

# Device Management

## PROFIBUS POWER Hub

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# **Device Management**

**PROFIBUS POWER Hub**

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# Table of Contents

## About This User Manual

User Manual Conventions .....	7
Warning, Caution, Information, and Tip Icons .....	8
Terminology.....	8
Related Documentation .....	12

## - Safety Summary

## Section 1 - Introduction

Area of Application .....	15
Feature Overview.....	16

## Section 2 - Installation, Configuration, Commissioning

Installation .....	19
General consideration.....	19
Configuration and Commissioning.....	23
General Consideration.....	23
System 800xA with PROFIBUS Default DTM .....	23
AC 870P / Melody with PROFIBUS Default DTM.....	28
AC 870P / Melody without DTM.....	32
Freelance 800F with PROFIBUS Default DTM .....	32
Replacing LD 800P by PROFIBUS Power Hub .....	35
General consideration.....	35
System 800xA .....	40

AC 870P / Melody .....	41
Freelance 800F.....	42
<b>Section 3 - Configuration and Commissioning of PROFIBUS PA Devices</b>	
PROFIBUS GSD files .....	43
Conversion of PROFIBUS PA GSD files .....	43
Using DTMs for PROFIBUS PA Devices .....	43
<b>Section 4 - Frequently Asked Questions (FAQ)</b>	
Miscellaneous.....	47
<b>Revision History</b>	
Updates in Revision Index C.....	49

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# About This User Manual

This application manual describes how to use the Pepperl + Fuchs Product\_Name with ABB control systems.

Especially, it describes the configuration settings to be applied to the Pepperl+Fuchs Product\_Name as described in [1] when used within ABB control systems.



This document is an extension to [1] and only valid in combination with it. Also, the related ABB control system's documentation needs to be followed.

Please note, that the Product\_Name is a Pepperl + Fuchs product only. Consequently, ABB is not responsible for any problems, that might be caused by using the Product\_Name



For the latest information about using Product\_Name with ABB control systems, please also refer to the corresponding Release Notes [6], [7]. Information in this manual is intended specifically for planning engineers, commissioning engineers, and maintenance personnel. Those using this document should be familiar with the basic method of operation of the PROFIBUS protocol with ABB control systems as described in [2], [3], [4], [5].

## User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

## Warning, Caution, Information, and Tip Icons

This User Manual includes **Warning**, **Caution**, and **Information** where appropriate to point out safety related or other important information. It also includes **Tip** to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:



Electrical warning icon indicates the presence of a hazard that could result in *electrical shock*.



Warning icon indicates the presence of a hazard that could result in *personal injury*.



Caution icon indicates important information or warning related to the concept explain in the text. It might indicate the presence of a hazard that could result in *corruption of software or damage to equipment/property*.



Information icon alerts the reader to pertinent facts and conditions.



Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all **Warning** and **Caution** notices.

## Terminology

The following is a list of terms associated with PROFIBUS PA, ABB control systems and Pepperl+Fuchs' Product\_Name, that you should be familiar with.

The list also contains terms and abbreviations that are unique to ABB or have a usage or definition that is different from standard industry usage.

Term	Description
Advanced Diagnostic Module	Product_Name Module HD2-DM-A, offering extensive analytic and monitoring possibilities for a PROFIBUS fieldbus installation.  Also available as “Mobile Advanced Diagnostic Module DM-AM”, which is a USB powered tool to analyze the Physical Layer parameters of a fieldbus segment.
Asset Monitor	Application providing a comprehensive overview of equipment health via continuous condition monitoring. Identification of maintenance requests and equipment failures with root cause reporting and recommended actions.
Device Type Manager (DTM)	Software component for configuration, diagnosing, forcing and displaying information of a field device. It is familiar with the way the device works and provides device-specific documentation.
Ex i	Type of protection “Intrinsically safe”, applied to electrical apparatus used in a potentially explosive area containing intrinsically safe electric circuits only. An electric circuit is intrinsically safe if no sparks or thermal effects produced under specified test conditions (which include normal operation and specific fault conditions) is not capable of causing ignition of a given explosive atmosphere. Often used e.g. for instrumentation, measurement, control.
Ex d	Type of protection “Flameproof”, applied to electrical apparatus such that equipment is robust can stand an explosion from within, without transmitting the flame to the outside. Often used e.g. for Motors, lighting, junction boxes.

Term	Description
Ex n	Type of protection “Non incendive”, applied to electrical apparatus such that in normal operation and on certain specified abnormal conditions it is not capable of igniting a surrounding explosive atmosphere. Often used e.g. for motors, lighting, junction boxes, electronic equipment.
Ex nA	<p>Non-sparking apparatus with type of protection “Non incendive”.</p> <p>Other electrical equipment for Zone 2:</p> <ul style="list-style-type: none"> <li>• nC = sparking apparatus in which contacts are protected conveniently</li> <li>• nL = energy-limited apparatus</li> <li>• nR = purged/pressurized apparatus</li> <li>• nZ = purged pressurized apparatus</li> </ul>
Field Device Tool (FDT)	Concept describing the interface between a Frame Application and a DTM. Enables devices produced by different manufacturers and different fieldbuses to be integrated in a single system.
Fieldbus Power Conditioner	Product_Name’s PA modules, <u>not</u> galvanically isolated
Fieldbus Power Supply Module	Product_Name’s PA modules, galvanically isolated
Gateway(Module)	<p>Linking module between PROFIBUS DP and PROFIBUS PA for connecting 1 ... 4 independent PROFIBUS PA segments.</p> <p>This kind of module is used by Product_Name as well as by its predecessor LD 800P.</p>
HD2-GTR-4PA	Product_Name’s “Gateway Module”
“Fixed” watchdog mode	Mode of operation of Product_Name, where a separate watchdog is used for the PROFIBUS PA slaves, being independent of the PROFIBUS DP watchdog.

Term	Description
LD 800P	PROFIBUS DP/PA linking device, predecessor of Product_Name.
Product_Name	Pepperl + Fuchs's new PROFIBUS DP/PA linking device, sucessor of the SK2 resp. the LD 800P
RLM01	ABB's RLM01 converts one simple, non-redundant Profibus line into two reciprocally redundant lines A/B. The module works bidirectionally, which means that all three interfaces can receive and transmit data.
SK2	PROFIBUS DP/PA linking device, predecessor of Product_Name
SK3	Name used synonymously for the Pepperl + Fuchs Product_Name.
"Transparent" watchdog mode	Mode of operation of Product_Name, where the PROFIBUS DP watchdog is used for the PROFIBUS PA slaves in a 1:1 fashion.
Zone 0	Zone in which a hazardous, potentially explosive atmosphere comprised of air and inflammable gases, fumes or fog is present permanently, over longer periods of time or frequently. Equal to a Division 1 hazardous location in the United States and Canadian classifications.
Zone 1	Zone in which during normal operation a hazardous, potentially explosive atmosphere comprised of air and inflammable gases, fumes or fog is occasionally present. Equal to a Division 1 hazardous location in the United States and Canadian classifications.
Zone 2	Zone in which a hazardous, potentially explosive atmosphere comprised of air and inflammable gases, fumes or fog is normally not or only present for short periods of time. Equal to a Division 2 hazardous location in the United States and Canadian classifications.

## Related Documentation

*Table 1. Related User Documentation*

<b>No</b>	<b>Title</b>	<b>Document Number</b>
[1]	Pepperl+Fuchs, "MANUAL PROFIBUS POWER HUB", Nov 17th, 2006	tdoct0835c
[2]	ABB, IndustrialIT 800xA - Control and I/O System Version 5.0, PROFIBUS DP, Engineering and Configuration	3BDS009030
[3]	ABB, Industrial IT 800xA, "PROFIBUS DP Topology, Redundancy and Installation"	2PAA101152
[4]	ABB, IndustrialIT 800xA – Control and I/O, "AC 870P / Melody – System data and handling"	2PAA101137
[5]	ABB ControlIT AC 800F, Engineering Reference Manual "Communications and Fieldbuses", Version 7.1	3BDD012515

*Table 2. Related Release Notes / Integration Notes*

<b>No</b>	<b>Title</b>	<b>Document Number</b>
[6]	ABB, System 800xA, Device Integration, "Release Notes, Pepperl + Fuchs HD2-GTR-4PA V1.0-DP"	2PAA103590
[7]	ABB, Freelance / Melody, Device Integration Notes, "Freelance / Melody - Pepperl + Fuchs HD2-GTR-4PA V1.0-DP"	2PAA103617

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## Safety Summary



The company who operates the plant, bears the responsibility regarding planning, mechanical installation, commissioning, operation and maintenance, specially in connection with applications in potentially explosive environments.



Laws and/or regulations governing the use or intended usage goal must be observed.



Protection of operating personnel and the system is not ensured if the device is not used in accordance with its intended purpose.  
The device must be operated by authorized specialist personnel only in accordance with these operating instructions.



# Section 1 Introduction

## Area of Application

The Product\_Name is an interface between the PROFIBUS DP and the PROFIBUS PA.

Combining a PROFIBUS Power Hub with field barriers and segment protectors makes it possible to connect field devices to a control system, which are located in Ex areas. The field barriers and segment protectors can be connected to the non-intrinsically safe outputs (trunks) of the Fieldbus Power Hub.

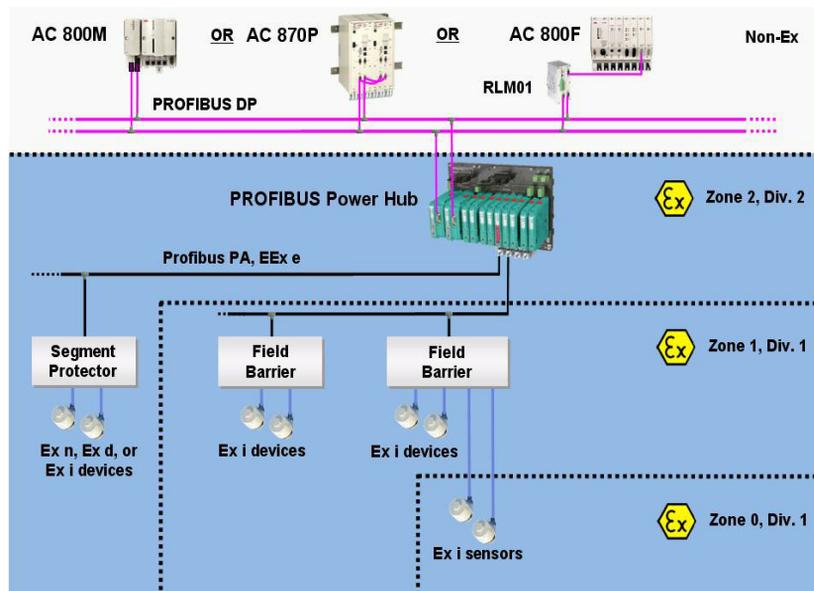


Figure 1. Product\_Name - Area of Application

## Feature Overview

The following table shows the main product features of Product\_Name and provides a comparison towards its predecessor LD 800P.

For further details refer to [1].

Table 3. Feature Overview Product\_Name vs. LD800P

	Feature	Product_Name	LD 800P
<b>Hardware - Design</b>			
	Motherboard based	yes	no
	Reduced wiring	yes	partly
	Exchange of modules during operation	yes	no
	Redundant power supply	yes	no
<b>Gateway Module (PROFIBUS DP)</b>			
	Device redundancy	yes	no
	Media redundancy	yes <sup>(1)</sup>	built-in
	Number of PA channels	4	1,2 or 4
	Device diagnostics via remote access	yes <sup>(2)</sup>	no
	Bus address <sup>(3)</sup>	1 ... 64 for primary gateway, + 64 for backup gateway (automatically)	not applicable
<b>Power Supply Modules (PROFIBUS PA)</b>			
	Device redundancy	yes	no
	Media redundancy	no	no
	Voltage rating per segment configurable	yes <sup>(4)</sup>	no <sup>(5)</sup>
	Advanced diagnostic via remote access	yes <sup>(6)</sup>	no

Table 3. Feature Overview Product\_Name vs. LD800P (Continued)

	Feature	Product_Name	LD 800P
	Galvanically isolated	yes <sup>(7)</sup>	yes
<b>Configuration</b>			
	PROFIBUS watchdog and retry settings	yes <sup>(8)</sup>	no
	PROFIBUS bus address	yes <sup>(9)</sup>	no
	Number of activated PROFIBUS PA segments	yes	no
	Advanced diagnostic module	yes	no
<b>FDT Technology</b>			
	DTM	yes <sup>(10)</sup>	no
<b>Hardware - Installation</b>			
	“Hard” grounding on PROFIBUS DP&PA side via built-in connection terminal	yes <sup>(11)</sup>	no
	Space required between cable channels	medium	low
	Field barriers needed for intrinsically safe areay	yes <sup>(12)</sup>	no <sup>(13)</sup>
<b>Hardware - Operating Conditions</b>			
	Approval for Zone 2	yes (TÜV 04 ATEX 2500 X)	yes (TÜV 02 ATEX 1886 ... 1888 X)
	Ambient temperature	-40 ... 60 °C	-20 ... 60 °C
	Storage temperature	-40 ... 85 °C	-40 ... 85 °C
	Relative humidity	< 95% non-condensing	max. 75 % rel. humidity without moisture condensation

(1) via additional RLM01 or gateway module

- (2) via PROFIBUS diagnosis or DTM, requires a separate bus address
- (3) Required for redundant operation
- (4) Output: 15 ... 30 V, 500 mA, depending on module type
- (5) Only 24 V (non-Ex), 12,8 V (Ex)
- (6) via PROFIBUS diagnosis or DTM, requires a separate bus address
- (7) Power Hub modules "HD2-FBPS-XXXX" only but not conditioner modules "HD2-FBCL-XXXX".
- (8) Adaption of PROFIBUS PA-Watchdog mode (transparent/non-transparent) and retries
- (9) via DIP switch to apply watchdog and retry settings, mandatory for redundant operation.
- (10) optional
- (11) With module types "HD2-FBPX-XXXX" at PA side.
- (12) For details ref. to [1], chap. 6 "Installation in Hazardous Areas".
- (13) In conjunction with LD 800P's module PL890

# Section 2 Installation, Configuration, Commissioning

## Installation

### General consideration

#### Gateway Module - Installation with Device Redundancy

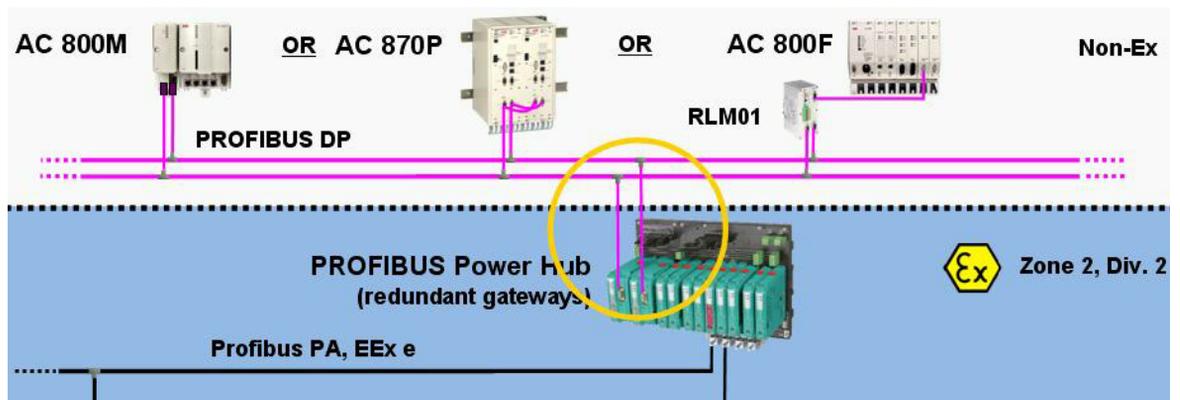


Figure 2. PROFIBUS Power Hub with redundant gateways

With PROFIBUS Power Hub, a device redundant installation can be attached to a line redundant PROFIBUS DP network by connecting each PROFIBUS Power Hub gateway module to the different lines of a line redundant PROFIBUS DP. This requires the assignment of an address to the built-in slaves via DIP switch.

In case of a single PROFIBUS DP, both gateway modules need to be connected to the single PROFIBUS DP line.

### Gateway Module - Installation without Device Redundancy

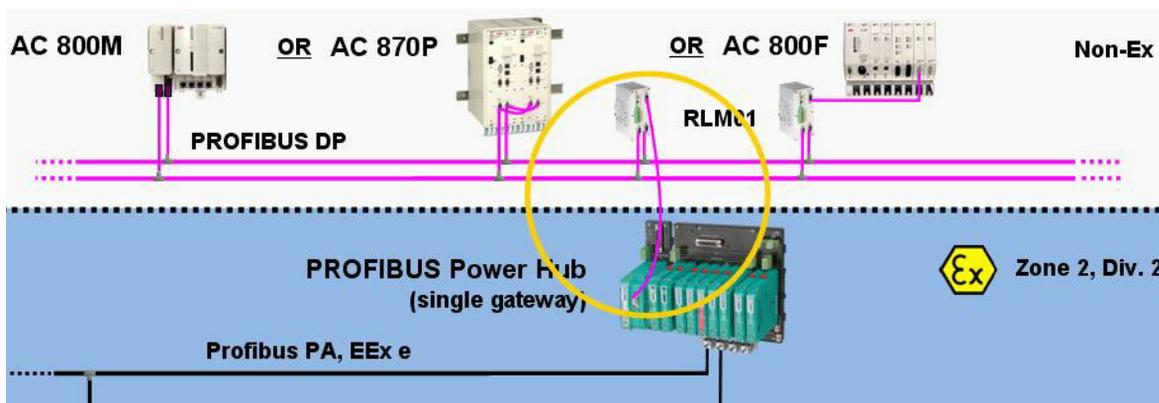


Figure 3. PROFIBUS Power Hub single gateway with line redundant connection

In case the PROFIBUS Power Hub has to operate without assigned PROFIBUS address, a single gateway module can be used only.

To participate from a line redundant PROFIBUS DP network, the gateway module can be connected via a RLM01.

### Power Hub Modules - Installation in Harzardous Areas

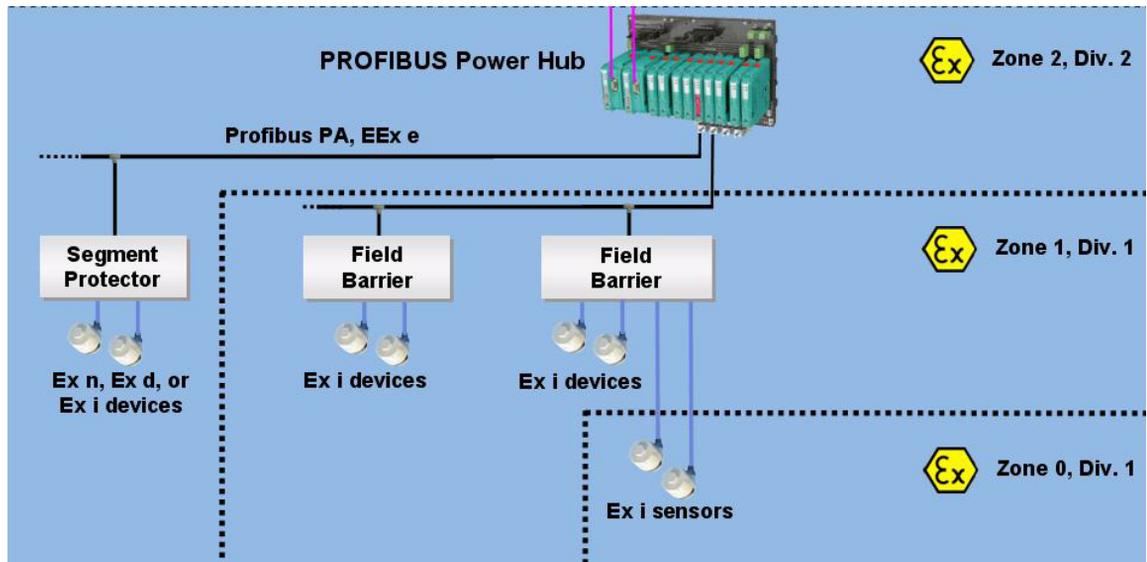


Figure 4. PROFIBUS Power Hub - Installation in Harzardous Areas

The PROFIBUS Power Hub can be installed based on its identification in Zone 2 or outside of harzardous areas and allows different topologies and Zone 2 installations depending on the type of Power Modules used. For details, refer to [1].

With the Fieldbus trunk always categorized as EEx nA for Zone 2 applications, connecting the PROFIBUS Power Hub to segment protectors allows hot swapping of field devices.

In intrinsically safe installations, field barriers are needed in addition to the PROFIBUS Power Hub's supply modules to perform the following tasks:

- Ensuring intrinsic safety on the outputs
- Ensuring galvanic isolation between the non-intrinsically safe trunk and the intrinsically safe outputs (spurs).

- Termination of the trunk with a terminator



For complete information about how to use PROFIBUS Power Hub for installations in hazardous areas, adhere to

- the PROFIBUS Power Hub manual [1],
- the EC type examination certificates and EC Certificates of Conformity and manufacturer's Declaration of Conformity and
- the "SpecLaws and/or regulations governing the use or intended usage goal.

# Configuration and Commissioning

## General Consideration

### Network Configuration

The PROFIBUS network will operate with standard values according to the PROFIBUS specification in case the PROFIBUS Power Hub is configured to run in “Fixed” watchdog mode with settings as described below.

### Gateway Module - Configuration.



Please note that for ABB control systems the PROFIBUS Power Hub shall be operated with module configuration “PA Bus Cfg + Diag” only!

In this mode of operation, PROFIBUS Power Hub’s communication and PA bus master parameters (see [Table 4](#)) are configured via the PROFIBUS controller during startup phase.

This is the recommended mode of operation in DCS systems because it ensures, that communication parameters are provided automatically by the controller in case of a device exchange. Also, no unintentional changes can be applied, e.g. via a DTM, while the device is in operation, which would result in a loss of communication otherwise.

A configuration of these communication parameters described is necessary in case the device shall be operated with its redundant gateway modules.

## System 800xA with PROFIBUS Default DTM

For a general overview about how to configure PROFIBUS with System 800xA, refer to [2].

### Precondition

- The device object type “Pepperl+Fuchs HD2-GTR-4PA V1.0-DP”<sup>1</sup> is installed.

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1. available from ABB Library / ABB Solutionsbank

### Network Configuration

- Define a new slave as part of the System Structure
- Do the network assignment and
  - define a free slave address (position) and ensure a further address of '+64' is free in case of redundant gateway modules
  - enable redundant mode in case of redundant gateway modules

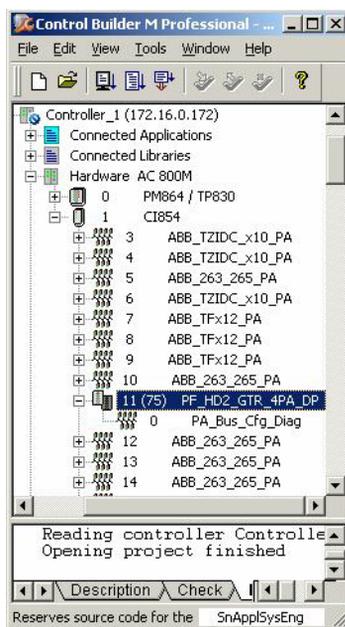


Figure 5. System 800xA - Network Configuration

### Gateway Module - Configuration

- Insert module “PA Bus Cfg + Diag” and set its parameters to the following values according to Table 4:
  - Watchdog mode: “Fixed”
  - Watchdog time: 5s

- Number of PA retries: 3
- Number of activated PA segments: 1 ... 4
- Advanced diagnostic module: “Enabled” / “Disabled”, depending on whether the module is available or not

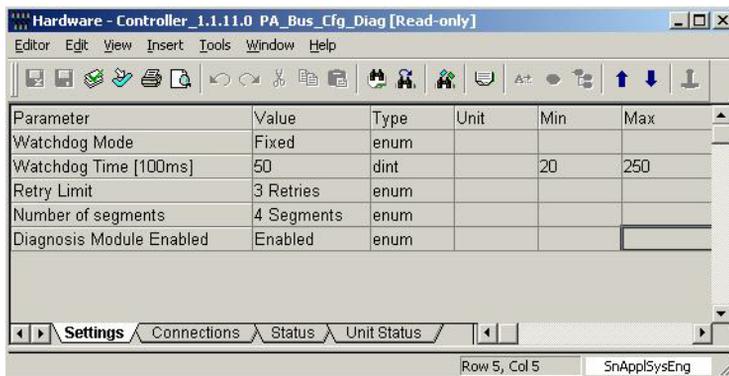


Figure 6. System 800xA - Gateway Module Configuration

### Gateway Module - Commissioning

- Start commissioning to running phasis.

### Asset Monitor - Configuration

The asset monitor provides a classified information about the functional health of the device according to NAMUR’s NE107 recommendations. Therefore, no extra configuration is necessary.

### Asset Monitor - Commissioning

Load the asset monitor into the Asset Optimization server and enable it. PROFIBUS Power Hub’s functional health status will be continously monitored from now on.

### Asset Monitor - Operation

In case of deviations detected, use 800xA’s Maintenance Workplace and Asset Viewer to get an overview about the health status of the installed PROFIBUS Power Hubs as shown in Figure 7:

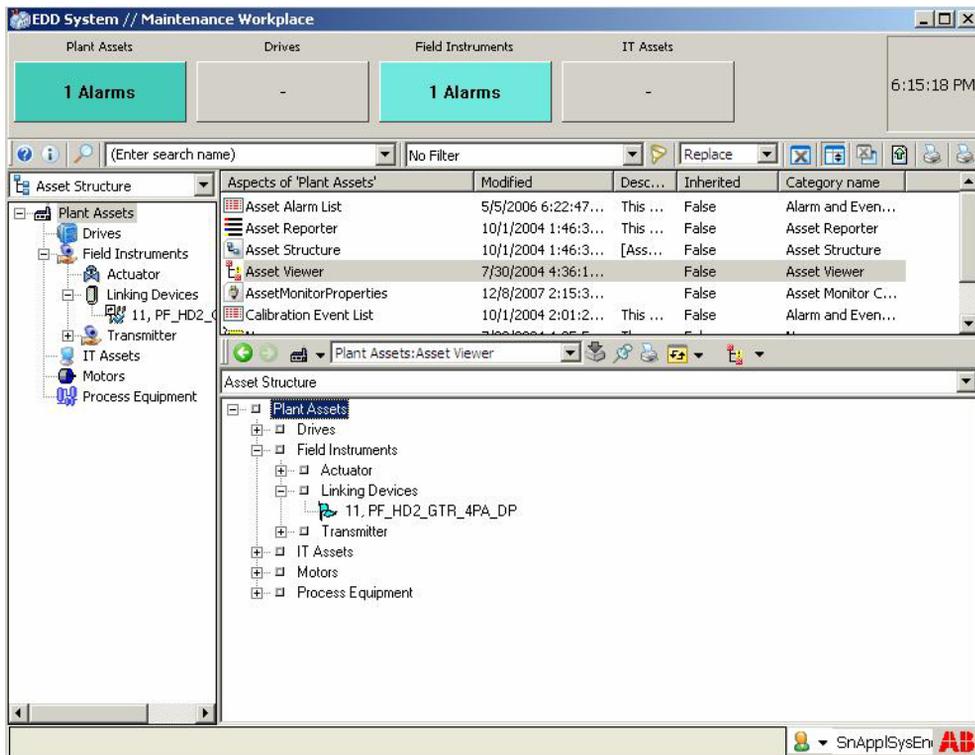


Figure 7. System 800xA - Maintenance Workplace

Navigate directly to the Asset Reporter of the affected PROFIBUS Power Hub instance to get its NE107 compliant health status displayed - including connected PROFIBUS PA segments as shown in Figure 8.

The screenshot shows the '11 - Asset Condition View' window. It contains a table with the following data:

Severity	AM Name	Condition	Sub Condition	Description	
	Profibus P&F DPV0 HD2_GTR_4PA	Configuration Status	Normal		3/1
500	Profibus P&F DPV0 HD2_GTR_4PA	Configuration Status - PA Segment	Out of specification	No full PA cycle possible in time.	3/1
	Profibus P&F DPV0 HD2_GTR_4PA	Hardware Status	Normal		3/1
	Profibus P&F DPV0 HD2_GTR_4PA	Hardware Status - PA Segment	Normal		3/1
	Profibus P&F DPV0 HD2_GTR_4PA	Operating Conditions	Normal		3/1
	Profibus P&F DPV0 HD2_GTR_4PA	Operating Conditions - PA Segment	Normal		3/1

Figure 8. Asset Reporter with Asset Conditions

The screenshot shows the 'Condition Details' window for the condition '11:Profibus P&F DPV0 HD2\_GTR\_4PA 'Configuration Status - PA Segment''. The details are as follows:

<b>Condition:</b> Configuration Status - PA Segment	
<b>Condition:</b> SubCondition:	[good] Configuration Status - PA Segment: Out of specification
<b>TimeStamp:</b>	Thursday, March 06, 2008 5:45:41 PM
<b>Severity:</b>	500
<b>Description:</b>	No full PA cycle possible in time.
<b>Possible Cause:</b>	The watchdog time in the bus parameter of the built-in slave is configured to a too short value in order to run a valid full PA cycle in time.
<b>Suggested Action:</b>	Verify the configured watchdog time. Set it to 5 seconds fixed or if it's too long consult corresponding gateway manual for exact calculation
<b>Corrective Action Taken:</b>	

Figure 9. System 800xA - Asset Monitor's Conditions Details

Use conditions details to read a description about detailed impact, possible cause and suggested actions as shown in [Figure 9](#).

## AC 870P / Melody with PROFIBUS Default DTM

For a general overview about how to configure PROFIBUS with System AC 870P / Melody, refer to [4].

### Precondition

None

### Network Configuration

- Define a new slave as part of the System Structure
- Via the “bus assignment” dialog,
  - select the DP network
  - define a free slave address and ensure a further address of +64 is free in case of redundant gateway modules
  - set redundancy to “System Redundancy” in case of redundant gateway modules
  - set the “Line assignment” in case PROFIBUS line redundancy is used:
    - “Line A+B” for redundant gateway modules connected to each line as described in [Gateway Module - Installation with Device Redundancy](#) on page 19
    - “Line A” or “Line B”, in case a single line is connected only.
- Define the diagnostic information routed via the AC870P controller. Figure [Figure 11](#) shows a recommended set of messages:

### Gateway Module - Configuration

- Choose module “PA Bus Cfg + Diag” with channels and data types as shown in [Figure 12](#).
- Set the following parameters for the PROFIBUS Power Hub gateway according to [Table 4](#):  
Select the the “Edit” check box to as shown in [Figure 13](#) and enter the following parameter into the first line:

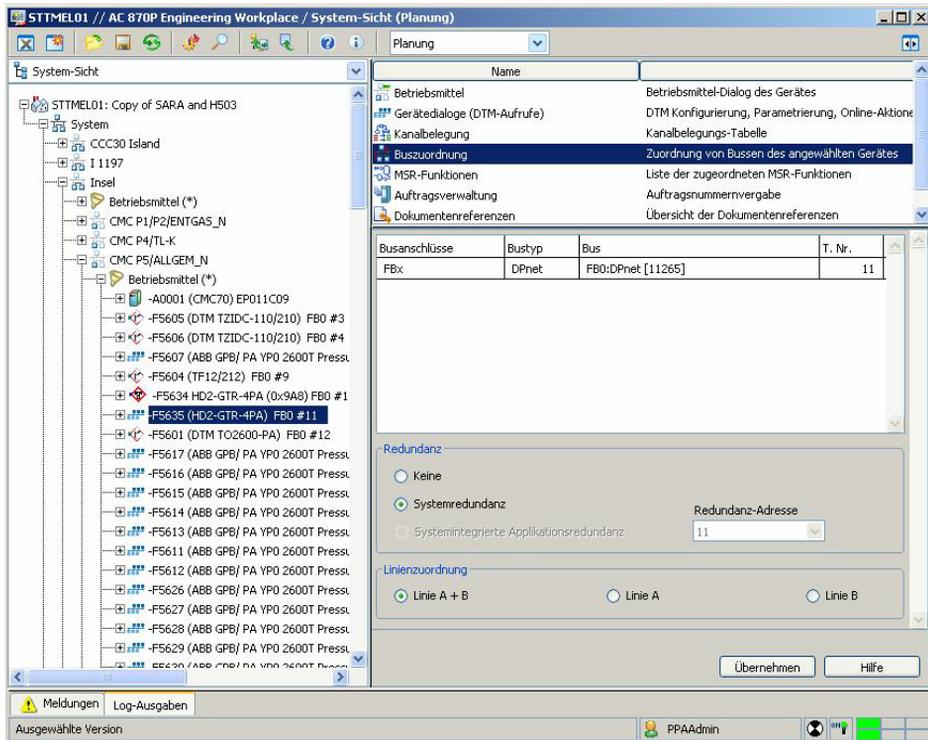


Figure 10. AC 870P / Melody - PROFIBUS Network Configuration

- 0x0, 0x0, 0x8

Enter the module definition plus the parameter according to Table 4 into the second line as follows:

- Module definition "PA Bus Cfg + Diag": 0x09, 0x81, 0x00, 0x00
- Watchdog mode (0 = "Transparent", 1 = "Fixed", here: "Fixed")
- Watchdog time (in [100 ms], here: 0x32 \* 100 ms = 5 s)
- Number of PA retries (here: 3)
- Number of activated PA segments (here: 4)

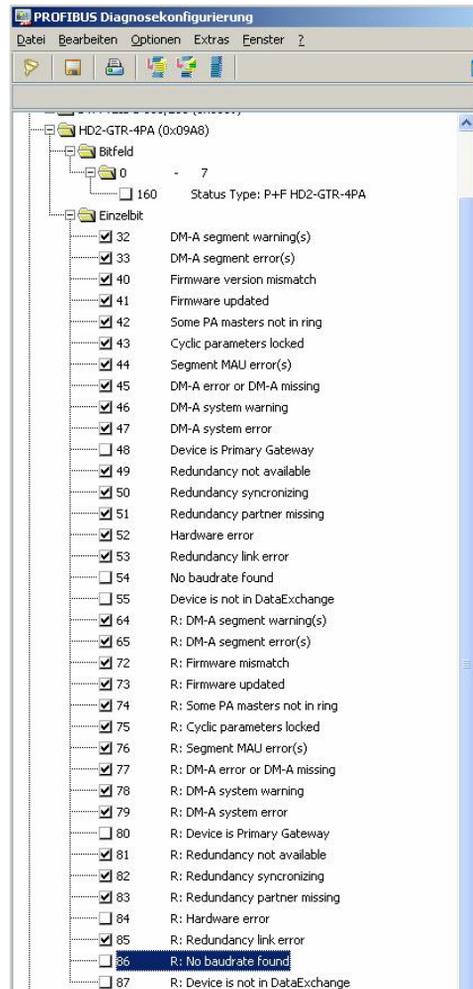


Figure 11. AC 870P / Melody - PROFIBUS Diagnostics Configuration

- Advanced diagnostic module (0 = “Disabled”, 0xFF = “Enabled”, here: “Enabled”)
- Define the diagnostic information presented on alarm and event lists, e.g. according to the recommended set of messages from above.

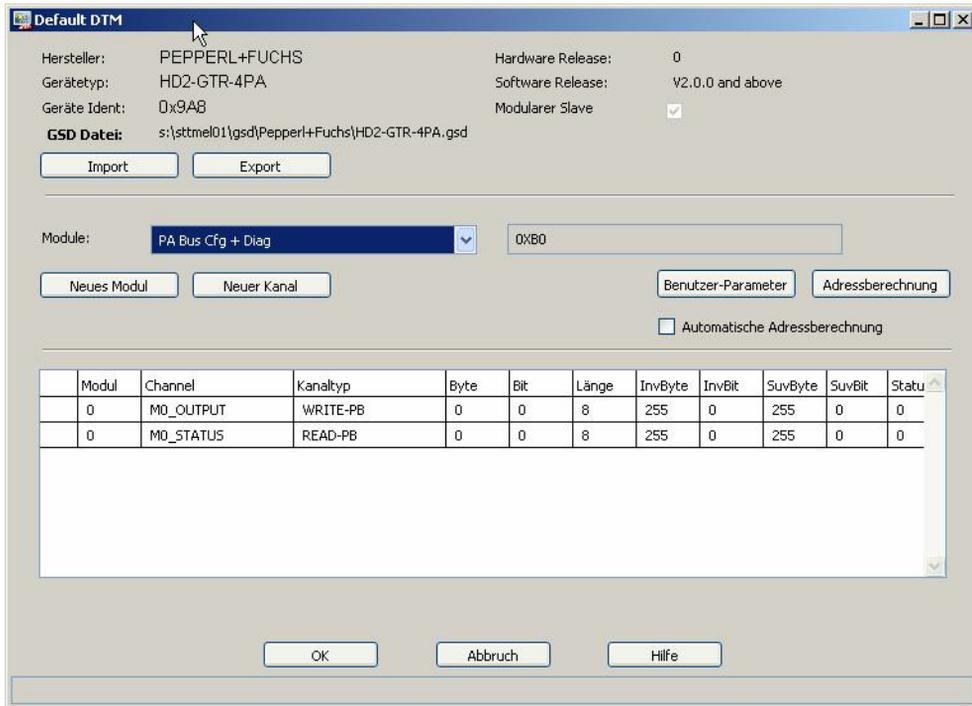


Figure 12. AC 870P / Melody - Gateway Module Configuration

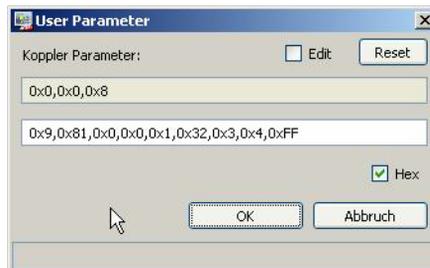


Figure 13. AC 870P / Melody - Gateway Parameter

## Gateway Module - Commissioning

Start commissioning to running phasis

### AC 870P / Melody without DTM



**Please note, that in AC870P / Melody the PROFIBUS Power Hub cannot be used without DTM , because it requires additional configuration to become compatible with AC870P / Melody’s PROFIBUS design.**

PROFIBUS Power Hub uses the PROFIBUS DP watchdog for its underlying PA devices by default, which is called “Transparent” watchdog mode. As a consequence, there is no distinction made between typically different watchdog times of a fast operating PROFIBUS DP and a slower PROFIBUS PA.

While a Melody system is designed to define an appropriate watchdog for the fast operating PROFIBUS DP, the PROFIBUS Power Hub’s needs to be configured for “Fixed” watchdog mode in conjunction with an appropriate watchdog time for its slower PROFIBUS PA master.

### Freelance 800F with PROFIBUS Default DTM

For a general overview about how to configure PROFIBUS with Freelance 800F, refer to [5].

#### Precondition

None

#### Network Configuration

- Insert a new slave to the Hardware Structure
- Via the parameter dialog as shown in [Figure 14](#),
  - define a free slave address and ensure a further address of +64 is free in case of redundant gateway modules
  - set “Slave redundance enabled” in case of redundant gateway modules
  - set “Cyclic communication”

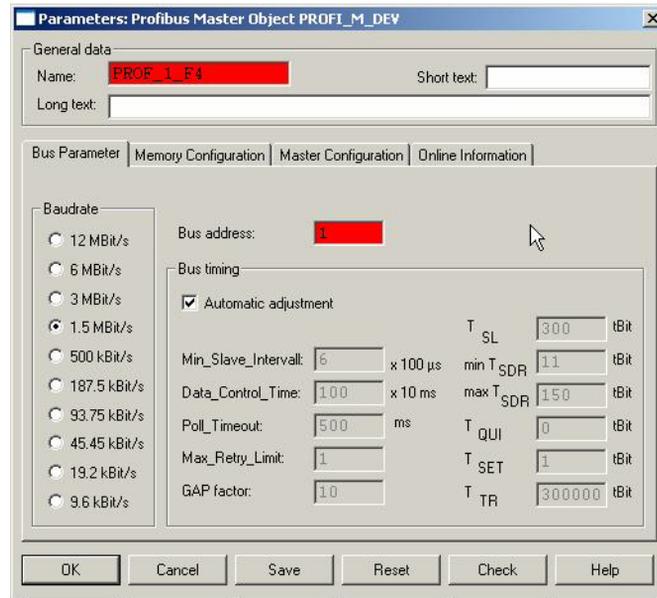


Figure 14. Freelance 800F - Network Configuration

### Gateway Module - Configuration

- Insert module “PA Bus Cfg + Diag”.
- Set the following parameters<sup>1</sup> for the PROFIBUS Power Hub gateway according to [Table 4](#) as shown in [Figure 15](#):
  - Watchdog mode (here: “Fixed”)
  - Watchdog time (here: 50 \* 100ms = 5s)
  - Number of PA retries (here: 3)
  - Number of activated PA segments (here: 4)
  - Advanced diagnostic module (here: “Enabled”)

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1. Please note, that this view requires the Module view” check box to be activated

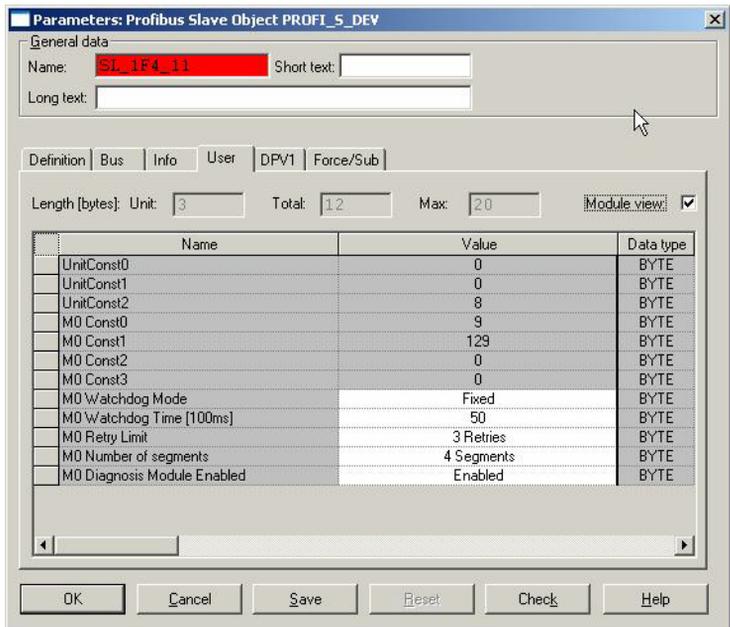


Figure 15. Freelance 800F - Gateway Configuration

### Gateway Module - Commissioning

Run a check of the new configuration and download it.



**Changing these values during operation can lead to a loss of communication and shall not be done therefore!**

## Replacing LD 800P by PROFIBUS Power Hub

### General consideration

#### Mechanical Dimensions

With PROFIBUS Power Hub's new motherboard-based design, its form and mechanical dimension changed so that an exact matching in form and shape is not given.

For details about dimensions refer to [1].

#### Gateway Module - Installation

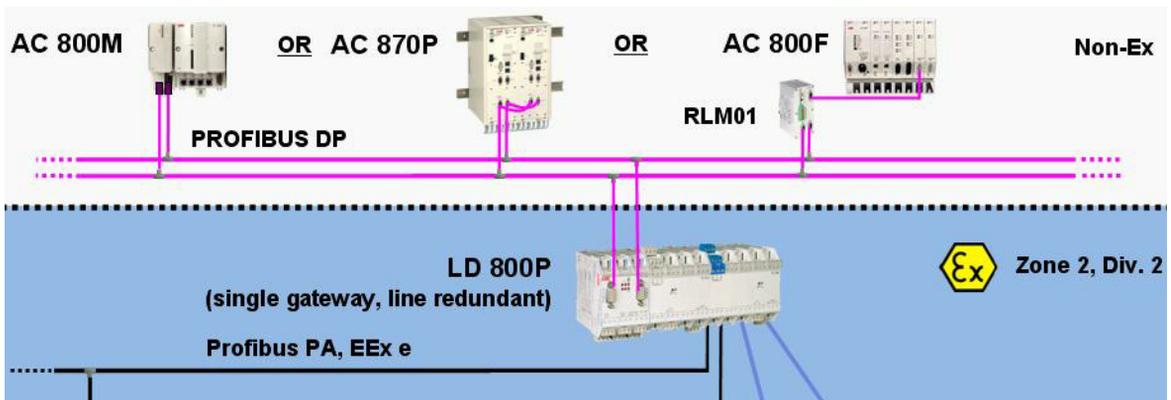


Figure 16. LD 800P with line redundant connection

LD 800P operates in line redundant mode via its two PROFIBUS DP connectors by default as shown in Figure 16. Typically, this is accomplished by connecting its gateway to redundant PROFIBUS DP lines.

With PROFIBUS Power Hub, a line redundant installation can be accomplished by

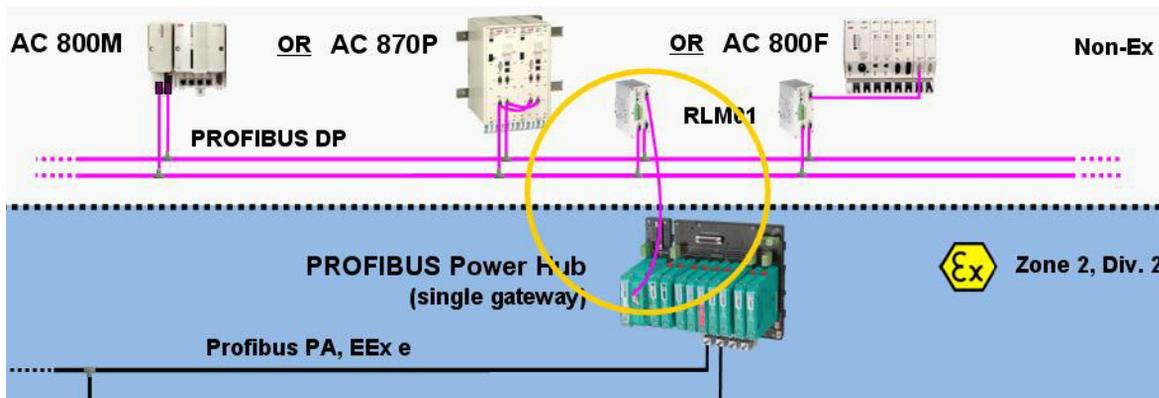


Figure 17. PROFIBUS Power Hub with line redundant connection

using:

- RLM01, connected to a non-redundant PROFIBUS Power Hub gateway module as shown in Figure 17. This will allow to use line redundancy, in case the PROFIBUS Power Hub needs to be operated without bus address.



Operating the PROFIBUS Power Hub without bus address is possible with a non-redundant gateway only, mounted on a non-redundant gateway motherboard. Additionally, its bus address needs to be set to a value > 126 via the motherboard's DIP switch.

- redundant PROFIBUS Power Hub gateways, each connected to a different PROFIBUS DP line. This requires to assign a bus address to PROFIBUS Power Hub's built-in slaves via DIP switch and to plan them in the ABB engineering tools as described in Configuration and Commissioning on page 23ff.

## Gateway Module - Configuration



LD 800P has different default settings for the communication parameter “Watchdog mode” and “PA retry limit” compared to the PROFIBUS Power Hub. Please refer to [Table 4](#) for comparison.

While its default settings enable a LD 800P to run with ABB’s DCS systems “out of the box”, PROFIBUS Power Hub’s configuration needs to be adjusted accordingly.

*Table 4. PROFIBUS Power Hub Communication Parameter  
(Module “PA Bus Cfg + Diag”)*

Parameter	PROFIBUS Power Hub	LD 800P
Watchdog mode	“Transparent” <sup>(1)</sup> / “Fixed” <sup>(2)</sup> (Default: “Transparent”)	“Transparent” / “Fixed” (Default: “Fixed”)
Watchdog time	2 ... 25 s (Default: 5 s in “Fixed” mode)	2 ... 25 s (Default: 5 s)
PA retry limit <sup>(3)</sup>	1 ... 7 (Default: 1)	1 ... 7 (Default: 3)
Number of activated PA segments	1 ... 4 (Default: 4)	1 ... 4 (automatic adaption)
Advanced diagnostic module <sup>(4)</sup>	“Enable” / “Disable” (Default: “Disable”)	Not applicable

- (1) The Linking Device passes through the calculated watchdog time from the DP Master to the PA slave devices.
- (2) The watchdog time received from DP master is being discarded and replaced by the fixed watchdog time.
- (3) If the coupling from DP to PA is designed redundantly and the DP bus uses optical fiber as a communication medium, increasing the retry limit is recommended depending on the PROFIBUS DP baudrate. For details refer to [1], chapt. 5.3.3 “Additional Information on Adjusting Retry”
- (4) “Enable”, in case an “Advanced diagnostic module” is used.

**PROFIBUS Power Hub - Watchdog mode “Transparent” / “Fixed”**

PROFIBUS devices are able to activate a watchdog mechanism to monitor the data exchange with the PROFIBUS master. Time measurement takes place in the PROFIBUS slave.

The watchdog time is transferred in a parameterizing telegram from the PROFIBUS Master to the PROFIBUS slave during slave commissioning. Typically, the watchdog value is bound to cycle times.



With **PROFIBUS Power Hub operating in “Transparent” watchdog mode**, the PROFIBUS DP watchdog is used in a 1:1 fashion for its PA slaves.

To ensure reliable operation of PROFIBUS PA in this case, the following bus parameters have to be set via the system’s configuration tools:

- PROFIBUS DP Standard settings according to transfer rate used (45,45 kBd... 12 MBd)
- Watchdog time TWD = 5 s<sup>(1)</sup>.

For a refined PA watchdog calculation, refer to [1].

Please note, that this mode **is not compatible with AC870P / Melody systems**.

- (1) For System 800xA, use “Actual value based” calculation of PROFIBUS master parameters as described in [2], chapter “Configure the PROFIBUS Master Unit”.



In “Transparent” watchdog mode, there is no distinction made between typically different watchdog times of a fast operating PROFIBUS DP and a slower PROFIBUS PA. Therefore, this mode of operation is not recommended when using mixed installations of PROFIBUS DP and PA.

## Power Hub Modules - Installation

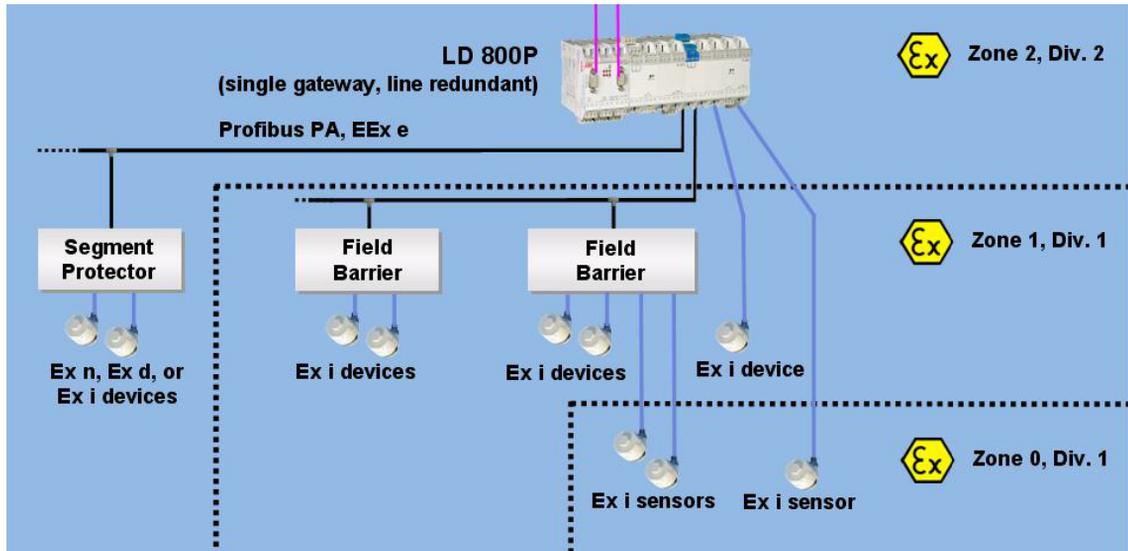


Figure 18. PROFIBUS PA Topology with LD 800P

With LD 800P, a topology as shown in [Figure 18](#) was possible with Ex i devices located in Zone 1 or Zone 0 and directly connected to LD 800P's power supply module PL890.

With PROFIBUS Power Hub, a field barrier becomes necessary to connect Ex i devices in Zone 0 and Zone 1 for reasons mentioned in [Power Hub Modules - Installation in Harzardous Areas](#) on page 21.

The following table shows possible replacements of power link modules by PROFIBUS Power Hub's power supply module. Generally, module replacement depends on the type of field device and application and is described in detail in [1]

Table 5. Power Hub Modules

LD 800P - Power Link Module	PROFIBUS Power Hub - Power Supply Module
PL890, Ex, max. 13,4V, 100mA	HD2-FBPS-1.500 max. 30V, 500 mA <sup>(1)</sup> HD2-FBPS-1.23.500 max. 23V, 500 mA <sup>(2)</sup> HD2-FBPS-1.17.500 max. 17V, 500 mA <sup>(3)</sup>
PL810, Non Ex, max. 26V, 400mA	HD2-FBPS-1.500 max. 30V, 500 mA <sup>(4)</sup> HD2-FBCL-1.500, max. 30V, 500 mA <sup>(5)</sup>

(1) galvanically isolated, in conjunction with a field barrier only

(2) galvanically isolated, in conjunction with a field barrier only

(3) galvanically isolated, in conjunction with a field barrier only

(4) galvanically isolated, in conjunction with a field barrier only

(5) not galvanically isolated

## System 800xA

The following options can be used to replace a LD 800P installation by PROFIBUS Power Hub. Any of the corresponding configurations can be used as described in [Configuration and Commissioning](#) on page 23. For limitations regarding different system versions, refer to PROFIBUS Power Hub's integration release notes [6].

### Using redundant PROFIBUS Power Hub gateway modules

- Using redundant PROFIBUS Power Hub gateway modules
  - Operating the PROFIBUS Power Hub's gateway modules in “device redundancy” mode requires to apply configuration settings as described in [Table 4](#), which in turn needs two additional bus addresses.

### Using a single PROFIBUS Power Hub gateway module

- “Fixed” watchdog mode

- The PROFIBUS Power Hub gateway can be connected to the redundant PROFIBUS lines via a RLM01
- Operating the PROFIBUS Power Hub’s gateway modules in “Fixed” watchdog mode requires to apply configuration settings as described in [Table 4](#), which in turn requires one additional bus address.
- “Transparent” watchdog mode
  - The PROFIBUS Power Hub gateway can be connected to the redundant PROFIBUS lines via a RLM01
  - PROFIBUS Power Hub operates in “Transparent watchdog mode”. This requires an adaption of the PROFIBUS Master timing according to [PROFIBUS Power Hub - Watchdog mode “Transparent” / “Fixed”](#) on page 38.
  - PROFIBUS Power Hub’s other communication parameters will remain with their default values in case not changed otherwise.

## AC 870P / Melody

The following options can be used to replace a LD 800P installation by PROFIBUS Power Hub. Any of the corresponding configurations can be used as described in [Configuration and Commissioning](#) on page 23. For limitations regarding different system versions, refer to PROFIBUS Power Hub’s integration release notes [7].

### Using redundant PROFIBUS Power Hub gateway modules

- Using redundant PROFIBUS Power Hub gateway modules
  - Operating the PROFIBUS Power Hub’s gateway modules in “device redundancy” mode requires to apply configuration settings as described in [Table 4](#), which in turn needs two additional bus addresses.

### Using a single PROFIBUS Power Hub gateway module

- “Fixed” watchdog mode
  - The PROFIBUS Power Hub gateway can be connected to the redundant PROFIBUS lines via a RLM01

- Operating the PROFIBUS Power Hub’s gateway modules in “Fixed” watchdog mode requires to apply configuration settings as described in [Table 4](#), which in turn requires one additional bus address.

## Freelance 800F

The same options apply as described in [System 800xA](#) on page 40 to replace a LD 800P installation by PROFIBUS Power Hub.

Any of the corresponding configurations can be used as described in [Configuration and Commissioning](#) on page 23. For limitations regarding different system versions, refer to PROFIBUS Power Hub’s integration release notes [7].

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# Section 3 Configuration and Commissioning of PROFIBUS PA Devices

## PROFIBUS GSD files

### Conversion of PROFIBUS PA GSD files

Since the Product\_Name works Transparently, PROFIBUS PA stations are treated by the PROFIBUS DP master like PROFIBUS DP slaves. This also applies to commissioning and configuration.

While former PROFIBUS DP/PA linking devices like Pepperl + Fuchs' SK2 were able to operate at a baud rate of 31.25 kBd, 45.45 kBd and 93.75 kBd only, GSD files have to be converted to DP GSD files in case the device manufacturers does not offer a PROFIBUS DP-GSD for his PA device.

Please refer to [1] for how to run a conversion in this case.

### Using DTMs for PROFIBUS PA Devices

DTMs use PROFIBUS DPV1 acyclic communication, for which the Product\_Name works transparently<sup>1</sup>.

According to the FDT specification, a DTM provides the GSD file information to the PROFIBUS DP master. To maintain the full PROFIBUS system capabilities with reference to transmission rate and reaction time, it is important that the DTM provides the GSD information in form of a DP-GSD.

For the provision of the DP-GSD information of a PROFIBUS PA device to the engineering tool<sup>2</sup> via DTM, there are two different ways:

- the DTM provides a contained DP-GSD file or

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1. For limitations regarding the maximum number of open DPV1 connections refer to [1].  
2. Relevant for AC 870P / Melody and Freelance 800F only.

- the DTM provides the GSD information from an accessible file on disk. This allows to run a conversion of the GSD file from PROFIBUS PA to PROFIBUS DP format according to [1].

### **Specialities with ABB DCS Symphony Melody**

- **Using a default DTM**

The System has access to the default DTM GSD files by using the path name. Here is an example of a path for saved GSD files:

drive:\DTM\_sub folder\GSD\ABB\Converter GSD LD 800P\...

- **Using a DTM with externally stored GSD file**

The GSD files of ABB PROFIBUS PA devices are stored in the same path, i.e. that also the converted GSD files have to be stored within this directory.

Example:

c:\programs\SMART\_VISION\...

- **Operation of Product\_Name in parallel with Segment Coupler 1 of Pepperl + Fuchs**

The GSD file content is centrally saved. Because of the different GSD file content the parallel operation of LD 800P and SK1 (Pepperl + Fuchs) is **not** possible.

- **Exchange of a Segment Coupler 1 with a Product\_Name**

If a project was planned and loaded with a segment coupler 1 (Pepperl + Fuchs) then based on the different GSD file contents the following steps are necessary:

- Delete all loaded PA slaves inclusive the belonging function plans
- Convert the GSD files with the GSD converter tool
- Save the converted GSD files in the necessary directories
- Plan all belonging PA-slave devices new.

### Specialties with ABB DCS Freelance (AC 800F)

- **Using a default DTM**

The System has access to the default DTM GSD files by using the path name. Here is an example of a path for saved GSD files:

```
c:\Industrial IT\Engineer IT\Control Builder F\GSD\ABB\Converter GSD LD  
800F\...
```

### Using with externally stored GSD file

The GSD files of ABB PROFIBUS PA devices are stored in the same path, i.e. that also the converted GSD files have to be stored within this directory.

Example:

```
c:\programs\SMART_VISION\SVDDesc\Com_DPV1\_0016\_2_04c4\...
```

### Handling with DTM, that require the original GSD-file name



With some DTMs (i.e. device specific DTMs delivered by ABB for PROFIBUS PA devices), the DTMs require to have GSD-files with the original manufacturer's file name.

In this case, it is necessary to rename the GSD files after conversion, because the GSD converter tool changed their names (i.e.: ABB\_040c4.GSD becomes YP0040c4.GSD after conversion and needs to be renamed to ABB\_040c4.GSD again).



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## Section 4 Frequently Asked Questions (FAQ)

### Miscellaneous

- What is the difference between Pepperl + Fuchs' Product\_Name and SK3?
  - There is no difference. Both names can be used synonymously. Having these two names applied, the Product\_Name underlines being a successor of the SK2 resp. LD 800P as a member of Pepperl + Fuchs' Power Hub family.
- Can I use the Product\_Name's Advanced Diagnostic Module without Pepperl + Fuchs' specific DTM?
  - Yes. If available, the module can be activated as described in [Gateway Module - Configuration](#) on page 23 by setting the parameter "Advanced Diagnostic Module" to "Enable". This will provide additional diagnostics compared to the "Basic Diagnostic Module" via PROFIBUS DP. In System 800xA, this information is used via a NAMUR NE107 compliant asset monitor to provide additional information as root cause and failure classification, description, possible cause and suggested action. For details refer to [6].



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## Revision History

This section provides information on the revision history of this User Manual.



The revision index of this User Manual is not related to the 800xA 6.0 System Revision.

The following table lists the revision history of this User Manual.

<b>Revision Index</b>	<b>Description</b>	<b>Date</b>
B	Published for 800xA 5.1.	June 2010
C	Published for 800xA 6.0.	August 2014

## Updates in Revision Index C

The following table shows the updates made in this User Manual for 800xA System Version 6.0.

<b>Updated Section/Sub-section</b>	<b>Description of Update</b>
Cover Page	Cover page changes as per template.





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