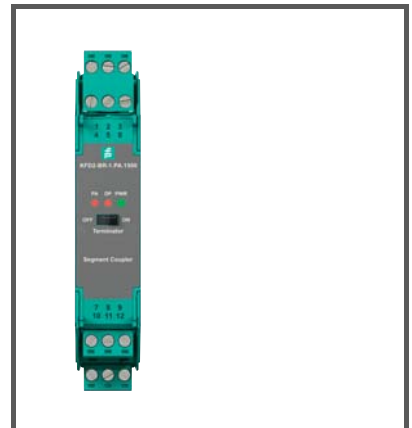


MANUAL

**FieldConnex[®] Basic
Segment Coupler
KFD2-BR-1.PA.1500**



With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

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1 Introduction

1.1 Contents

This document contains information that you need in order to use your product throughout the applicable stages of the product life cycle. These can include the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal



Note!

This document does not substitute the instruction manual.



Note!

For full information on the product, refer to the instruction manual and further documentation on the Internet at www.pepperl-fuchs.com.

The documentation consists of the following parts:

- Present document
- Instruction manual
- Datasheet

Additionally, the following parts may belong to the documentation, if applicable:

- EC-type of examination
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Additional documents

1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.



Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.



Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.



Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols



Note!

This symbol brings important information to your attention.



Action

This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

2 Product Specifications

2.1 Overview and Application

The Pepperl+Fuchs basic Segment Coupler is intended to transparently couple a PROFIBUS PA segment to PROFIBUS DP. Due to the transparent coupling, PROFIBUS PA devices are represented as devices that are directly connected to a PROFIBUS DP segment. The Segment Coupler supports auto-detected PROFIBUS DP baud rates of up to 1.5 MB/s. An integrated PROFIBUS DP terminator can be activated by a switch.

The integrated fieldbus power supply provides power for connected PROFIBUS PA field devices.

The Segment Coupler may be installed in Zone 2 or Class I, Division 2 hazardous areas. Types of protection are:

- Zone 2, gas groups IIA, IIB, IIC: Ex ec (increased safety)
- Class I, Division 2, gas groups A, B, C, and D: non-incendive

The Segment Coupler feeds PROFIBUS PA segments following the high-power trunk concept for explosion protection. Device couplers such as FieldBarriers or Segment Protectors feed high-power levels to field devices via the trunk.

The basic Segment Coupler is intended to be used as a replacement of the Segment Coupler SK1 KFD2-BR-1.PA.93.

Compatibility with Predecessor KFD2-BR-1.PA.93

The device is intended to replace the Segment Coupler SK1 KFD2-BR-1.PA.93. The KFD2-BR-1.PA.1500 now supports standard PROFIBUS DP baud rates of up to 1.5 MB/s and no longer uses the optional RS-485 signals CNTR-P, DGND, and VP. Implementing the successor does not require the adjustment of the protocol timing of the master. The pinout of the connectors is identical. The power consumption of the KFD2-BR-1.PA.1500 is lower compared to its predecessor.

Functional Description

The basic Segment Coupler is a compact DIN mounting rail-mounted device supporting 1 powered PROFIBUS PA segment for up to 31 PROFIBUS PA devices. The Segment Coupler simultaneously performs the following tasks:

- Transparent coupling of 1 PROFIBUS PA segment with 1 PROFIBUS DP segment
- Power supply to the PROFIBUS PA field devices

Segment Coupling

PROFIBUS DP (DP) and PROFIBUS PA (PA) use similar protocols. Data sent via DP or PA networks is essentially interpreted the same way.

The physical layer used to transfer data is different. The PA protocol supplies both power and data via the same cable and thus is suitable for harsher environments such as processing plants. The PA network is typically connected to a larger DP installation.

The Segment Coupler establishes a transparent connection between PA and DP. All PA field devices appear to be directly connected to the DP network. The PA devices are set up in the process control system or in the DP master like normal DP slaves. The Segment Coupler responds to requests from the DP master under the guise of the respective PA slave addressed by the PROFIBUS DP master in the telegram.

The basic Segment Coupler requires no manual configuration. The device configures itself when the PROFIBUS DP master initializes communication and becomes transparent for the control system and the field devices. The Segment Coupler contains a fully functional PA master for fast, independent segment communication. The PA master imitates the DP master. The Segment Coupler offers the following functions:

- Conversion of the PROFIBUS DP to the physical layer on the PROFIBUS PA
- Adaptation of DP and PA transfer rates
- Electrical isolation between PROFIBUS DP and PA
- LEDs for basic function diagnostics

2.2 Component Overview and Dimensions

The following section gives you an overview of the system components and the dimensions of the product.

Component Overview and Dimensions

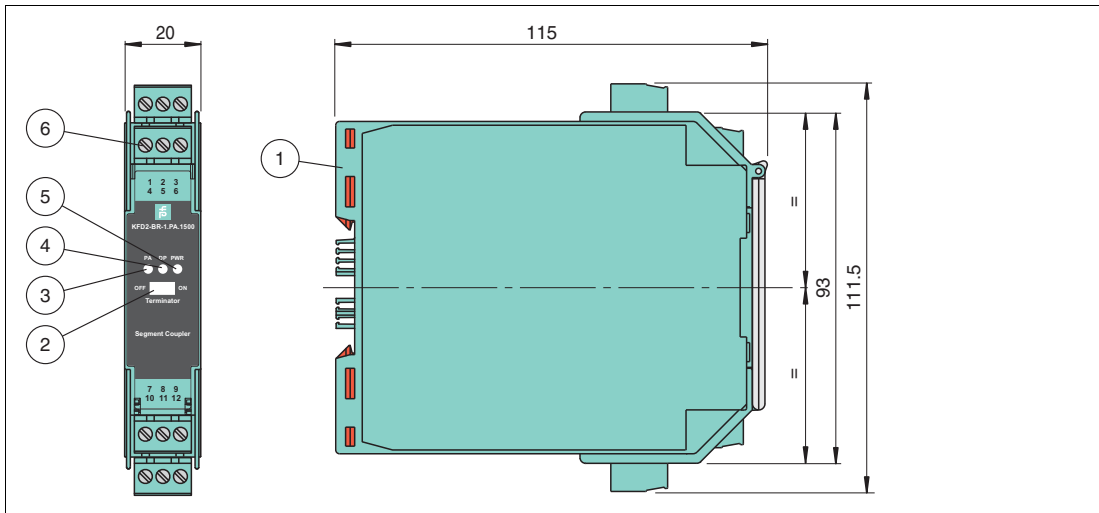


Figure 2.1 KFD2-BR-1.PA.1500: Basic Segment Coupler

- 1 Extendable lugs
- 2 Switch: Terminator for PROFIBUS DP
- 3 LED PA: Status of PROFIBUS PA
- 4 LED DP: Status of PROFIBUS DP and hardware
- 5 LED PWR: Status of power supply
- 6 Removable terminal with test plug sockets

All dimensions in mm without tolerance indication.

2.3 Technical Data

Technical Data	
General specifications	
Function	PROFIBUS gateway
Design / Mounting	Cabinet installation
Supply	
Connection	Power Rail or terminals 11 (L+), 12 (L-)
Rated voltage	20 ... 30 V DC
Ripple	≤ 10 %
Rated current	640 mA ... 365 mA
Power dissipation	max 2.5 W
Fieldbus interface	

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Technical Data	
PROFIBUS PA	
Connection	3+, 6+, 2-, 5-, 1 shield, 4 shield
Rated voltage	24 ... 26 V
Rated current	max. 400 mA
Terminating impedance	100 Ω , integrated
PROFIBUS DP	
PROFIBUS with RS-485 transmission technology	
Connection	terminals 7 RxD/TxD-P, 8 RxD/TxD-N, 9 shield, 10 FE
Baud rate	1.5 MBit/s max.
Indicators/operating means	
Switch	PROFIBUS DP terminator
LED PWR	green: Power on
LED DP/ERR	red 2 Hz flashing: DP error red on: Hardware error red off: DP communication detected
LED PA	red 2 Hz flashing: No PA communication or overload Off: PA communication OK
Electrical isolation	
PROFIBUS DP/PROFIBUS PA	functional insulation acc. to IEC 62103, rated insulation voltage 50 V AC /70 V DC
PROFIBUS DP/Supply	basic insulation according to IEC/EN 61010, rated insulation voltage 253 V AC /357 V DC
PROFIBUS PA/Supply	basic insulation according to IEC/EN 61010, rated insulation voltage 253 V AC /357 V DC
Directive conformity	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013
Standard conformity	
Electromagnetic compatibility	NAMUR NE 21
Degree of protection	IEC/EN 60529
Fieldbus standard	EN 50170/2
Climatic conditions	DIN IEC 721
Shock resistance	EN 60068-2-27
Vibration resistance	EN 60068-2-6
Ambient conditions	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Relative humidity	< 95 % non-condensing
Shock resistance	15 g 11 ms
Vibration resistance	1 g 10 ... 150 Hz
Pollution degree	max. 2, according to IEC 60664
Corrosion resistance	acc. to ISA-S71.04-1985, severity level G3
Mechanical specifications	
Connection type	Terminals
Core cross-section	up to 2.5 mm ²



Technical Data	
Housing material	Polycarbonate
Degree of protection	IP20
Mass	180 g
Mounting	DIN rail mounting
Data for application in connection with Ex-areas	
Statement of conformity	TÜV 16 ATEX 7831 X
Group, category, type of protection, temperature class	⊕ II 3G Ex ec IIC T4 Gc
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012 , EN 60079-7:2015
International approvals	
CSA approval	pending
IECEx approval	IECEx TUR 16.0006X

3 Installation

In the following section you find information on how to install the device in your fieldbus topology.



Danger!

Explosion hazard from exposure to potentially explosive gas atmosphere

If the device is installed in Zone 2 without mounting it in a sufficiently suitable enclosure, gas, dust, water or other external interferences can cause the live device to spark. The sparks can ignite the surrounding potentially explosive atmosphere.

Only mount the device in an enclosure with degree of protection IP54 according to IEC/EN 60529. The enclosure must have an EU declaration of conformity according to the ATEX Directive for at least equipment category 3G.



Danger!

Explosion hazard from exposure to potentially explosive dust atmosphere

If the device is installed in Zone 22 without mounting it in a sufficiently suitable enclosure, dust, water or other external interferences can cause the live device to spark. The sparks can ignite the surrounding potentially explosive atmosphere.

Only mount the device in a suitable enclosure. The enclosure must have an EU declaration of conformity according to the ATEX Directive for at least equipment category 3D.



Danger!

Explosion hazard from live wiring

If you connect or disconnect energized non-intrinsically safe circuits in a potentially explosive atmosphere, sparks can ignite the surrounding atmosphere.

Only connect or disconnect energized non-intrinsically safe circuits in the absence of a potentially explosive atmosphere.



Note!

Read the instruction manual first!

Before you install and commission this product: Read the instruction manual for this product carefully. Make sure you have understood all information that is relevant for your application.

3.1 Mounting Options

The Segment Coupler can be mounted and powered in 2 alternative ways:

- DIN mounting rail, powered through pluggable connectors
- DIN mounting rail powered through a power rail (Power Rail®)



3.1.1 DIN Mounting Rail

The devices are mounted on a 35 mm DIN mounting rail according to EN 60715.

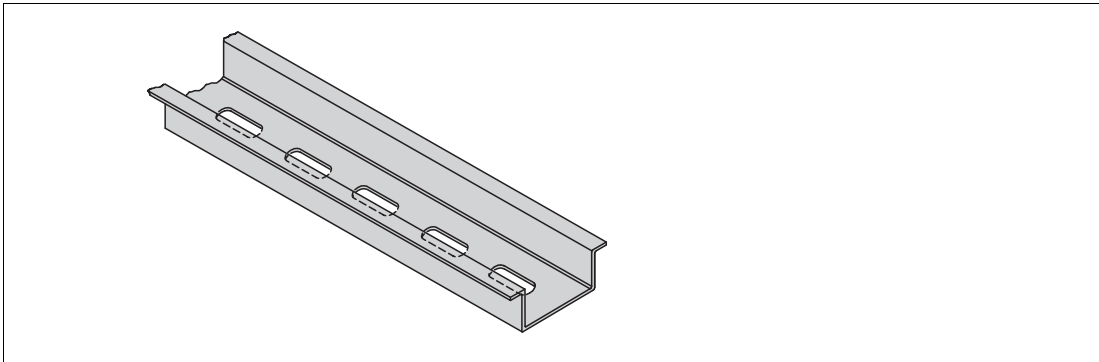


Figure 3.1 Example: DIN mounting rail UPR-MR (35 mm x 15 mm)

3.1.2 Power Rail

To reduce wiring and installation costs, Power Rail is the optimum solution. The Power Rail is a DIN mounting rail with plastic insert, that delivers power to the devices (24 V DC) and transfers bus signals and a collective error message.

The Power Rail is factory-equipped with cover and end caps. These parts cover empty and open segments of the Power Rail. Thus, the Power Rail is protected from contamination. Additionally the cover and end caps prevent that electrically conductive parts come in contact with the Power Rail.

Power Rail UPR-03

The Power Rail UPR-03 comprises 3 leads.

- 2 conductors for power
- 1 conductor for collective error messaging

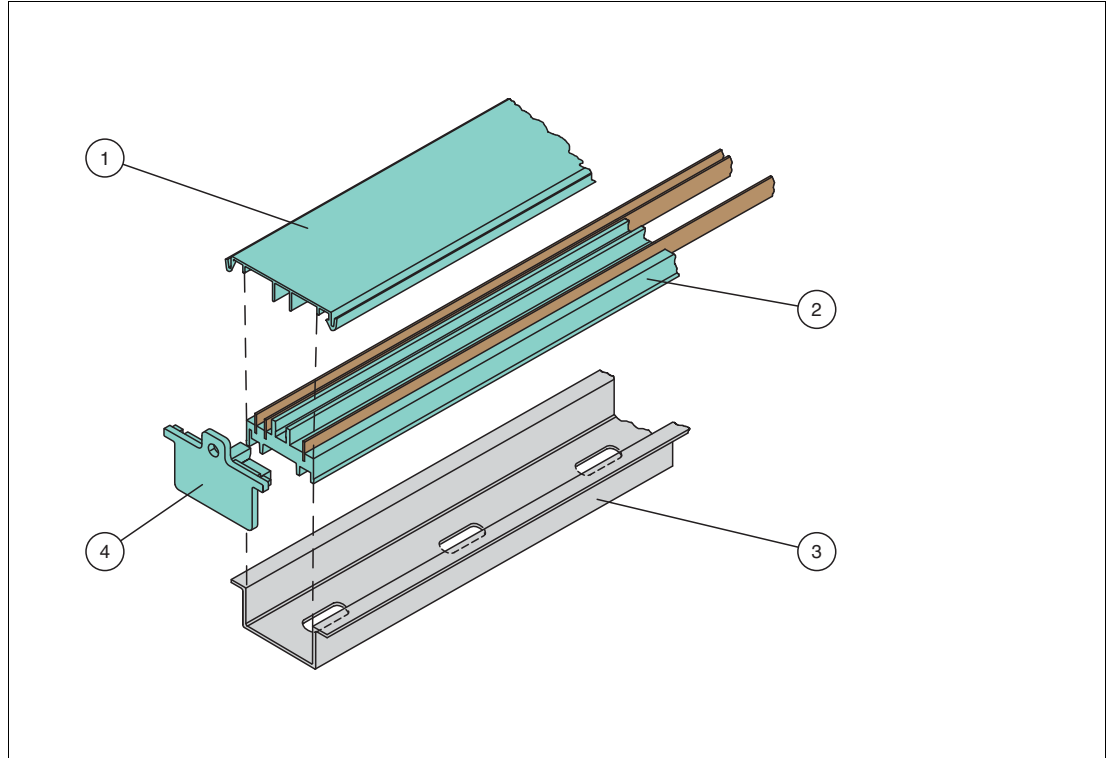


Figure 3.2 Example: Power Rail UPR-03

- 1 Cover UPR-COVER
- 2 Insert UPR-INS-03
- 3 DIN mounting rail UPR-MR (35 mm x 15 mm)
- 4 End cap UPR-E



3.2 Mounting and Dismounting

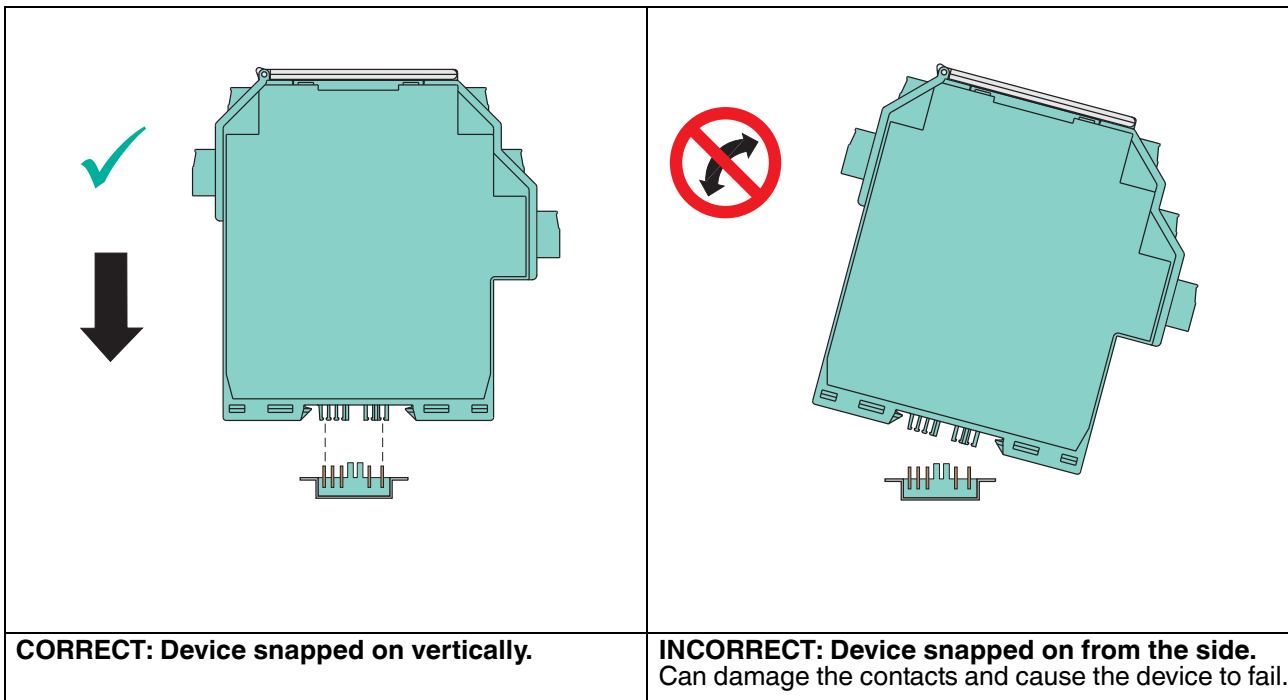
The following chapter describes how to mount or dismount the device.

3.2.1 Mounting



Mounting the Device

Snap the device onto the DIN mounting rail in a **vertical downward** movement. See figure below.



Mounting the Terminal Blocks

The insulation of the removable terminal blocks protect against direct contact. If you replace the terminal blocks, observe the rated insulation voltage. If the rated voltage is higher than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

3.3 Connection Layout and Connection

The following section describes the connection details of the Segment Coupler with special focus on the torques required for a safe installation.



Danger!

Explosion hazard from exposed conductors

Exposed conductors of inadequately attached cables can cause sparks that can ignite the surrounding potentially explosive atmosphere.

When installing the device ensure that the cables are adequately attached.



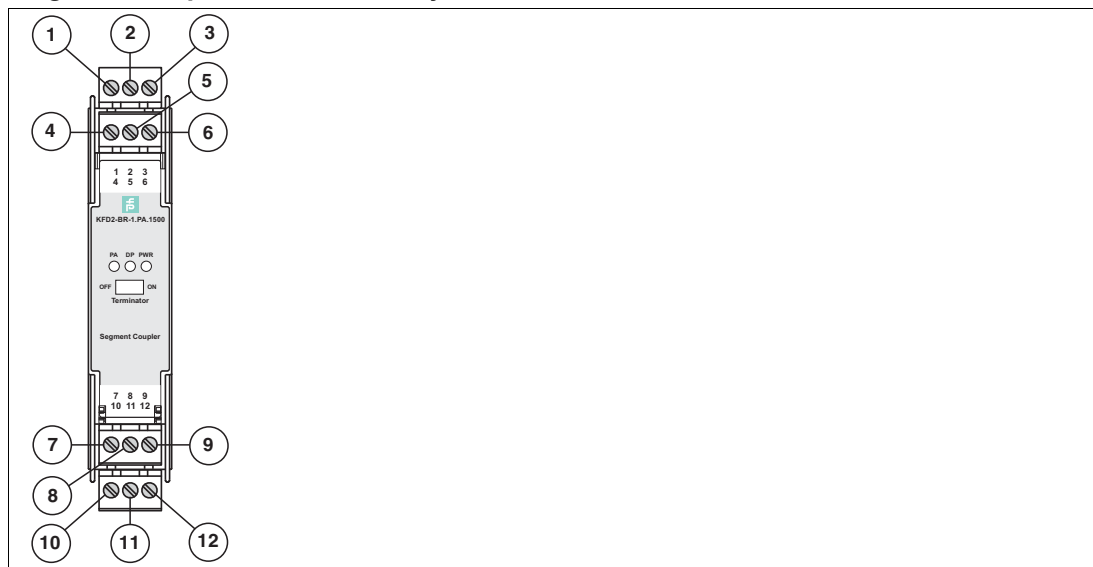
Danger!

Explosion hazard from connection damage

Manipulating connections outside of the specified ambient temperature range can lead to material damage, resulting in an unwanted failure of the connection. This could result in an increased explosion hazard in potentially explosive atmospheres.

Only manipulate connections in the specified ambient temperature range.
Temperature range: -5 C° ... +70 C°

Segment Coupler Connection Layout



Terminal no.	Function
1	PA shield
2	PA -
3	PA +
4	PA shield
5	PA -
6	PA +
7	DP RxD/TxD-P
8	DP RxD/TxD-N
9	DP shield
10	FE
11	24 V +
12	24 V -

For terminal connections, observe the following cable and connection information.

Screw Terminals: Cable and Connection Information

- Permissible wire core section:
Screw terminals with flexible or rigid wires: 0.2 ... 2.5 mm²
- Insulation stripping length: 7 mm
- If you use stranded connectors: Crimp on wire end ferrules
- Ensure that connectors are mechanically locked
- Torque required for tightening terminal screws: 0.5. ... 0.6 Nm

Shielding/Grounding

For information on shielding and grounding the Segment Coupler, see chapter 3.4.

3.3.1 Power Supply without Power Rail

If devices with AC or universal power supplies are used, the advantages of Power Rail are not available.

Conventional power supplies create complicated and expensive wiring systems. After all devices are connected, there is a significant amount of wiring.

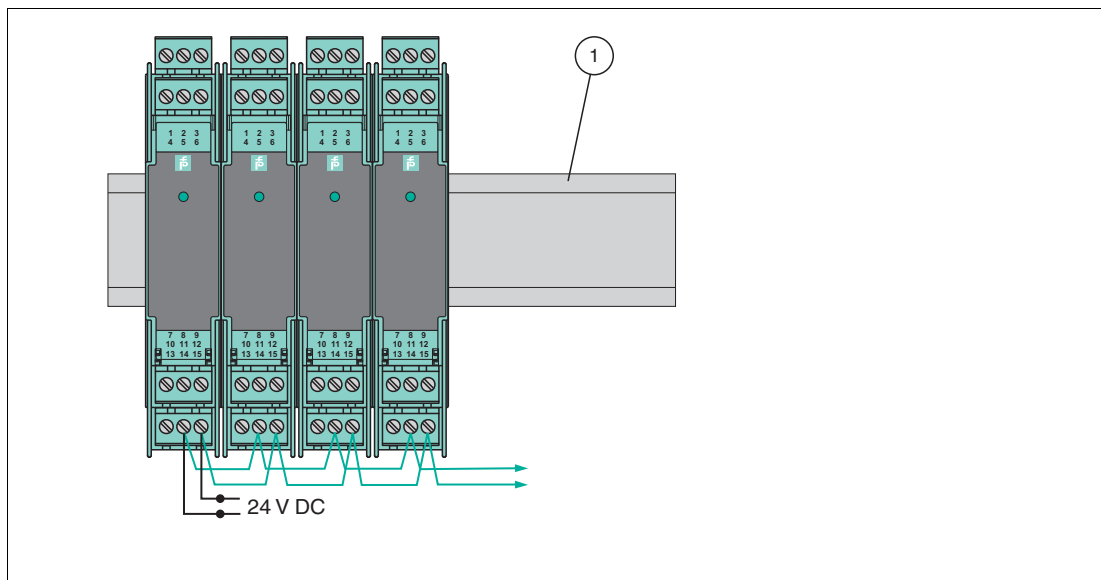


Figure 3.3 Conventional installation

- 1 DIN mounting rail

3.3.2 Power Supply with Power Rail

For devices with a 24 V DC supply voltage, use of the Power Rail reduces wiring and installation costs. The Power Rail almost completely eliminates the risk of wiring faults and facilitates expansion.

Power is supplied to the Power Rail via a power feed module which provides a voltage of 24 V DC (max. 4 A).

The power feed module features a replaceable 5 A fuse at the front. This fuse ensures that the Power Rail and connecting contacts are protected. It prevents damage caused by reverse supply voltage or by installing too many isolators. The isolators on the Power Rail feature integrated device fuses. Any faults in the isolator or in the signal leads do not affect the Power Rail supply system. The 5 A fuse permits a rated current of up to 4 A across the entire temperature range.

Alternatively, supply of the Power Rail can be provided using the power supply KFA6-STR-1.24.*.

Non-Redundant Supply with Power Feed Modules

The power feed module mounts on the Power Rail for easy and reliable distribution of power to all connected isolators. This method eliminates the wiring loops (daisy chain) necessary on a conventional installation without Power Rail.

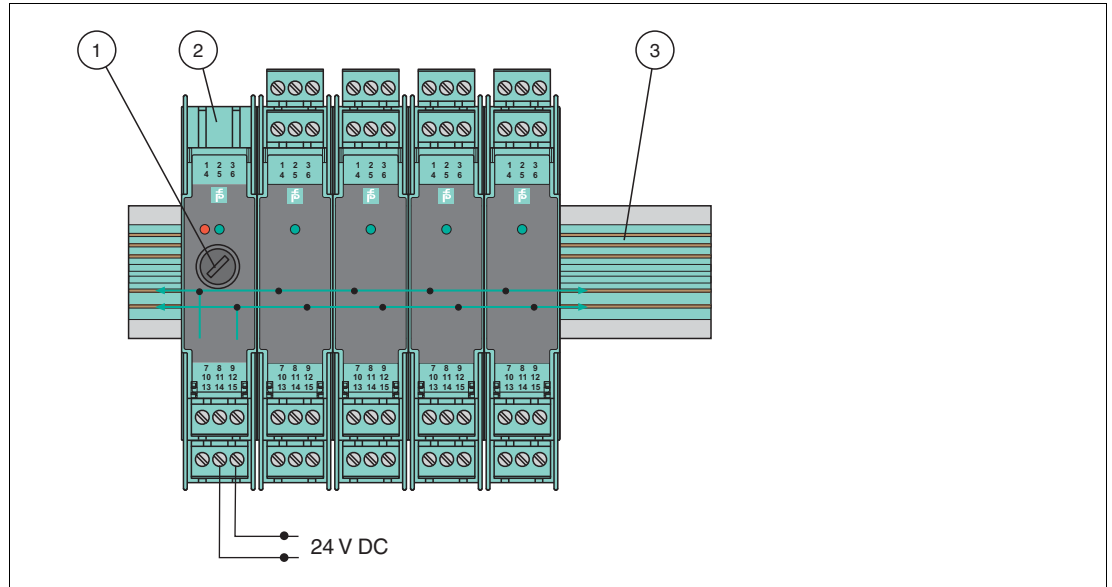


Figure 3.4 Power Rail installation

- 1 Replaceable fuse
- 2 Power feed module
- 3 Power Rail

Redundant Supply with Power Feed Modules

Two power supplies or a redundant power supply with two power feed modules offer a high degree of availability. If a power supply or the fuse in a power feed module fails, the redundant supply continues to energize the isolators through their Power Rail connection.

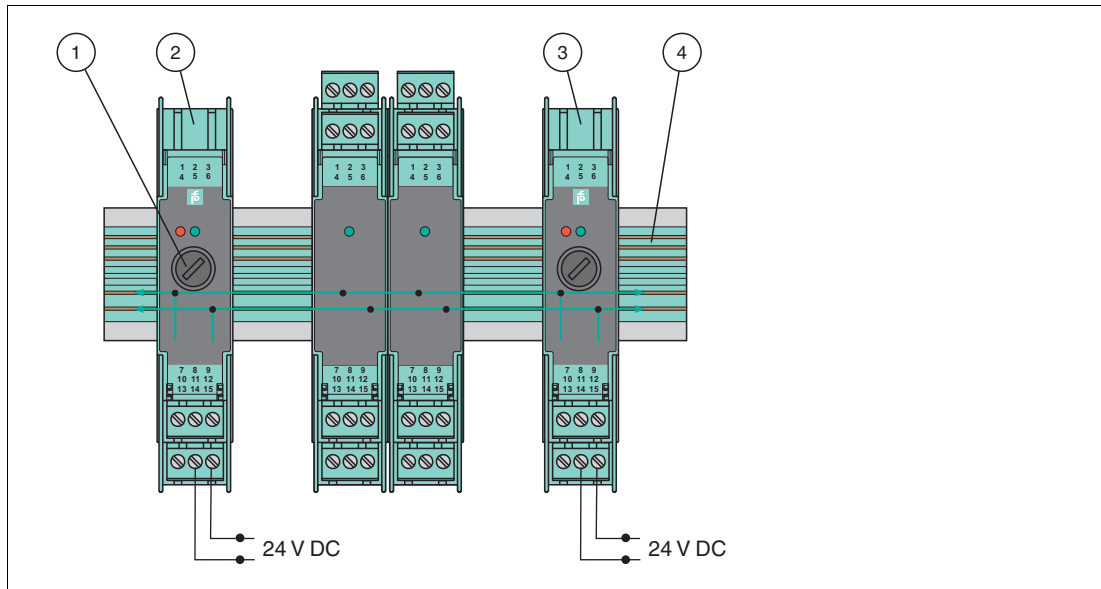


Figure 3.5 Redundant power connections

- 1 Replaceable fuse
- 2 Power feed module 1
- 3 Power feed module 2
- 4 Power Rail

Direct Supply with Power Supplies

A complete power solution for a K-System installation is possible by using the following power supply:

- KFA6-STR-1.24.4 from 115/230 V AC to 24 V DC/4 A

The power supplies snap on the Power Rail to easily and efficiently distribute power to the isolated barriers.

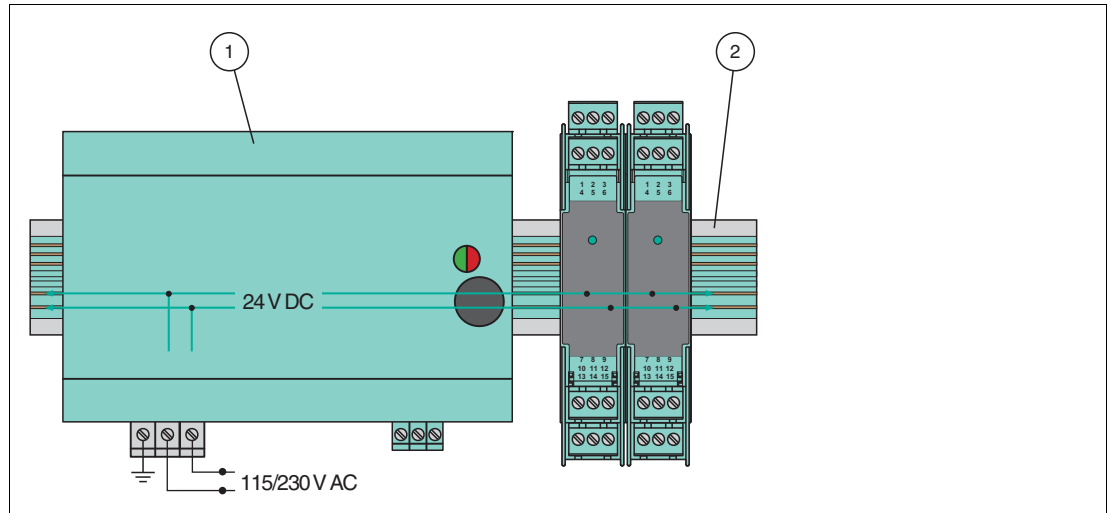


Figure 3.6 Integrated power supply (4 A)

- 1 Power supply
- 2 Power Rail

3.4 Shielding and Grounding

In order to achieve the highest immunity against electromagnetic disturbances, appropriate shielding and grounding is mandatory. Connect all shields of PROFIBUS DP and PROFIBUS PA cables to earth, both at the Segment Coupler and at the field devices. If a cable leads into the explosion hazardous area, ensure to route an equipotential bonding between each grounding point.

If the PROFIBUS PA field devices used comply with your specific industry requirements without the need to ground the cable shield at the device, leave the cable shield open and ensure that it is properly isolated. Refer to the PROFIBUS PA Installation Guideline for further information.

The cable shields of the PROFIBUS DP (terminal 9) and PROFIBUS PA cables (terminals 1 and 4) are interconnected internally and routed to functional earth (FE, terminal 10).

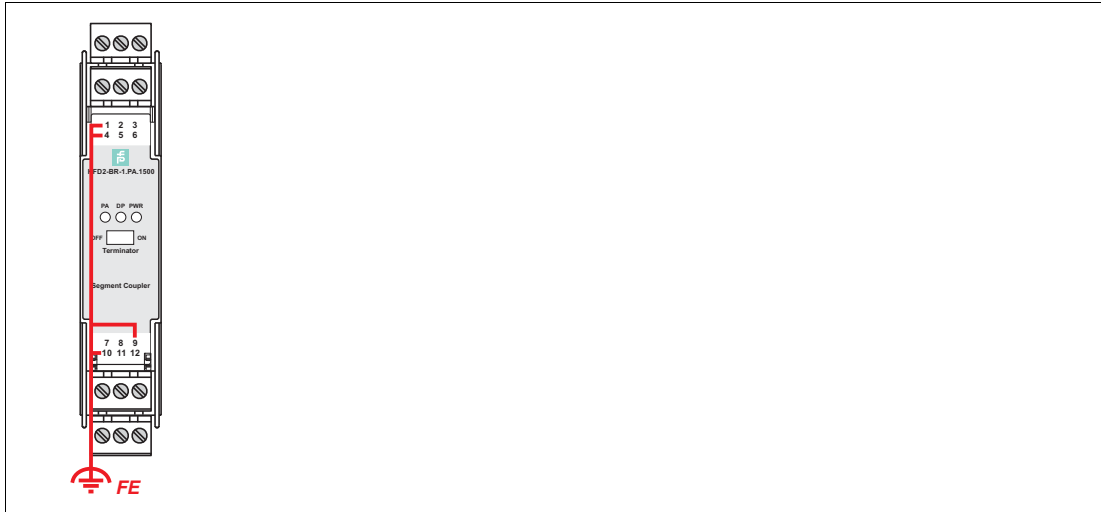
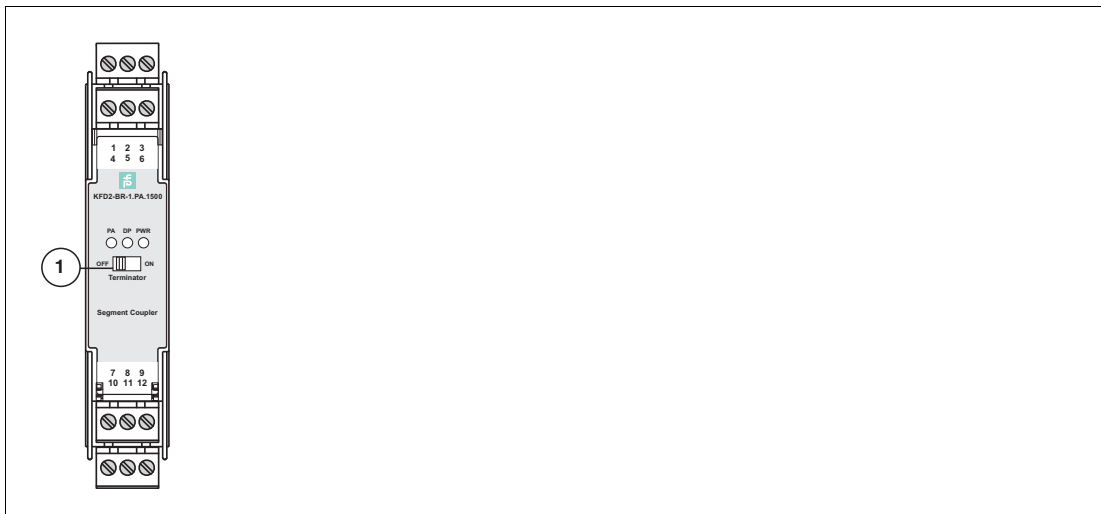


Figure 3.7 Stylized composition of the shield lines inside the KFD2-BR-1.PA.1500

3.5 Bus Termination

The Segment Coupler includes a fixed terminator on the PROFIBUS PA side and a switchable terminator on PROFIBUS DP side. Ensure that the physical ends of the segments are terminated on both segments in order to avoid reflection.

PROFIBUS DP Terminator Switch



1 KFD2-BR-1.PA.1500 terminator switch

3.6 Accessories

For more information on KFD2-EB2 (power feed module) or KFD2-EB2-R4A-B (redundant power feed module) refer to the manual System Description K-System on the Internet at pepperl-fuchs.com.

4 Commissioning

In the following section you find information on how to commission the device in your fieldbus topology.



Note!

Read the instruction manual first!

Before you install and commission this product: Read the instruction manual for this product carefully. Make sure you have understood all information that is relevant for your application.

4.1 Cyclic Data Exchange

A suitable configuration tool is required to configure the cyclic data exchange and to define the slaves, user data, etc. via a PROFIBUS DP master, class 1.



Preparing the Cyclic Data Exchange

1. If necessary, convert existing GSD files for the PA slaves using the P+F GSD converter, then integrate them into the configuration tool.
2. Adapt the response monitor (watchdog) to the master. Guide value: 5 seconds.

4.1.1 Information on GSD File Conversion

Because coupling is transparent, the PROFIBUS DP master treats PROFIBUS PA slaves like PROFIBUS DP slaves. This also applies to start-up and configuration.

The GSD file must be integrated in a configuration tool before it can be used to configure and operate a PROFIBUS PA slave.

Before converting GSD files, always consider the following distinctions between GSD files for PROFIBUS PA slaves:

- Is the GSD file a profile GSD file or a manufacturer-specific GSD file?
- Is the GSD file designed to communicate via an RS-485 interface (DP GSD file) or an interface according to IEC 61158-2 (PA GSD file)?

If a profile GSD file is being used, the file name indicates whether it is a DP GSD file or a PA GSD file.

Example 1

"PA039733.gsd" is a profile GSD file for 4 binary outputs.

The name resolves as follows:

PA = PROFIBUS PA slave

0 = DP GSD file

39733.gsd = name of the file

Example 2

"PA139733.gsd" is a profile GSD file for 4 binary outputs.

The name resolves as follows:

PA = PROFIBUS PA slave

1 = PA GSD file

39733.gsd = name of the file

If manufacturer-specific GSD files are used, e.g., to define functionalities outside the profile, proceed as follows to identify whether it is a DP or PA GSD file:

- If not already done, load the GSD file in your configuration tool.
- Check which baud rates your configuration tool supports.

If a baud rate of 31.25 kBd is supported, this indicates a PA GSD file. The PA GSD file usually only supports the baud rates 31.25 kBd, 45.45 kBd and 93.75 kBd.

If the data transfer rates are supported according to the PROFIBUS specification IEC 61158, i.e., the baud rates 9.6 kBd to 1.5 MBd or 12 MBd, this indicates a DP GSD file.

Some PROFIBUS PA field device manufacturers do not offer PROFIBUS DP GSD files. In this case, existing PROFIBUS PA GSD files must be converted. A suitable conversion software (a GSD file converter) is available free-of-charge at www.pepperl-fuchs.com. The conversion software enters the missing data transfer rates and sets necessary bus parameters to values that enable the PROFIBUS DP to operate correctly.

When the GSD file is converted, several functions that were previously supported by the original GSD file are restricted. The following functions can be affected:

- FREEZE function is disabled.
- SYNC function is disabled.

These functions are used with PROFIBUS DP to synchronize sensors/actuators. It is possible that these functions do no longer work correctly because operations at the PROFIBUS DP end (host end) run at data transfer rates of up to 12 MB/s and operations at the PROFIBUS PA end (field end) run at a data transfer rate of 31.25 KB/s.

At present, many PROFIBUS functions are not supported yet. In case a field device does not support a function, a message appears to inform you that these functions are no longer available after conversion. The following functions are affected:

- Master class 1 acyclic access
- PROFIBUS DP V2 function: Data Exchange Broadcast (publisher/subscriber)
- PROFIBUS DP V2 function: Isochronous mode, i.e., synchronous cyclic transmission

GSD Converter

If you need a conversion tool in order to convert PA GSD files into DP GSD files, you can use the Pepperl+Fuchs GSD converter free of charge.



Tip

Download Free Software Tool

If needed, download the Pepperl+Fuchs GSD converter from the product information page of the device you obtained at www.pepperl-fuchs.com.



Using the Pepperl+Fuchs GSD Converter



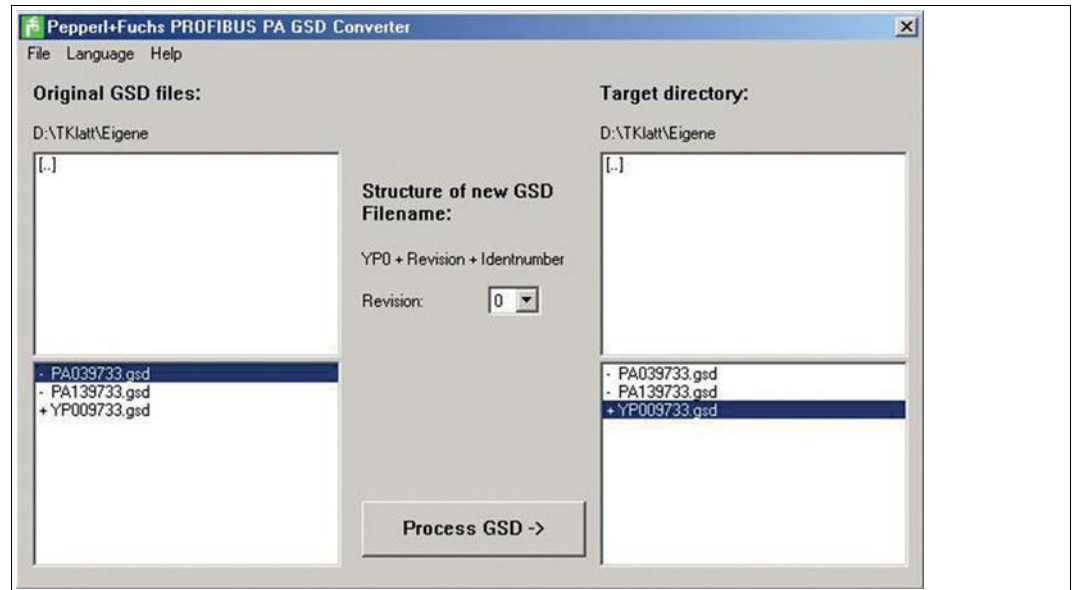
Note!

The advisory board of the PROFIBUS user organization has agreed not to rescind the certification of GSD files that are modified using Pepperl+Fuchs GSD converter software.

In order to convert GSD files, proceed as follows:

1. Start the program PFGSDCX.EXE

↳ The following dialog window appears:



2. Select the directory that contains the GSD files intend to convert.
3. Select the GSD files you intend to convert.
Files preceded by a "+" symbol are the result of a previous conversion. These files cannot be converted again and an error message appears if an attempt is made to do so. Files beginning with a "-" symbol have not been converted yet and can be converted if required. Doubleclick to open and view or edit a file.
You can select one or more files for conversion by pressing the [CTRL] or [SHIFT] keys.
4. Select the directory where you intend to store the converted GSD files.
5. Convert the GSD files by clicking the **Process GSD ->** button.

↳ A window opens with information on the finished conversion process.

4.1.2 Information on Watchdog Time (T_{WD})

PROFIBUS devices can activate a mechanism that monitors each time interval in the cyclic data exchange process (or "user data exchange") to ensure that the PROFIBUS master is still active. This so-called watchdog time (T_{WD}) is measured in the PROFIBUS slave.

If the response monitor is active and the T_{WD} since the last cyclic polling process has expired, the device stops the cyclic data exchange, reverts to its original status (Wait_prm) and secures the status of the outputs.

The T_{WD} time value and the signal for activating the response monitor are transmitted from the PROFIBUS master to the PROFIBUS slave in the parameter telegram at start-up during the cyclic data exchange. The T_{WD} is generally defined as user-specific and not device-specific, i.e., it is not included in the GSD file. Lower values are limited by the cycle times.

The T_{WD} is usually entered via the configuration tool. The watchdog setting in the DP/PA gateway is transparent. In some configuration tools, the response monitor is preset once for the PROFIBUS master. In other tools, the response monitor is preset individually for each PROFIBUS PA participant. The response monitor value does not change in any way.

Many tools calculate the T_{WD} automatically with a corresponding baud rate based on the cycle time of the master.

If the baud rates at the PROFIBUS DP end are high (e.g., 1.5 MB/s), the cycle times of the PA end are up to 300 x longer. If a PROFIBUS PA device is directly programmed with a T_{WD} calculated at a higher master baud rate (DP), this is usually shorter than the PA cycle and the device does not exchange data.

In order to ensure that the DP/PA gateway operates reliably, it is recommended that you set the following bus parameters:

- Program only one T_{WD} for the entire PROFIBUS system. Determine the longest delay period in order to define the T_{WD} .
- Program one T_{WD} for each individual slave.

The preset (programmed) time T_{WD} must be greater than the maximum occurring delay period T_{V_max} . This is determined as follows:

$$T_{V_max} = T_{cycle_DP} + T_{cycle_PA_channel}$$

with $T_{cycle_PA_channel}$ = cycle time of the PROFIBUS PA channel

T_{cycle_DP} = cycle time of PROFIBUS DP

Pepperl+Fuchs recommends a value 3 x the PROFIBUS PA cycle time.

The PA cycle time $T_{cycle_PA_channel}$ depends on the following aspects:

- Number of devices attached to the bus on 1 channel n
- User data length L

The user data length L is a unitless variable calculated as an average quantity of user data input and output (in bytes) for all devices.

The following is an approximate calculation for the cycle time:

$$T_{cycle_PA_channel} = n * (0.256 \text{ ms} * L + 12 \text{ ms}) + 40 \text{ ms}$$

5 Operation

5.1 Getting Started

Connect PROFIBUS PA, PROFIBUS DP, 24 V power supply, and earth to the Segment Coupler. If the Segment Coupler is physically the last device on the PROFIBUS DP segment with the terminator activated, no further configuration is required.

1. All cables and wires are connected and the 24 V power supply is switched on.

Observe LED PWR:

- The LED PWR is switched on if the PROFIBUS PA voltage is between 24 V ... 26 V
 - If the LED PWR is off, the device is defective.
2. The PROFIBUS PA master starts to scan connected field devices independently of whether the Segment Coupler is connected to a PROFIBUS DP master or not.








Observe LED PA:

- If field devices are found, the LED PA is switched off.
 - If no field devices are detected, the LED PA starts to flash at 2 Hz.
3. The Segment Coupler is connected to a PROFIBUS DP master.

Observe LED DP:

- If the Segment Coupler detects PROFIBUS DP communication, the LED DP is switched off.
 - If no PROFIBUS DP communication is detected, the LED DP flashes at 2 Hz.
 - If the Segment Coupler has a defect, the LED DP is lit up.
4. Configure your PROFIBUS PA devices in your system. Check that the GSD files of the PROFIBUS PA devices in use contain the baud rate you intend to configure in your PROFIBUS DP master. If this is not the case, run the Pepperl+Fuchs GSD converter program.

LED Indicators on the Power Supply Module

LED	Status / Error	Remedy
LED is lit up green:  PWR	PROFIBUS PA voltage is between 24 V ... 26 V	
LED is off:  PWR	The device is not connected to the power supply. The device is defective.	Check the termination. Check the cable connection. Exchange the device or contact Pepperl+Fuchs for repair.
LED is off:  PA	(Provided that the Segment Coupler is powered:) Field devices found.	
LED flashes red at 2 Hz:  PA	No field devices detected.	Ensure that the device is connected to a PROFIBUS DP master. Ensure the field devices are connected properly.
LED is off:  DP	(Provided the device is connected to a PROFIBUS DP master:) PROFIBUS DP communication detected.	
LED flashes red at 2 Hz:  DP	No PROFIBUS DP communication detected.	Ensure the device is properly connected to the DP master. Check the DP master.
LED is lit up red:  DP	The device is defective.	Exchange the device or contact Pepperl+Fuchs for repair.

6 Appendix

6.1 Ordering Information

Accessories

Type Code	Description
UPR-03	Universal Power Rail®
KFD2-EB2	Power feed module
KFD2-EB2.R4A.B	Redundant power feed module

6.2 Electromagnetic Compatibility Verification

Verification in Accordance with EC Council Legislation Directive 2004/108/EC and 2014/30/EU

Compatibility in Accordance with EN 61326-1 and NAMUR NE 21 Recommendation

The electromagnetic compatibility (EMC) requirements, applicable for electrical equipment for measurement, control, and laboratory use in general are anchored in the international standard EN 61326. 3 different performance criteria are distinguished in this standard:

A class **A** device operates as intended during the test. This device can withstand the immunity tests without any noticeable performance degradations within the specification limits of the manufacturer.

A class **B** device operates as intended after the test. The device shows temporary degradation or loss of function of performance during the test but self-recovers from that state when the exposures are ceased.

A class **C** device has loss of function. The device may need manual restoration. During the test a temporary loss of function is allowed, as long as an operator can restore the device back to operation.

The requirements of the association for standard and control and regulations of the German chemical industries, defined in the NE 21 recommendation, are partly higher compared to the test levels and failure criteria defined in EN 61326-1. For the product qualification, the failure criteria and test levels selected always represent the worst case conditions.

EN 61000-4, as a generic standard, defines the test setups for the specific required test for EN 61326-1 and NE 21.

See declaration of conformity for standards and editions applied.

Conducted EMC Tests

Immunity

Standard	Type	Test Level	Category
EN 61000-4-2	Electrostatic discharge, direct contact	6 kV	A
	Electrostatic discharge, indirect, air	8 kV	A
EN 61000-4-3	Electromagnetic field radiated, radio frequency	10 V/m	A
EN 61000-4-4	Fast transients burst on signal lines	1 kV	A
	Fast transients burst on power lines	2 kV	A
EN 61000-4-5	Slow transient surge on signal lines	1 kV	B
	Slow transient surge on shielded lines	2 kV	B
EN 61000-4-6	Conducted immunity, radio frequency	10 V	A
EN 55011	Reduction factor conducted emission	Class A	–
	Reduction factor radiated emission	Class A	–

6.3

Referenced Documents

- Manual: "Using Pepperl+Fuchs Fieldbus Equipment in Zone 2 Hazardous Area Environment"
- PROFIBUS & PROFINET International (PI): PROFIBUS PA Installation Guideline.
- Manual: System Description K-System.

PROCESS AUTOMATION – PROTECTING YOUR PROCESS



Worldwide Headquarters

Pepperl+Fuchs GmbH
68307 Mannheim · Germany
Tel. +49 621 776-0
E-mail: info@de.pepperl-fuchs.com

For the Pepperl+Fuchs representative
closest to you check www.pepperl-fuchs.com/contact

www.pepperl-fuchs.com

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