

SIEMENS

SIMATIC

DP/DP Coupler

Manual

Preface, Contents	1
Product Overview	2
Installation	3
Wiring	4
Configuring and commissioning	5
Operation of the DP/DP Coupler	6
Diagnostics	
Appendices	
Technical data	A
Order numbers and accessories	B
Glossary, Index	

Safety Guidelines

This manual contains notices intended to ensure personal safety, as well as to protect the products and connected equipment against damage. These notices are highlighted by the symbols shown below and graded according to severity by the following texts:



Danger

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.



Warning

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Caution

indicates that minor personal injury can result if proper precautions are not taken.

Caution

indicates that property damage can result if proper precautions are not taken.

Notice

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

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Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

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We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

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Preface

Purpose of the manual

This manual provides all the information required to install, wire, configure and commission the DP/DP Coupler.

Required basic knowledge

Knowledge required for handling this manual:

- General knowledge in the field of automation engineering
- Knowledge in the use of computers or PC-related equipment (e. g. programming devices) under the Windows operating system
- Knowledge of STEP 7. Provided in the "Programming in STEP 7 V5.2" manual.

Area where this manual applies

This manual applies to the DP/DP Coupler, order no. 6ES7 158-0AD01-0XA0.

It describes the components valid at the time of the manual's publication. We reserve the right to enclose a product information document containing current information with new components and new releases of components.

Changes since the previous version

This manual contains the descriptions of enhancements and changes compared with the previous version:

- Chapter A.1.1 Standards and approvals updated.

Approbation

see chapter A.1 General technical data

CE label

see chapter A.1 General technical data

Australian label (C-Tick-Mark)

see chapter A.1 General technical data

Standards

see chapter A.1 General technical data

Position in the information landscape

In addition to this manual, you require the following hardware-specific manuals:

- The manual of the DP master being used, especially the following information:
 - Configuration and commissioning of a DP master system
 - Description of the DP master
- The manual entitled *SIMATIC NET, PROFIBUS Networks* (order no. 6GK1 970-5CA10-0xA0)

Manual guide

This manual is organized by the following topics:

- Product overview and description of the DP/DP Coupler
- Installation, wiring and commissioning
- Operation and diagnostics
- Appendices
- Important terminology is explained in the glossary.
- The index will help you to quickly find text passages associated with specific keywords.

Recycling and disposal

The DP/DP Coupler can be recycled due to its low-pollutant equipment. For environment-friendly recycling or disposal of your old equipment, contact a company certified for the disposal of electronic waste.

Additional support

If you have any questions on the use of the product described in this manual that are not answered here, please contact your local Siemens partner or branch office.

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Here you will find the following:

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- The right documents, using our Service & Support search engine.
- A forum for the exchange of information between users and specialists worldwide.
- Your local representative for Automation & Drives in our partner database.
- Information on local services, repairs, spare parts. Still more information is available to you under "Services".

Contents

	Preface	iii
1	Product Overview	1-1
1.1	Field of application and function	1-1
1.2	Compatibility to precursor modules	1-4
2	Installation	2-1
2.1	Installation principles	2-1
2.2	Installing the P/DP Link	2-2
3	Wiring	3-1
3.1	Electrical isolation and grounding	3-1
3.1.1	General rules and regulations for operation	3-2
3.1.2	Operation on a grounded power supply	3-5
3.2	Connections	3-6
3.3	Connecting the power supply	3-7
3.4	Connecting PROFIBUS DP	3-8
4	Configuring and commissioning	4-1
4.1	What are my steps in configuring the DP/DP Coupler?	4-2
4.2	Setting the DIL switch on the DP/DP Coupler	4-3
4.2.1	Setting the "PS" DIL switch	4-3
4.2.2	Setting the "DIA" DIL switch (data validity indication)	4-4
4.2.3	Setting the "ADDR" DIL switch	4-5
4.2.4	Setting the PROFIBUS address on the DIL switch	4-6
4.3	Configuring the DP/DP Coupler in STEP 7	4-8
4.3.1	Configuring the DP/DP Coupler in STEP 7	4-9
4.3.2	Setting the PROFIBUS address in STEP 7	4-10
4.3.3	Setting the properties of the DP/DP Coupler in STEP 7	4-11
4.3.4	Example of a configuration of the DP/DP Coupler I/O in STEP 7	4-12
4.4	Configuring the DP/DP Coupler with another engineering tool	4-13
4.5	Commissioning the DP/DP Coupler	4-14
5	Operation of the DP/DP Coupler	5-1
5.1	Replacement of a faulty DP/DP Coupler	5-1
5.2	Response times of the DP/DP Coupler	5-1

6	Diagnostics	6-1
6.1	Diagnostics by means of LED indication	6-2
6.2	Diagnostics by means of the user program	6-4
6.2.1	Structure of the slave diagnosis	6-4
6.2.2	Standard diagnosis	6-6
6.2.3	Status message (module diagnostics) – only for operation on a DP master (DPV1) or S7 DP master	6-8
6.2.4	Module diagnostics - replacement part mode or operation on a DP master (DPV0)	6-10
6.3	Example of a diagnosis	6-11
6.3.1	Task	6-11
6.3.2	Solution with STEP 7	6-12
A	Technical data	A-1
A.1	General technical data	A-1
A.1.1	Standards and approvals	A-2
A.1.2	Electromagnetic compatibility	A-6
A.1.3	Transportation and storage conditions	A-8
A.1.4	Mechanical and climatic ambient conditions for operation	A-9
A.1.5	Data on insulation tests, protection class and degree of protection	A-11
A.1.6	Rated voltage	A-11
A.2	Technical data of the DP/DP Coupler (6ES7 158-0AD01-0XA0)	A-12
A.3	Use of the DP/DP Coupler in potentially explosive environments of Zone 2 (in all official EU languages)	A-13
B	Order numbers and accessories	B-1
	Glossary	
	Index	

Figures

1-1	DP/DP coupling of two PROFIBUS DP networks	1-1
1-2	Function principle of the DP/DP Coupler (example)	1-2
1-3	Operator and display elements of the DP/DP Coupler	1-3
2-1	Remove the slide on the bottom of the module before you install it on the S7 system rail	2-3
3-1	Termination of the PROFIBUS cable shielding on the grounded shielding busbar	3-4
3-2	Configuration with a grounded supply	3-5
3-3	Connections of the DP/DP Coupler	3-6
3-4	Power supply für den DP/DP Coupler	3-7
4-1	Example of DIL switch settings	4-7
4-2	Example: Configuration of the DP/DP Coupler on network 1	4-12
4-3	Example: Configuration of the DP/DP Coupler on network 2	4-13
6-1	Status / error displays of the DP/DP Coupler	6-2
6-2	Structure of the standard diagnosis	6-6
6-3	Structure of module diagnostics (DPV1 / S7 DP master)	6-9
6-4	Structure of module diagnostics (replacement part mode or operation on a DP master (DPV0))	6-10
6-5	Example of the analysis of diagnostics data from the DP/DP Coupler ...	6-11

Tables

4-1	How to configure the DP/DP Coupler	4-2
4-2	Meaning of the "DIA" switch positions	4-4
6-1	Meaning of the LEDs ON 1 and ON 2	6-2
6-2	Status / error messages of the DP/DP Coupler	6-3
6-3	Length and start addresses of the diagnostics blocks for operation on a DP master (DPV1) or S7 DP master	6-5
6-4	Length and start addresses of the diagnostic blocks in replacement mode	6-5
6-5	Structure of station status 1	6-6
6-6	Structure of station status 2	6-7
6-7	Structure of station status 3	6-7
6-8	Structure of the device identifier	6-8
6-9	Call of the SFC 13 (DPNRM_DG) in the OB 1	6-12
6-10	Example: Analysis of the diagnostics data	6-13
A-1	Use in industrial environments	A-4
A-2	Pulse-type interference	A-6
A-3	Sinusoidal interference	A-7
A-4	Transportation and storage conditions	A-8
A-5	Mechanical ambient conditions	A-9
A-6	Test for mechanical ambient conditions	A-10
A-7	Climatic ambient conditions	A-10
A-8	Test voltages	A-11
B-1	Order numbers for the DP/DP Coupler	B-1

Product Overview

1

1.1 Field of application and function

Field of application

DP/DP Coupler is used to interconnect two PROFIBUS DP networks in order to enable the transfer of data between the master of both networks.

The maximum length of transferred data consists of 244 bytes of input data and 244 bytes of output data.

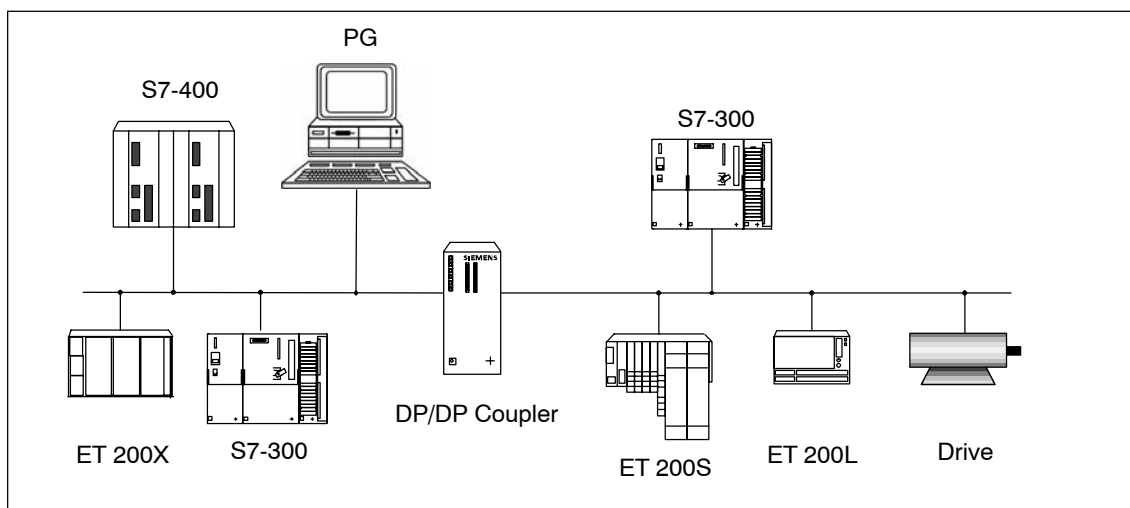


Figure 1-1 DP/DP coupling of two PROFIBUS DP networks

Configuration

You configure the DP/DP Coupler using either STEP 7 or a programming tool that integrates the DP/DP Coupler by means of a GSD file.

In STEP 7, you can set up the required length of input and output data. The output data on one side of the DP/DP Coupler form the input data of the other, and vice versa.

In STEP 7, define the I/O data areas based on the slot IDs.

Example

The example below shows the independence of both networks. That means, you configure a separate PROFIBUS address for each PROFIBUS DP network.

In the figure below, that is PROFIBUS address 3 in network 1, and PROFIBUS address 50 in network 2.

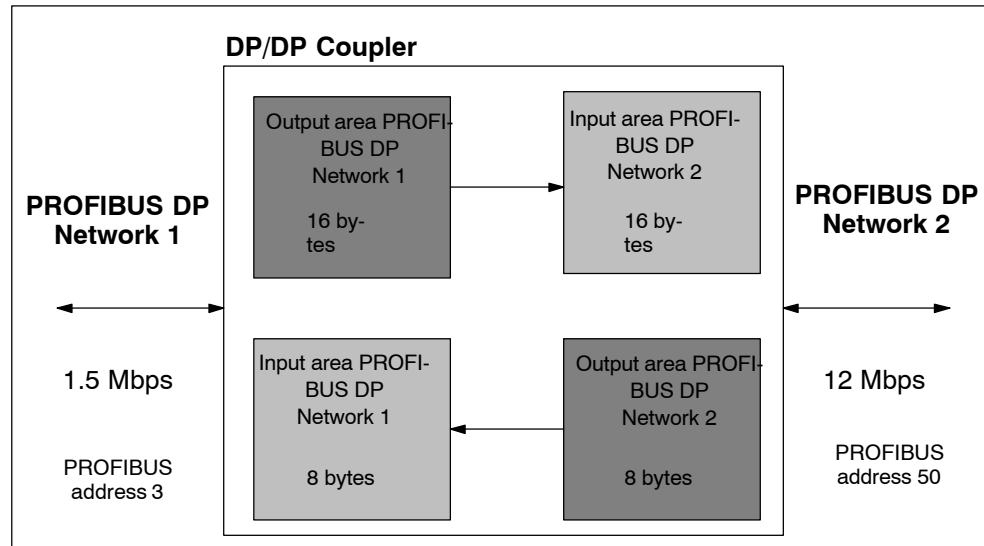


Figure 1-2 Function principle of the DP/DP Coupler (example)

Both networks may operate at different baud rates. The rate at which network 1 writes data to the output buffer is slower than the rate at which network 2 reads these data. Hence, network 2 reads the same data successively. The effect is the reverse when data are transferred from network 2 to network 1. The output buffer will be overwritten several times before network 1 reads the data buffer. This means that only the currently written data are available.

Notice

You need to balance the I/O area of both networks.

Appearance

The figure below shows the DP/DP Coupler and its operator and display elements:

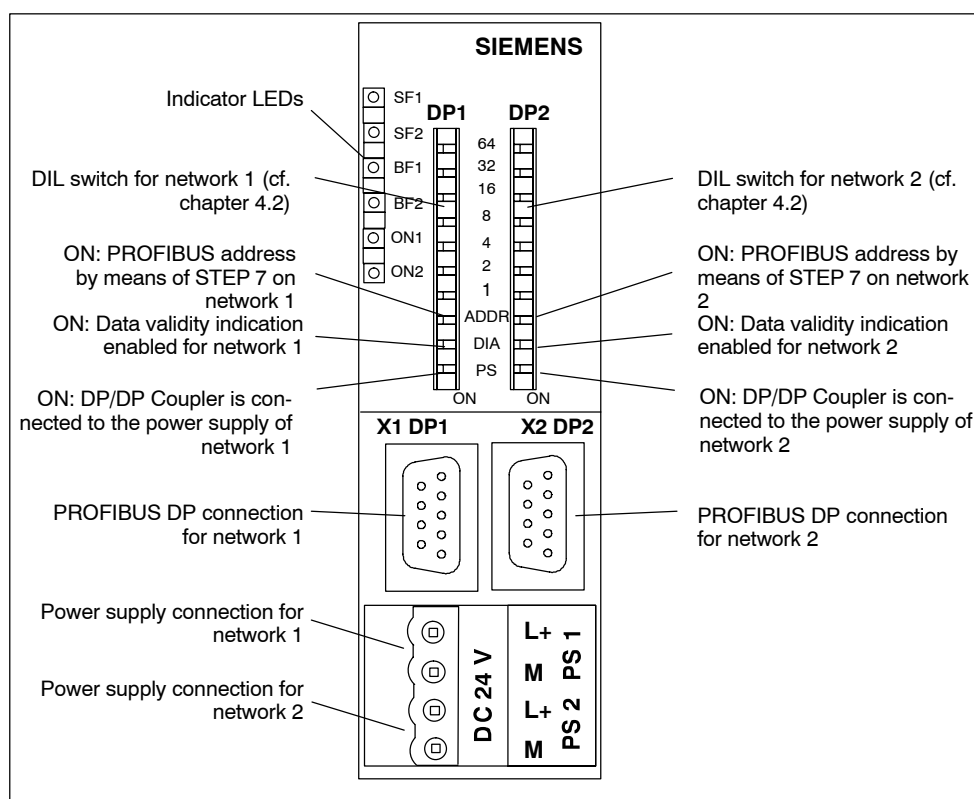


Figure 1-3 Operator and display elements of the DP/DP Coupler

Features

Properties of the DP/DP Coupler:

- Maximum length of data exchanged consists of 244 bytes input data and 244 bytes of output data, of which up to 128 bytes are consistent
- Up to 16 I/O areas for data exchange
- If one side fails, the output values of the other are retained
- DPV1 is supported with full and uniform diagnostic functions
- PROFIBUS address setting either via selector switch on the DP/DP Coupler, or in STEP 7, or by means of another programming tool
- Different transmission rates and PROFIBUS addresses on both sides of the DP/DP Coupler
- Electrical isolation between the DP networks
- Dual power supply

1.2 Compatibility to precursor modules

The DP/DP Coupler, order no. 6ES7 158-0AD01-0XA0, is compatible with the DP/DP Coupler, order no. 6ES7 158-0AD00-0XA0. We have enhanced the diagnostic information for SYNC and FREEZE mode on Link 6ES7 158-0AD01-0XA0 compared with DP/DP Coupler 6ES7 158-0AD00-0XA0, and adapted these data in accordance with PROFIBUS standard.

The DP/DP Coupler 6ES7 158-0AD01-0XA0 can be used to replace previous module versions. The design is compatible.

The DP/DP Coupler is available as spare part under order no. 6ES7 158-0AD00-0XA0.

Installation

2

Overview of contents

Section	Topic	Page
2.1	Installation principles	2-1
2.2	Installing the DP/DP Coupler	2-2

2.1 Installation principles

Mounting position

The mounting position of the DP/DP Coupler is user-specific. Please note, that the ambient temperature may not exceed 60 °C when the device is mounted vertically, and for all other mounting positions 40 °C.

For further information on operational conditions, refer to chapter A.1.

Open equipment

The DP/DP Coupler is an open device. It may only be installed in cubicles, cabinets or electrical control rooms which can only be accessed by means of a key or a tool. Only trained or authorized personnel should have access to the housings, cabinets or electrical control rooms.

Mounting system

The DP/DP Coupler may be mounted on a DIN rail (7.5 mm and 15 mm), or on an S7 system profile rail . Ample free space of at least 40 mm above and below the module should be provided for the installation.

For more information on installing S7 modules, refer to the *S7-300 Programmable Controller, Installation* manual.

2.2 Installing the DP/DP Coupler

Components required

- DP/DP Coupler
- Profile rail:
 - DIN rail (7.5 mm or
 - 15 mm), or
 - a rail for the S7 mounting system

Component order nos. are found in appendix B.

Installing the DP/DP Coupler on a DIN rail

Step	Activity
1	When you install the DIN rail, make sure you provide at least 40 mm of free space above and below the modules in order to allow easy installation and the deflection of heat. Note: Always ensure a low-impedance connection between the DIN rail and the grounded sheet metal plate or mounting panel. For the installation on varnished or galvanized sheet metal you should use a suitable contact agent or contact disks, for example.
2	Hang the DP/DP Coupler onto the DIN rail and then swing it down.
3	Screw-tighten the DP/DP Coupler.
4	Wire the DP/DP Coupler as described in chapter 3.

Installing the DP/DP Coupler on a profile rail for the S7 installation system

Step	Activity
1	When you install the S7 profile rail, make sure you provide at least 40 mm of free space above and below the modules in order to allow easy installation and the deflection of heat. Note: Always ensure a low-impedance connection between the DIN rail and the grounded sheet metal plate or mounting panel. For the installation on varnished or galvanized sheet metal you should use a suitable contact agent or contact disks, for example.
2	Remove the slide from the bottom of your DP/DP Coupler with the help of a screwdriver (see fig. 2-1).
3	Hang the DP/DP Coupler onto the S7 profile rail and then swing it down.
4	Screw-tighten the DP/DP Coupler.
5	Wire the modules as described in chapter 3.

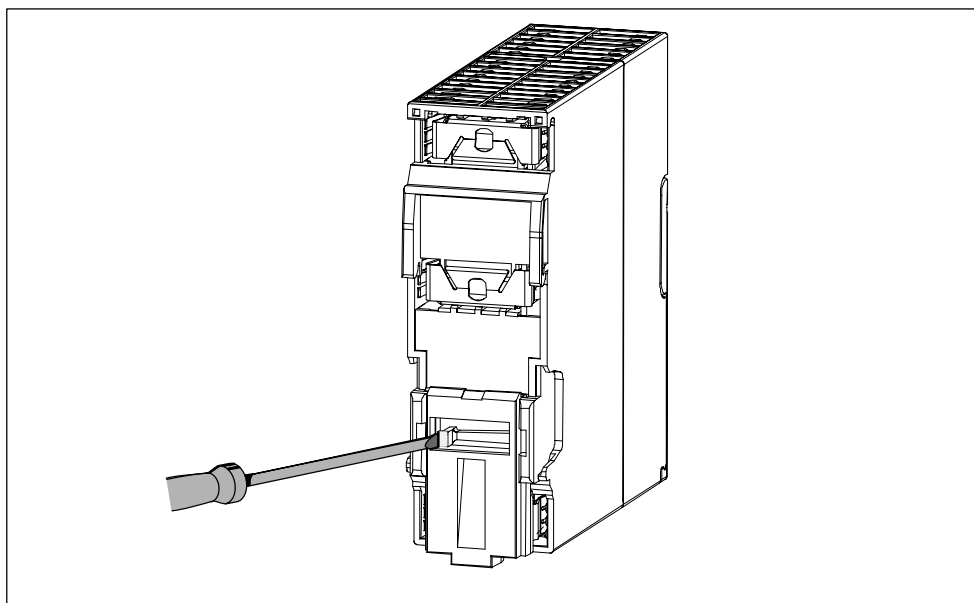


Figure 2-1 Remove the slide on the bottom of the module before you install it on the S7 system rail

Removing the DP/DP Coupler

You remove the DP/DP Coupler in reverse order.

Switch off the 24 V DC power supply to the DP/DP Coupler before you remove it.

Overview of contents

This chapter informs you of general requirements for wiring the DP/DP Coupler and of the connections you need.

Section	Topic	Page
3.1	Electrical isolation and grounding	3-1
3.2	Connections	3-6
3.3	Connecting the power supply	3-7
3.4	Connecting PROFIBUS DP	3-8

3.1 Electrical isolation and grounding

Overview of contents

Section	Topic	Page
3.1.1	General rules and regulations for operation	3-2
3.1.2	Operation with a grounded supply	3-5

Dual 24 V DC power supply

You may connect the DP/DP Coupler to two separate 24 V DC power supply modules.

Properties of the DP/DP Coupler

- both PROFIBUS DP networks are galvanically isolated
- both PROFIBUS DP networks are galvanically isolated from the 24 V DC power supply
- both 24 V DC power supplies are galvanically isolated
- PROFIBUS DP (network 1) and the logic components of the DP/DP Coupler are galvanically interconnected

Ungrounded power supply

Note

The DP/DP Coupler must be operated on a grounded 24 V DC power supply. It can not be operated on an ungrounded 24 V DC power supply!

3.1.1 General rules and regulations for operation

Introduction

When the described modules are used in a system, certain rules and regulations must be followed that depend on the area of application.

This section provides an overview of the most important rules that must be observed for safe integration in a system.

Specific applications

Please comply with the safety and accident prevention regulations (e.g. machine protection guidelines) that are valid for specific applications.

EMERGENCY-OFF equipment

EMERGENCY-OFF equipment to IEC 6204 (corresponds with DIN VDE 113) must retain an operational state in all operating modes of then system or plant.

Start-up of the system following specific events

The following table shows what you have to look out for when the system starts up after certain events.

In the case of ...	...
The system starts up after a voltage dip or power failure Start-up of the system after interruption of bus communication,	dangerous operating states may not develop. If necessary, force an "EMERGENCY-OFF"!
Startup after the "EMERGENCY-OFF" system is released Startup of the system without the DP master addressing the slaves,	an uncontrolled or undefined state must be prevented.

24V DC power supply

The following table shows what you have to look out for in the case of the 24V supply.

In the case of ...	You must remember ...	
Buildings	External lightning protection	Lightning protection measures (e.g. lightning conductors)
24 V DC power supply cables, signal cables	Internal lightning protection	
24 V DC supply	Safety extra-low voltage with safe electrical isolation (SELV)	

Note

For information on lightning protection, refer to the *S7-300 PLC; Installation* installation manual.

Protection from external electrical interference

The following table shows what you have to look out for to ensure protection against electrical influences or faults.

In the case of ...	You must ensure that ...
All systems in which the modules are integrated	... The system is connected to the protective conductor so that electromagnetic interference can be discharged.
Connecting, signal and bus lines	... The cable has been routed and installed correctly.
Signal and bus lines	... Cable or conductor breaks do not lead to undefined system states.

Shielding braid of the PROFIBUS cable

The shielding braid of the PROFIBUS cable must be terminated on a grounded shielding busbar.

- Connect the shielding braid with the help of metal cable clamps.
- Terminate the shielding to a shielding busbar which is mounted directly downstream of the cable inlet of the cabinet.
- The clamp should provide good contact to a large area of the shielding.

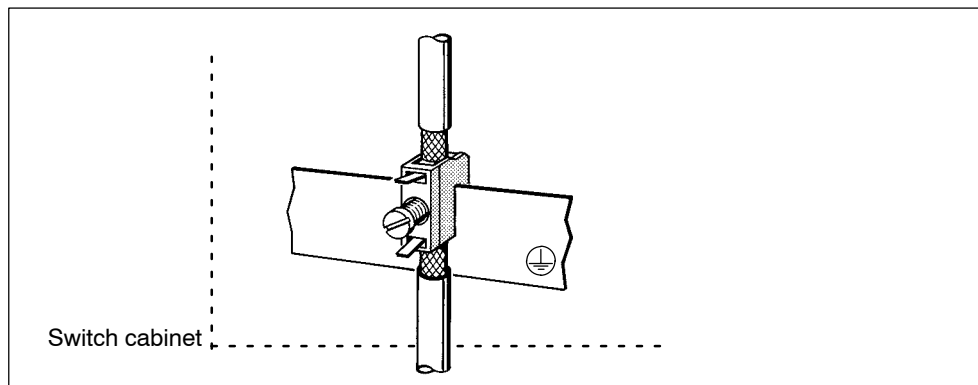


Figure 3-1 Termination of the PROFIBUS cable shielding on the grounded shielding busbar

3.1.2 Operation on a grounded power supply

Definition: Grounded power supply

The neutral conductor of grounded supplies is bonded to earth. An earth fault between a voltage-carrying conductor or grounded part of the system trips the connected protective devices.

Components and protective measures

Various components and protective measures are prescribed for the system installation. The type of components used and degree of protection for your system configuration is specified in accordance with DIN VDE directives.

- Main switch (see Figure 3-2, [1]): DIN VDE 0100 Part 460
- Isolator (see Figure 3-2, [2]): DIN VDE 0113 Part 1

Operation on grounded power supply

Figure 3-2 shows the position of the modules in a configuration connected to a TN-S power supply network. In installations with grounded reference potential, interference currents are discharged via the protective conductor.

Note: The arrangement of the power connections shown does not correspond to the actual arrangement on the modules; it was selected in the interest of clarity.

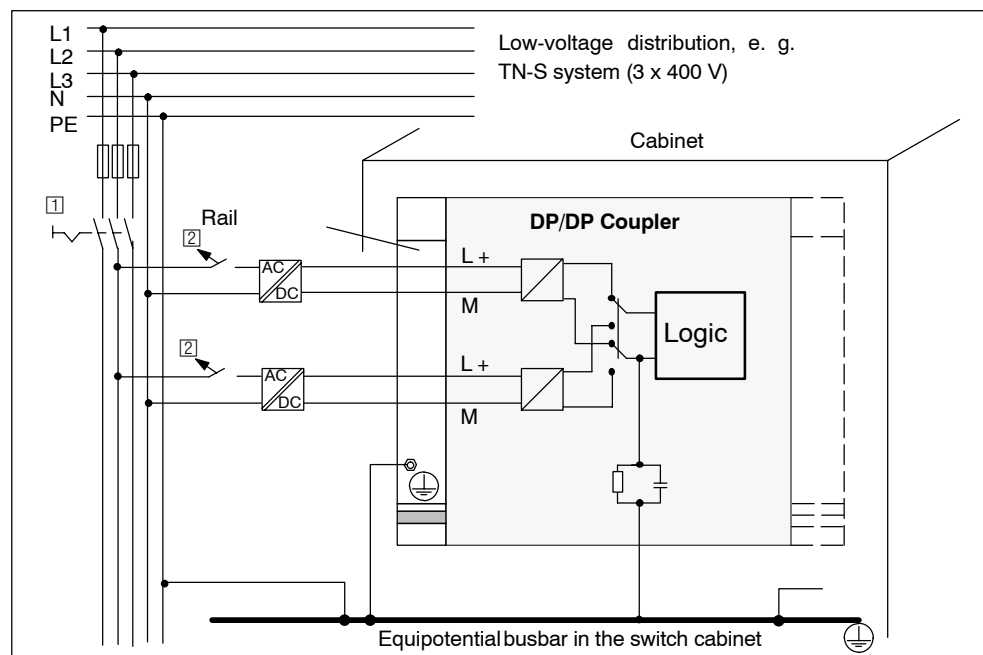


Figure 3-2 Configuration with a grounded supply

3.2 Connections

Connections of the DP/DP Coupler

The figure below shows all interconnections of the DP/DP Coupler:

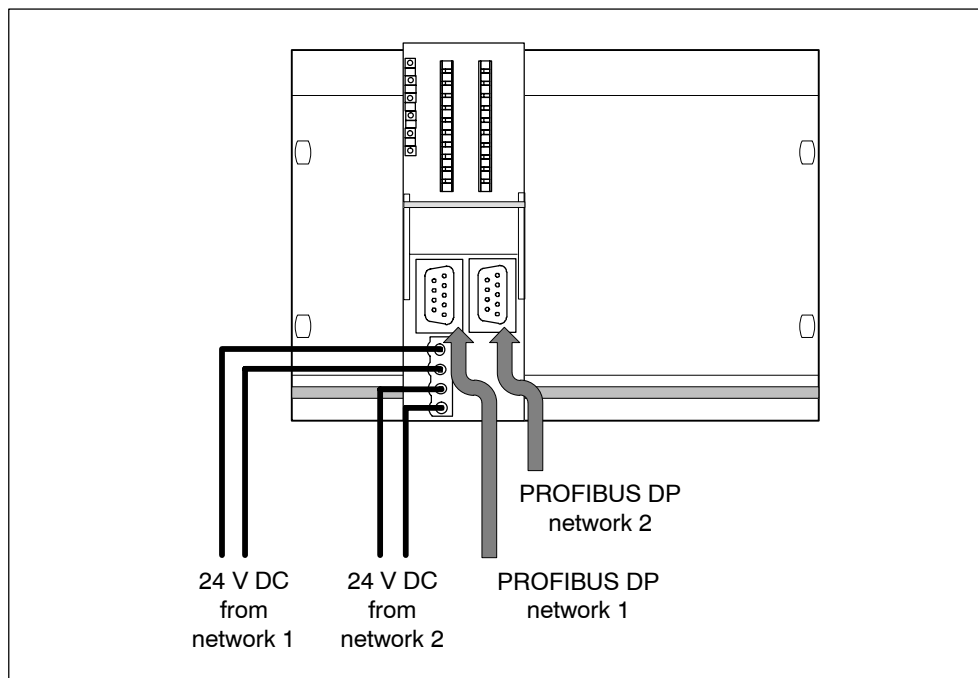


Figure 3-3 Connections of the DP/DP Coupler

3.3 Connecting the power supply

Required tool

To connect the power supply, you require a 3 mm screwdriver.

Power supply unit

You may only use power supply modules of the type PELV with electrically isolated operational extra-low voltage (≤ 60 V DC).

Dual power supply

You can use two separate power supply sources for the DP/DP Coupler:

- This power supply is redundant, i.e. in case of a module failure, the DP/DP Coupler automatically switches over the other source module.
- If both connections are under load (network 1 / network 2), the DP/DP Coupler automatically uses the network 1 power source.
- When using only a single power supply for the DP/DP Coupler, you should preferably connect this to PS2.

Note

The diagnostic system shows you whether the DP/DP Coupler is connected to the 24 V DC power supply or not. Always set the “PS” switch on the DP/DP Coupler to the correct position!

For further information on the DIL switch settings, refer to chapter 4.2.

Power supply connector

The 4-pin 24 V DC power supply connector is located on the front panel of the DP/DP Coupler. The connections have the following functions:

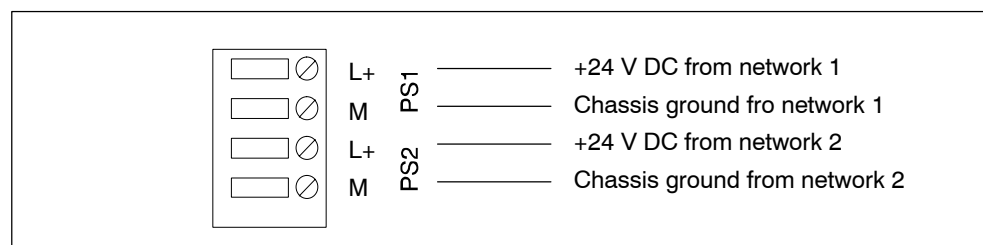


Figure 3-4 Power supply für den DP/DP Coupler

The maximum conductor cross-section is 2.5 mm². A cable strain relief is not provided.

Step	Activity
1	Strip the wires to a length of 10 mm.
2	Connect the wires to the 2-pin screw terminals of the connector. This connector is plugged into the power supply socket on the supplied unit. When a dual power supply is available for the DP/DP Coupler, you should connect both. If you only have one, you should preferably connect it to PS2.
3	Plug the wired 2-pin connector into the power supply socket of your DP/DP Coupler.
4	Set the "PS" selector switch on the DP/DP Coupler: • L+/M (PS1) connected to 24 V DC: Selector switch PS (DP1) to "ON" • L+/M (PS2) connected to 24 V DC: Selector switch PS (DP2) to "ON" The selector switch "PS" must be set properly in order to allow the correct evaluation of diagnostic data in STEP 7!

3.4 Connecting PROFIBUS DP

Required tool

You need a screwdriver with a blade width of 3 mm to install the bus connector to the DP/DP Coupler.

Bus cable and connector

Always use the accessories specified in appendix B for PROFIBUS DP.

For information on handling bus cables and connectors, refer to the *Distributed I/O System ET 200* manual.

Procedure

To connect PROFIBUS DP:

1. Insert the bus connector into the PROFIBUS socket.
2. Tighten the mounting screws on the bus connector.

Configuring and commissioning

4

Contents

This chapter shows you the steps in commissioning the DP/DP Coupler. Details are found in the relevant subsections.

Section	Topic	Page
4.1	What are the steps in commissioning DP/DP Coupler?	4-2
4.2	Setting the DIL switch on the DP/DP Coupler	4-3
4.3	Programming the DP/DP Coupler in STEP 7	4-8
4.4	Programming the DP/DP Coupler using another engineering tool	4-13
4.5	Commissioning of the DP/DP Coupler	4-14

4.1 What are my steps in configuring the DP/DP Coupler?

The table below shows you the steps required in commissioning.

Table 4-1 How to configure the DP/DP Coupler

Step	Activity	Content	Further information
1	Mounting	You have mounted the DP/DP Coupler onto a profile rail.	Chapter 2
2	Wiring	You have connected the DP/DP Coupler to the power supply and to PROFIBUS DP.	Chapter 3
3	Setting the "PS" DIL switch	Setting for both sides, according to the power supply connection to the DP/DP Coupler.	Chapter 4.2.1
4	Setting the "DIA" DIL switch	Setting for both sides, defines whether to validate transferred input data.	Chapter 4.2.2
5	Setting the "ADDR" DIL switch	Setting for both sides, to define whether the PROFIBUS address is set by means of DIL switch or in STEP 7.	Chapter 4.2.3
6	Setting the PROFIBUS address	Set the PROFIBUS address for both sides, using either the DIL switch or STEP 7.	
		• by means of DIL switch	Chapter 4.2.4
		• in STEP 7	Chapter 4.3.2
7	Configuring the DP/DP Coupler	• using STEP 7	Chapter 4.3.1
		• using another engineering tool	Chapter 4.4
8	Commission the DP/DP Coupler	Switch on the DP/DP Coupler and load the configuration data	Chapter 4.5

4.2 Setting the DIL switch on the DP/DP Coupler

Contents

Section	Topic	Page
4.2.1	Setting the “PS” DIL switch	4-3
4.2.2	Setting the “DIA” DIL switch (data validity indication)	4-4
4.2.3	Setting the “ADDR” DIL switch	4-5
4.2.4	Setting the PROFIBUS address on the DIL switch	4-6

4.2.1 Setting the “PS” DIL switch

Function of the “PS” (Power Supply) DIL switch

The “PS” DIL switch setting tells the DP/DP Coupler to which of its inlets the power supply is connected. This also allows the diagnostic function to report failures of the power supply.

Setting the “PS” DIL switch

Set the proper position of the “PS” DIL switch für sides of the DP/DP Coupler:

- PS (DP1) set to “ON”: L+/M (PS1) is connected to 24 V DC
- PS (DP2) set to “ON”: L+/M (PS2) is connected to 24 V DC

Note

The DP/DP Coupler accepts all changes immediately.

4.2.2 Setting the “DIA” DIL switch (data validity indication)

Function of the “DIA” DIL switch (data validity indication)

The “DIA” DIL switch function allows you to validate I/O data.

The setting of the “DIA” DIL switch does not influence the normal diagnostic messages of the DP/DP Coupler described in chapter 6.2.

Function principle of the data validity indication

The DP/DP Coupler enables the data transfer between two PROFIBUS DP networks. If one of the DP masters is silent, or data exchange is not possible due to an error at one of the DP/DP Coupler interfaces, the partner DP master should recognize invalid data transferred via the DP/DP Coupler.

You can validate data either by means of the slave diagnostics functions, or directly by analyzing the I/O data.

“DIA” in “OFF” position

I/O data validation is disabled when the “DIA” switch is set to “OFF”.

“DIA” in “ON” position

I/O data validation is enabled when the “DIA” switch is set to “ON”.

Table 4-2 Meaning of the “DIA” switch positions

DIA switch position	Validation of
DIA = ON (DP1)	input data from network 1 = output data from network 2
DIA = ON (DP2)	input data from network 2 = output data from network 1

The function uses the first bit of the LSB byte of the first configured input byte:

- Bit 1 (LSB inputs) = 1: Data from DP/DP Coupler are valid
- Bit 1 (LSB inputs) = 0: Data from DP/DP Coupler are invalid

Example

- Network 1: 8 byte input data – 16 byte output data
- Network 2: 16 byte input data – 8 byte output data

The first bit of the 8 byte of input data indicates validity of data from network 2, the first bit of the 16 byte input data indicates validity of data from network 1.



Warning

When “DIA” is in “ON” position, you may not use the first bit in the LSB of the first configured input byte for normal input data!

We advise you not to use the first byte of the input data for the inputs when using the data validity indication function!

Note

The DP/DP Coupler accepts all changes immediately.

4.2.3 Setting the “ADDR” DIL switch

Function of the “ADDR” (PROFIBUS address) DIL switch

The position of this switch determines whether the PROFIBUS address is set directly on the DP/DP Coupler, or whether it is assigned via PROFIBUS DP in the STEP 7 program.

Setting “ADDR”

Set the relevant position of the “ADDR” DIL switch for both sides of the DP/DP Coupler:

- “ADDR” in “OFF” position: The PROFIBUS address is set directly on the DIL switch of the DP/DP Coupler.

For further information, refer to chapter 4.2.4.

- “ADDR” in “ON” position: The PROFIBUS address is assigned in the STEP 7 program.

For further information, refer to chapter 4.3.2.

4.2.4 Setting the PROFIBUS address on the DIL switch

Definition

Each bus node must receive a PROFIBUS address so that it can be uniquely identified on PROFIBUS-DP. The PROFIBUS address is set separately for both PROFIBUS DP networks directly on the DIL switches of the DP/DP Coupler.

Note:

You can also assign the PROFIBUS address in STEP 7 (cf. chapter 4.3.2).

Rules

Rules for the assignment of a PROFIBUS address:

- Valid PROFIBUS address range: 1 to 125.
- All PROFIBUS addresses assigned must be unique within the DP master system.
- You assign a PROFIBUS address to **each side** of the DP/DP Coupler. It is also possible to assign the PROFIBUS address for one side of the DP/DP Coupler directly on the Link, and the other in STEP 7.

Required tool

To set the PROFIBUS address, you require a 3 mm screwdriver.

How to set the PROFIBUS address directly on the DP/DP Coupler

Step	Activity
1	Switch off the 24 V DC power supply to the DP/DP Coupler.
2	Open the front panel door of the DP/DP Coupler.
3	Set the required PROFIBUS address with a screwdriver. The PROFIBUS address is formed by the sum of all values of the switches in "ON" position (switch in right position).
4	Set the ADDR DIL switch to the left ("OFF" position). Result: The PROFIBUS address is read from the DIL switch position, rather than from the non-volatile memory of the DP/DP Coupler.
5	Switch on the 24 V DC power supply to the DP/DP Coupler. Result: The DP/DP Coupler applies the PROFIBUS address you have set on the switch.

Example of DIL switch settings

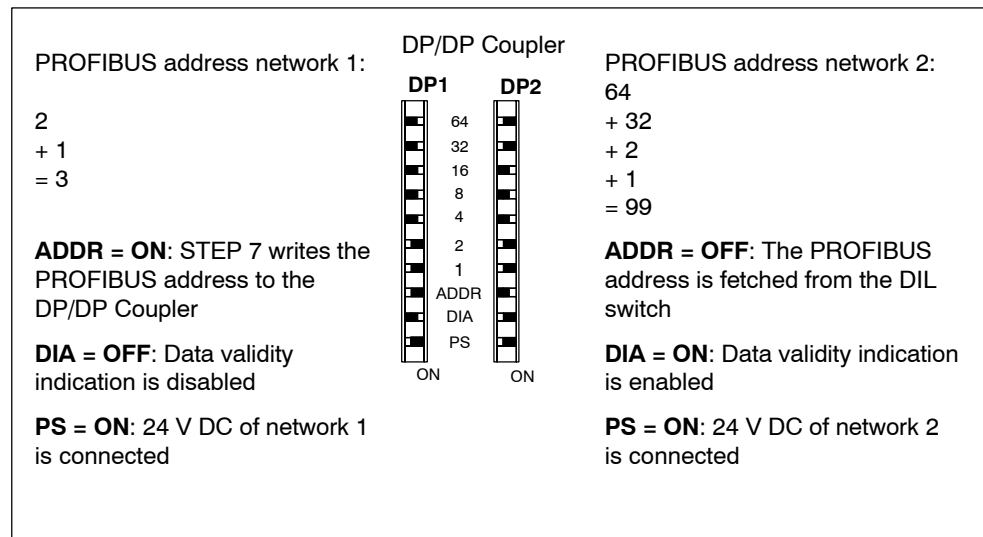


Figure 4-1 Example of DIL switch settings

Changing the PROFIBUS address

You may change the set PROFIBUS address (1 to 125) at any time.

Note

The changes are not applied to the DP/DP Coupler until you have cycled the 24 V DC supply (off/on).

4.3 Configuring the DP/DP Coupler in STEP 7

Contents

Section	Topic	Page
4.3.1	Configuring the DP/DP Coupler in STEP 7	4-9
4.3.2	Setting the PROFIBUS address in STEP 7	4-10
4.3.3	Setting the DP/DP Coupler properties in STEP 7	4-11
4.3.4	Example of an I/O configuration for the DP/DP Coupler in STEP 7	4-12

Prerequisites

You require the GSD file SI018070.GS? in order to be able to program the DP/DP Coupler in STEP 7. Integrate this GSD file into your engineering tool.

This GSD file is included in STEP 7 V5.3 and higher.

GSD file

A GSD file (SI018070.GS?) is available for the DP/DP Coupler. You can download this file free of charge from the Internet, under:

http://www.ad.siemens.de/csi_e/gsd

4.3.1 Configuring the DP/DP Coupler in STEP 7

The DP/DP Coupler is programmed in STEP 7 for standard operation. The DP/DP Coupler requires a configuration for both DP networks, with separate master systems.

Notice

You need to balance the I/O area of both networks.

Step	Activity
1	Start STEP 7 and open HW Config.
2	Drag-and-drop the DP/DP Coupler from the hardware catalog in the folder PROFIBUS-DP\Further FIELD DEVICES\Gateway\DP/DP Coupler, Release 2 to the PROFIBUS network. Result: The properties dialog box for the PROFIBUS interface of the DP/DP Coupler appears.
3	Set the PROFIBUS address of the DP/DP Coupler. This address must correspond with the PROFIBUS address set on the DP/DP Coupler. Confirm your entries with OK. Result: The DP/DP Coupler is added to the DP master system.
4	Now you configure the slots of the DP/DP Coupler Starting at slot 1, type in the relevant DP IDs for the input or output data. If you are using I/O data in mixed mode, use a universal DP identifier module.
5	Type in the input and/or output address for each slot.
6	Confirm your entries with "OK". Result: You have now configured one side of the DP/DP Coupler.
7	Repeat steps 2 to 6 for the second PROFIBUS DP system connected to the DP/DP Coupler. Important • Network 1 inputs are outputs of network 2, • Network 1 outputs are inputs of network 1,

Note

Only with configuration of both sides of the DP/DP Coupler
6ES7 158-0AD01-0XA0:

If your slot configuration (of inputs and outputs) is incongruent, the DP/DP Coupler reports a configuration error to the networks 1 and 2.

4.3.2 Setting the PROFIBUS address in STEP 7

Requirements

The DP/DP Coupler has been configured in STEP 7(cf. chapter 4.3.1).

Definition

Each bus node must receive a PROFIBUS address so that it can be uniquely identified on PROFIBUS-DP. The PROFIBUS address is set in STEP 7 separately for each on of the two PROFIBUS DP networks.

Note:

You can also set the PROFIBUS address directly on the DIL switches of the DP/DP Coupler (cf. chapter 4.2.4).

Rules

Rules for the assignment of a PROFIBUS address:

- The valid PROFIBUS addresses are: 1 to 125.
- Each PROFIBUS address can only be assigned once in a DP master system.
- You assign a PROFIBUS address to **each side** of the DP/DP Coupler. It is also possible to assign the PROFIBUS address for one side of the DP/DP Coupler directly on the Link, and the other in STEP 7.

Setting the PROFIBUS address in STEP 7

The default PROFIBUS address "126" is stored in the non-volatile memory of your DP/DP Coupler.

Step	Activity
1	Set the ADDR DIL switch to the left "ON" position. Result: The PROFIBUS address is fetched from the non-volatile memory area in the DP/DP Coupler.
2	Switch on the 24 V DC power supply to the DP/DP Coupler. Result: The LEDs ON1 and/or ON2 are lit.
3	Connect the PG/PC via PG cable to the DP network or to the DP/DP Coupler.
4	Open STEP 7 <i>HW Config</i> and configure the DP/DP Coupler.
5	In <i>HW Config</i> , select the configured DP/DP Coupler.
6	Go to PLC > PROFIBUS > Assign PROFIBUS address . Result: The "PROFIBUS address" view appears.
7	Enter the configured PROFIBUS address and confirm with "OK". Result: The PROFIBUS address is transferred to the non-volatile memory of the DP/DP Coupler.

4.3.3 Setting the properties of the DP/DP Coupler in STEP 7

Properties – DP slave

In the "Configuration" tab of the "Properties – DP slave" dialog box, you can set the following properties:

- "Configuration" tab:
 - DP alarm mode: DPV0 or DPV1 slave
 - Permit external diagnostics

DPV0 or DPV1 slave

The DP/DP Coupler can only be operated as a DPV1 slave in combination with a DPV1 master. The additional functions (acyclical services) of a DPV1 slave can only be used if this is the case.

DP slaves defined as DPV1 slaves in their GSD file can be selected from a dropdown list for operation in DPV1 or DPV0 mode.

Allow external diagnostics

- **Extended diagnostics enabled:**

This setting is used in RUN mode. When the DP/DP Coupler reports a diagnostics event on network 1 (e.g. bus connector on network 1 has been removed), OB 82 is executed. LED SF2 is lit in addition. The message "Module error" is written to the diagnostics buffer of the CPU.

- **Extended diagnostics disabled:**

This setting is used for commissioning the system. When the DP/DP Coupler reports a diagnostics event on network 1 (e.g. bus connector on network 1 has been removed), OB 82 is also executed. LED SF2 is not lit. The system does not write any data to the diagnostics buffer of the CPU.

After you commissioned the system, reset the diagnostics function to "Extended diagnostics enabled"!

4.3.4 Example of a configuration of the DP/DP Coupler I/O in STEP 7

Introduction

This example shows a typical configuration of the DP/DP Coupler using STEP 7.

Task

The following assumptions have been made for this example:

- **Network 1:**
 - The DP/DP Coupler is assigned PROFIBUS address 4.
 - To be **transferred to the DP master on network 2:**
 - 2 bytes inputs (inconsistent)
 - 16 bytes outputs (inconsistent)
 - 8 bytes inputs (consistent)
 - 2 bytes outputs (consistent)
 - 3 bytes inputs / 5 bytes outputs (consistent)
- **Network 2:**
 - The DP/DP Coupler is assigned PROFIBUS address 24.
 - To be **transferred to the DP master on network 1:**
 - 2 bytes outputs (inconsistent)
 - 16 bytes inputs (inconsistent)
 - 8 bytes outputs (consistent)
 - 2 bytes inputs (consistent)
 - 5 bytes inputs / 3 bytes outputs (consistent)

Configuring the DP/DP Coupler on network 1 in STEP 7

Configuration of the DP/DP Coupler on network 1:

  (4) DP/DP Coupler, release 2					
Slot	DP ID	Order no./name	Input address	Output address	Comment
1	16DE	2 bytes input	0...1		
2	47	16 bytes output		0...15	
3	151	8 bytes input consistent	256...263		
4	161	2 bytes output consistent		256...257	
5	192	Universal module	2...4	16...20	
6					
7					

Figure 4-2 Example: Configuration of the DP/DP Coupler on network 1

Configuring the DP/DP Coupler on network 2 in STEP 7

This DP/DP Coupler configuration must be absolutely congruent to the network 1 configuration. The resultant configuration of the DP/DP Coupler on network 2:

(24) DP/DP Coupler, release 2					
Slot	DP ID	Order no./name	Input address	Output address	Comment
1	16DA	2 bytes output		0...1	
2	31	16 bytes input	0...15		
3	167	8 bytes output consistent		256...263	
4	145	2 bytes input consistent	256...257		
5	192	Universal module	16...20	2...4	
6					
7					

Figure 4-3 Example: Configuration of the DP/DP Coupler on network 2

4.4 Configuring the DP/DP Coupler with another engineering tool

Use the GSD file if you prefer to configure the DP/DP Coupler with another engineering tool such as COM PROFIBUS.

GSD file

A GSD file (SI018070.GS?) is available for the DP/DP Coupler. You can download this file free of charge from the Internet, under:

http://www.ad.siemens.de/csi_e/gsd

Configuring the DP/DP Coupler

Configure the DP/DP Coupler with your configuration tool (e.g. COM PROFIBUS) as you would any other DP slave on PROFIBUS-DP.

To do so, load the complete GSD file for the DP/PA link into your configuration tool.

assignment frame

The frame has a length of 15 bytes. Information on the parameter assignment frame is available on the Internet, under:

http://www.ad.siemens.de/csi_e/gsd

4.5 Commissioning the DP/DP Coupler

Requirements

Conditions to be met before you commission the DP/DP Coupler:

- You have installed and wired the DP/DP Coupler as described in chapters 2 and 3.
- You have installed both PROFIBUS DP networks. PROFIBUS DP is ready for operation.
- You have programmed the DP/DP Coupler.

Commission the DP/DP Coupler

Step	Activity
1	Switch on the power supply to the DP/DP Coupler.
2	Download the configuration data to the PLC by executing the PLC > Download to module command.

Operation of the DP/DP Coupler

Overview of contents

Section	Topic	Page
5.1	Replacing faulty modules	5-1
5.2	Response times of the DP/DP Coupler	5-1

5.1 Replacement of a faulty DP/DP Coupler

The table below shows you the steps in replacing a faulty DP/DP Coupler.

Step	Activity
1	Disconnect the bus connectors from the PROFIBUS DP interfaces.
2	Disconnect the faulty DP/DP Coupler from the power supply.
3	Replace the faulty DP/DP Coupler.
4	Connect the new DP/DP Coupler to the power supply.
5	Connect the PROFIBUS DP interfaces of the new DP/DP Coupler.

5.2 Response times of the DP/DP Coupler

Overview

The chapter below shows you the average time required for the transfer of data from the DP master on network 1 to the DP master on network 2 via DP/DP Coupler.

Response times

The interval expiring between the time data from a DP master are written to the process image of outputs unit and the time until these can be read in the process image of the second DP master depends on the following variables:

- CPU scan cycle time of both DP masters
- Bus cycle time of the corresponding DP masters
- Copy cycle within the DP/DP Coupler (T_{COPY})
- Overall data length [in bytes] (input/output)

The copy cycle of the DP/DP Coupler is independent of the currently set data transfer rate.

The following applies:

$$T_{\text{COPY}} = 1 \text{ ms} + n \times 7 \text{ } \mu\text{s}$$

The measurement for the formula above is performed based on the following criteria:

- CPU 416-2 DP
- Bus cycle time 6 ms
- Data length (n) 1 ... 488 bytes
- Data transfer rate of 12 Mbps
- In the measurement we use neither cyclic diagnostic functions, nor any global control commands (FREEZE, SYNC).

Note

The copy cycle can usually be neglected when operating at low data transfer rates.

Factors influencing the response times

The following applies to time-sensitive applications:

- Reduce the amount of data exchanged via the DP/DP Coupler to the minimum.
- Avoid diagnostic data requests at the DP master.
- Do not use any global control command (FREEZE, SYNC) for the DP/DP Coupler, but rather use a separate group.
- High data transfer rate (12 Mbps).

Diagnostics

6

Overview of contents

This chapter shows you the meaning of the LED displays on your DP/DP Coupler. The tables provide information on error states indicated by the LEDs, the possible causes and suggested corrective measures.

In the next section, you are made familiar with the diagnostic system of the DP/DP Coupler. An example is used to illustrate the evaluation of a diagnostic frame.

Section	Topic	Page
6.1	Diagnostics by means of LEDs	6-2
6.2	Diagnostics Using the User Program	6-4
6.3	Example of a diagnosis	6-11

6.1 Diagnostics by means of LED indication

SF 1		SF 1:	Group error on PROFIBUS DP network 1 (red)
SF 2		SF 2:	Group error on PROFIBUS DP network 2 (red)
BF 1		BF 1:	Bus error on PROFIBUS DP network 1 (red)
BF 2		BF 2:	Bus error on PROFIBUS DP network 1 (red)
ON 1		ON 1:	24 V power supply DP/DP Coupler network 1 (green)
ON 2		ON 2:	24 V power supply DP/DP Coupler network 2 (green)

Figure 6-1 Status / error displays of the DP/DP Coupler

Table 6-1 Meaning of the LEDs ON 1 and ON 2

ON 1	ON 2	Meaning	What to do
Off	Off	- Voltage not present at DP/DP Coupler, - Applied supply voltage is not within permissible range. - Hardware fault on the DP/DP Coupler	- Switch the power supply module on. - Check the applied voltage. - Replace the DP/DP Coupler.
On	Off	The DP/DP Coupler is supplied with power from network 1.	—
Off	On	The DP/DP Coupler is supplied with power from network 2.	—
On	On	The DP/DP Coupler is supplied with power from network 1 and 2.	—

Table 6-2 Status / error messages of the DP/DP Coupler

LEDs					Meaning	What to do
ON 1 and/o r ON 2	SF 1	SF 2	BF 1	BF 2		
On	On	On	On	On	All LEDs come on for approximately 1 second. DP/DP Coupler in startup mode.	—
On	On	*	*	*	Diagnostic message on PROFIBUS DP network 1	Analyze the diagnostic data.
On	*	On	*	*	Diagnostic message on PROFIBUS DP network 2	Analyze the diagnostic data.
On	*	*	On	*	No connection to DP master on PROFIBUS DP network 1. Possible causes: - Bus communication to the DP/DP Coupler is down. - The DP master is not in operation.	- Verify the correct seating of the bus connector. - Check whether the bus cable to the DP master has been interrupted. - Switch the 24V DC switch on the power supply module off and then on again.
On	*	*	*	On	No connection to DP master on PROFIBUS DP network 2. Possible causes: - Bus communication to the DP/DP Coupler is down. - The DP master is not in operation.	
On	*	*	Flashes	*	No data exchange between the DP master and DP/DP Coupler on PROFIBUS DP network 1.	- Check the configuration. - Check the PROFIBUS address.
On	*	*	*	Flashes	No data exchange between the DP master and DP/DP Coupler on PROFIBUS DP network 2.	
Flashes	Flashes	Flashes	Flashes	Flashes	Internal DP/DP Coupler error	Get in touch with your Siemens partner.

*: Not relevant

6.2 Diagnostics by means of the user program

Contents

This chapter describes the structure of the DP/DP Coupler diagnostics system. An example is used to illustrate the evaluation of a diagnostic frame.

Section	Topic	Page
6.2.1	Structure of the slave diagnosis	6-4
6.2.2	Standard diagnosis	6-6
6.2.3	Status message (module diagnostics) – only for operation on DP master (DPV1) or S7 DP master	6-8
6.2.4	Module diagnostics – replacement part mode or on DP master (DPV0)	6-10

Slave diagnosis

Slave diagnosis is performed in accordance with IEC 61784-1:2002 Ed1 CP 3/1. Depending on the DP master, it can be read out with STEP 7 or other engineering tools.

In STEP 7, the diagnostic frames of the underlying DP slaves can be displayed in the online view of the HW Config. See “Diagnosing hardware” in the STEP 7 online help.

Additional methods of reading out diagnostic information are described in the *SIMATIC Software; Programming with STEP 7 V5.x* manual.

6.2.1 Structure of the slave diagnosis

Influencing factors

The structure of slave diagnostics data depends on which DP master the DP/DP Coupler is operating. The DP/DP Coupler operates either:

- on the DP master (according with DPV0)
- on the DP master (according with DPV1)
- on the S7 DP master
- in replacement part mode for the DP/DP Coupler 6ES7 158-0GG30-0XA0

Diagnostic blocks for operation on the DP master (DPV1) or S7 DP master

The table below shows the length of the diagnostic blocks and their start addresses in the diagnostic frame. The diagnostics blocks have a length of 26 bytes.

Table 6-3 Length and start addresses of the diagnostics blocks for operation on a DP master (DPV1) or S7 DP master

Diagnostic block	Length in bytes	Start address
Standard diagnosis	6	0
Reserved	11	6
Status message (module diagnostics)	9	17

Diagnostics blocks for replacement part mode or operation on a DP master (DPV0)

You obtain these diagnostic blocks,

- If you operate the DP/DP Coupler 6ES7 158-0AD01-0XA0 as DP/DP Coupler 6ES7 158-0AD00-0XA0 as a replacement part with old configuration data.
- if the DP/DP Coupler is operated on a DP master (DPV0).

The table below shows the length of the diagnostic blocks and their start addresses in the diagnostic frame. The diagnostics blocks have a length of 11 bytes.

Table 6-4 Length and start addresses of the diagnostic blocks in replacement mode

Diagnostic block	Length in bytes	Start address
Standard diagnosis	6	0
Module diagnostics	5	6

Diagnostic blocks

The structure of diagnostic blocks is described in the following chapters.

6.2.2 Standard diagnosis

The standard diagnosis consists of 6 bytes and is subdivided as follows:

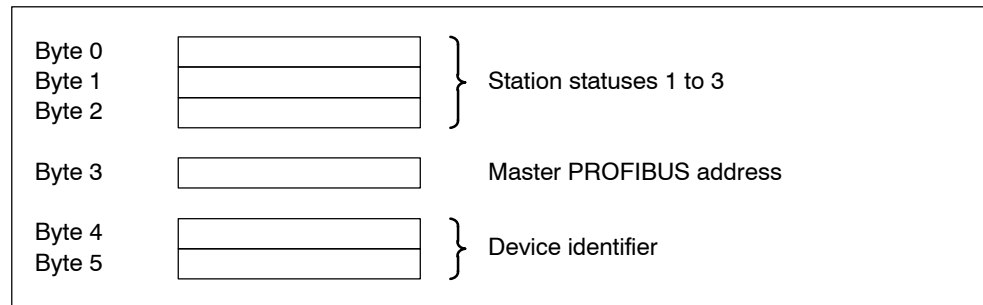


Figure 6-2 Structure of the standard diagnosis

Station status 1 to 3

Station status 1 to 3 provides an overview of the DP/DP Coupler status.

Table 6-5 Structure of station status 1

Bit	Meaning	Cause/remedy
0	1: The DP master failed to address the DP/DP Coupler.	- Have you set the correct PROFIBUS address on the DP/DP Coupler? - Is the bus connector connected? - Voltage on the DP/DP Coupler?
1	1: The DP/DP Coupler is not ready for data exchange.	Wait until the DP/DP Coupler is in startup mode.
2	1: The DP master has transferred configuration data to the DP/DP Coupler which is inconsistent with the data on the DP/DP Coupler.	I/O configuration of both networks is incongruent.
3	1: External diagnosis available. (Group diagnosis display)	Analyze the module diagnostic data. Bit 3 is reset as soon as all faults have been rectified. The bit is reset when there is a new diagnostic message in the bytes the diagnostics data mentioned earlier.
4	1: The DP/DP Coupler does not support the requested function (e.g. modification of the PROFIBUS address by means of the software).	Check the configuration.
5	1: The DP master can not interpret the answer from the DP/DP Coupler.	Check the bus configuration.

Table 6-5 Structure of station status 1, Fortsetzung

Bit	Meaning	Cause/remedy
6	1: The configured station type is inconsistent with the DP/DP Coupler.	Is the correct station type entered in the configuration software?
7	1: The DP/DP Coupler was configured by another DP-Master (not by the DP master currently allowed access to the DP/DP Coupler).	The bit is always set to 1 when, for instance, you are accessing the DP/DP Coupler using the PG or another DP master. The PROFIBUS address of the DP master that has provided the parameters for the DP/DP Coupler is located in the diagnostic byte "Master PROFIBUS address".

Table 6-6 Structure of station status 2

Bit	Meaning
0	1: The DP/DP Coupler must be assigned new parameters.
1	1: A diagnostic message is queued. The DP/DP Coupler can not resume RUN until the error is rectified (static diagnostic message).
2	1: This bit is always set to "1".
3	1: Response monitoring is enabled on the DP/DP Coupler.
4	1: The DP/DP Coupler has received a "FREEZE" control command.
5	1: The DP/DP Coupler has received a "SYNC" control command.
6	0: This bit is always set to "0".
7	0: This bit is always set to "0".

Table 6-7 Structure of station status 3

Bit	Meaning
0 to 7	0: These bits are always set to "0".

Master PROFIBUS address

Byte 3 of the standard diagnostic data contains the PROFIBUS address of the DP master that has provided the parameters for the DP/DP Coupler and has read/write access to the DP/DP Coupler.

Device identifier

The device ID is a code that uniquely identifies the DP slave (PROFIBUS ID number).

Table 6-8 Structure of the device identifier

Byte 4	Byte 5	Designation
80 _H	70 _H	DP/DP Coupler

6.2.3 Status message (module diagnostics) – only for operation on a DP master (DPV1) or S7 DP master

The module diagnostics provides detailed information on the DP/DP Coupler.

The structure of module diagnostics is determined by the DP/DP Coupler mode, i.e. operation on a DP master (DPV1)/S7 DP-Master or in replacement part mode.

Note

Bytes 6 to 16 of the diagnostics data are reserved!

Structure of module diagnostics (DPV1 / S7 DP master)

The module diagnostics comprises 9 bytes.

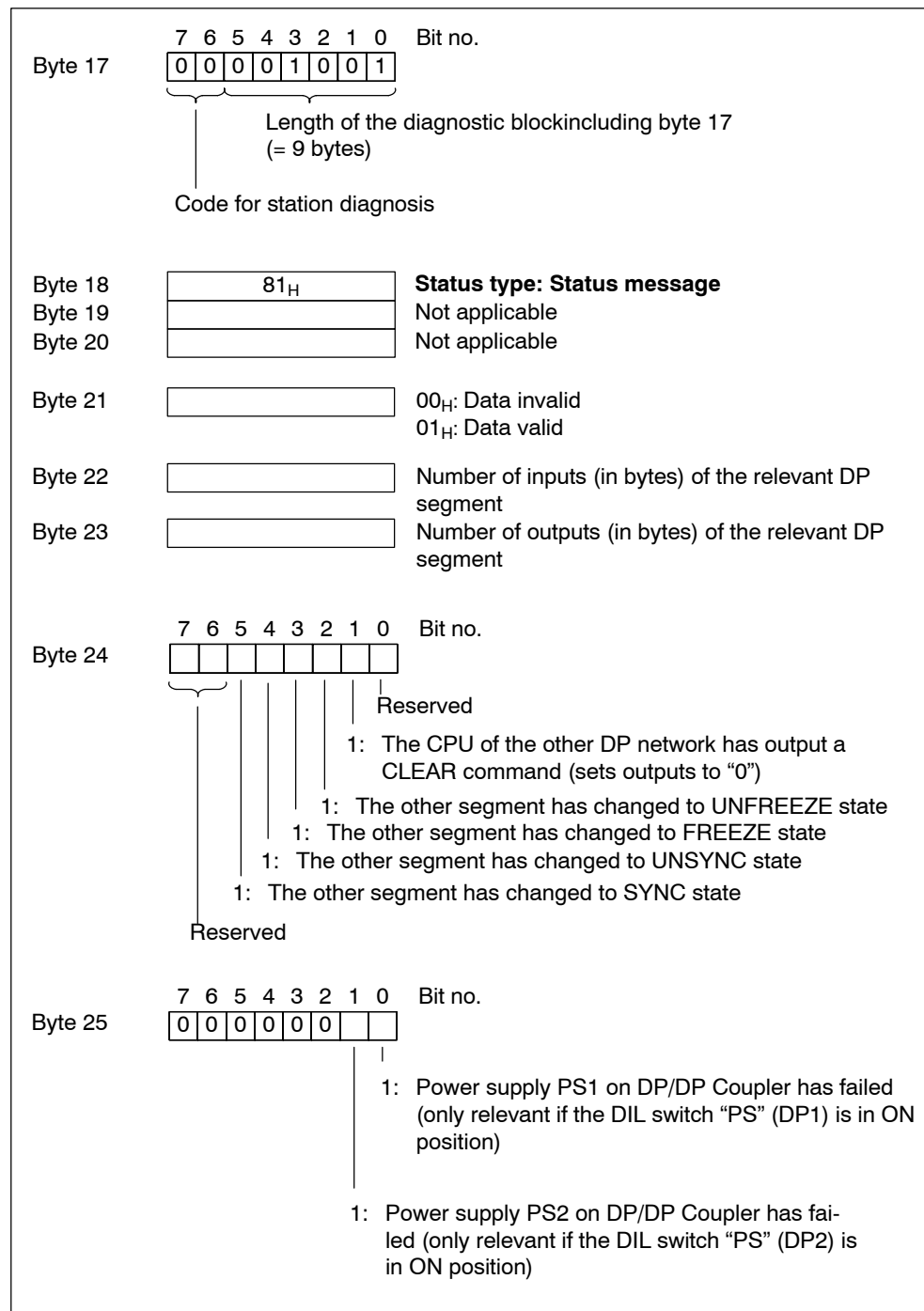


Figure 6-3 Structure of module diagnostics (DPV1 / S7 DP master)

6.2.4 Module diagnostics - replacement part mode or operation on a DP master (DPV0)

Structure of module diagnostics (replacement part mode or operation on a DP master (DPV0))

The module diagnostics comprises 5 bytes.

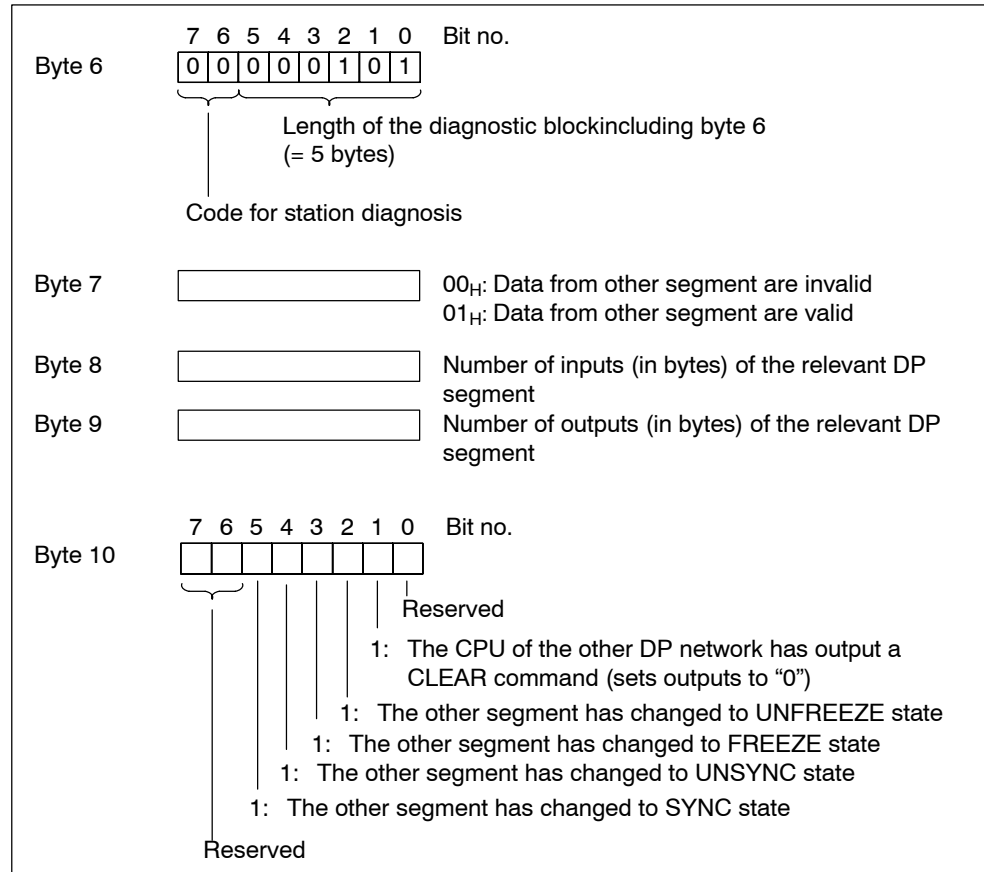


Figure 6-4 Structure of module diagnostics (replacement part mode or operation on a DP master (DPV0))

6.3 Example of a diagnosis

Introduction

This practical example shows the call of a diagnostic function on the DP/DP Coupler:

Section	Topic	Page
6.3.1	Task	6-11
6.3.2	Solution with STEP 7	6-12

6.3.1 Task

The following assumptions have been made for this example:

- The DP/DP Coupler is assigned diagnostics address 1022 (corresponds with 3FE_H).
- Figure 6-5 shows an example of the structure for diagnostic data analysis.

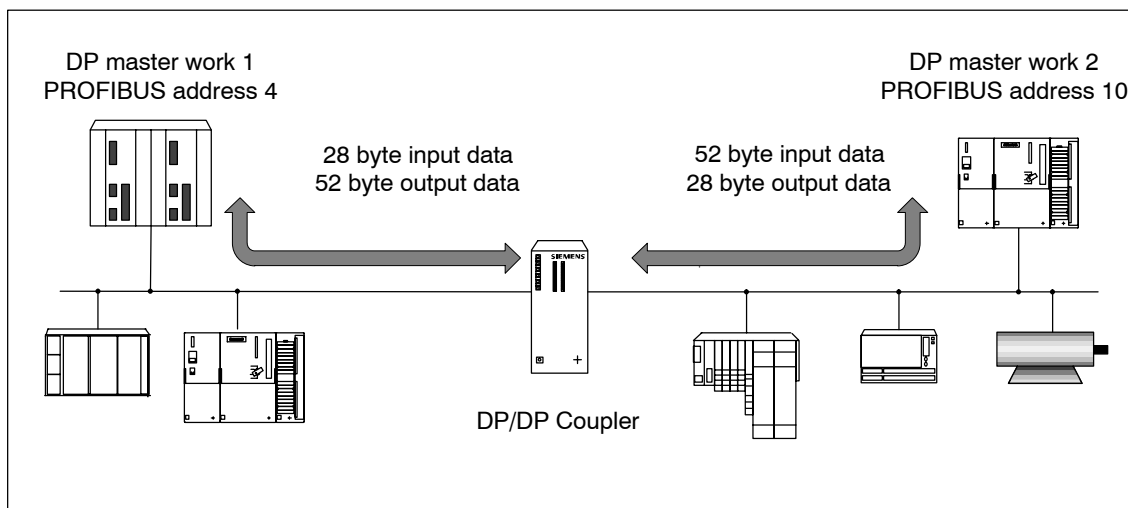


Figure 6-5 Example of the analysis of diagnostics data from the DP/DP Coupler

6.3.2 Solution with STEP 7

Call of the SFC 13

To read the diagnostic data of the DP/DP Coupler, call SFC 13 (DPNRM_DG) in OB 1.

Table 6-9 Call of the SFC 13 (DPNRM_DG) in the OB 1

STL	Explanation
CALL SFC 13	
REQ :=TRUE	//Request to read the diagnostic data
LADDR :=W#16#3FE	//Diagnostics address
RET_VAL :=MW0	//RET_VAL of SFC 13
RECORD :=P#DB10.DBX 0.0 BYTE 26	//Data mailbox for the diagnosis in DB10
BUSY :=M2.0	//Read operation runs through several OB1 cycles

With this call, the diagnostic data are stored in DB 10.

Appearance of DB 10

Define the following structure for DB 10:

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	Norm_Diag	ARRAY[1..6]		Standard diagnosis
*1.0		BYTE		
+17.0	Status_Message	ARRAY[1..9]		Status message
*1.0		BYTE		
=26.0		END_STRUCT		

Content of DB10

The relevant diagnostic data in DB 10 have the following meanings:

Table 6-10 Example: Analysis of the diagnostics data

Diagnostics address	DP master network 1	Meaning	DP master network 2	Meaning
DB10.DBB0	00 _H	Station status 1	00 _H	
DB10.DBB1	0C _H	Station status 2: Response monitoring enabled	0C _H	Station status 2: Response monitoring enabled
DB10.DBB2	00 _H	Station status 3	00 _H	Station status 3
DB10.DBB3	04 _H	PROFIBUS address of the DP master on network 1	0A _H	PROFIBUS address of the DP master on network 2
DB10.DBB4	80 _H	Device ID of the DP/DP Coupler	80 _H	Device ID of the DP/DP Coupler
DB10.DBB5	70 _H		70 _H	
DB10.DBB6 to DB10.DBB16	Reserved		Reserved	
DB10.DBB17	09 _H	Code and length of module diagnostics data	09 _H	Code and length of module diagnostics data
DB10.DBB18	81 _H	Status message (fixed)	81 _H	Status message (fixed)
DB10.DBB19	Reserved		Reserved	
DB10.DBB20	Reserved		Reserved	
DB10.DBB21	01 _H	Data from network 2 are valid	01 _H	Data from network 1 are valid
DB10.DBB22	34 _H	52 bytes input data from network 2	1C _H	28 bytes input data from network 1
DB10.DBB23	1C _H	28 bytes output data from network 2	34 _H	52 bytes output data from network 1
DB10.DBB24	14 _H	The network 2 node is in UNSYNC, UNFREEZE mode	16 _H	The network 1 node is in UNSYNC, UNFREEZE, and CLEAR mode
DB10.DBB25	00 _H	Power supply present on both DP/DP Coupler segments	00 _H	Power supply present on both DP/DP Coupler segments

Result

The network 1 data are valid, the network 1 DP master has switched its stations to CLEAR mode (e.g. CPU of network is in STOP).

Technical data

A

Overview of contents

This chapter provides general technical data and the technical data of the DP/DP Coupler:

Section	Topic	Page
A.1	General technical data	A-1
A.2	Technical data of the DP/DP coupler (6ES7 158-0AD01-0XA0)	A-12
A.3	Use of the DP/DP Coupler in potentially explosive environments of Zone 2 (in all official EU languages)	A-13

A.1 General technical data

What are general technical data?

The general technical data consist of:

- the standards and test values that the described components must comply with and fulfil.
- the test criteria by which the described components were tested.

Section	Topic	Page
A.1.1	Standards and approvals	A-2
A.1.2	Electromagnetic compatibility	A-6
A.1.3	Transportation and storage conditions	A-8
A.1.4	Mechanical and climatic ambient conditions for operation	A-9
A.1.5	Data on insulation tests, protection class and degree of protection	A-11
A.1.6	Rated voltage	A-11

A.1.1 Standards and approvals

CE certification



The described components fulfil the requirements and safety objectives of the following EC Directives and comply with the harmonized European standards (EN) published for programmable logic controllers in the official journals of the EC:

- 73/23/EEC Low Voltage Directive (for electrical equipment)
- 89/336/EEC Electromagnetic Compatibility Directive (EMC Directive)
- Directive 94/9/EC on protective devices and systems for use in potentially explosive areas (explosion protection directive)

The EC Declarations of Conformity are available for the relevant authorities at the following address:

Siemens Aktiengesellschaft
Automation and Drives
A&D AS RD ST Type Test
PO Box 1963
D-92209 Amberg

Approvals



Underwriters Laboratories Inc. to

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)

Or



Underwriters Laboratories Inc. to

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)
- UL 1604 (Hazardous Location)
- CSA-213 (Hazardous Location)

APPROVED for use in
Class I, Division 2, Group A, B, C, D T4;
Class I, Zone 2, AEx nC, Group IIC T4

Note

The approvals currently effective are found on the rating plate of each module.

FM approval



Factory Mutual Research (FM) in accordance with
Approval Standard Class Number 3611, 3600, 3810
APPROVED for use in

Class I, Division 2, Group A, B, C, D T4;
Class I, Zone 2, Group IIC T4



to EN 50021 (Electrical apparatus for potentially explosive atmospheres; Type of protection "n")



II 3 G EEx nA II T4

Label for Australia



The described components comply with the requirements of the
AS/NZS 2064 (Class A) standard.

IEC 61131

The described components comply with the requirements and criteria of the IEC 61131-2 standard (programmable logic controllers, Part 2: Equipment requirements and tests).

Marine approval (pending)

Classification societies:

- ABS (American Bureau of Shipping)
- BV (Bureau Veritas)
- DNV (Det Norske Veritas)
- GL (Germanischer Lloyd)
- LRS (Lloyds Register of Shipping)
- Class NK (Nippon Kaiji Kyokai)

PROFIBUS standard

The components described are based on the standard IEC 61784-1:2002 Ed1 CP 3/1.

Use in industrial environments

SIMATIC products are designed for use in industry.

Table A-1 Use in industrial environments

Area of application	Requirements	
	Emitted interference	Noise immunity
Industry	EN 61000-6-4:2001	EN 61000-6-2:2001

Use in residential areas

If you use the described components in residential areas, you must ensure that they comply with limit value class B to EN 55011 with respect to radio interference.

Measures suitable for achieving the radio interference level required by limit value class B are:

- Installation in grounded switch cabinets / cubicles
- Use of filters in supply lines



Warning

There is a risk of injury and damage to property.

In areas where there is a risk of explosion, injuries and damage may be caused if you remove connectors during operation.

In potentially explosive environments, always switch off the power supply before you disconnect any component connectors.

A.1.2 Electromagnetic compatibility

Introduction

This chapter contains data on the noise immunity and RF suppression of the described components.

The described components meet the requirements of the European EMC legislation for the single market.

Pulse-type interference

The table below shows the electromagnetic compatibility of the described components with respect to pulse-type interference. The prerequisite for this is that the system meets and complies with the relevant requirements and guidelines relating to electrical equipment.

Table A-2 Pulse-type interference

Pulse-type interference	Tested at	Corresponds to severity of
Electrostatic discharge in accordance with IEC 61000-4-2	8 kV 4 kV	3 (air discharge) 2 (contact discharge)
Burst impulse (rapid transient interference) in accordance with IEC 61000-4-4	2 kV (supply line) 2 kV (signal line)	3
High energy single pulse (surge) in accordance with IEC 61000-4-5 External RC circuit is required (see installation manual entitled <i>Automation System S7-300, Installation</i> , Section "Lightning protection and surge protection")		
• Asymmetric interference	2 kV (supply line) 2 kV (signal line/ data line)	3
• Symmetric interference	1 kV (supply line) 1 kV (signal line/ data line)	

Sinusoidal interference

The table below shows the EMC behavior of the described components with respect to sinusoidal interference.

Table A-3 Sinusoidal interference

Sinusoidal interference	Test values	Corresponds to severity of
RF radiation (electromagnetic fields) in accordance with IEC 61000-4-3	10 V/m with 80 % amplitude modulation of 1 kHz in the range 80 MHz to 1000 MHz 10 V/m with 50 % pulse modulation at 900 MHz	3
RF interference on cables and cable shields in accordance with IEC 61000-4-6	Test voltage of 10 V with 80 % amplitude modulation of 1 kHz in the range 9 kHz to 80 MHz	3

Emission of radio interference

Emitted interference from electromagnetic fields in accordance with EN 55011: limit value class A, group 1

From 30 to 230 MHz	< 30 dB (μV/m)Q
From 230 to 1000 MHz	< 37 dB (μV/m)Q
Measured at 30 m distance	

Emitted interference via a.c. supply in accordance with EN 55011: limit value class A, group 1

From 0.15 to 0.5 MHz	< 79 dB (μV)Q < 66 dB (μV)M
From 0.5 to 5 MHz	< 73 dB (μV)Q < 60 dB (μV)M
From 5 to 30 MHz	< 73 dB (μV)Q < 60 dB (μV)M

A.1.3 Transportation and storage conditions

Transport and storage of modules

The described components exceed the requirements of IEC 61131, Part 2, as regards transportation and storage requirements. The following values apply to modules that are transported or stored in the original packaging.

Table A-4 Transportation and storage conditions

Type of condition	Permissible range
Free fall (in transport packaging)	≤ 0.3 m
Temperature	from -40 °C to $+70$ °C
Air pressure	From 1080 to 660 hPa (corresponds to a height of -1000 to 3500 m)
Relative air humidity	From 10 to 95 %, without condensation
Sinusoidal vibrations in accordance with IEC 60068-2-6	5 - 9 Hz: 3.5 mm 9 - 150 Hz: 9.8 m/s^2
Shock in accordance with IEC 60068-2-29	250 m/s^2 , 6 ms, 1000 shocks

A.1.4 Mechanical and climatic ambient conditions for operation

Operating conditions

The described components are designed for use in a fixed, sheltered location. The operating conditions exceed the requirements of IEC 61131 Part 2.

The described components meet the operating conditions of Class 3C3 in accordance with DIN EN 60721 Part 2.

Use with additional measures

Without additional measures, the described components may **not** be used:

- in locations with a high proportion of ionizing radiation
- in locations with operating conditions that are severe on account of the following, for example:
 - dust
 - corrosive vapors or gases
 - strong electrical or magnetic fields
- in systems that require special monitoring, such as:
 - lift systems
 - electrical systems in especially endangered areas

An additional measure could be, for example, the installation in a cabinet or in an enclosure.

Mechanical ambient conditions

The mechanical ambient conditions for the described components are specified for sinusoidal vibrations in the following table.

Table A-5 Mechanical ambient conditions

Frequency range in Hz	Continuous	Occasional
$10 \leq f \leq 58$	0.0375 mm amplitude	0.075 mm amplitude
$58 \leq f \leq 150$	0.5 g constant acceleration	1 g constant acceleration

Vibration reduction

When the described components are subjected to major shocks or vibrations, you must take suitable action to reduce the acceleration or amplitude.

We recommend mounting the described components on damping material (e.g. on rubber-metal connections).

Tests for mechanical ambient conditions

The following table provides information on the type and scope of the tests for mechanical ambient conditions.

Table A-6 Test for mechanical ambient conditions

Test for ...	Test standard	Comments
Vibrations	Oscillations tested in accordance with IEC 60068, Parts 2–6 (sine)	Vibration type: frequency sweeps with a rate of change of 1 octave per minute. $10 \text{ Hz} \leq f \leq 58 \text{ Hz}$, constant amplitude 0.075 mm $58 \text{ Hz} \leq f \leq 150 \text{ Hz}$, constant acceleration 1 g Vibration duration: 10 frequency sweeps per axis in each of the 3 vertically arranged axes
Shock	Shock test in accordance with IEC 60068 Part 2-29	Type of shock: half-sine Strength of shock: 15 g peak value, 11 ms duration Shock direction: 3 shocks in both + and – direction in each of the 3 vertically arranged axes

Climatic environmental conditions

The components described may be used under the following climatic ambient conditions:

Table A-7 Climatic ambient conditions

Ambient conditions	Permissible range
Temperature: vertical mounting position: all other mounting positions	from 0 to 60 °C from 0 to 40 °C
Relative humidity	From 10 to 95 %,
Air pressure	From 1080 to 795 hPa
Contaminant concentration	SO ₂ : < 0.5 ppm; RH < 60 %, no condensation H ₂ S: < 0.1 ppm; RH < 60 %, no condensation

A.1.5 Data on insulation tests, protection class and degree of protection

Test voltages

The insulating properties are verified in individual testing with the following test voltages:

Table A-8 Test voltages

Circuits with a rated voltage of U_e against other circuits or ground	Test voltage
$0 \text{ V} < U_e \leq 50 \text{ V}$	600 VDC, 1 s

Protection class

Protection class I in accordance with IEC 60536, i. e. PE connection to rail is required!

Protection against solid bodies and water

Protection type IP 20 in accordance with IEC 60529; i.e. protection against contact with standard probes.

The device is not water-proof.

A.1.6 Rated voltage

Rated voltages for operation

The described components work with a rated voltage of 24 VDC. The tolerance range lies between 20.4 and 28.8 VDC.

A.2 Technical data of the DP/DP Coupler (6ES7 158-0AD01-0XA0)

Dimensions and weight		Insulation tested at	500 VDC
Dimensions W × H × D (mm)	40 × 127 × 117	Power input	typically 90 mA
Weight	Approx. 250 g	Power loss	Typically 2 W
Module-specific data		Status, interrupts, diagnostics	
Transmission speed	9,6; 19,2; 45,45; 93,75; 187,5; 500 kbps 1,5; 3, 6, 12 Mbps	Status display	No
Bus protocol	PROFIBUS DP	Interrupts	No
Frame length of I/O data	max. 244 bytes inputs / 244 bytes outputs	Diagnostic function	Yes
Diagnostic frame length	Max. 26 bytes	• Group error PROFIBUS DP network 1	red LED "SF1"
Parameter assignment frame length	Max. 15 bytes	• Group error PROFIBUS DP network 2	red LED "SF2"
Suitable for system changes during operation:	No	• Bus error PROFIBUS DP network 1	red LED "BF1"
Voltages, currents, potentials		• Bus error PROFIBUS DP network 2	red LED "BF2"
Rated supply voltage	24 VDC (20.4 V ... 28.8 V)	• 24 V DC monitoring on network 1	green LED "ON1"
• Polarity reversal protection	Yes	• 24 V DC monitoring on network 2	green LED "ON2"
• Power failure bridging	Min. 5 ms		
Galvanic isolation of the 24 V power supply			
• to PROFIBUS-DP	Yes		
• between each other	Yes		

A.3 Use of the DP/DP Coupler in potentially explosive environments of Zone 2 (in all official EU languages)

In the following sections you will find important information in all official EU languages.

Chapter overview

Section	Topic
A.3.1	Einsatz der Buskopplung DP/PA im explosionsgefährdeten Bereich Zone 2
A.3.2	Use of the DP/DP Coupler in potentially explosive environments of Zone 2
A.3.3	Utilisation du coupleur de bus DP/PA dans un environnement à risque d'explosion en zone 2
A.3.4	Aplicación del acoplamiento de bus DP/PA en áreas con peligro de explosión, zona 2
A.3.5	Impiego dell'accoppiamento di bus DP/PA nell'area a pericolo di esplosione zona 2
A.3.6	Gebruik van de buskoppeling DP/PA in het explosieve gebied zone 2
A.3.7	Brug af buskoblingen DP/PA i det eksplosionfarlige område zone 2
A.3.8	Väyläkytkenän DP/PA käyttö räjähdysvaarannetuilla alueilla, vyöhyke 2
A.3.9	Användning av bussanslutning DP/PA i explosionsriskområde zon 2
A.3.10	Uso do acoplamento de bus DP/PA em área exposta ao perigo de explosão, zona 2
A.3.11	Χρηση της συσκευής διαυλου DP/PA σε ...

A.3.1 Einsatz des DP/DP-Kopplers im explosionsgefährdeten Bereich Zone 2

Zone 2

Explosionsgefährdete Bereiche werden in Zonen eingeteilt. Die Zonen werden nach der Wahrscheinlichkeit des Vorhandenseins einer explosionsfähigen Atmosphäre unterschieden.

Zone	Explosionsgefahr	Beispiel
2	explosive Gasatmosphäre tritt nur selten und kurzzeitig auf	Bereiche um Flanschverbindungen mit Flachdichtungen bei Rohrleitungen in geschlossenen Räumen
sicherer Bereich	nein	- außerhalb der Zone 2 - Standardanwendungen von dezentraler Peripherie

Nachfolgend finden Sie wichtige Hinweise für die Installation des DP/DP-Kopplers im explosionsgefährdeten Bereich.

Weitere Informationen

Weitere Informationen zum DP/DP-Koppler und zu den verschiedenen Komponenten finden Sie im Handbuch.

Fertigungsort

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Zulassung

 II 3 G EEx nA II T4 nach EN 50021 : 1999
Prüfnummer: **KEMA 02ATEX1096 X**

Hinweis

Baugruppen mit der Zulassung  II 3 G EEx nA II T4 dürfen nur in Automatisierungssysteme SIMATIC S5/S7 / DP-Slaves der Gerätekategorie 3G eingesetzt werden.

Instandhaltung

Für eine Reparatur muss die betroffene Komponente an den Fertigungsort geschickt werden. Nur dort darf die Reparatur durchgeführt werden.

Besondere Bedingungen

1. Der DP/DP-Koppler muss in einen Schaltschrank oder ein metallisches Gehäuse eingebaut werden. Diese müssen mindestens die Schutzart IP 54 (nach EN 60529) gewährleisten. Dabei sind die Umgebungsbedingungen zu berücksichtigen, in denen das Gerät installiert wird. Für das Gehäuse muss eine Herstellererklärung für Zone 2 vorliegen (gemäß EN 50021).
2. Wenn am Kabel bzw. an der Kabeleinführung dieses Gehäuses unter Betriebsbedingungen eine Temperatur $> 70^{\circ}\text{C}$ erreicht wird oder wenn unter Betriebsbedingungen die Temperatur an der Aderverzweigung $> 80^{\circ}\text{C}$ sein kann, müssen die Temperatureigenschaften der Kabel mit den tatsächlich gemessenen Temperaturen übereinstimmen.
3. Die eingesetzten Kabeleinführungen müssen der geforderten IP-Schutzart und dem Abschnitt 7.2 (gemäß EN 50021) entsprechen.
4. Alle Geräte, einschließlich Schalter etc., die an den Ein- und Ausgängen des DP/DP-Koppler angeschlossen werden, müssen für den Explosionsschutz Typ EEx nA oder EEx nC genehmigt sein.
5. Es müssen Maßnahmen getroffen werden, dass die Nennspannung durch Transienten um nicht mehr als 40 % überschritten werden kann.
6. Umgebungstemperaturbereich: 0°C bis 60°C
7. Innerhalb des Gehäuses ist an einem nach dem Öffnen gut sichtbaren Platz ein Schild mit folgender Warnung anzubringen:

Warnung

Das Gehäuse darf nur kurze Zeit geöffnet werden, z. B. für visuelle Diagnose. Betätigen Sie dabei keine Schalter, ziehen oder stecken keine Baugruppen und trennen keine elektrischen Leitungen (Steckverbindungen). Diese Warnung kann unberücksichtigt bleiben, wenn bekannt ist, dass keine explosionsgefährdete Atmosphäre herrscht.

Liste der zugelassenen Baugruppen

Die Liste mit den zugelassenen Baugruppen finden Sie im Internet:

<http://www4.ad.siemens.de/WW/view/de/13702947>.

A.3.2 Use of the DP/DP Coupler in a Zone 2 Hazardous Area

Zone 2

Hazardous areas are divided up into zones. The zones are distinguished according to the probability of the existence of an explosive atmosphere.

Zone	Explosion Hazard	Example
2	Explosive gas atmosphere occurs only seldom and for a short time	Areas around flange joints with flat gaskets in pipes in enclosed spaces
Safe area	No	• Outside zone 2 • Standard distributed I/O applications

Below you will find important information on the installation of the components of the DP/DP coupler in a hazardous area.

Further Information

You will find further information on the DP/DP coupler and the various components in the manual.

Production Location

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Certification

 II 3 G EEx nA II T4 to EN 50021 : 1999
Test number: **KEMA 02ATEX1096 X**

Note

Modules with  II 3 G EEx nA II T4 certification can only be used in SIMATIC S5/S7 / DP Slave automation systems belonging to equipment category 3G.

Maintenance

If repair is necessary, the affected component must be sent to the production location. Repairs can only be carried there.

Special Conditions

1. The DP/DP coupler must be installed in a cabinet or metal housing. These must comply with the IP 54 degree of protection as a minimum. The environmental conditions under which the equipment is installed must be taken into account. There must be a manufacturer's declaration for zone 2 available for the housing (in accordance with EN 50021).
2. If a temperature of > 70 °C is reached in the cable or at the cable entry of this housing under operating conditions, or if a temperature of > 80 °C can be reached at the junction of the conductors under operating conditions, the temperature-related properties of the cables must correspond to the temperatures actually measured.
3. The cable entries used must comply with the required IP degree of protection and Section 7.2 (in accordance with EN 50021).
4. All devices (including switches, etc.) that are connected to the inputs and outputs of a DP/DP coupler must be approved for EEx nA or EEx nC explosion protection.
5. Steps must be taken to ensure that the rated voltage through transients cannot be exceeded by more than 40 %.
6. Ambient temperature range: 0° C to 60° C
7. A sign containing the following warning must be put up inside the housing in an easily visible position when the housing is opened:

Warning

The housing can only be opened for a short time (e.g. for visual diagnostics). If you do this, do not operate any switches, remove or install any modules or disconnect any electrical cables (plug-in connections).

You can disregard this warning if you know that the atmosphere is not hazardous (i.e. there is no risk of explosion).

List of Approved Modules

You will find the list of approved modules on the Internet:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.3 Utilisation du coupleur DP/DP dans un environnement à risque d'explosion en zone 2

Zone 2

Les environnements à risque d'explosion sont répartis en zones. Les zones se distinguent par la probabilité de présence d'une atmosphère explosive.

Zone	Risque d'explosion	Exemple
2	Formation rare et brève d'une atmosphère gazeuse explosive	Environnement de raccords à joints plats dans le cas de conduites dans des locaux fermés
Zone sûre	Non	• A l'extérieur de la zone 2 • Utilisation standard de périphérie décentralisée

Vous trouverez ci-après des remarques importantes pour l'installation des composantes du coupleur DP/DP dans un environnement à risque d'explosion.

Informations complémentaires

Des informations complémentaires sur le coupleur DP/DP et les diverses composantes se trouvent dans le manuel.

Lieu de production

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Homologation

 II 3 G EEx nA II T4 selon EN 50021 : 1999
 Numéro de contrôle : **KEMA 02ATEX1096 X**

Nota

Les modules homologués  II 3 G EEx nA II T4 ne peuvent être utilisés que dans des automates SIMATIC S5/S7 / esclaves DP de catégorie 3G.

Entretien

Si une réparation est nécessaire, la composante concernée doit être expédiée au lieu de production. La réparation ne doit être effectuée qu'en ce lieu.

Conditions particulières

1. Le coupleur DP/DP doit être installé dans une armoire ou un boîtier métallique. Ceux-ci doivent assurer au moins l'indice de protection IP 54. Il faut alors tenir compte des conditions d'environnement dans lesquelles l'appareil est installé. Le boîtier doit faire l'objet d'une déclaration de conformité du fabricant pour la zone 2 (selon EN 50021).
2. Si dans les conditions d'exploitation, une température $> 70^{\circ}\text{C}$ est atteinte au niveau du câble ou de l'entrée du câble dans ce boîtier, ou bien si la température au niveau de la dérivation des conducteurs peut être $> 80^{\circ}\text{C}$, les capacités de résistance thermique des câbles doivent correspondre aux températures effectivement mesurées.
3. Les entrées de câbles utilisées doivent avoir le niveau de protection IP exigé et être conformes au paragraphe 7.2 (selon EN 50021).
4. Tous les appareillages (y compris les interrupteurs, etc.) raccordés aux entrées et sorties du coupleur DP/DP doivent être homologués pour la protection antidéflagrante type EEx nA ou EEx nC.
5. Il faut prendre des mesures pour que la tension nominale ne puisse pas être dépassée de plus de 40% sous l'influence de transitoires.
6. Plage de température ambiante : 0°C à 60°C
7. A l'intérieur du boîtier, il faut placer, à un endroit bien visible après ouverture, une plaquette comportant l'avertissement suivant :

Avertissement

Ouvrir le boîtier le moins longtemps possible, par exemple pour effectuer un diagnostic visuel. Ce faisant, n'actionnez aucun commutateur, ne déconnectez aucun module et ne débanchez pas de câbles électriques (connexions).

Le respect de cet avertissement n'est pas impératif s'il est certain que l'environnement ne présente pas de risque d'explosion.

Liste des modules homologués

Vous trouverez sur Internet la liste des modules homologués :

<http://www4.ad.siemens.de/WW/view/fr/13702947>.

A.3.4 Aplicación del acoplador DP/DP en áreas con peligro de explosión, zona 2

Zona 2

Las áreas con peligro de explosión se clasifican en zonas. Las zonas se diferencian según la probabilidad de la existencia de una atmósfera capaz de sufrir una explosión.

Zona	Peligro de explosión	Ejemplo
2	La atmósfera explosiva de gas sólo se presenta rara vez y muy brevemente	Áreas alrededor de uniones abridadas con juntas planas en tuberías en locales cerrados
Área segura	no	- fuera de la zona 2 - Aplicaciones estándar de la periferia descentralizada

A continuación encontrará importantes informaciones para la instalación de los componentes del acoplador DP/DP en áreas con peligro de explosión.

Otras informaciones

Encontrará otras informaciones relativas al acoplador DP/DP y a los distintos componentes en el Manual.

Lugar de fabricación

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Homologación

 II 3 G EEx nA II T4 según norma EN 50021 : 1999

Número de comprobación: **KEMA 02ATEX1096 X**

Nota

Los módulos con la homologación  II 3 G EEx nA II T4 pueden utilizarse únicamente en los autómatas programables SIMATIC S5/S7/ esclavos DP de la categoría de equipo 3G.

Mantenimiento

Para una reparación se ha de remitir el componente afectado al lugar de fabricación. Sólo allí se puede realizar la reparación.

Condiciones especiales

1. El acoplador DP/DP se ha de montar en un armario eléctrico de distribución o en una carcasa metálica. Éstos deben garantizar como mínimo el grado de protección IP 54. Para ello se han de tener en cuenta las condiciones ambientales, en las cuales se instala el equipo. La caja deberá contar con una declaración del fabricante para la zona 2 (conforme a EN 50021).
2. Si durante la operación se alcanzara una temperatura $> 70^{\circ}\text{C}$ en el cable o la entrada de cables de esta caja o bien una temperatura $> 80^{\circ}\text{C}$ en la bifurcación de hilos, deberán adaptarse las propiedades térmicas de los cables a las temperaturas medidas efectivamente.
3. Las entradas de cable utilizadas deben cumplir el grado de protección IP exigido y lo expuesto en el apartado 7.2 (conforme a EN 50021).
4. Todos los dispositivos –inclusive interruptores, etc.– conectados a las entradas y salidas del acoplador DP/DP deben estar homologados para la protección contra explosiones del tipo EEx nA o EEx nC.
5. Es necesario adoptar las medidas necesarias para evitar que la tensión nominal pueda rebasar en más del 40 % debido a efectos transitorios.
6. Margen de temperatura ambiente: 0°C hasta 60°C
7. Dentro de la caja deberá colocarse en un lugar perfectamente visible tras su apertura un rótulo con la siguiente advertencia:

Precaución

Abrir la caja sólo brevemente, p.ej. para el diagnóstico visual. Durante este tiempo Ud. no deberá activar ningún interruptor, desenchufar o enchufar módulos ni separar conductores eléctricos (conexiones enchufables).

Esta advertencia puede ignorarse si Ud. sabe que en la atmósfera existente no hay peligro de explosión.

Lista de los módulos homologados

En la internet hallará Ud. una lista con los módulos homologados:

<http://www4.ad.siemens.de/WW/view/es/13702947>.

A.3.5 Impiego dell'accoppiatore di bus DP/DP nell'area a pericolo di esplosione zona 2

Zona 2

Le aree a pericolo di esplosione vengono suddivise in zone. Le zone vengono distinte secondo la probabilità della presenza di un'atmosfera esplosiva.

Zona	Pericolo di esplosione	Esempio
2	L'atmosfera esplosiva si presenta solo raramente e brevemente	Aree intorno a collegamenti a flange con guarnizioni piatte nelle condotte in ambienti chiusi
Area sicura	No	- Al di fuori della zona 2 - Applicazioni standard di periferia decentrata

Qui di seguito sono riportate delle avvertenze importanti per l'installazione dei componenti dell'accoppiatore di bus DP/DP nell'area a pericolo di esplosione.

Ulteriori informazioni

Ulteriori informazioni sull'accoppiatore di bus DP/DP e sui diversi componenti si trovano nel manuale.

Luogo di produzione

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Autorizzazione

 II 3 G EEx nA II T4 secondo EN 50021 : 1999

Numero di controllo: **KEMA 02ATEX1096 X**

Avvertenza

Le unità con l'autorizzazione  II 3 G EEx nA II T4 possono essere impiegate solo nei controllori programmabili SIMATIC S5/S7 / slave DP della categoria di apparecchiature 3G.

Manutenzione

Per una riparazione, il componente interessato deve essere inviato al luogo di produzione. La riparazione può essere effettuata solo lì.

Condizioni particolari

1. L'accoppiatore di bus DP/DP deve essere montato in un armadio elettrico o in un contenitore metallico. Questi devono assicurare almeno il tipo di protezione IP 54. In questo caso bisogna tenere conto delle condizioni ambientali nelle quali l'apparecchiatura viene installata. Per il contenitore deve essere presente una dichiarazione del costruttore per la zona 2 (secondo EN 50021).
2. Se nei cavi o nel loro punto di ingresso in questo contenitore viene raggiunta in condizioni di esercizio una temperatura $> 70^{\circ}\text{C}$ o se in condizioni di esercizio la temperatura nella derivazione dei fili può essere $> 80^{\circ}\text{C}$, le caratteristiche di temperatura dei cavi devono essere conformi alla temperatura effettivamente misurata.
3. Gli ingressi dei cavi usati devono essere conformi al tipo di protezione richiesto e alla sezione 7.2 (secondo EN 50021).
4. Tutte le apparecchiature, inclusi interruttori, ecc. che vengono collegati agli ingressi/uscite dell'accoppiatore di bus DP/DP, devono essere state omologate per la protezione da esplosione tipo EEx nA o EEx nC.
5. Devono essere prese delle misure per evitare che la tensione nominale possa essere superata per più del 40% da parte di transienti.
6. Campo termico ambientale: da 0°C a 60°C
7. All'interno del contenitore va apportata, in un luogo ben visibile dopo l'apertura, una targhetta con il seguente avvertimento:

Attenzione

Il contenitore può rimanere aperto solo per breve tempo, ad esempio per una diagnostica a vista. In tal caso non azionare alcun interruttore, non disinnestare o innestare unità e non staccare connessioni elettriche (connettori).

Non è necessario tenere conto di questo avvertimento se è noto che non c'è un'atmosfera a rischio di esplosione.

Elenco delle unità abilitate

La lista con le unità omologate si trova in Internet al sito:

<http://www4.ad.siemens.de/WW/view/it/13702947>.

A.3.6 Gebruik van de buskoppeling DP/DP in het explosieve gebied zone 2

Zone 2

Explosieve gebieden worden ingedeeld in zones. Bij de zones wordt onderscheiden volgens de waarschijnlijkheid van de aanwezigheid van een explosieve atmosfeer.

Zone	Explosiegevaar	Voorbeeld
2	Een explosieve gasatmosfeer treedt maar zelden op en voor korte duur	Gebieden rond flensverbindingen met pakkingen bij buisleidingen in gesloten vertrekken
Veilig gebied	neen	- Buiten de zone 2 - Standaardtoepassingen van decentrale periferie

Hierna vindt u belangrijke aanwijzingen voor de installatie van de componenten van de buskoppeling DP/DP in een explosief gebied.

Verdere informatie

In het handboek vindt u verdere informatie over de buskoppeling DP/DP en over de verschillende componenten.

Productieplaats

Siemens AG, Bereich A&D
Werner-von-Siemens-Strasse 50
92224 Amberg
Germany

Vergunning

 II 3 G EEx nA II T4 conform EN 50021 : 1999

Keuringsnummer: **KEMA 02ATEX1096 X**

Opmerking

Modulen met de vergunning  II 3 G EEx nA II T4 mogen slechts worden gebruikt in automatiseringssystemen SIMATIC S5/S7 / DP-slaves van de apparaatcategorie 3G.

Instandhouding

De te herstellen component moet voor reparatie naar de plaats van vervaardiging worden gestuurd. Alleen daar mag de reparatie worden uitgevoerd.

Speciale voorwaarden

1. De buskoppeling DP/DP moet worden ingebouwd in een schakelkast of in een behuizing van metaal. Deze moeten minstens de veiligheidsgraad IP 54 waarborgen. Hierbij dient rekening te worden gehouden met de omgevingsvoorwaarden waarin het apparaat wordt geïnstalleerd. Voor de behuizing dient een verklaring van de fabrikant voor zone 2 te worden ingediend (volgens EN 50021).
2. Als aan de kabel of aan de kabelinvoering van deze behuizing onder bedrijfsomstandigheden een temperatuur wordt bereikt $> 70^{\circ}\text{C}$ of als onder bedrijfsomstandigheden de temperatuur aan de adervertakking $> 80^{\circ}\text{C}$ kan zijn, moeten de temperatuureigenschappen van de kabel overeenstemmen met de werkelijk gemeten temperaturen.
3. De aangebrachte kabelinvoeringen moeten de vereiste IP-veiligheidsgraad hebben en in overeenstemming zijn met alinea 7.2 (volgens EN 50021).
4. Alle apparaten, schakelaars enz. inbegrepen, die worden aangesloten op de in- en uitgangen van de buskoppeling DP/DP, moeten zijn goedgekeurd voor de explosiebeveiliging type EEx nA of EEx nC.
5. Er dienen maatregelen te worden getroffen, zodat de nominale spanning door transiënten met niet meer dan 40 % kan worden overschreden.
6. Omgevingstemperatuurbereik: 0°C tot 60°C
7. Binnen de behuizing dient op een na het openen goed zichtbare plaats een bord te worden aangebracht met de volgende waarschuwing:

Waarschuwing

De behuizing mag slechts voor korte tijd worden geopend, bijv. voor een visuele diagnose. Bedien hierbij geen schakelaar, trek of steek geen modules en ontkoppel geen elektrische leidingen (steekverbindingen).

Deze waarschuwing kan buiten beschouwing blijven, indien bekend is dat er geen explosieve atmosfeer heerst.

Lijst van de toegelaten modules

De lijst met de toegelaten modules vindt u in het internet:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.7 Brug af DP/DP-kobleren i det eksplosionsfarlige område zone 2

Zone 2

Eksplodingsfarlige områder inddeles i zoner. Zonerne adskiller sig indbyrdes efter hvor sandsynligt det er, at der er en eksplosiv atmosfære.

Zone	Eksplodingsfare	Eksempel
2	Ekspløsiv gasatmosfære optræder kun sjældent og varer kort	Områder rundt om flangeforbindelser med flade pakninger ved rørledninger i lukkede rum
Sikkert område	Nej	• Uden for zone 2 • Standardanvendelser decentral periferi

I det følgende findes vigtige henvisninger vedr. installation af komponenterne til DP/DP-kobleren i det eksplosionsfarlige område.

Yderligere informationer

Yderligere informationer om DP/DP-kobleren og de forskellige komponenter findes i manualen.

Produktionssted

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Godkendelse

 II 3 G EEx nA II T4 efter EN 50021 : 1999
 Kontrolnummer: **KEMA 02ATEX1096 X**

Bemærk

Komponenter med godkendelsen  II 3 G EEx nA II T4 må kun monteres i automatiseringssystemer SIMATIC S5/S7 / DP-slaves - udstyrskategori 3G.

Vedligeholdelse

Skal den pågældende komponent repareres, bedes De sende den til produktionsstedet. Reparation må kun udføres der.

Særlige betingelser

1. DP/DP-kobleren skal monteres i et kontrolskab eller et metalkabinet. Disse skal mindst kunne sikre beskyttelsesklasse IP 54. I denne forbindelse skal der tages højde for de omgivelsestemperaturer, i hvilke udstyret er installeret. Der skal være udarbejdet en erklæring fra fabrikanten for kabinettet for zone 2 (iht. EN 50021).
2. Hvis kablet eller kabelindføringen på dette hus når op på en temperatur på $> 70^{\circ}\text{C}$ under driftsbetingelser eller hvis temperaturen på åreforegreningen kan være $> 80^{\circ}\text{C}$ under driftsbetingelser, skal kablernes temperaturegenskaber stemme overens med de temperaturer, der rent faktisk måles.
3. De benyttede kabelindføringer skal være i overensstemmelse med den krævede IP-beskyttelsestype og afsnittet 7.2 (iht. EN 50021).
4. Alle apparater, inkl. kontakter osv., der forbindes med ind- og udgangene på DP/DP-kobleren, skal være godkendt til eksplosionsbeskyttelse af type EEx nA eller EEx nC.
5. Der skal træffes foranstaltninger, der sørger for, at den nominelle spænding via transienter ikke kan overskrides mere end 40 %.
6. Omgivelsestemperaturområde: 0°C til 60°C
7. I kabinettet skal der anbringes et skilt, der skal kunne ses, når kabinettet åbnes. Dette skilt skal have følgende advarsel:

Advarsel

Kabinettet må kun åbnes i kort tid, f.eks. til visuel diagnose. Tryk i denne forbindelse ikke på kontakter, træk eller isæt ikke komponenter og afbryd ikke elektriske ledninger (stikforbindelser).

Denne advarsel skal der ikke tages højde for, hvis man ved, at der ikke er nogen eksplosionsfarlig atmosfære.

Liste over godkendte komponenter

Listen med de godkendte komponenter findes på internettet:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.8 Väyläkytkennän DP/PA-kytkimen käyttö räjähdysvaarannetuilla alueilla, vyöhyke 2

Vyöhyke 2

Räjähdysvaarannetut alueet jaetaan vyöhykkeisiin. Vyöhykkeet erotellaan räjähdyskelpoisen ilmakehän olemassa olon todennäköisyyden mukaan.

Vyöhyke	Räjähdysvaara	Esimerkki
2	Räjähtävä kaasuilmakehä ilmaantuu vain harvoin ja lyhytaikaisesti	Alueet putkistojen lattatiivisteillä varustuilla laippaliitoksilla suljetuissa tiloissa
turvallinen alue	ei	- vyöhykkeen 2 ulkopuolella - Hajautetun ulkopiirin vakiosovellukset

Seuraavasta löydätte tärkeitä ohjeita DP/PA-kytkimen asennukseen räjähdysvaarannetuilla alueilla.

Lisätietoja

Lisätietoja DP/PA-kytkimeen ja erilaisiin komponentteihin löydätte ohjekirjasta.

Valmistuspaikka

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Hyväksyntä

 II 3 G EEx nA II T4 EN 50021 mukaan: 1999
Tarkastusnumero: **KEMA 02ATEX1096 X**

Ohje

Rakenneryhymät hyväksynnän  II 3 G EEx nA II T4 kanssa saadaan käyttää ainoastaan laitekategorian 3G automatisointijärjestelmissä SIMATIC S5/S7 / DP-Slaves.

Kunnossapito

Korjausta varten täytyy kyseinen komponentti lähettää valmistuspaikkaan. Korjaus voidaan suorittaa ainoastaan siellä.

Erityiset vaatimukset

1. DP/PA-kytkin täytyy asentaa kytkentäkaappiin tai metalliseen koteloon. Näiden täytyy olla vähintään kotelointiluokan IP 54 mukaisia. Tällöin on huomioitava ympäristöolosuhteet, johon laite asennetaan. Kotelolle täytyy olla valmistajaselvitys vyöhykettä 2 varten (EN 50021 mukaan).
2. Kun johdolla tai tämän kotelon johdon sisäänviennillä saavutetaan $> 70^{\circ}\text{C}$ lämpötila tai kun käyttöolosuhteissa lämpötila voi pihajaotuksella olla $> 80^{\circ}\text{C}$, täytyy johdon lämpötilaominaisuuksien vastata todellisesti mitattuja lämpötiloja.
3. Käytettyjen johtojen sisäänohjauksien täytyy olla vaaditun IP-kotelointiluokan ja kohdan 7.2 (EN 50021 mukaan) mukaisia.
4. Kaikkien laitteiden, kytkimet jne. mukaan lukien, jotka liitetään DP/PA-kytkimen tuloille ja lähdöille, täytyy olla hyväksyttyjä tyyppin EEx nA tai EEx nC räjähdys-suojauksia varten.
5. Toimenpiteet täytyy suorittaa, ettei nimellisjännite voi transienttien kautta ylittyä enemmän kuin 40 %.
6. Ympäristölämpötila-alue: $0^{\circ}\text{C} \dots 60^{\circ}\text{C}$
7. Kotelon sisälle, avauksen jälkeen näkyvälle paikalle, on kiinnitettävä kilpi, jossa on seuraava varoitus:

Varoitus

Kotelo saadaan avata ainoastaan lyhyeksi ajaksi, esim. visuaalista diagnoosia varten. Älä tällöin käytä mitään kytkimiä, vedä tai liitä mitään rakenneryhmiä, äläkä erota mitään sähköjohtoja (pistoliittimiä). Tätä varoitusta ei tarvitse huomioida, kun on tiedossa, että minkäänlaista räjähdysvaarannettua ilmakehää ei ole olemassa.

Hyväksytyjen rakenneryhmien lista

Lista hyväksytyistä rakennesarjoista löytyy internetistä osoitteesta:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.9 Användning av DP/DP-kopplaren i explosionsriskområde zon 2

Zon 2

Explosionsriskområden delas in i zoner. Zonerna delas in enligt sannolikheten att en atmosfär med explosionsfara föreligger.

Zon	Explosionsfara	Exempel
2	Explosiv gasatmosfär uppstår endast sällan eller kortvarigt	Områden kring flänsförbindelser med packningar vid rörledningar i slutna utrymmen
Säkert område	Nej	• Utanför zon 2 • Standardanvändning av decentral periferi

Nedan följer viktiga anvisningar om installationen av DP/DP-kopplaren i ett explosionsriskområde.

Ytterligare information

Ytterligare information om DP/DP-kopplaren och de olika komponenterna finner du i handboken.

Tillverkningsort

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Godkännande

 II 3 G EEx nA II T4 enligt EN 50021 : 1999
Kontrollnummer: **KEMA 02ATEX1096 X**

Anvisning

Komponentgrupper med godkännande  II 3 G EEx nA II T4 får endast användas i automatiseringssystemen SIMATIC S5/S7 / DP Slaves från apparatgrupp 3G.

Underhåll

Vid reparation måste den aktuella komponenten insändas till tillverkaren. Reparationer får endast genomföras där.

Särskilda villkor

1. DP/DP-kopplaren måste monteras i ett kopplingsskåp eller metallhus. Dessa måste minst vara av skyddsklass IP 54. Därvid ska omgivningsvillkoren där enheten installeras beaktas. För kåpan måste en tillverkardeklaration för zon 2 föreligga (enligt EN 50021).
2. Om en temperatur på $> 70^{\circ}\text{C}$ uppnås vid husets kabel resp kabelinföring under driftvillkor eller om temperaturen vid trådförgreningen kan vara $> 80^{\circ}\text{C}$ under driftvillkor, måste kabelns temperaturegenskaper överensstämma med den verkliga uppmätta temperaturen.
3. De använda kabelinföringarna måste uppfylla kraven i det krävda IP-skyddsutförandet och i avsnitt 7.2 (enligt EN 50021).
4. Alla apparater, inklusive brytare osv, som ansluts till DP/DP-kopplarens in- och utgångar, måste vara godkända för explosionsskydd av typ EEx nA eller EEx nC.
5. Åtgärder måste vidtas så, att märkspänningen ej kan överskridas med mer än 40% genom transienter.
6. Omgivningstemperatur: 0°C till 60°C
7. När huset öppnats ska en skylt med följande varning monteras på ett tydligt synligt ställe huset:

Varning

Huset får endast öppnas under kort tid, t ex för visuell diagnos. Använd därvid inga brytare, lossa eller anslut inga enheter och frånskilj inga elektriska ledningar (insticksanslutningar).

Ingen hänsyn måste tas till denna varning om det är säkert att det inte råder någon explosionsfarlig atmosfär.

Lista över godkända komponentgrupper

Lista över godkända enheter återfinns i Internet:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.10 Uso do acoplador DP/DP em área exposta ao perigo de explosão, zona 2

Zona 2

As áreas expostas ao perigo de explosão são divididas em zonas. As zonas são diferenciadas de acordo com a probabilidade da existência de uma atmosfera explosiva.

Zona	Perigo de explosão	Exemplo
2	Só raramente e por um breve período de tempo surgem atmosferas explosivas	Áreas em torno de ligações flangeadas com vedações chatas em tubulações em recintos fechados
Área segura	não	• fora da zona 2 • Aplicações descentralizadas de periferia descentralizada

A seguir, o Sr. encontrará avisos importantes para a instalação do acoplador DP/DP em área exposta ao perigo de explosão.

Mais informações

Para obter mais informações sobre o acoplador DP/DP e sobre os diversos componentes, consulte o manual.

Local de produção

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Licença

 II 3 G EEx nA II T4 seg. EN 50021 : 1999

Número de ensaio: **KEMA 02ATEX1096 X**

Aviso

Componentes com a licença  II 3 G EEx nA II T4 só podem ser aplicados em sistemas de automação SIMATIC S5/S7 / escravos DP da categoria de aparelho 3G.

Reparo

Os componentes em questão devem ser remetidos para o local de produção a fim de que seja realizado o reparo. Apenas lá deve ser efetuado o reparo.

Condições especiais

1. O acoplador DP/DP deve ser montado em um armário de distribuição ou em uma caixa metálica. Estes devem garantir no mínimo o tipo de proteção IP 54. Durante este trabalho deverão ser levados em consideração as condições locais, nas quais o aparelho será instalado. Para a caixa deverá ser apresentada uma declaração do fabricante para a zona 2 (de acordo com EN 50021).
2. Caso no cabo ou na entrada do cabo desta carcaça sob as condições operacionais seja atingida uma temperatura de $> 70^{\circ}\text{C}$, ou caso sob condições operacionais a temperatura na ramificação do fio poderá atingir $> 80^{\circ}\text{C}$, as características de temperatura deverão corresponder às temperaturas realmente medidas.
3. As entradas de cabo utilizadas devem corresponder ao tipo exigido de proteção IP e à seção 7.2 (de acordo com o EN 50021).
4. Todos os aparelhos, inclusive as chaves, etc., que estejam conectadas em entradas e saídas do acoplador DP/DP, devem possuir a licença para a proteção de explosão do tipo EEx nA ou EEx nC.
5. Precisam ser tomadas medidas para que a tensão nominal através de transitórios não possa ser ultrapassada em mais que 40 %.
6. Área de temperatura ambiente: 0°C até 60°C
7. No âmbito da carcaça deve ser colocada, após a abertura, em um ponto bem visível uma placa com a seguinte advertência:

Advertência

A carcaça deve ser aberta apenas por um breve período de tempo, por ex. para diagnóstico visual. Não acione nenhum interruptor, não retire ou conecte nenhum módulo e não separe nenhum fio elétrico (ligações de tomada).

Esta advertência poderá ser ignorada caso se saiba que não há nenhuma atmosfera sujeita ao perigo de explosão.

Lista dos componentes autorizados

A lista com os módulos autorizados encontram-se na Internet:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

A.3.11 Χρήση του συζεύκτη DP/DP σε επικίνδυνη για έκρηξη περιοχή, ζώνη 2

Ζώνη 2

Οι επικίνδυνες για έκρηξη περιοχές χωρίζονται σε ζώνες. Οι ζώνες διαφέρουν σύμφωνα με την πιθανότητα ύπαρξης ενός ικανού για έκρηξη περιβάλλοντος.

Ζώνη	Κίνδυνος έκρηξης	Παράδειγμα
2	Εκρηκτικό περιβάλλον αερίου παρουσιάζεται μόνο σπάνια και για σύντομο χρονικό διάστημα	Περιοχές γύρω από φλαντζωτές συνδέσεις με τσιμούχες σε σωληνώσεις σε κλειστούς χώρους
Ασφαλής περιοχή	όχι	- Εκτός της ζώνης 2 - Τυπικές εφαρμογές αποκεντρωμένης περιφέρειας

Στη συνέχεια θα βρείτε σημαντικές υποδείξεις για την εγκατάσταση του συζεύκτη DP/DP σε επικίνδυνη για έκρηξη περιοχή.

Επιπλέον πληροφορίες

Επιπλέον πληροφορίες για το συζεύκτη DP/DP και για τα διάφορα εξαρτήματα θα βρείτε στο εγχειρίδιο.

Τόπος κατασκευής

Siemens AG, Bereich A&D
Werner-von-Siemens-Straße 50
92224 Amberg
Germany

Άδεια

 II 3 G EEx nA II T4 σύμφωνα με το πρότυπο EN 50021 : 1999

Αριθμός ελέγχου: **KEMA 02ATEX1096 X**

Υπόδειξη

Τα δομικά συγκροτήματα με την άδεια  II 3 G EEx nA II T4 επιτρέπεται να τοποθετηθούν μόνο σε συστήματα αυτοματισμού SIMATIC S5/S7 / DP-Slaves της κατηγορίας συσκευής 3G.

Συντήρηση

Για μια επισκευή πρέπει να σταλθεί το αντίστοιχο εξάρτημα στον τόπο κατασκευής. Μόνο εκεί επιτρέπεται να γίνει η επισκευή.

Ιδιαίτερες προϋποθέσεις

1. Ο συζεύκτης DP/DP πρέπει να ενσωματωθεί σε ένα ερμάριο ζεύξης ή σε ένα μεταλλικό περίβλημα. Αυτά πρέπει να εξασφαλίζουν το λιγότερο το βαθμό προστασίας IP 54. Σε αυτήν την περίπτωση πρέπει να ληφθούν υπόψη οι περιβαλλοντικές συνθήκες, στις οποίες θα εγκατασταθεί η συσκευή. Για το περίβλημα πρέπει να προβλέπεται δήλωση του κατασκευαστή για τη ζώνη 2 (σύμφωνα με το πρότυπο EN 50021).
2. Εάν στο καλώδιο ή στην είσοδο του καλωδίου αυτού του περιβλήματος κάτω από συνθήκες λειτουργίας η θερμοκρασία ξεπεράσει τους 70 °C ή όταν κάτω από συνθήκες λειτουργίας η θερμοκρασία στη διακλάδωση του σύρματος μπορεί να είναι μεγαλύτερη από 80 °C, πρέπει οι θερμοκρασιακές ιδιότητες των καλωδίων να ταυτίζονται με τις πραγματικά μετρημένες θερμοκρασίες.
3. Οι χρησιμοποιούμενες εισόδους καλωδίων πρέπει να συμμορφώνονται με το βαθμό προστασίας IP 54 στην ενότητα 7.2 (σύμφωνα με το πρότυπο EN 50021).
4. Όλες οι συσκευές, συμπεριλαμβανομένων διακοπών κ.α., που συνδέονται στις εισόδους και εξόδους του συζεύκτη DP/DP, πρέπει να φέρουν εγκριμένη προστασία κατά έκρηξης τύπου EEx nA ή EEx nC.
5. Πρέπει να ληφθούν μέτρα, να μην μπορεί να γίνει υπέρβαση της ονομαστικής τάσης μέσω αιφνίδιας μεταβολής της τάσης πάνω από 40 %.
6. Περιοχή θερμοκρασίας περιβάλλοντος: 0° C έως 60° C
7. Πρέπει να τοποθετηθεί μέσα στο περίβλημα σε ευδιάκριτο σημείο μετά το άνοιγμα μία πινακίδα με την ακόλουθη προειδοποίηση:

Προειδοποίηση

Το περίβλημα επιτρέπεται να ανοίγει μόνο για μικρό χρονικό διάστημα, π.χ. για τη διενέργεια οπτικής διάγνωσης. Μην κάνετε χρήση διακοπών, μην τραβάτε ή εμβυσματώνετε δομικά συγκροτήματα και μη διαχωρίζετε ηλεκτροφόρους αγωγούς (εμβυσματώσιμες συνδέσεις).

Η προειδοποίηση αυτή δε χρειάζεται να ληφθεί υπ' όψιν, εάν είναι γνωστό ότι δεν υφίσταται ατμόσφαιρα παρουσιάζουσα κίνδυνο έκρηξης.

Κατάλογος των εγκεκριμένων δομικών συγκροτημάτων

Η λίστα με τα εγκεκριμένα δομικά συγκροτήματα υπάρχει στο διαδίκτυο:

<http://www4.ad.siemens.de/WW/view/en/13702947>.

Order numbers and accessories

Table B-1 Order numbers for the DP/DP Coupler

Component	Order number
DP/DP Coupler	6ES7 158-0AD01-0XA0
DIN rail 35 mm • 483 mm • 530 mm • 830 mm • 2000 mm	6ES5 710-8MA11 6ES5 710-8MA21 6ES5 710-8MA31 6ES5 710-8MA41
Rail for the S7 mounting system • 482 mm • 530 mm • 830 mm • 2000 mm	6ES7 390-1AE80-0AA0 6ES7 390-1AF30-0AA0 6ES7 390-1AJ30-0AA0 6ES7 390-1BC00-0AA0
Bus connector for PROFIBUS DP • for looping the PROFIBUS DP (without PG socket) • for looping the PROFIBUS DP (with PG socket)	6ES7 972-0BA12-0XA0 6ES7 972-0BA50-0XA0 (FastConnect) 6ES7 972-0BB12-0XA0 6ES7 972-0BB50-0XA0 (Fast Connect)
PROFIBUS DP bus cable • Normal (flexible)	6XV1 830-0EH10

Glossary

Address

The address of a node is used to identify it on the network. It must be unique throughout the entire system.

Equipment, electrical

Components, electrical circuits or parts of electrical circuits which are usually contained in a single enclosure.

Bus

Shared data transfer path to which all nodes are connected; with two defined end points.

Bus connector

Physical connection between the bus node and the bus cable.

Chassis ground

Chassis ground is formed by the interconnection of inactive equipment parts, which can not acquire any hazardous contact voltage in the event of a malfunction.

Diagnostics

Diagnostics is the detection, localization, classification, indication and analysis of errors, faults and messages.

The diagnostics system provides automatic monitoring functions for system runtime. This increases the availability of systems by reducing startup times and downtimes.

DP master

A → master that responds in accordance with IEC 61784-1:2002 Ed1 CP 3/1 is referred to as a DP master.

DP standard

Represents the bus protocol of the DP system in accordance with IEC 61784-1:2002 Ed1 CP 3/1.

DP slave

This → slave type is operated on PROFIBUS based on the PROFIBUS DP protocol, and responds in accordance with IEC 61784-1:2002 Ed1 CP 3/1.

Earth

Conductive earth, the electrical potential of which can be set equal to zero at any point.

Electromagnetic Compatibility (EMC)

Electromagnetic compatibility is the capability of electrical equipment to work free of problems in a defined environment without affecting its environment in an impermissible manner.

Equipotential bonding

An electrical connection (equipotential conductor) that keeps the body of electrical equipment and external conductive bodies at the same or close to the same potential, in order to prevent the development of interference or hazardous voltages between these bodies.

Grounding

Grounding means connecting an electrically conductive component to ground by means of a grounding system.

GSD file

All slave-specific characteristics are stored in a GSD file. The format of the GSD file is defined in the PROFIBUS Guideline: Specification for PROFIBUS Device Description and Device Integration Vol.1: GSD V4.1, 07/2001 of the PROFIBUS User Organisation (PUO).

HW Config

Hardware configuration component in STEP 7.

Master

Masters in possession of the token may transmit data to other nodes, and request data from other nodes (= active node). The CPU 315-2 DP or IM 308-C are Dp masters, for example.

Parameter assignment

Parameter assignment is the passing of slave parameters from the master to the slave.

Power supply unit

This unit supplies power to the field devices and their process peripherals.

PROFIBUS

Process field bus standard that is defined in the field bus standard to IEC 61784-1:2002 Ed1 CPF 3 PROFIBUS and PROFINet. It defines functional, electrical and mechanical properties for a bit-serial field bus system.

PROFIBUS is available with the following protocols: DP (for distributed I/O systems) and FMS (= Fieldbus Message Specification).

PROFIBUS address

Each bus node must be assigned a PROFIBUS address that uniquely identifies it on the PROFIBUS-DP.

The PC / PG or hand-held ET200 are assigned the PROFIBUS address "0".

The PROFIBUS address of the DP masters and DP slaves lie within the range from 1 to 125.

PROFIBUS DP

This is the PROFIBUS system based on the DP protocol. The abbreviation DP stands for Distributed Peripherals.

PUO

PROFIBUS user organization

Reference potential

Electrical potential that forms the reference for viewing and/or measuring the voltage of relevant circuits.

SELV

Safety extra-low voltage (SELV) is a voltage of ≤ 30 V AC / 60 V DC generated by means of a safety isolating transformer, battery, etc.

TN-S system

In a TN-S system, the neutral conductor (N) and protective conductor (PE) are routed separately. The neutral conductor is always connected to the grounded protective conductor at a central point. The conductor can be grounded any number of times.

Terminating resistor

Terminating resistors are used to terminate the data transmission line in order to avoid reflections.

Transmission rate

The transmission rate defines the number of transmitted bits per second.

Ungrounded

without galvanic connection to earth

Index

A

- Accessories, B-1
- ADDR, 4-5
- Address, Glossary-1
- Ambient conditions
 - mechanical, A-9
 - operation, A-9
 - transport and storage, A-8
- Appearance, 1-3
- Approbation, iv
- Approvals, A-2
- Australia – Label, A-3

B

- Basic knowledge, iii
- BF, 6-2
- Bus, Glossary-1
- Bus connector, Glossary-1

C

- C–Tick, iv
- CE, certification, A-2
- CE label, iv
- Certification, CE, A-2
- Changes compared with the previous version,
 - iii
- Chassis ground, Glossary-1
- Climatic ambient conditions, A-10
 - climatic, A-10
- Commissioning, 4-1, 4-14
- Compatibility, 1-4
- Components, 2-2
- Configuration, 1-1
 - Procedure, 4-2
- Configuration frame, 4-13
- Configuration in STEP 7, Example, 4-12
- Configuring in STEP 7, 4-8
- Configuring using another engineering tool,
 - 4-13
- Connections, 3-6
- CSA approval, A-3

D

- Data validity indication, 4-4
- Device identifier, 6-8
- DIA, 4-4
- Diagnostics, Glossary-1, Glossary-2,
 - Glossary-4
 - by means of LED indication, 6-2
 - by means of the user program, 6-4
 - Example, 6-11
- DIN rail, 2-2
- Display elements, 1-3, 6-2
- DP master, Glossary-1
- DP slave, Glossary-2
- DP Standard, Glossary-2
- DP/DP Coupler
 - installation , 2-2
 - Technical data, A-12
- DPV0 / DPV1, 4-11
- DPV1, iii
- Dual power supply, 3-7
- dual power supply, iii

E

- Electrical isolation, 3-1
- Electromagnetic compatibility, A-6
- EMERGENCY–OFF equipment, 3-2
- Enhancements, iii
- Equipment
 - electrical, Glossary-1
 - open, 2-1
- Equipotential bonding, Glossary-2
- Error indication, 6-2
- External diagnostics, 4-11

F

- Field of application, 1-1
- FM approval, A-3
- Function, 1-1
- Further support, v

G

Galvanic properties, 3-1
Grounding, 3-1, Glossary-2
GSD file, 4-8, 4-13, Glossary-2

H

Hotline, v
HW Config, Glossary-2

I

IEC 61131, A-4
Industrial area, use in the, A-4
Information landscape, iv
Installation, 2-2
Insulation test, A-11
Interference
 pulse-type, A-6
 sinusoidal, A-7
Internet address, v

L

LED indication, 6-2
LEDs, 6-2

M

Manual guide, v
Manual objectives, iii
Manuals, Further important manuals, iv
Master, Glossary-3
Module diagnostics
 in replacement part mode, 6-10
 status message, 6-8
Module replacement, 5-1
Mounting position, 2-1
Mounting system, 2-1

N

Newsletter, vii

O

Objectives of this manual, iii
ON, 6-2
Operating conditions, A-9
Operator elements, 1-3
Order numbers, B-1

P

Parameter assignment, 1-1, Glossary-3
Parameter assignment frame, 4-13
Potentially explosive environments, A-13
Power supply
 connection, 3-7
 dual, iii, 3-7
Power supply unit, Glossary-3
Procedure, Configuration, 4-2
PROFIBUS, Glossary-3
PROFIBUS address, Glossary-3
PROFIBUS address of the DP master, 6-8
PROFIBUS cable, 3-4
PROFIBUS DP, Glossary-3
 connecting, 3-8
PROFIBUS standard, A-4
Profile rail for the S7 installation system, 2-3
Programming, 1-1
Programming example, 1-2
Properties, 1-3
Properties – DP slave, 4-11
Protection class, A-11
Protection type, A-11
PS, 4-3
PUO, Glossary-3

R

Radio interference, emission of, A-7
Range of validity, iii
Rated voltage, A-11
Recycling, v
Reference potential, Glossary-3
 grounded, 3-5
Removal, 2-3
Replacement of a faulty DP/DP Coupler, 5-1
Residential areas, use in, A-5
Response times, 5-2

S

SELV, Glossary-4
Service, vii
Setting the DIL switch, 4-3
Setting the PROFIBUS address, iii, 4-6, 4-10
SF, 6-2
Slave diagnosis, 6-4
Standard diagnosis, 6-6
Standards, iv, A-2
Station status, 6-6
Status indication, 6-2
Status message, Module diagnostics, 6-8

STEP 7, Setting the properties of the DP/DP
Coupler, 4-11
Support on the Internet, vii

T

Technical data, A-1
Terminating resistor, Glossary-4
Test voltages, A-11
TN-S system, Glossary-4
Training Center, v
Transmission rate, Glossary-4

U

UL approvals, A-3
Ungrounded installation , 3-2
Use, in potentially explosive environments,
A-13

V

Vibrations, A-9

