SIEMENS

SIMATIC

Industrial Software
Engineering Tools
TS Adapter II

Manual

06/2008
A5E00272728-03

Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

⚠ WARNING
This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Purpose of this manual

This manual provides a complete overview of the TS Adapter II and supports you in the installation and commissioning of the software and hardware. It explains the requirements for operation and hardware installation, and how to connect the adapter to MPI/DP/PPI networks.

It is intended for programmers and persons involved in configuring, commissioning, and servicing of automation systems.

Required basic knowledge

This manual requires general knowledge of automation engineering.

You also require knowledge of the use of computers or PC-based equipment (such as programming devices) operating on Windows 2000 and Windows XP platforms.

Scope of this manual

This manual applies to the TS Adapter II product.

Network approval for Europe

The TS Adapter II-Modem is compliant with the European Standard TBR 21.

The TS Adapter II-ISDN is compliant with the telecommunications registration TBR 3.

Network approval for the USA

This equipment complies with ACTA.

Network approval for Canada

The Industry Canada (ic) label identifies certified equipment.

Additional support

If you have any questions relating to the products described in this manual, and do not find the answers in this documentation, please contact your Siemens partner at our local offices.

You will find information on who to contact at:

http://www.siemens.com/automation/partner

A signpost to the documentation of the various SIMATIC products and systems is available at:

http://www.siemens.de/simatic-tech-doku-portal

You will find the online catalog and order system at:

http://mall.automation.siemens.com

Training center

We offer a range of courses to help you to get started with the SIMATIC S7 automation system. Please contact your regional training center, or the central training center in D 90327 Nuremberg, Germany.

Telephone: +49 (911) 895-3200.

Internet: http://www.sitrain.com

Technical support

How to contact Technical Support for all Industry Automation products

- Using the Web form for a support request
  http://www.siemens.de/automation/support-request

- Telephone: + 49 180 5050 222

- Fax: + 49 180 5050 223

Additional information about our technical support is available in the Internet at http://www.siemens.de/automation/service.

Service & Support on the Internet

In addition to our documentation, we offer a comprehensive online knowledge base on the Internet at:

http://www.siemens.com/automation/service&support

There you will find:

- The newsletter, which constantly provides you with up-to-date information on your products.

- Relevant documentation for your application, which you can access via the search function in Product Support

- A forum for worldwide knowledge exchange for users and experts.

- Your local partner of Industry onsite.

- Information about repairs, spare parts and consulting.

Table of contents

Tables

Figures

Properties of the TS Adapter II

1

1.1 Properties

Overview

The USB connection of the TS Adapter II is compatible with USB V1.1 and complies with the specifications for a "Low-Powered" USB device. The TS Adapter II supports hibernate mode.

When used in an S7-300 system, the TS Adapter II does not loop through the I/O bus. Therefore, the TS Adapter II should preferably be mounted in the last position on the rack.

1.2 Function

Connections

- **Modem connection:** The TS Adapter II allows a component running on a PC (e.g., STEP 7) to access automation components (S7 and C7) on an MPI/DP/PPI bus by means of the telephone network. The TeleService application is required to establish a remote connection.

- **Direct connection:** With direct connection, the TS Adapter II allows data exchange between the programming device or PC and an S7/C7 system via the Universal Serial Bus (USB). The TS Adapter II with direct connection corresponds functionally to a PC Adapter USB.

The TS Adapter II can be assigned with modem connection (with an established remote connection) and with direct connection. The TeleService application is used to assign parameters.

The following figures show the TS Adapter II-Modem with direct connection and with modem connection:

TS Adapter II-Modem

USB   MPI
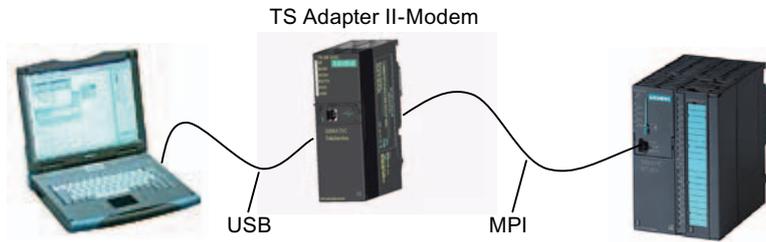
Figure 1-1   TS Adapter II with direct connection

Note

You can operate only one TS Adapter II on a PC.

TS Adapter II-Modem

Phone network

Modem

MPI

Analog phone cable
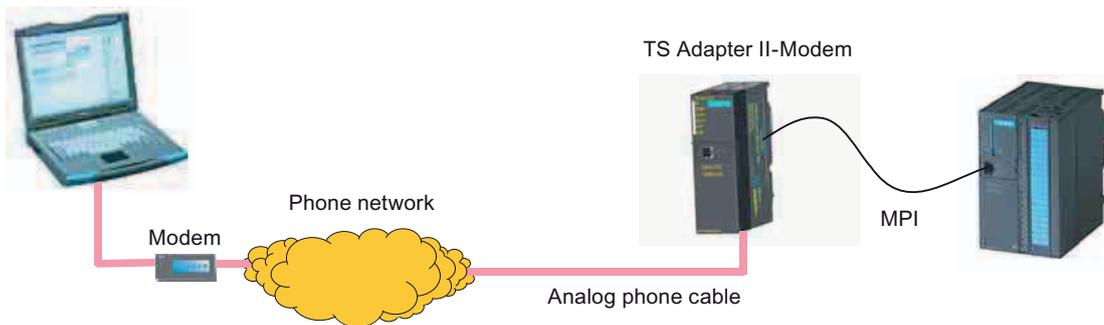
Figure 1-2   TS Adapter II with modem connection

1.3 Performance features

You can operate the TS Adapter II on MPI networks, PROFIBUS networks, and homogeneous PPI networks. The TS Adapter II corresponds basically to a PC Adapter USB.

Baud rates and bus profiles

The following table shows the baud rates supported by the TS Adapter II on various network types.

Table 1-1   Bus profiles and baud rates

Baud rate	MPI	PPI	PROFIBUS			
			DP	Standard	Universal	User-defined
9,600 bps	-	✓	✓	✓	✓	✓
19,200 bps	✓	✓	✓	✓	✓	✓
45,450 bps	-	-	✓	✓	-	✓
93,750 bps	-	-	✓	✓	✓	✓
187,500 bps	✓	✓	✓	✓	✓	✓
500 kbps	-	-	✓	✓	✓	✓
1500 kbps	✓	-	✓	✓	✓	✓
3 Mbps	✓	-	✓	✓	-	✓
6 Mbps	✓	-	✓	✓	-	✓
12 Mbps	✓	-	✓	✓	-	✓

Performance features of the TS Adapter II

- Connection to PC via USB
- Automatic bus profile detection
- Up to 16 communication connections, including a maximum of 4 slaves (DP/T connections)
- Support for routing
- Support for "PG_DIAL", "AS_DIAL", "SMS_SEND" function blocks
- External voltage supply possible
- A DIN rail mounting is also integrated.

Scope of delivery

2

Overview

The scope of delivery of both SIMATIC TS Adapter II variants includes:

- "SIMATIC TeleService Edition" CD with software and documentation
- USB cable (5 m)
- 24 V power plug
- MPI cable (0.8 m)
- Slide for DIN rail mounting

You can use the MPI cable to connect the TS Adapter II to MPI networks, homogeneous PPI networks, or PROFIBUS (DP) networks.

Additionally for the modem variant:

- Analog phone cable with 2 RJ12 connectors (3 m)
- TAE connector (Europe)

Additionally for the ISDN variant:

- ISDN phone cable with 2 RJ45 connectors (3 m)

Spare parts

Designation	Order No.
MPI cable, 0.8 m	A5E00228477
USB cable, 5 m	A5E00276884
Analog phone cable	A5E00243688
ISDN phone cable	A5E00243651
TAE connector	A5E00243701
24 V power plug	A5E00073529
Slide for DIN rail mounting	A5E00213070

The spare parts can be ordered from your local Siemens representative.

Requirements for operation

<div align="right">

3

</div>

3.1 Software requirements

Overview

For working with the TS Adapter II, you need a PC with an MS Windows operating system and the software (device driver) for the TS Adapter II.

The list of supported operating systems is included in the latest Readme file for the TS Adapter II software.

To assign parameters and to establish a remote connection, you will need:

- SIMATIC TeleService
  TeleService V6.0 or higher is required for parameter assignment of the TS Adapter II. Prior versions can be used to establish a remote connection and, if necessary, to log on to the TS Adapter II.

- Teleservice V6.0 SP1 is required to operate the TS Adapter II ISDN in the USA or Canada.

And a

- SIMATIC SW package that accesses via MPI communication (e.g., STEP 7)

The STEP 7 Micro/Win32 SW package is also required to operate the TS Adapter II on a PPI network.

3.2 Hardware Requirements

Overview

To work with the TS Adapter II, you will need a PC with one of the following hardware items:

- You will need a PC with a USB interface and CD-ROM drive.

- To comply with the installation requirements of UL for the TS Adapter II-ISDN, you must use a
  UL-listed NTBA (Network Terminal Basic Adapter).

- To comply with the UL requirements for the TS Adapter II-Modem, you must use a UL DUXR phone cable (comprising a cable and connectors) with AWG 26 cable cross-section. The supplied cable fulfills this requirement.

3.3   Installation

Types of installation

You can install the TS Adapter II as follows:

- On the mounting rail of the S7-300 (see section "Installation on mounting rail"). Make sure that you use the lost slot of the mounting rail since the TS Adapter II does not loop through the signals of the I/O bus, or

- On the DIN rail (see section "Installation on DIN rail").

> ⚠ **WARNING**
>
> The mounting rail or DIN rail on which the TS Adapter II is installed must be grounded.

Rear panel of the TS Adapter II:
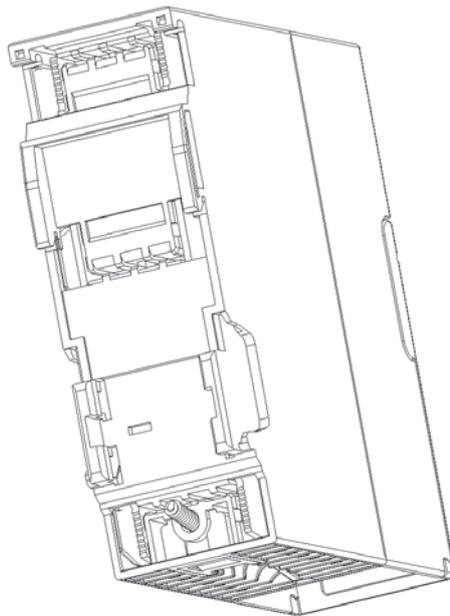
Figure 3-1   Rear panel of the TS Adapter II

3.3.1 Installation on mounting rail

Procedure

The various module installation steps are explained below.

1. Place the TS Adapter II at the of the profile rail. Unlike S7-300 modules, the TS Adapter II does not require a bus connector. Hook the TS Adapter II onto the rail (1), slide it over until it reaches the module on the left (2), and swing it down into place (3).
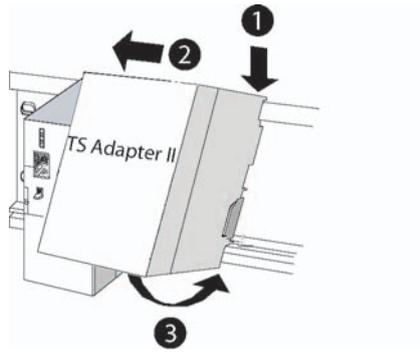
2. Hand-tighten the screws on the TS Adapter II.
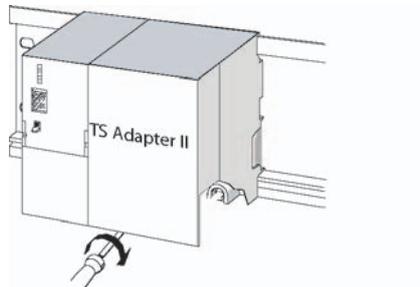
3.3.2 Installation on a DIN rail

Requirement

The DIN rail is mounted.

Tools required: 3-mm screwdriver

The enclosed slide must be inserted into the rear panel of the TS Adapter II from below.
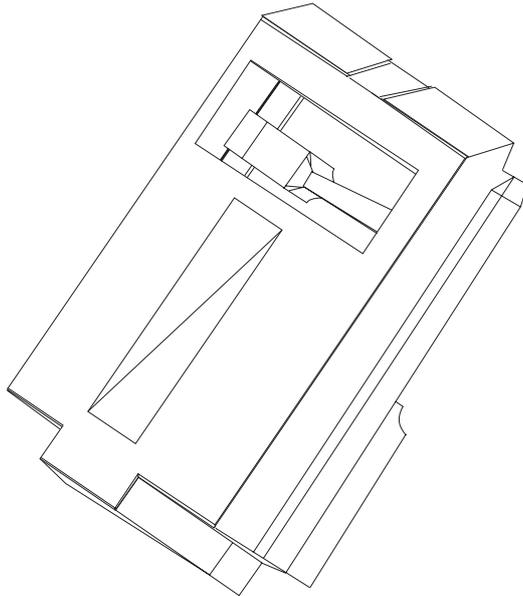
Figure 3-2   Slide for installing the TS Adapter II on a DIN rail

Installing TS Adapter II

1. Hook the TS Adapter II onto the DIN rail.

2. Swivel the TS Adapter II back until the slide engages audibly.
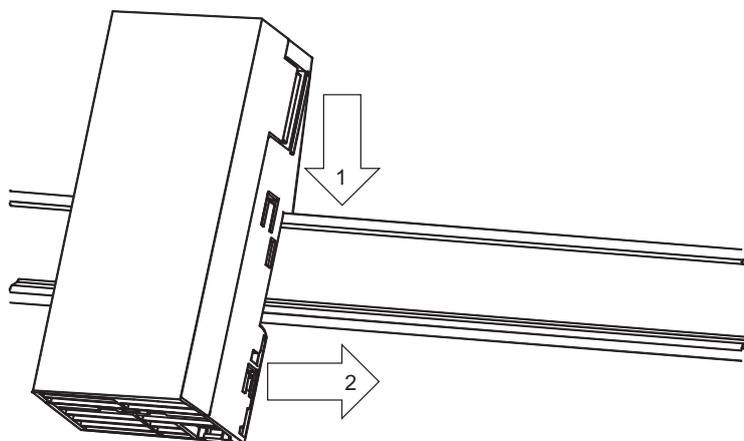
Figure 3-3   Installing TS Adapter II

Uninstalling TS Adapter II

1. You can see the bottom end of the slide on the underside of the TS Adapter II. Using a screwdriver, press against the slide in the direction of the DIN rail and pull the slide downward, thus loosening the engagement mechanism.

2. Swivel the TS Adapter II forward out of the DIN rail.

Minimum clearances for installation, wiring, and ventilation

When installing the TS Adapter II in a housing, ensure that the distance to the lid of the housing or the front door is at least 2 mm.
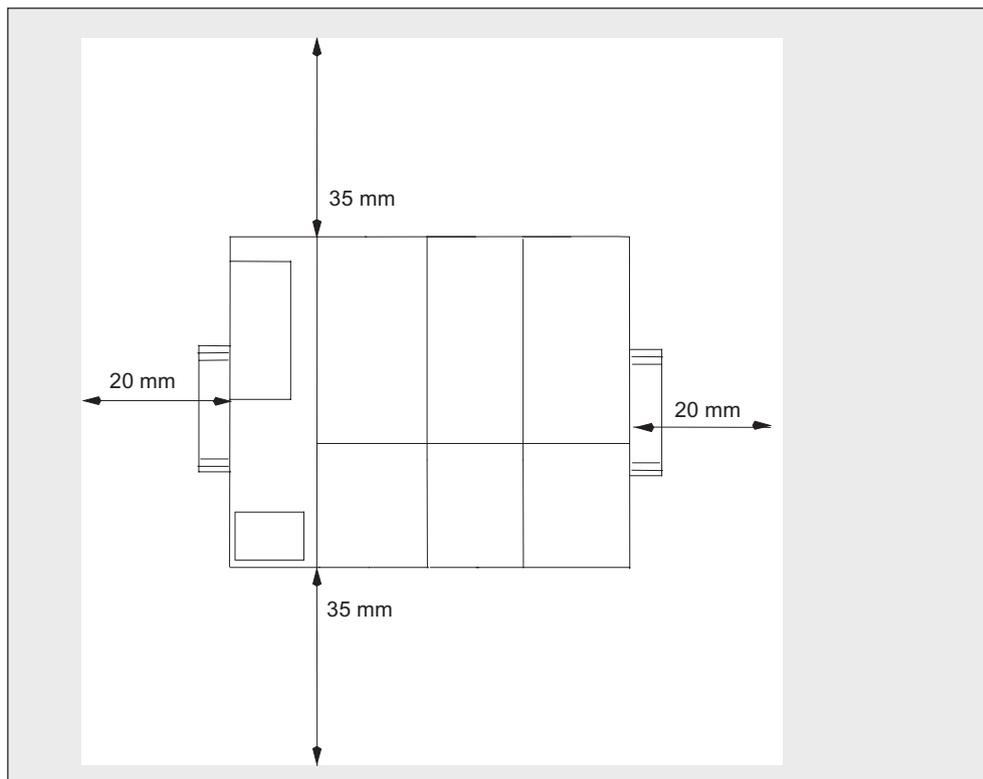
Figure 3-4   Minimum clearance

Hardware configuration of the TS Adapter II

<div style="text-align: right; font-size: 2em;">4</div>

4.1 Connections

Below are two figures showing the different adapters and their respective connections.

TS Adapter II-Modem

The TS Adapter II-Modem is equipped with the following connections:
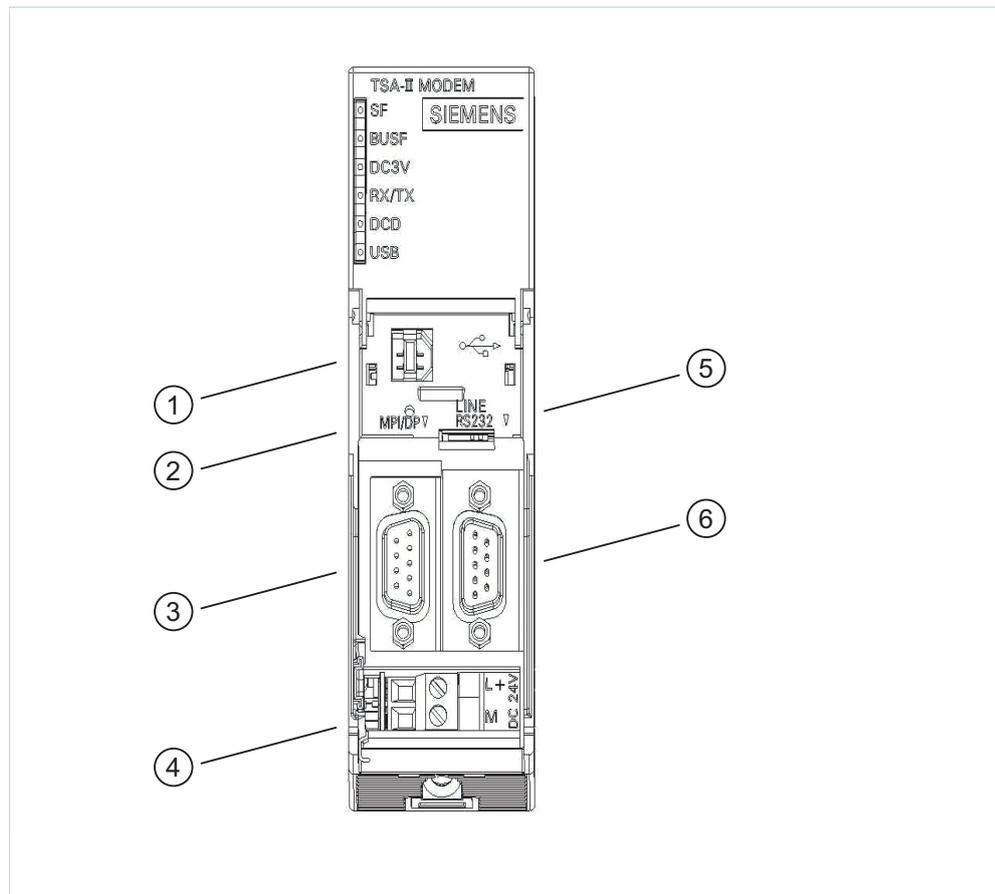
Figure 4-1   TS Adapter II-Modem

①	USB interface
②	Reset button

③   MPI/DP socket

④   Power plug for power supply

⑤   RJ12 MODEM interface

⑥   RS232 serial interface

TS Adapter II-ISDN

The TS Adapter II-ISDN is equipped with the following connections:
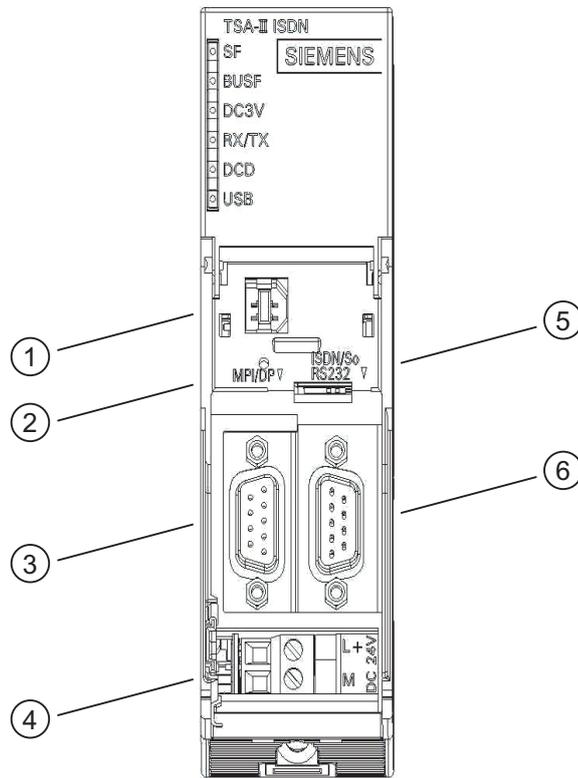
Figure 4-2   TS Adapter II-ISDN

①   USB interface

②   Reset button

③   MPI/DP socket

④   Power plug for power supply

⑤   RJ45 ISDN interface

⑥   RS232 serial interface

4.2 LEDs on the TS Adapter II

Overview

The TS Adapter II is equipped with the following LEDs:

- 3V operating voltage
- Bus fault
- USB
- DCD
- RX/TX
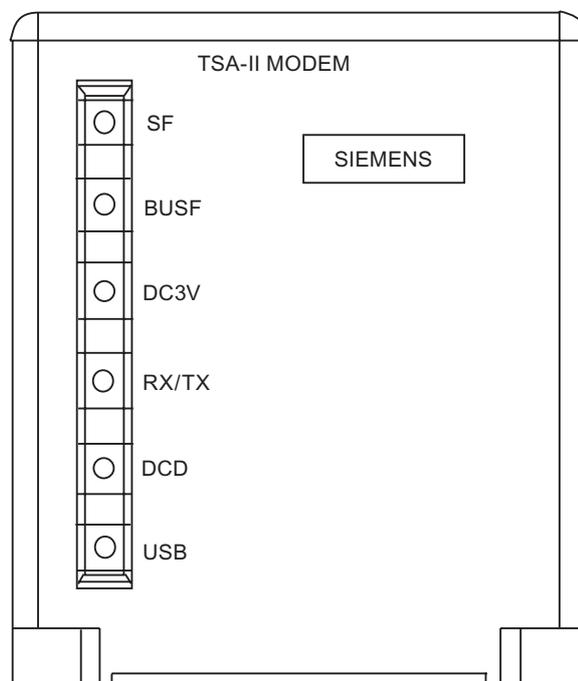
Figure 4-3   LEDs of the TS Adapter II

SF	Group error
BUSF	Bus fault
DC3V	3V operating voltage
RX/TX	RX/TX
DCD	DCD
USB	USB

Startup characteristics

All LEDs are switched on when power is restored. After a few seconds, the LEDs are set according to the current operating state.

The LEDs on the TS Adapter II have the following meaning:

Designation	Color	Meaning
SF	Red	**Group error:** Lights up when the TS Adapter II detects an error situation on the modem interface or the MPI/DP interface. This LED also is also lit during a firmware download operation.
BUSF	Red	**Bus fault:** This LED is switched off when the TSP Adapter II has been incorporated in the MPI/DP network without errors. It is lit if the TS Adapter II is not incorporated in the MPI/DP network due to faulty network parameters or a missing MPI connection.
DC3V	Green	Lights up when the TS Adapter II is supplied with the necessary operating voltage.
RX/TX	Green	Indicates data traffic between the TS Adapter II and the (integrated) modem. The LED flickers during data transmission.
DCD	Yellow	Lights up when a remote connection is established via the modem interface of the TS Adapter II. The LED is off when there is no remote connection. After reset using the Reset key: Flashes 3 times when the default parameter assignment has been applied.
USB	Green	Lights up when the TS Adapter II is connected to the USB and the operating system of your PC is in normal mode. This LED is off when the PC is in standby or idle mode. The LED flickers during data transmission.

The indication of possible error states is described in section "Error Diagnostics".

4.3   Power supply

The automation system supplies power to the TS Adapter II via the supplied MPI cable or the power socket for an external power supply.

The TS Adapter II requires only 24 V voltage (see appendix "General technical specifications").

No current is drawn from the USB interface.

> ⚠ **DANGER**
>
> Only connect the TS Adapter II to devices with power supplies with limited power (SELV).

The MPI/DP interface is electrically isolated. Therefore, the TS Adapter II can also be operated directly on ungrounded mounted S7 and C7 systems.

The power supply makes available electrically-isolated internal voltages from the 24 V DC of the MPI/DP interface or an external infeed. Approximately 2 W of power are supplied.

4.4 MPI/DP interface

Connector assignment

The MPI/DP socket has the following pinout:
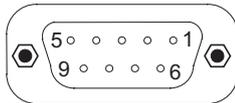
Signal description

Pin. No.	Short description	Meaning	Input/ output
1	NC	Not connected	-
2	M24V	For 0 V line of the 24 V supply; supplies the adapter electronics via a DC/DC converter (PC potential area)	Input
3	LTG_B	Data line B	Input/output
4	RTS_AS	RTS_AS, control signal for receive data stream. The signal is "1" when the directly connected AS is sending	Input
5	M5V	Reference potential of MPI/DP interface for the RTS_AS and RTS_PG signals	Input
6	P5V	For supplying power to terminating resistors	Output
7	P24V	For +24V line of the 24 V supply; supplies the adapter electronics via a DC/DC converter (PC potential area)	Input
8	LTG_A	Data line A	Input/output
9	RTS_PG	RTS output signal of the adapter. The signal is "1" when the adapter is sending. The signal is not contained in the MPI cable.	Output
Shield		On connector casing*	-
* The shield is interconnected with the USB socket via the adapter electronic module.			

> ⚠ **WARNING**
>
> Use the MPI cable described below and supplied with your TS Adapter II only for transmission rates up to 1500 kbps. If you want to operate the adapter on systems with higher transmission rates, use a PROFIBUS cable. In this case, you must supply power to the TS Adapter II with an external 24 V supply.

MPI cable

UL cable, AWM 2464, 80°C, 300V, 28 AWG, VW-1

Figure 4-4   MPI cable, 0.8 m with 9-pin sub D connectors

Signal assignment
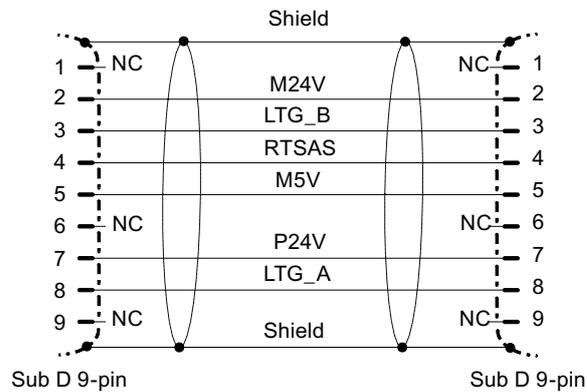
Figure 4-5   MPI cable (0.8 m)

4.5 USB interface

Interface assignment

Top view of the USB socket:
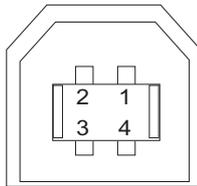
Signal description

Pin no.	Signal	
1	+5V	Power supply
2	-Data	- Differential signal
3	+Data	+ Differential signal
4	Ground	Ground

> ⚠ **CAUTION**
>
> If multiple USB devices are operating on your PC, this can affect the data transmission times. To achieve optimal performance of communication functions with the automation system, any unnecessary USB devices should be removed.

4.6 RS232 interface

The TS Adapter II has a COM interface configured as an RS232C interface, which is used solely for connecting external modems.

Standard modems, ISDN terminal adapters, or GSM radio modems can be connected to and operated on the COM interface.

Note

The firmware detects the insertion of an external modem and switches automatically from internal to external modem operation.

Simultaneous internal and external modem operation is not possible.

Connector assignment

The RS232 plug connector has the following pinout:
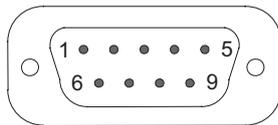
Signal description

Pin. No.	Short description	Meaning	Input/ output
1	DCD	Data carrier detect - the DCE signals to the DTE the reception of a carrier or the connection setup	Input
2	RXD	Receive data - from DCE[1] to DTE[2]	Input
3	TXD	Transmit data - from DTE to DCE	Output
4	DTR	Data terminal ready - the DTE signals this to the DCE	Output
5	GND	Internal reference ground	
6	DSR	Data set ready - the DCE signals this to the DTE	Input
7	RTS	Request to send - the DTE requests the DCE to transmit data on the data cable. The DTE waits for the CTS (clear to send) signal from the DCE	Output
8	CTS	Clear to send - the DCE is able to transmit the data incoming from the DTE	Input
9	RI	Ring indicator - the DCE signals reception of a call signal to the DTE	Input
Shield		On connector casing	-
[1] DCE = Data communication equipment			
[2] DTE = Data terminal equipment			

4.7 Power plug for power supply

Supply system connection

The 24 V supply voltage can be delivered via the MPI/DP interface cable or the power cord for the power supply. The 24 V infeed socket is located at the bottom of the module front panel.
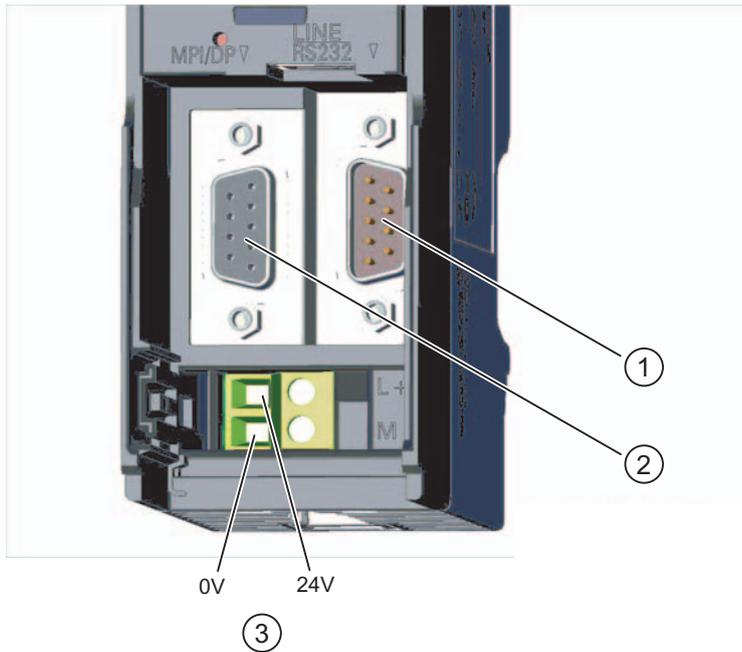
①	RS232 serial interface
②	MPI/DP socket
③	Infeed socket for power supply

Connectable cables for 24 V power plug	On TS Adapter II
Solid wires	No
Flexible cables	
• Without end sleeve	0.25 mm^2 to 2.5 mm^2
• With end sleeve	0.25 mm^2 to 1.5 mm^2
Number of conductors per terminal	1 cable or 2 cables up to 1.5 mm^2 (total) in a common end sleeve
Diameter of the cable insulation	Max. 3.8 mm
Stripped length	11 mm
End sleeves in accordance with DIN 46228	
• Without insulating collar	Design A, 10 mm to 12 mm length
• With insulating collar	Form E, up to 12 mm long

Note

For information on how to connect the power supply, refer to section "Connecting the TS Adapter II".

4.8 Modem interfaces

4.8.1 TS Adapter II-Modem variant

The TS Adapter II-Modem variant has an analog modem interface with a 6-pin RJ12 connector. The supplied analog phone cable is connected to this interface. This allows the modem to be connected to a phone socket. The length of the cable is 3 m.

Analog phone cable

Note

To use the TS Adapter II-Modem outside Germany, a TAE plug adapter for the country in question can be applied to the RJ12 connector. For Germany, a TAE6N connector is supplied. In some countries, phone sockets with RJ12 sockets are already available, in which case you can use the phone cable without any TAE connector.

Connector assignment and signal description

Illustration	Pin no.	Signal name	Signal direction	Comments
	1			
	2			
	3	b1	Bidirectional	Incoming wire pair
	4	a1		
	5			
	6			
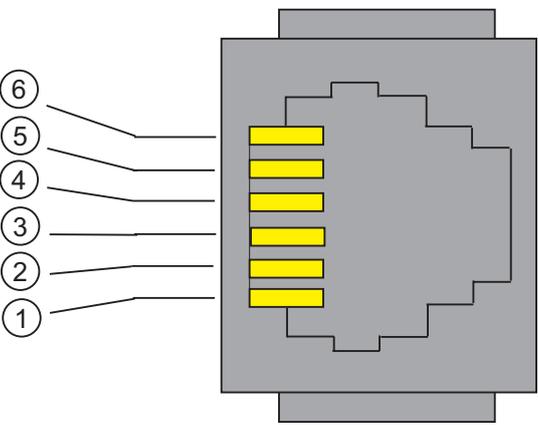
4.8.2   Technical specifications of the analog modem

Modem modules of the SIM family are used on the TS Adapter II. These modules are small, highly integrated, state-of-the-art data communication units.

Properties / technical specifications

- ITU Transmission Standards:
  V.21, V.22, V.22 to, V.23, V.32, V.32 to, V.34, V.34x, K56flex, V.90, V.92

- Error correction and data compression

- Supply voltage 3.3 V

- Serial interface V.24/TTL, 300 kbps to 115 kbps

- a/b interface

- Hayes (AT) command set

- All data formats

- Dial procedures: Dual-tone multiple-frequency (DTMF), pulse dialing

Country list

Explicit telecommunications approvals have been obtained for the following countries:

Australia [1]	Iceland	Poland
Belgium	Italy	Portugal
Bulgaria	Canada	Romania
Denmark	Latvia	Sweden
Germany	Lithuania	Switzerland
Estonia	Luxembourg	Slovakia
Finland	Malta	Slovenia
France	New Zealand [1]	Spain
Greece	The Netherlands	Czech Republic
Great Britain	Norway	Hungary
Ireland	Austria	USA
		Cyprus

[1] As of hardware version 03. Extended modem parameterization (initialization) is also required See product information.

For information on approval in other countries, please contact Technical Support.

Note

The modem in the TS Adapter II modem variant is design for use worldwide. Ensure compliance with national laws and country-specific requirements when installing and operating the TS Adapter II modem.

Customer Support has a list of countries in which the TS Adapter II modem cannot be used. Please request this list in cases of doubt.

4.8.3   TS Adapter II-ISDN variant

The TS Adapter II-ISDN variant provides an S0 interface at the 8-pin RJ45 socket. Using the supplied ISDN phone cable, you can connect the TS Adapter II to an ISDN S0 socket. The length of the cable is 3 m.

ISDN phone cable

RJ45   RJ45
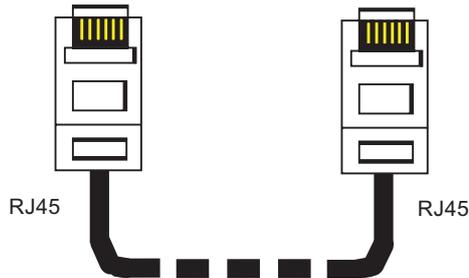
Note

When inserting, grasp the cable just below the RJ45 connector. Make sure the RJ45 connector engages audibly.

You can remove the connector as follows:

- Using a screwdriver, press the connector jack to the left and then remove the cable.

Connector assignment and signal description

| Signal name | RJ-45 Western plug | |
	Pin no.	Illustration
-	1	
-	2	
TX-	3	
RX-	4	
RX+	5	
TX+	6	
-	7	
-	8	

4.8.4 Technical specifications of the ISDN terminal adapter

The TS Adapter II is equipped with a modular active ISDN terminal adapter, which is controlled with TTL signal levels via a serial interface.

Properties / technical specifications

- D-channel protocols DSS1 (Euro-ISDN), 1TR6, NI1, 5ESS, DMS100
- Additional protocol-specific parameters
  - Multiple subscriber number (MSN)
  - Directory number (DN)
  - Service profile identifier (SPID)
- Support for the major B-channel protocols:
  V.110 (9600 bps, 19200 bps, 38400 bps)
  V.120 (64 kbps, 56 kbps)
  X.75 (64 kbps)
- Supply voltage 3.3 V
- Serial interface V.24/TTL, 300 kbps to 115 kbps
- AT command interpreter

Country list

Explicit telecommunications approvals have been obtained for the following countries:

Belgium	Canada	Sweden
Bulgaria	Latvia	Switzerland
Denmark	Lithuania	Slovakia
Germany	Luxembourg	Slovenia
Estonia	Malta	Spain
Finland	Netherlands	Czech Republic
France	Norway	Turkey
Greece	Austria	Hungary
United Kingdom	Poland	USA
Ireland	Portugal	Cyprus
Italy	Romania	

For information on approval in other countries, please contact Technical Support.

Note

Ensure compliance with national laws and country-specific requirements when installing and operating the TS Adapter II ISDN.

Working with the TS Adapter II

<div align="right">5</div>

5.1 Safety notices

Qualified personnel

The device may only be serviced by qualified personnel. 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.

Correct usage:

> ⚠ **WARNING**
>
> The device may be used only for the applications described in the catalog and in the technical description, and only in connection with devices or components from other manufacturers that have been approved or recommended by Siemens.
>
> This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

5.2 Installing the software

Procedure

1. Insert the supplied "SIMATIC TeleService Edition" CD into the CD-ROM drive of your PC.

2. The setup program starts automatically and guides you through the installation.

If the autostart function for your CD-ROM drive is disabled, run the setup program by double-clicking *Setup.exe* in the root folder of your "SIMATIC TeleService Edition" CD.

5.3 Setting the PG/PC Interface

Procedure

During installation of the software you are prompted to set the PG/PC interface.

1. In the "Set PG/PC Interface" dialog, check whether the following interface parameter has been assigned.
   The selection list must contain the entry:

   – TS Adapter

   If this is not the case,

   – click "Select..." to add/remove an interface. The "Install/Remove Interface" dialog box opens.

   – Select the "TS Adapter II" module from the selection list and install the adapter. Click "Close" to close the dialog box.

2. In the "Set PG/PC Interface" dialog, select the interface parameter assignment that you want to use in the future for communication (TS Adapter). Click the "Properties" button.

3. The "Properties - TS Adapter" dialog box opens. Open the "Local Connection" tab. Set "USB" as the direct connection.

4. Click "OK" to close the "Properties - TS Adapter" dialog box.

5. Click "OK" to close the "Set PG/PC Interface" dialog box.

6. If you have changed an access path in these settings, a warning message then appears. To apply the changes, click "OK".

5.4 Connecting the TS Adapter II

Connecting to the PC

1. When prompted to do so, insert the supplied USB cable onto a USB interface of your PC.

2. Insert the other end of the USB cable onto the USB interface of the TS Adapter II.

Connecting to the automation system

1. Insert the supplied MPI cable onto the TS Adapter II and tighten the screws.

2. Insert the other end of the MPI cable onto the MPI interface of your CPU and tighten the screws.

Note

The adapter and the S7/C7 system each represent a node.

1. In networks consisting of two nodes (adapter and S7/C7 system), the adapter is operated directly at the socket of the S7/C7 system.

2. In networks consisting of more than 2 nodes, the adapter is either connected to the "PG socket" of a PROFIBUS cable connector (SINEC L2 bus connector) using the supplied MPI cable or connected directly into the ring using a PROFIBUS cable connector. In this case, the adapter must additionally be supplied with 24 V.

Connecting to 24 V

Wire the supplied 24 V connector as shown in section "Power cord for power supply" and insert the connector into the TS Adapter II. The supplied MPI cable or the power cord supplies the voltage to the TS Adapter II. The power cord must be used to supply the voltage if the CPU that is connected to the TS Adapter II via the MPI cable cannot supply 24 V.

Note

If 24 V are delivered over the MPI cable and the 24 V power cord, the higher voltage prevails.

Windows cannot detect the TS Adapter II until it is supplied with voltage. When the adapter is connected initially, the "Found New Hardware Wizard" appears. Select "Install software automatically (recommended)", then click "Next". Windows will install the pre-installed TS Adapter II driver (see also section "Installing the software").

Note

Make sure the 24 V supply cable is protected suitably for its cross-section.

Connecting to the analog phone socket

1. Insert the supplied analog phone cable onto the TS Adapter II.

2. Plug the other end of the phone cable into your phone socket. Use the TAE plug adapter if necessary.

Note

You can operate the TS Adapter II-Modem on internal and public analog telecommunications networks (TNV-3 system).

The insulating voltage between the phone side and the remaining electronics is rated for 250 V AC.

⚠ WARNING

Connecting the TS Adapter II-ISDN to an analog phone socket is not permitted and can lead to life-threatening situations and destruction of the adapter.

Connecting to the ISDN phone socket

1. Fold the supplied ferrite over the phone line close to the TS Adapter II-ISDN.

2. Insert the supplied ISDN phone cable onto the TS Adapter II.

3. Insert the other end of the ISDN phone cable into the ISDN socket on your NTBA or your ISDN socket.

Connecting to the external modem

Use a modem cable to connect your modem to the RS232 plug connector.

Reset button

The TS Adapter II is equipped with a Reset button that you can use to reset the adapter parameter assignment to the default parameter assignment. This may be necessary if the adapter parameters in a remote system have been modified such that the TS Adapter II can no longer be reached via the phone connection. In this case, the operator of the remote system must hold the reset button down for approximately 2 seconds.

The DCD-LED of the TS Adapter II flashes three times to acknowledge that a reset operation was performed remotely by means of the reset button. The TS Adapter II is then reset to the default parameter assignment.
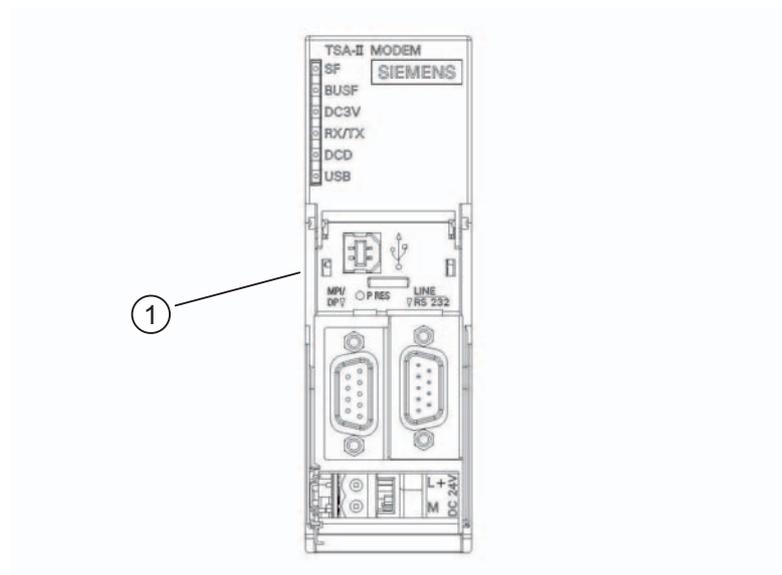
Figure 5-1   Front view with reset button

①   Reset button

TS Adapter II on the MPI/DP/PPI network

<div align="right">

6
</div>

6.1 General information

A maximum of 32 nodes can be connected to an MPI/DP/PPI network segment. The total cable length must not exceed 50 m. Multiple network segments can be combined using RS485 repeaters to form an overall network with a maximum of 127 nodes. The maximum data transmission rate in the MPI/DP network is 12 Mbps.

The TS Adapter II supports transmission rates up to a maximum of 12 Mbps.

> ⚠ **WARNING**
>
> Extension cables in addition to the supplied MPI cable are not allowed between the TS Adapter II and S7/C7 system.

6.2 Use in a stand-alone system

The following figure shows the connection to an individual system (2 nodes). Both nodes are connected using the supplied MPI cable (0.8 m).
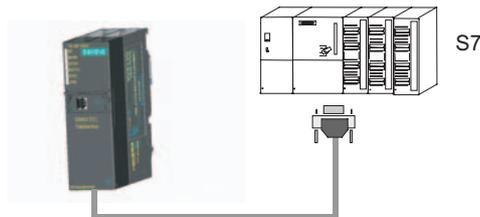
Figure 6-1   Connection to a stand-alone system

6.3 Use on networked system

6.3.1 Connection to networked S7 systems

The following figure shows the connection to networked S7 systems (MPI network with 2 or more nodes). You use the supplied MPI cable to connect the TS Adapter II.

| Supplied MPI cable | PROFIBUS cable | PROFIBUS cable |
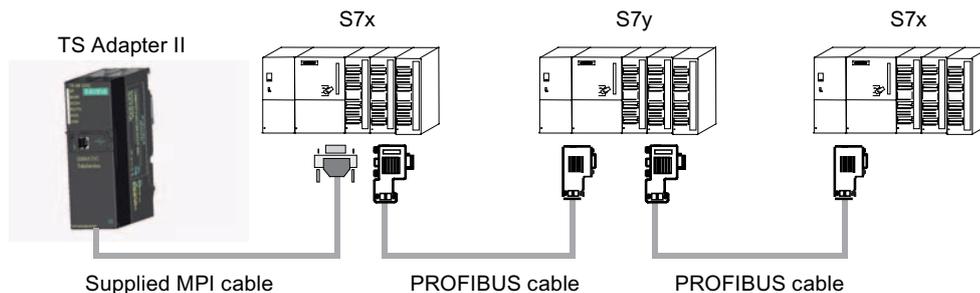
6.3.2 Connection in the ring

+ external 24 V supply

| PROFIBUS cable | PROFIBUS cable | PROFIBUS cable |
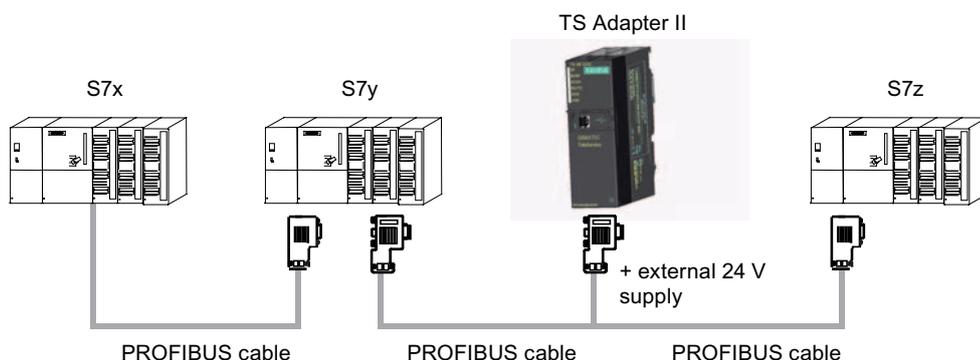
You use a PROFIBUS DP connector to connect the TS Adapter II in the ring (not included in the scope of delivery). In this case, you must supply 24 V to the TS Adapter II.

Note

If you want to install the TS Adapter II together with other S7-300 modules in a rack, you must take into account the fact that the TS Adapter II has no backplane bus. There must therefore be no S7-300 modules that communicate with the CPU over the backplane bus (SM, FM or CP) installed to the right of the TS Adapter II.

If the TS Adapter II is the last module in the ring, the terminating resistors must be activated on the PROFIBUS DP connector.

Firmware update

<div style="text-align: right; font-size: 3em;">7</div>

The TS Adapter II firmware can be updated as required, for example, after new features have been added.

To update the firmware, proceed as follows:

● You will find the latest firmware and the firmware update tool on the Internet at:

http://www.siemens.com/automation/simatic-cs

● Search for "TS Adapter II" under Product Support.

● Download the self-extracting exe file containing the available firmware and the firmware update tool to your PC.

● Extract the files to a local drive. Follow the instructions of the firmware update tool to update the firmware on your TS Adapter II.

● In addition, please read the Readme file in the "Firmware" catalog of the firmware update tool. This file contains information regarding installation and use of the new firmware.

Note

The firmware current at time of shipping and the firmware update tool is included on your "SIMATIC TeleService Edition" CD in the "TS Adapter II\Firmware" catalog.

Error diagnostics

<div align="right">

8

</div>

To check the functioning of the LEDs, switch the operating voltage of the TS Adapter II off and back on. All LEDs are switched on when power is restored. After a few seconds, the LEDs are set according to the current operating state.

Simple malfunctions that you can diagnose and correct in some cases are explained below.

Error/cause	Remedy
SF and BUSF LEDs are lit	
• The assigned network parameters of the TS Adapter II are incorrect.	• Use TeleService to check and modify the network parameter assignment of the TS Adapter II.
• MPI cable is not inserted	• Insert MPI cable
• Automation system is switched off	• Switch on the automation system
SF LED lit, BUSF LED not lit	
• The TS Adapter II cannot communicate with the modem.	• Check the cabling to the modem and switch on the modem, if necessary
• The modem replies with an error message	• Use TeleService to check and modify the modem parameter assignment of the TS Adapter II.
DC3V LED not lit	
• MPI cable is not inserted	• Insert MPI cable
• Automation system is switched off.	• Switch on the automation system
• The external power supply is not connected or is switched off	• Connect or switch on external power supply
• Hardware error has occurred	• Inform Customer Support
USB LED not lit	
• The USB cable is not inserted	• Insert the USB cable
• The PC and the USB interface of the TS Adapter II is in hibernate mode.	• Impermissible operating mode
• TS Adapter II is not detected by the PC.	• Check and install the software, if necessary
No LED lit	
• MPI cable is not inserted	• Insert MPI cable
• The 24 V supply is not available when using the MPI/DP socket.	• Check the cabling
• Automation system is switched off.	• Switch on the automation system
• The external power supply is not connected or is switched off	• Connect or switch on external power supply
• Hardware fault has occurred.	• Inform Customer Support
All LEDs flashing continuously	
• Hardware fault has occurred.	• If all the LEDs on the device continue to flash after reinsertion of the MPI cable or the external voltage supply, the device is defective and must be replaced.

Appendix A

A.1 Standards, Approvals, Certificates, Guidelines, Labels, and Declarations

> **Note**
>
> The currently valid approvals are to be found on the product rating plate.

Safety requirements

- The TS Adapter II meets the requirements and criteria of the IEC 61131-2 standard.
- The IT interface is subject to the IEC 60950 standard.

CE mark

Our products conform to the requirements and safety objectives of the EC Directives listed below. They are compliant with the harmonized European Standards (EN) for programmable logic controllers as published in the official gazettes of the European Community:

- 2004/108/EC "Electromagnetic Compatibility" (EMC Directive)
- 94/9/EC "Equipment intended for use in potentially explosive atmospheres" (ATEX)
- 1999/5/EC "Radio and telecommunications terminal equipment" (RTTE Directive)

The EC Declarations of Conformity are available to the relevant authorities at:

Siemens Aktiengesellschaft
Industry Sector
I IA AS RD ST Typetest
P.O. Box 1963
D-92209 Amberg

EMC directive

SIMATIC products are designed for industrial applications.

Area of application	Requirements	
	Interference emission	Interference immunity
Industry	EN 61000-6-4: 2007	EN 61000-6-2: 2005

Explosion protection directive

Conforming to EN 60079-15:2005 and EN 60079-0:2006 (Electrical apparatus for potentially explosive atmospheres; Type of protection "n")

II 3 G Ex nA II T3 ... T6

RTTE Directive

- Security: Telecommunications interface tested in accordance with EN 60950-1
- EMC: see EMC Directive
- Network compatibility:

  TS Adapter II-ISDN: TBR3

  TS Adapter II-Modem: TBR21

Marking for Australia and New Zealand

Our products comply with the requirements of the AS/NZS CISPR 11 standard (Class A).

cULus approval

Underwriters Laboratories Inc., in accordance with

- UL 508 (Industrial Control Equipment)
- C22.2 No. 142 (IND.CONT.EQ)

cULus approval, Hazardous Location

cULus Listed 7RA9 INT. CONT. EQ. FOR HAZ. LOC.

Underwriters Laboratories Inc., to

HAZ. LOC.

- 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

- Cl. 1, Div. 2, GP. A, B, C, D T4A
- Cl. 1, Zone 2, GP. IIC T4

Note

The system installation must be compliant with NEC (National Electric Code) requirements.

For use in Class I, Division 2 environments, the TS Adapter II must be installed in a cubicle with minimum IP54 protection to IEC 60529.

Information on use of the TS Adapter II in Zone 2 hazardous areas is contained in the "Product Information ATEX Zone 2.pdf" file,

This file is located on the product CD in the "_Product_Information" folder.

⚠ WARNING

Explosion Hazard - Do not disconnect while circuit is live unless area is known to be non-hazardous.

Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2 or Class I, Zone 2.

FM approval

Factory Mutual Approval Standard Class Number 3611,

Class I, Division 2, Group A, B, C, D, T4A.

Class I, Zone 2, Group II C, T4.

> ⚠ **WARNING**
>
> Personal injury and property damage can occur.
>
> In potentially explosive atmospheres there is a risk of injury to persons or damage to property if you connect or disconnect a live electrical circuit, such as connectors, fuses, switches, when a TS Adapter II is in operation.
>
> Do not connect or disconnect equipment when a flammable or combustible atmosphere is present.
>
> For use under FM conditions, the TS Adapter II must be installed in a cubicle with minimum IP54 protection to IEC 60529.

Safety requirements for installation

The TS Adapter II is "open equipment" in accordance with IEC 61131-2, and an "open type" in accordance with UL / CSA certification.

The alternative installation methods described below are stipulated in order to ensure safe operation with respect to mechanical strength, flame resistance, stability and touch protection:

- Installation in a suitable cabinet
- Installation in a suitable enclosure
- Installation in an appropriately equipped and closed operating area

Observing installation guidelines

The installation guidelines and safety instructions set out in this manual must be observed during commissioning and operation.

Connecting peripherals

Interference immunity requirements are met when connected to an industrial standard PC/modem in accordance with EN61000-6-2:2005.

Approval regulations

The TS Adapter II modem is designed for connection to the analog public telecommunications network. In Germany, the device is connected by means of the supplied standard cable with TAE connector and N-coding.

The TS Adapter II ISDN is designed for connection to the digital public ISDN network. Use the supplied standard ISDN cable for connection.

EU approval

This equipment has been approved in accordance with Council Decision 98/4827EC for pan-European single terminal connection to the public switched telephone network. However, due to differences between the individual PSTNs provided in different countries the approval does not, of itself, give an unconditional assurance of successful operation on every PSTN network termination point.

Network compatibility

In accordance with the European Telecommunication Standard Institute (ETSI) Guide EG 201121 (R&TTE Directive), this product conforms to European standard TBR21/TBR3 and to national requirements. Consequently, this product will function correctly in conjunction with the telecommunications networks of all the member states of the EU as well as in those countries which support the TBR21/TBR3 standard.

IC and REN for Canada

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Registration Number:
TS Adapter II Modem: IC 4030A-022 B3V3

TS Adapter II ISDN: IC 5237A-TSA2 ISDN

The RINGER EQUIVALENCE NUMBER (REN) for the TS Adapter II Modem is 1.0. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five (5.0).

A.2 Customer Information for ACTA

Customer Information for ACTA

This equipment is compliant with Part 68 of the FCC regulations and requirements adopted by ACTA. The label on the right sideof this equipment also contains the product ID (US: CO4DT10B022B3V3 for the TS Adapter II-Modem respectively US:EVIDENAN-TSA2ISDN for the TS Adapter II-ISDN). This ID must be submitted to the telephone company on request.

The plug and jack used to connect this equipment to the circuit and telephone network at your site must conform to FCC Part 68 regulations and requirements adopted by ACTA. A compliant telephone cord and modular plug is supplied with this product. It is designed to be connected to a compliant modular jack. See the installation instructions for details.

The REN is used to determine the maximum number of devices on an analog telephone line. If the number of RENs on an analog telephone line is exceeded, the devices may not ring in response to an incoming call. In most areas the sum of RENs should not exceed five (5.0). Contact the local telephone company to ascertain the number of devices that may be connected to a line, as determined by the total RENs. For products approved after July 23, 2001, the REN forms part of the product identifier that has the format for the TS Adapter II-Modem: US: CO4DT10B022B3V3.

REN is set to NAN and invalid at the TS Adapter II-ISDN (product ID US: EVIDENAN-TSA2ISDN. The user does not need to calculate the REN, but may not exceed a maximum number of 8 ISDN terminals on the network termination.

The telephone company will notify you in advance if services are temporarily discontinued as a result of your TS Adapter II causing disturbances on the telecommunications network. If advance notice is not deemed practical, the telephone company will notify the customer as soon as possible. You will be advised of your rights of filing a complaint with the FCC.

The telephone company may modify its services, equipment, operations or procedures, which could affect operation of your equipment. In this case, the telephone company will notify you in advance, thus allowing you to adapt your equipment configuration for uninterrupted service.

If you experience trouble with the TS Adapter II and require repair or warranty information, please contact

Siemens Johnson City - SIAC -
One Internet Plaza
Johnson City, TN 37604

If the equipment is causing disturbances on the telecommunications network, the telephone company may ask you to disconnect the equipment until the problem is resolved.

Connections to a party line service are subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your premises are equipped with an alarm system which is connected to the telephone line, ensure the installation of the TS Adapter II does not disable your alarm system. If you have questions about negative effects on your alarm system, contact your telephone company or a qualified service point.

Note

Disruptions of the alarm functions of alarm equipment may occur not only as a result of faulty installation, but also in situations where the TS Adapter II is used as intended (dual channel mode).

A.3 General technical specifications

What are the general technical specifications?

The general technical specifications include:

- The standards and test values to which the TS Adapter II complies.
- The criteria by which the TS Adapter II was tested.

TS Adapter II	
Order number TSA-II ISDN	6ES7 972-0CC35-0XA0
Order number TSA-II Modem	6ES7 972-0CB35-0XA0
Dimensions	Approx. 125 x 110 x 40 mm
Weight	Approx. 250 g
Interfaces	
To SIMATIC S7 / C7 To PC To external modem To analog phone network To ISDN phone network	RS 485 (up to max.12 Mbps) USB 1.1 (12 Mbps) RS 232 (up to max. 115 kbps) RJ 12 RJ 45
Supply voltage, external or via MPI interface	24 V DC (SELV) (20.4 V … 28.8 V DC)
Current consumption (TSA-II ISDN)	40 mA (typical) / 120 mA (maximum)
Current consumption (TSA-II Modem)	44 mA (typical) / 120 mA (maximum)
Inrush current	I_{max} 700 mA; 8 µs

Horizontal and vertical installation
Comply with the general installation guidelines for SIMATIC. Cabinet installation is stipulated. You can install the TS Adapter II vertically or horizontally. The following ambient air temperatures are permitted: Vertical installation: 0 to 40 °C Horizontal installation: 0 to 60 °C Always install the TS Adapter II at the top or on the right.   ① the vertical installation of an S7-300 ② the horizontal installation of an S7-300 ③ the mounting rail
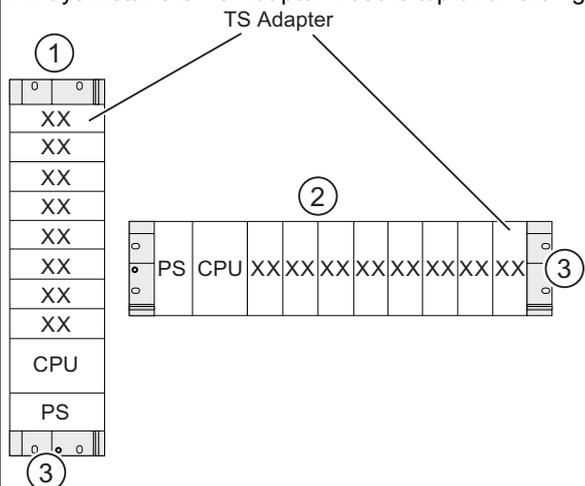
A.3.1   Electromagnetic compatibility

Definition of "EMC"

Electromagnetic compatibility (EMC) is the capacity of an electrical installation to function satisfactorily in its electromagnetic environment without affecting that environment.

⚠ WARNING
Personal injury and damage to property may occur.
Any installation of expansion units which are not approved for TS Adapter II may violate requirements and standards relating to safety and electromagnetic compatibility.
Only use expansion units that are approved for the system.

Pulse-shaped Interference

The table below shows the electromagnetic compatibility of the TS Adapter II in relation to pulsed interference. This requires that the electrical installation to comply with relevant specifications and standards.

Table A-1   Pulse-shaped Interference

Pulse-shaped interference	Test voltage	Degree of severity
Electrostatic discharge according to IEC 61000-4-2	Air discharge: ±8 kV	3
	Contact discharge: ±6 kV	
Bursts (fast transient interference in accordance with IEC 61000-4-4)	2 kV (power supply cable)	3
	2 kV (Signal cable > 30 m)	
	1 kV (Signal cable < 30 m)	
Powerful single pulse (surge) according to IEC 61000-4-5		3
• Asymmetrical coupling	2 kV (power supply line) DC with protective elements [1]	
	1 kV (signal/data line only >30 m), with protective elements as required	
• Symmetrical coupling	1 kV (power supply line) DC with protective elements [1]	
[1] e.g. surge arresters from Dehn Type: BD VT AD24 Order no. 918402		

Sinusoidal Interference

The table below shows the electromagnetic compatibility of the TS Adapter II in relation to sinusoidal interference.

Table A-2   Sinusoidal Interference

Sinusoidal interference	Test values	Degree of severity
HF irradiation (electromagnetic fields) according to IEC 61000-4-3	10 V/m with 80% amplitude modulation of 1 kHz in the range from 80 MHz to 1000 MHz and 1.4 GHz to 2 GHz	3
	1 V/m with 80% amplitude modulation of 1 kHz over the range from 2 GHz to 2.7 GHz	
RF interference current on supply, cables and cable shielding conforming to IEC 61000-4-6	Test voltage 10 V, with 80% amplitude modulation of 1 kHz in the 10 MHz to 80 MHz range	3

Emission of Radio Interferences

Interference emission of electromagnetic fields according to EN 55011: Limit value class A, Group 1.

Additional measures

If you want to operate the TS Adapter II in an office environment, you must ensure compliance with limit class B to EN 55022.

Take suitable measures for increasing resistance to high external interference levels as required.

A.3.2   Shipping and storage conditions

Shipping and storage of modules

The TS Adapter II surpasses the requirements of IEC 61131-2 with respect to transportation and storage conditions. The following specifications apply to TS Adapter II units that are transported and stored in their original packaging.

Climatic conditions correspond to IEC 60721-3-3, Class 3K7 for storage and IEC 60721-3-2, Class 2K4 for transportation.

Mechanical conditions are compliant with IEC 60721-3-2, Class 2M2.

Table A-3   Shipping and storage conditions for modules

	Permissible range
Temperature	-40 °C to +70 °C
Atmospheric pressure	1080 to 660 hPa (corresponds to an altitude of -1000 to 3500 m)
Relative humidity (at +25° C)	5% to 95%, no condensation
Sinusoidal vibrations in accordance with IEC 60068-2-6	5 - 9 Hz: 3.5 mm 9 - 500 Hz: 9.8 m/s^2
Shock in accordance with IEC 60068-2-29	250 m/s^2, 6 ms, 1000 shocks

A.3.3   Mechanical and climatic environmental conditions for operation of the TS Adapter II

Operating conditions

The TS Adapter II is designed for weather-protected, stationary use. The TS Adapter II complies with the operating conditions defined in DIN IEC 60721-3-3:

● Class 3M3 (mechanical requirements)

● Class 3K3 (climatic environmental conditions)

Use with additional measures

The TS Adapter II must not be used under the conditions outlined below without taking additional measures:

● At locations with a high degree of ionizing radiation

● In locations subject to harsh operating conditions, such as dust, aggressive fumes or gases, severe electrical or magnetic fields

● In installations requiring special monitoring, such as elevators and electrical systems in high risk areas

An additional measure can be installation of the TS Adapter II in a cabinet or in an enclosure, for instance.

Mechanical environmental conditions

The table below sets out the mechanical environmental conditions for the TS Adapter II in the form of sinusoidal vibrations.

Table A-4   Mechanical environmental conditions

Frequency range in Hz	Test values
10 ≤ f < 58	0.075 mm amplitude
58 ≤ f < 500	9.81 m/s^2 constant acceleration

Reduction of vibrations

If the TS Adapter II is subject to greater shocks or vibrations, you must take suitable measures in order to reduce the acceleration or amplitude.

We recommend the installation of the TS Adapter II on damping materials (for example, rubber-metal vibration dampers).

Testing for Mechanical Environmental Conditions

The following table provides information about the type and scope of testing for mechanical environmental conditions.

Table A-5   Test for mechanical environmental conditions

Test	Test Standard	Remarks
Vibrations	Vibration test in accordance with IEC 60068-2-6 (sinusoidal)	Type of vibration: frequency sweeps with a rate of change of 1 octave/minute. 10 Hz ≤ f < 58 Hz, constant amplitude of 0.075 mm 58 Hz ≤ f < 500 Hz, constant acceleration of 9.81 m/s^2 Duration of vibration: 10 frequency cycles per axis in each of the 3 perpendicular axes
Shock	Shock impact test to IEC 60068-2-29	Type of shock: half-sine Type of shock: 150 m/s^2 peak value, 11 ms period Direction of shock: 100 shocks on each of the 3 perpendicular axes

Climatic environmental conditions

The TS Adaptor II may be used under the following climatic environmental conditions:

Table A-6   Climatic environmental conditions

Environmental conditions	Permissible range	Comments
Temperature		
	0 to +60 °C	Horizontal installation
	0 to +40 °C	Vertical installation
Temperature change	Max. 10 °C/h	
Relative humidity	Max. 95% at +25° C	No condensation, corresponds to relative humidity degree 2 to IEC 61131-2
Atmospheric pressure	1080 to 795 hPa (corresponds to an elevation of -1000 to 2000 m)	-
Contaminant concentration	SO_2: < 0.5 ppm; RH < 60%, no condensation H_2S: < 0.1 ppm; RH < 60%, no condensation	Check: 10 ppm; 4 days Check: 1 ppm; 4 days

A.3.4   Specification of Insulation Testing, Protection Class and Degree of Protection / Test Voltage

Test voltage

The TS Adapter II-MODEM can also be operated in TNV-3 systems. The insulating voltage between the phone end and the processing end is rated at 250 V AC. In routine testing of the TS Adapter II-MODEM, the reinforced insulation between the phone end and the rest is tested with 2200 V DC for 1 second in accordance with EN 60950-1, March 2003.

Protection class

Protection class I in accordance with EN 61140 (VDE 0140-1), i.e., the mounting rail or DIN rail on which the TS Adapter II is installed must be grounded.

Protection against the ingress of foreign matter and water

Degree of protection IP 20 in accordance with IEC 60529, i.e., protection against contact with standard probes.

There is no protection against the ingress of water.

Index

A

Adapter connections, 7, 19
Analog phone socket
    Connecting the adapter, 38
Approval regulations, 51
Automation system
    Connecting the adapter, 37

B

Baud rates, 9
Bus profiles, 9

C

CE mark, 47
Certifications and approvals, 47
Climatic environmental conditions, 59
Compatibility, 7
Connecting
    in the ring, 42
    to a networked S7 system, 42
    to a standalone system, 41
    to the analog phone socket, 38
    to the automation system, 37
    to the external modem, 38
    to the ISDN phone socket, 38
    to the MPI/DP network, 41
    to the PC, 37
cULus approval, 48

D

Degree of protection, 59

E

Electromagnetic compatibility, 55
EMC directive, 48
Environmental conditions, 57
Error diagnostics, 45

EU approval, 51
Explosion protection directive, 48

F

Firmware update
    Updating, 43
FM approval, 50

H

Hardware requirements, 13
Hibernate mode, 7

I

Installation
    Horizontal, 54
    Vertical, 54
Installing, 14
    Modules, 15
    On a DIN rail, 16
    on a mounting rail, 15
ISDN phone socket
    Connecting the adapter, 38

M

Marking for Australia and New Zealand, 48
Minimum clearances, 17
Modem
    Connecting the adapter, 38
Module
    Installing, 15
MPI cable, 11
MPI/DP interface, 24
MPI/DP network, 41
    Connecting the adapter, 41

N

Networked S7 system
    Connecting the adapter, 42

O

Operating conditions, 57

P

PC
    Connecting the adapter, 37
Performance features, 9
Power supply, 23
Protection class, 59

R

Requirements
    Hardware, 13
    Software, 13
RTTE directive, 48

S

Safety notices, 35
Safety requirements, 50
Scope of delivery, 11
Signal description, 25
Software, 35
Software requirements, 13
Stand-alone system
    Connecting the adapter, 41

T

Technical specifications, 53
Test voltages, 59
Transmission rates, 41
TS Adapter II, 53

U

Uninstalling, 17
Updating
    Firmware update, 43
USB cable, 11
USB interface, 26