfiTrace OE

Statistics	Description	Critical
Lost	How many times a device in data exchange fails to respond after the maximum retries have been reached. Lost is retriggered when the device recovers back to data exchange and fails to re- spond again.	Yes
	- The "Live list" page could indicate a yellow-colored address (after time-out).	
Syncs	Attempts of the master to contact a device for the first time or es- tablish a communication relationship. This occurs in most cases after station lost, device unavailability or startup of the master. In the statistics view, these values add up relatively quick.	Yes, in most cases
	<ul> <li>Some DCS systems read diagnostics all the time with Syncs ON.</li> <li>The "Live list" page could indicate a yellow colored address.</li> </ul>	
Repeats Total	Attempt of the master to get a response from an unanswered telegram. The response did not come or has content errors. The maximum amount of repeats a master attempts can be customized in the master.	Yes
	<ul> <li>When the retries have reached the limit, the master goes to the Syncs state.</li> </ul>	
Repeats Max (worst se- quence)	This value represents the highest amount of retries that were at- tempted on this specific device in one cycle.	Yes
	- This value will never get higher than the retry value that has been set up in the master.	
Illegal Responses	The response to a master request telegram contains framing er- rors (parity error, wrong FCS, SD error, etc.). This mostly hap- pens with EMC and cabling problems.	Yes
	<ul> <li>When this statistic adds up relatively quick, it could also be a double device address.</li> </ul>	
Internal Diag	Negative responses at the lowest telegram level (Layer 2: FDL) are rare. In the telegram recording you will see SD1 telegrams with, for example, an RS (Reject Service) or RR (Reject Resources).	No
	Examples of situations where this occurs:	
	<ul> <li>DP-V1 connections to DP-V0 devices.</li> </ul>	
	<ul> <li>Watchdog has run out on a DP device and the master sends a Data Exchange output telegram.</li> </ul>	
	<ul> <li>Non-certified DP devices that do not support a specific service/command or cannot handle a command in time.</li> </ul>	
External Diag	All responses from Get Diagnostics requests from all masters.	No

#### FB-HS...

Statistics	Description	Critical		
Diag while in DX	Only responses to Get Diagnostics requests from the master that controls this slave (primary class 1 master).	Yes, in most cases		
	<ul> <li>When the first two bytes of the diagnostic content contain 08 0C or 08 04, a red indicator blinks in the left corner of the device on the "Live list" page (critical content).</li> </ul>			
Master lost	One of the masters is not active after getting the token; it is not responding anymore. Note that this also happens when a Class 2 DP-V1 master is disabled.	Yes, in most cases		
Baud rate change	The detected baud rate of the PROFIBUS network has been changed.	Yes (in most cases)		
Low/High signal (Bar graph)	The amplitude of at least one station is too low (in PROFIBUS DP and PA networks) or too high (in PROFIBUS PA networks only).	Yes		
Redundancy Failure	One of the redundant cables has failed.	No		
PA signal and levels	PROFIBUS PA values, such as jitter, DC voltage, or DC noise out of range.	Yes		

#### Table 5-1 Summary of statistics and events monitored by ProfiTrace OE

## 6 CommDTM

The FB-HS... head station provides a fully functional gateway between any Windows platform and field devices via a CommDTM. This enables the FB-HS... head station and attached modules to function as a real asset management tool. Currently, FDT 1.2 frame applications are supported, such as PACTware and E+H FieldCare. During interaction with the CommDTM, all FB-HS... head station functions can be used simultaneously (web-based monitoring, oscilloscope, OPC, and alarms via e-mail).

## 6.1 Setting up the PCD server

- 1. Download the PCD server application (available at <u>PhoenixContact.com</u>). Unzip the file or navigate to and double-click the file to start the executable.
- 2. Right-click the "PCD" icon in the notification area and click the "Show" option.

PCD Server V1.1.1 (c) 2014 Phoenix	Contact	23
Interfaces		
Interfaces:		
Location 1	Add	
	Remove	
	Modify	
	Setup	
	Hide Shut Down	

Figure 6-1 "PCD/Interfaces" page

- 3. Click the "Modify" button to open the "Interface Settings" dialog box.
  - Type a name for the device in the "Interface Name" field.Click the "Driver" drop-down menu and select a driver.



It is recommended that the most recent driver be selected.

- The "Serial Nr." field can remain empty. Click the "OK" button to close the dialog box.

IP Nr./DNS name	192. 168. 254. 101 Procentec discovery	tool
Port	38890 < Default (38890)	
Remote settings		
Network Nr.	Network 1 👻	
Master timeout (sec)	240	
	Use Password	
Username	User v	
Password		



"Ethernet Connection Configurator" dialog box

- 4. Click the "Setup" button to open the "Ethernet Connection Configurator" dialog box.
  - Enter the IP address of the FB-HS... module in the "IP Nr./DNS name" field.
  - Enter the port number in the "Port" field.
  - Click the "Network Nr." drop-down menu and click the name of the desired network.
    - Populate the "Username" and "Password" fields, if your network requires it.
  - Click the "OK" button to close the dialog box

## 6.2 Creating a project using FdtCONTAINER

#### Adding devices

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Start the FDT manager and create or load a project. The vendor-independent application FdtCONTAINER (available at <a href="http://mm-software.com/en/oem-fdtcontainer-application">http://mm-software.com/en/oem-fdtcontainer-application</a>) is used in the example below. Refer to the manual of your FDT manager for details.

PROJECT DEVICE	TOPOLOGY VIEW		GROUP AN			[Un	named] - fdtCONTAINER app	lication		? _ 5 Administrator
6 Cut La Add B Copy X Remove	Connect Disconnect		Load from Device	Store to Device	Set Offline Parameter	Configuration Coserve Compare * Dev	<ul> <li>Diagnosis</li> <li>Channel Functions</li> <li>Additional Functions - ice Functions</li> </ul>	<ul> <li>Update Catalogue</li> <li>Filter on Allowed</li> <li>DTM Info</li> <li>Device Catalogue</li> </ul>		
twork View	≁ ₫ ×		Device Cata	logue ×	General Node Info					
Device Summary		0	Category							
[Unnamed] Network		T	Add	Name			Vendor		FDT Version	Protocol(s)
Ivetwork		F	▲ Categ	ory: Comm	unication					
		-	0	YFGW	710		YOKOGAWA		1.2.0.0	ISA100
			•	YFGW			YOKOGAWA		1.2.0.0	ISA100
			0	🛤 FF H1	Communication DTM		CodeWrights GmbH		1.2.0.0	Fieldbus FF H1
			0	# RAD-V	WHG/WLAN-XD		Phoenix Contact GmbH & C	o. KG	1.2.0.0	HART_Wireless
			•	PROFI	dtm DPV1		Softing Industrial Automatic	n GmbH	1.2.0.0	Profibus DPV1
			0	E IPC (Le	evel, Pressure) FXA193/291		Endress+Hauser		1.2.0.0	IPC
			0	🧕 Phoen	ix Contact DP-V1 Master		Phoenix Contact		1.2.0.0	Profibus DPV1
			•	BRAIN	Communication		YOKOGAWA		1.2.0.0	BRAIN
			•	HART	Communication		CodeWrights GmbH		1.2.0.0	HART
			•	isNet (	Cube		ifak system		1.2.1.0	isNet Cube,isNet Pro (1 channel),isNet Pro (2 channels),isNet
			0	👂 isNet I	Lite		ifak system		1.2.1.0	isNet Cube,isNet Pro (1 channel),isNet Pro (2 channels),isNet
			•	HART	OPC Client		Endress+Hauser, Metso Aut	omation	1.2.0.0	HART

Figure 6-3 "CommDTM/Device" dialog box

- 1. Click the "Device" tab.
- 2. Click the "Add..." button. Select Phoenix Contact DP-V1 Master in the device list.

Bin Convert Los for Bin Convert Divide Catalogue	PROJECT DEVICE	TOPOLOGY VIEW			[Unnan	ned] (*) - fdtCONTAINER aj	oplication		? _ & × Administrator 🍰 😞
Peter & Summary     Peter & Summar	E Copy X Remove	<b>F4</b> 41-	Load from Store to Device Device		Dbserve	Channel Functions	<ul> <li>Filter on Allowed</li> <li>DTM Info</li> </ul>		
V       V	Network View	* # ×	Device Catalogue G	eneral Node Info Phoe	nix Contact DP-V Conf	īguration ×			
Phoenix Contact DP-VI Mase       Board Name:       Location 1       Slot Time:       000         Baad Bate:       1.5 Hopp:       Min. Station Delay:       11       If Use Standard Bas Parameters         Highert Station Address:       0       Max. Station Delay:       150       Autodate: Base Parameters         Highert Station Address:       125       Seature:       1       Stati         Max. Retry Linit:       1       Quiet Time:       0         Scan Range       Scan Range End:       125          Son Range Begin:       0       Scan Range End:       125          Detakt       0       Detakt       0       Acc/v       Hob	т	*	Communication Phoenix Cont	on					
Station Address:       0       Max. Station Delay:       150       Autodetect Bus Parameters         Highest Station Address:       126       Station       Static       3500         Max. Retry Limit:       1       Quet Time:       0       3500         Target. Rotation Time:       20000       Gap Update Factor:       10         Scan Range Bright:       0       Scan Range End:       126          Default:       0       Scan Range End:       126	and the second s			Location 1	Slot Tim	e: 300	<u>.</u>		
Heylest Station Address:       125 *       Setup Time:       1       Start         Max. Retry Limit:       1       Quiet Time:       0       Stop         Target Rotation Time:       30000       Gap Update Factor:       10         Soan Range       5an Range End:       125 *         Soan Range Begin:       0       *       Stan Range End:       125 *         Default       0       *       Stan Range End:       125 *			Baud Rate:	1.5 Mbps 💌	Min. Station Dela	y: 11	Use Standard Bus Parameters		
Highert Station Address:       125       Scho Time:       1         Max. Rety Limit:       1       Quiet Time:       0         Scan Range       5can Range End:       10         Scan Range Begin:       0       Scan Range End:       125         Default       0       Scan Range End:       125         V       V       OK       Cancel       Apply			Station Address:	0 💌	Max. Station Dela	y: 150	Autodetect Bus Parameters		
Max. Rety Linit:       1       Quet Time:       0         Target Rotation Time:       20000       Gap Lpdate Factor:       10         Scan Range       Scan Range Engin:       0       Scan Range Engin:       126         Scan Range Engin:       0       Scan Range Engin:       0       Scan Range Engin:       0         Default:			Highest Station Address:	126	Setup Tim	e: 1			
Scan Range Begin: 0 Scan Range End: 125 Default: OK Cancel Acct/ Hebr			Max. Retry Limit:	1	Quiet Tim	e: 0	Stop		
Son Range Begin:       0       Son Range End:       125         Default       OK       Cancel       Accl/       Help         Ø       Ø Obsennected       O Data set       Obsect       Obsect			Target Rotation Time:	20000	Gap Update Facto	w: 10			
Defaults         OK         Cancel         Apoly         Help           Ø         Ø         OK         Data set         Image: Cancel         Image: Cancel         Help			Scan Range						
Image: Constructed in the set			Scan Range Begin:	0 💌	Scan Range En	d: 126	-		
Image: Construction of the set									
				0 -				OK Cancel	Apply Help
	Error Log FDT Monitor	00	Disconnected	🔰 Data set					

3. Click the "OK" button, and then double-click **Phoenix Contact DP-V1 Master** to open the "Bus Parameter" page.

Figure 6-4 FdtCONTAINER "Parameters" dialog box

- 4. In the "Device Summary" list, right-click the Phoenix Contact DP-V1 master and click "Parameters" from the context menu.
- 5. Enter the correct parameters or select the "Start" button to initiate the "Autodetect Bus Parameters" process.
- 6. Click the "OK" button.

The FB-HS... is now set up as a DP-V1 master. To activate the connection to field devices, right-click the Phoenix Contact DP-V1 master, and click the "Connect" option.

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5°	Import / Export	•										
	Expand All	Defaults							ок	Cancel	Apply	Help
Error Log FDT Monitor	Collapse All General Node Info	sconnected	🚺 Data set	Ţ								

Figure 6-5 Connecting to devices

A communication session is now active between the software to the device connected on the network.

#### **Network scan**

Once communication is established with the FB-HS... head station, the network will now be able to scan for all the connected field devices on the network. To initiate the scan, rightclick the Phoenix Contact DP-V1 master and click the "Scan/Create" option. The head station will scan the entire PROFIBUS network for active PROFIBUS DP and PROFIBUS PA devices.

PROJECT DEVI	ICE	TOPOLOGY VIEW	NETWORK VIEW GROUP AND FILTER			[Unnar	ed] (*) - fdtCONTAINER a	pplication				? _ 🗗 × Administrator 🏜 a
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			Bus Parameter									
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		Remove Rename	Baud Rate:	1.5 Mbps	•	Min. Station Dela	n 11	Use Standard Bus Parame	ters			
	90 IO	Connect Disconnect	Station Address:	0	•	Max. Station Dela	y: 150	- Autodetect Bus Parameters				
	0) 0)	Load from Device Store to Device	est Station Address:	126	¥.	Setup Tim	e: 1	Start				
	四回	Set Offline Parameter Set Online Parameter	Max. Retry Limit:	1		Quiet Tim		Stop				
		Compare Configuration	arget Rotation Time:	20000		Gap Update Facto	r: 10					
	8	Observe Diagnosis	Scan Range Begin:	0	•	Scan Range En	d: 126	-				
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1	0	General Node Info	onnected	Data set								

Figure 6-6

Network scan

FB-HS...

# A Technical appendix

#### A 1 Bus parameters

Some adjustments to the bus parameters in the PLC or DCS need to be made. Follow the table below for your master project:

Baud rate	Tslot (only DX)	Max TSDR (only DX)	Tslot (with DP-V1)	Max TSDR (with DP-V1)
9.6 - 19.2 kbps	330	145	1500	150
45.45 kbps	640	480	640	480
93.75 kbps	2500	1000	2500	1000
187.5 kbps	3200	1500	14000	1400
500 kbps	8500	4000	38000	3700
1.5 Mbps	25500	11500	110000	11000

Table A-1 Bus parameters for PROFIBUS/PA (in bit times)

These are worst-case values. It is recommended to examine the timing of your installation and decrease the bus parameters to a suitable value for your network.

In small applications it is required to set a value for the Tset parameter. Usually a value of 95 is sufficient.

Because of the longer Slot Time and MaxTSDR, it is also recommended to set the Watchdog to at least 2 seconds. This is normal in PA networks.

In coupler mode, the module has no bus address on either side. When configuring the PA network there is no restriction in the use of addresses for field devices, although most configuration tools do not allow addresses 0, 1, and 2.

### A 2 Current consumption calculations

The FB-PA/SC module provides a maximum of 500 mA to the PROFIBUS/PA trunk. The total current consumption of all slaves on this trunk cannot exceed 500 mA. The PROFIBUS/PA module consumes 10 mA. At least one FDE (Fault Disconnection Electronics, stated in the manual of the PA device) should also be calculated. The calculation for the current consumption is as follows:

$$\mathbf{I}_{\mathsf{SEG}} = \mathbf{I}_{\mathsf{B0}} + \mathbf{I}_{\mathsf{B1}} + \ldots + \mathbf{I}_{\mathsf{BN}} + \mathbf{I}_{\mathsf{FDE}}$$

where

ISEG = Total current in a segment

I<sub>BN</sub> = Basic current of devices

I<sub>FDE</sub> = Current of the Fault Disconnection Electronics

### A 3 Voltage at the end of the segment

The resistance of the cable causes a lower voltage at the end of the cable. At least 9 V should be available for the last device at the end of the cable. The following calculation is a worst-case scenario where all devices are connected at the end of the cable:

$$U_{B} = U_{S} - (I_{SEG} \times R_{CABLE} \times L_{SEG})$$

where

 $U_B$  = Bus voltage at the last device (V)

 $U_S$  = Voltage of the segment coupler (V)

I<sub>SEG</sub> = Total current in a segment (A)

 $R_{CABLE}$  = Resistance per unit length of the cable ( $\Omega$ /km)

L<sub>SEG</sub> = Length of all cables in the segment, including stubs (km)

U<sub>B</sub> > minimal specified operating voltage of the last device

### A 4 Directories and files

The following directories are standardized for the FB-HS... modules and are, in most cases, located on the SD card:

Table A-2	SD card directory
-----------	-------------------

Directories	Description
/Busmon	ProfiTrace message-recoding files
/Log	Log files
/Doc	Contains the web server download page

Table A-3 File extensions

Files and extensions	Description
Journal.dat	System file (Do not delete or remove)
gsd.bin	File with GSD information for the Live list
settings.ini	Head station settings (IP address, name, location, etc.)
.ptc	ProfiTrace OE message-recoding files located in the "Busmon" directory
.pkg	Firmware files
.CSV	Log files located in the "Log" directory

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