

SIEMENS

SIMATIC

Industrial Software Engineering Tools Modular TS Adapter

Manual

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Legal information

Warning notice system

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 relevant 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 product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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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.

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Preface

Purpose of this manual

This manual provides a comprehensive overview of the modular TS Adapter. It supports you during the installation and setting up of the hardware. It explains the requirements for operation and the hardware installation, and how to connect the individual components to the Ethernet and the telephone network.

The intended readership of the manual includes programmers and engineering personnel involved in configuration, commissioning and servicing of automation systems.

Basic knowledge required

The following knowledge is required in order to understand the manual:

- General knowledge of automation technology
- You will also need to know how to use computers or PC-like equipment (such as programming devices) under the Microsoft® Windows® operating system.
- Knowledge about STEP 7-programming
- Knowledge about Ethernet communication and modems.

Supplementary documentation

You can find information on PROFINET and Ethernet in the following documentation:

Documentation	Contents
PROFINET system description System manual	Basic knowledge of PROFINET: Network component, data exchange and communications, PROFINET IO, Component Based Automation, application example - PROFINET IO and Component Based Automation
SIMATIC NET: Twisted-pair and fiber-optic networks Manual	Description of Industrial Ethernet networks, network configuration, components, installation regulations for networked automation systems in buildings, etc.
Communication with SIMATIC Manual	Basics, services, networks, communication functions, connecting PGs/OPs, project design and configuration in STEP 7

Range of validity of this manual

The manual is relevant to the following components:

Components	Order number	As of version	
		Firmware	Hardware
TS Adapter IE Basic	6ES7 972-0EB00-0XA0	V 1.0.0	V 1.0.0
TS Module Modem	6ES7 972-0MM00-0XA0	-	V 1.0.0
TS Module ISDN	6ES7 972-0MD00-0XA0	-	V 1.0.0
TS Module RS232	6ES7 972-0MS00-0XA0	-	V 1.0.0
TS Module GSM	6GK7 972-0MG00-0XA0	-	V 1.0.0

This manual contains a description of the components which were valid at the time the manual was published.

Network approval for Europe

The TS Module Modem corresponds with the European standard TBR 21.

The TS Module ISDN corresponds with the telecommunication approval TBR 3.

Network approval for the USA

This TS Module Modem complies with ACTA.

Network approval for Canada

The Industry Canada (ic) label identifies certified TS Module Modem.

Recycling and disposal

The TS Adapter and the TS Module are recyclable due to their low pollutant content. For environmentally sound recycling and disposal of your old devices please contact a certified disposal service company for electronic scrap.

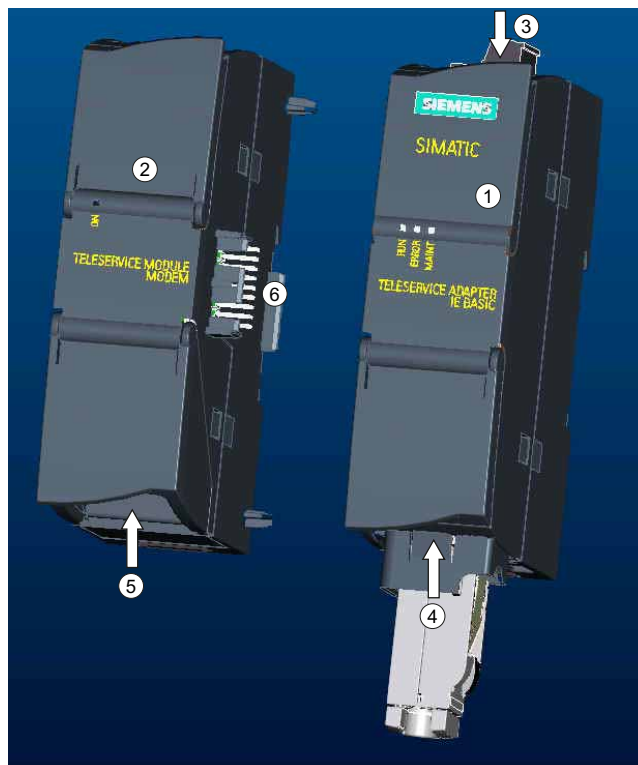
Product overview

2.1 Components

Components of the modular TS Adapter

A modular TS Adapter as a total unit consists respectively of the following two components:

- Basic unit
- TS Module



- ① Basic unit (the TS Adapter IE Basic illustrates an example)
- ② TS Module (the TS Module Modem illustrates an example)
- ③ Socket board for power supply with DC 24 V (above)
- ④ Interface to the automation system (under the front panel)
- ⑤ Interface to the telephone network (under the front panel)
- ⑥ Connection between TS Module and basic unit

Figure 2-1 Basic unit and TS Module

Only the combination of a basic unit and a TS Module forms a complete functional unit (total unit). Basic unit and TS Module are connected and assembled together through a connector.

Basic unit

The functions of the TS Adapter are implemented in the basic unit. The basic unit has an Ethernet port for the connection to a PG or to a PC or to the automation system. The basic unit is supplied and grounded with DC 24 V through a 3-pin socket board.

Use the following as a basic unit:

- TS Adapter IE Basic

More information about this can be found in the manual from the respective basic unit.

TS Module

The TS Module forms the electrical interface to the telephone network. The TS Modules are supplied with electricity from the basic unit through the shared connector.

The following TS Modules exist:

- TS module modem (Page 23)

The TS Module Modem contains an analog modem for the connection to the analog telephone network.

- TS Module ISDN (Page 31)

The TS Module ISDN contains a terminal adapter for the connection to the ISDN network.

- TS Module RS232 (Page 39)

The TS Module RS232 has a RS232 interface for the connection of an external modem.

- TS Module GSM (Page 45)

The TS Module GSM contains a radio modem for connection to the GSM/GPRS network.

More information about the individual TS modules can be found in the respective chapters of this manual.

2.2 Hardware Requirements

Overview:

- In order to fulfill the installation requirements for UL, you must use a UL-listed NTBA on the TS Module ISDN. NTBA = Network Terminal Basic Adapter
- TS Module Modem: The following telephone cable is prescribed for compliance of the UL requirements:

Phone cable of UL category DUXR, consisting of a line plus connector, with a cross-section of AWG 26.

The supplied cable fulfills this requirement.

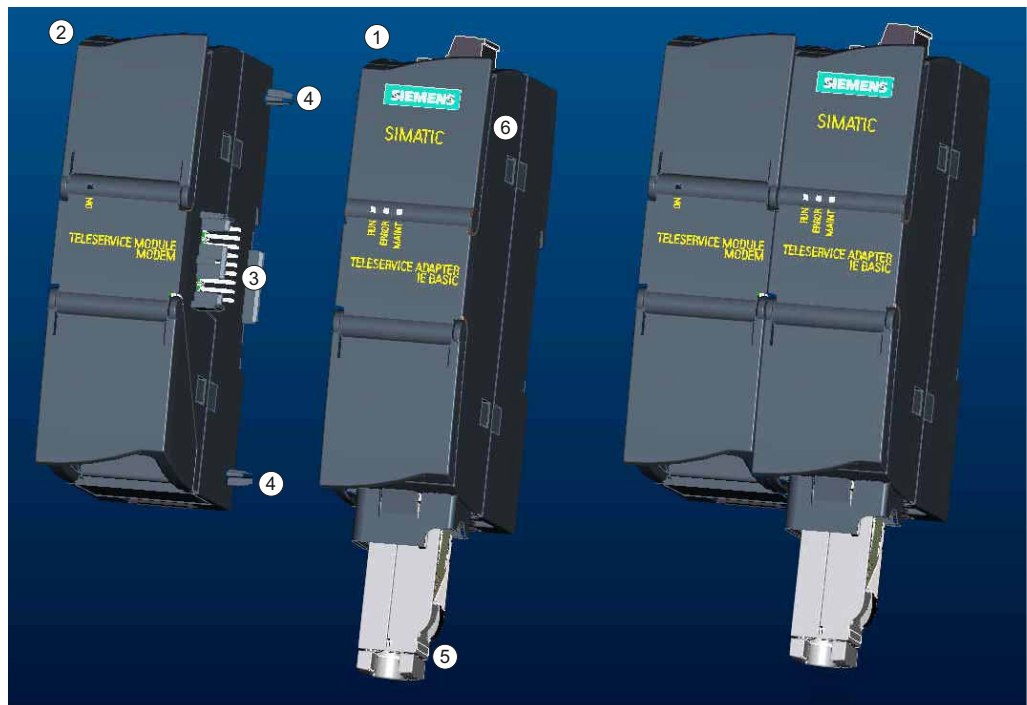
- TS Module RS232: All conventional modems permitted for industrial use can be connected to the TS Module RS232.

Mounting

3.1 Connect TS Adapter and TS Module

Before assembly

Before the assembly of the modular TS Adapter, the basic unit and the TS Module must be connected:



- ① Basic unit
- ② TS Module
- ③ Plug connector from the TS module
- ④ Elements
- ⑤ Ethernet port
- ⑥ Cannot be opened!

Figure 3-1 Connect basic unit and module

CAUTION

A TS Module can be damaged if you touch the contacts of the plug connector sticking out sideways of the TS Module.

Follow the EGB directives and directions in order to avoid damaging the TS Module through electrostatic discharge.

Before you assemble the TS Module and the basic unit make sure that both are in a de-energized state and that all mounting parts (busbars, plates, etc.) are connected with the protective conductor.

CAUTION

Modules can get damaged.

- Before connecting the TS Module and basic unit, make sure that the contact pins sticking out sideways from the TS Module are straight and not bent.
- When connecting, ensure that the male connector and guide elements are positioned correctly.
- Don't try to use force to connect a TS Module or a TS adapter basic unit to a module/block from a different system.
- Through constructive measures and coded guide elements, you can make sure that only TS modules can be connected with the TS adapter basic units. Do not change the mechanical construction with force and do not remove or damage the guide elements.
- Only place a TS module onto a basic unit of the modular TS adapter and vice versa.

Mounting methods

You have the following alternatives for the mounting of the TS Adapter and TS Module:

- Installing on the S7-300 standard rail (Page 13)
- Installation on a standard rail (Page 15)
- Wall mounting (Page 17)
- Cubicle Mounting (Page 18)

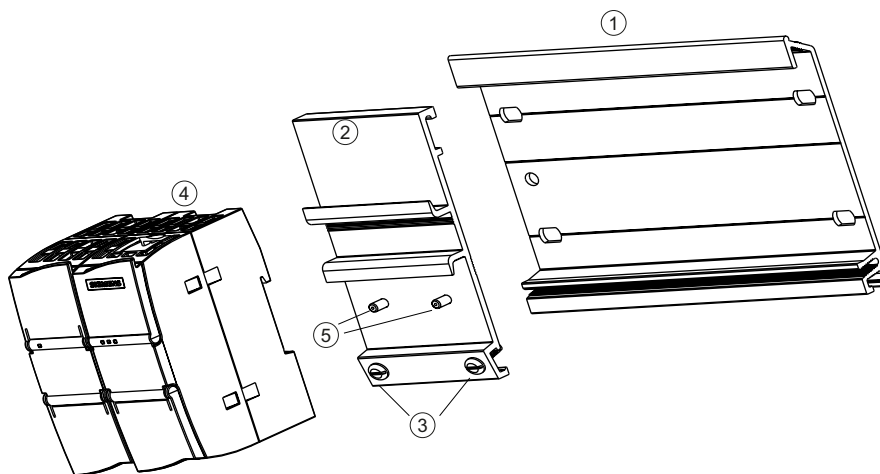
3.2 Installing on the S7-300 standard rail

Requirement

- You have connected the basic unit and TS Module to the total unit.
- The S7-300-mounting rail is installed.

Mounting

1. Hang the standard rail adapter (optional) ② on the upper edge of the S7-300-standard rail ①.
2. Clamping the profile rails adapter ② with both screws ③ to the S7-300-standard rail ①.
3. Hang the total unit ④ in the standard rail profile of the adapter ② and move it backwards until you hear it lock. Make sure that you position the total unit directly above the fixing bolt.



- ① S7-300 mounting rail
- ② Mounting rail adapter
60mm rail: 6ES7 972-0SE00-7AA0
75mm rail: 6ES7 972-0SE10-7AA0
- ③ Screws
- ④ Total unit
- ⑤ Fixing bolt

Figure 3-2 Mount on S7-300-rails

Dismounting

 **WARNING**

Remove the plug of the analog cable and Ethernet cable from the TS Module and from the basic unit before you remove the voltage and thus, separate the grounding of the TS Adapter.

1. Remove both latching mechanisms on the underside of the basic unit and TS Module with a screwdriver and disengage the latching mechanism.
2. Move the basic unit and TS Module forwards out of the standard rail profile.

3.3 Installation on a standard rail

Requirement

- You have connected the basic unit and TS Module to the total unit.
- The DIN rail is mounted.

Mounting

Note

If you install the total unit in vertical installation or in an environment with strong vibrations, use the end bracket 8WA1 808 on the DIN rail to prevent that the TS Module comes off the TS Adapter IE Basic.

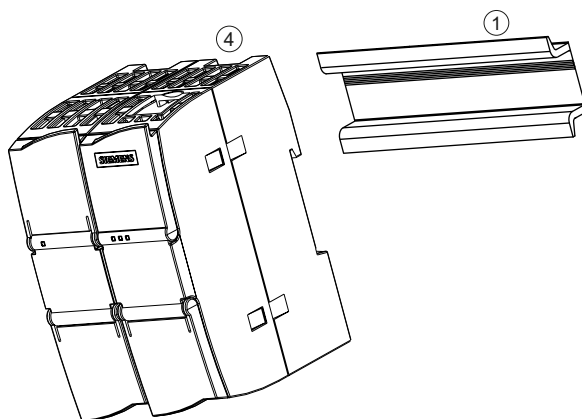
You can also use screws as described in section "Wall mounting (Page 17)".

CAUTION

TS Module GSM

Always use the end retainers 8WA1 808 with the TS Module GSM to prevent loosening of the TS Module from the TS Adapter IE Basic.

1. Hang the total unit ② in the standard rail ①.
2. Tip the total unit back until you hear it engage.



- ① DIN rail
② Total unit

Figure 3-3 Mounting on DIN Rails

Dismounting

 **WARNING**

Remove the plug of the analog cable and Ethernet cable from the TS Modul and from the basic unit before you remove the voltage and thus, separate the grounding of the TS Adapter.

1. Remove both latching mechanisms on the underside of the TS Adapter and TS Module with a screwdriver and disengage the latching mechanism.
2. Move the basic unit and TS Module forwards out of the standard rail.

3.4 Wall mounting

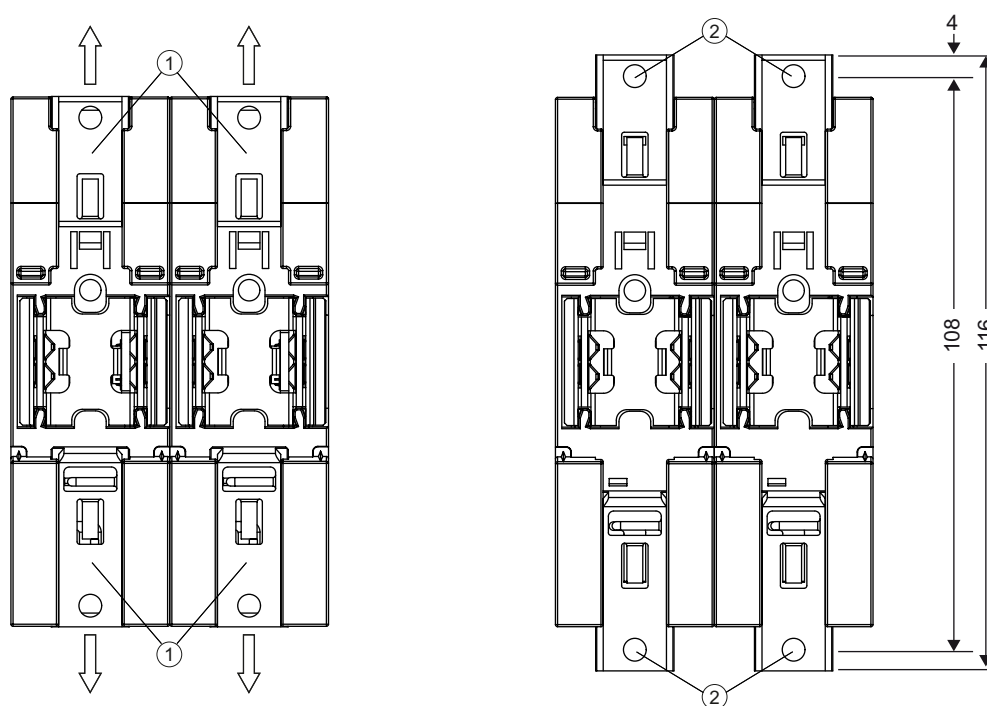
Requirement

You have connected the basic unit and TS Module.

Mounting

1. Move the attachment slider ① to the backside of the basic unit and TS Module in the direction of the arrow until it engages.
2. Screw the basic unit and TS module to the position marked with ② to the designated assembly wall.

The following image shows the total unit in the view from behind with the attachment sliders ① in both positions:



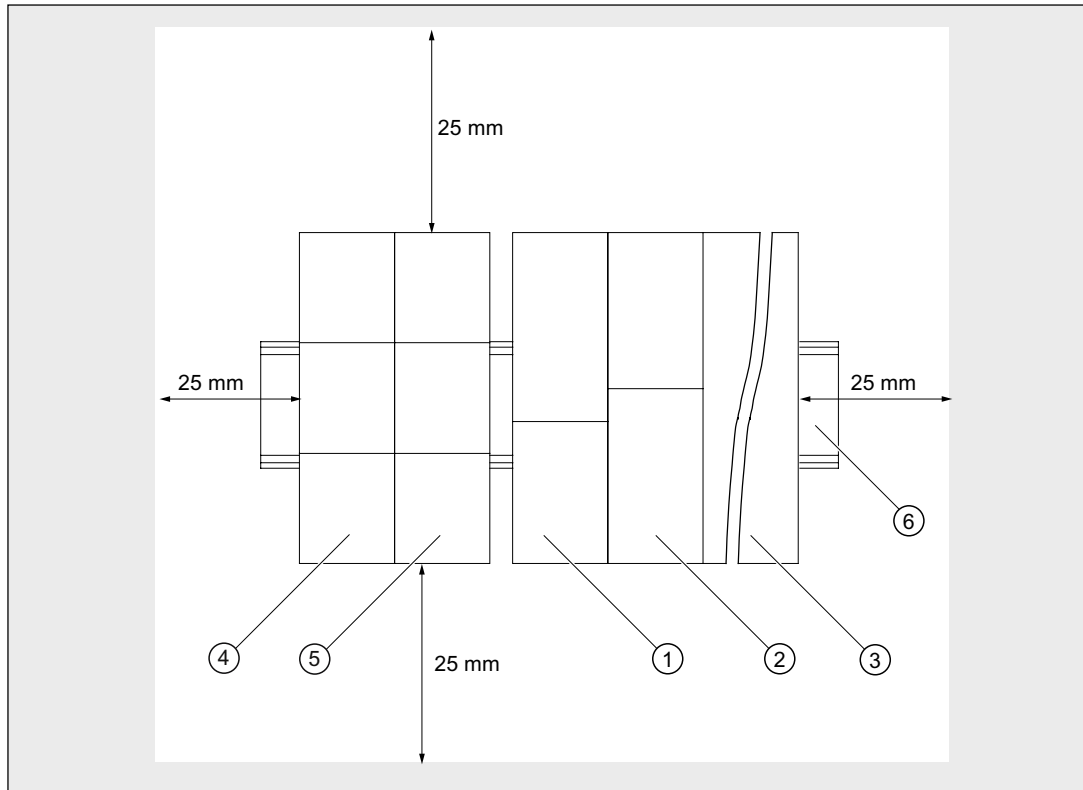
- ① Attachment slider
- ② Drill holes for wall mounting

Figure 3-4 Wall mounting

3.5 Cubicle Mounting

Minimum clearances for mounting, wiring and heat dissipation

If you install the modular TS Adapter in a cubicle, you must maintain the following minimum clearances to the side, above and below the modules:



- ① Power supply module
- ② CPU
- ③ Modules
- ④ TS Module
- ⑤ TS Adapter basic unit
- ⑥ S7-300 profile rail / DIN rail

Figure 3-5 Minimum clearances in a cubicle

The clearance from the front of the module to the cubicle lid and front door must be at least 25 mm.

Connecting

4.1 Change the voltage

Rules for wiring voltage

Observe the following rules when connecting lines to the voltage:

Rules for wiring	
Solid conductor	No
Flexible conductor without ferrule	0.25 mm ² to 2.5 mm ²
Flexible conductor with ferrule	0.25 mm ² to 1.5 mm ²
Number of conductors per clamp	1 conductor or 2 conductors up to 1.5 mm ² in total in a common ferrule
Diameter of wire insulation	Maximum 3.8 mm
Length of insulation to be stripped for the single conductor	8 to 10 mm without ferrule 10mm with ferrule
Ferrules according to DIN 46228 without insulating collar	Shape A, 10 mm to 12 mm long
Ferrules according to DIN 46228 with insulating collar	Shape E, to 12 mm long

4.1 Change the voltage

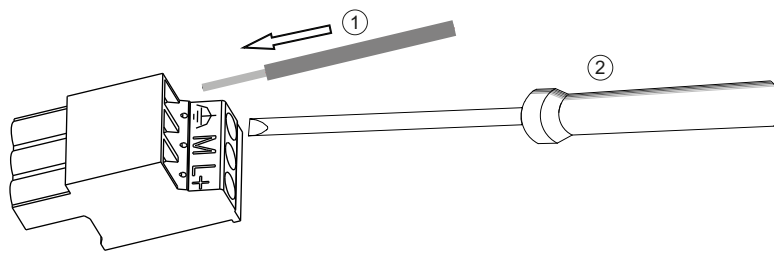
Procedure

To change the voltage, proceed as follows:

1. If you want to use ferrules, isolate the wires to 10 mm. Cap the crimp ferrules with the lines.

Strip about 8 to 10 mm off the wires.

2. Place the cores on (①).
3. Screw the ends of the cores with the voltage, tightening torque: 0.6 to 0.8 Nm (②).

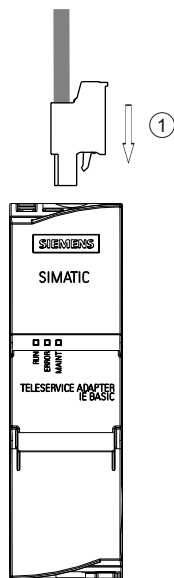


L+ 24 V DC
M Ground
⊕ Ground connection

Figure 4-1 Change the voltage

Plug on voltage

place the wired voltage ① until it locks into the power socket.



① Voltage

Figure 4-2 Plug voltage on TS Adapter IE Basic .


4.2 Connecting cables

Requirement

The following requirements must be met:

- You have connected the TS Adapter basic unit and the TS Module.
- You have mounted the total unit (TS Adapter-Basic Unit + TS Module).
- You have wired the voltage (Page 19) with which the total unit is supplied with DC 24 V.

Safety information

 WARNING
Personal damages may occur. Through overvoltage on the telephone lines, there may be personal damage if you do not maintain the prescribed sequence when connecting and separating the lines. That is why you should observe the following instructions:

Connecting lines

1. Make sure that the power supply for the total unit is turned off.
2. Place the wired voltage for the TS Adapter on the socket board for the power supply with DC 24 V.
3. Connect the lines for L+ and M to the DC 24 V power supply.
4. Connect the ground connection of the TS Adapter to the ground.
5. With the help of the Ethernet cable, establish the connection from the TS Adapter to the PG/PC or to the automation system.
6. Establish the connection between the TS Module and telephone network.
7. Switch on the power supply for the total unit.

Separating lines

1. Switch off the power supply for the total unit.
2. Disconnect the connection between the TS Module and telephone network.
3. Disconnect the remaining connections.

TS module modem

5.1 Scope of delivery and replacement parts for the TS Module modem

Product package

Designation	Order number
TS Module Modem	6ES7 972-0MM00-0XA0
Analog phone cable with 2 RJ11 connectors length 3 m	A5E00243688
TAE connector	A5E00243701

Spare parts

Designation	Order number
Analog phone cable with 2 RJ11 connectors length 3 m	A5E00243688
TAE connector	A5E00243701

Please order the spare parts from your local Siemens representative.

5.2 Properties of the TS module modem

Properties

The TS Module Modem has an internal analog modem.

The analog modem port is the 6-pin RJ11 socket behind the lower front panel. See the image in the chapter LED display of the TS Module Modem

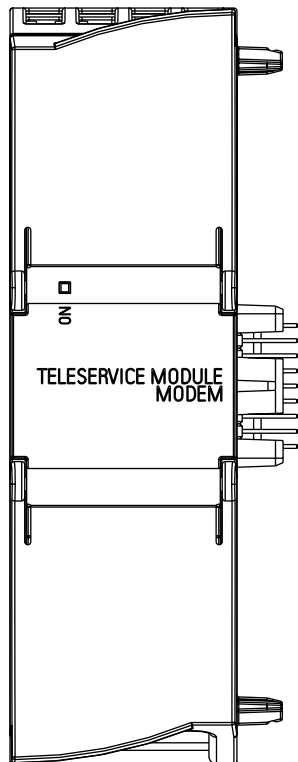
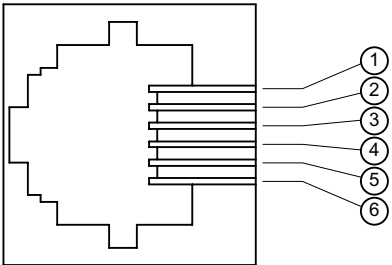


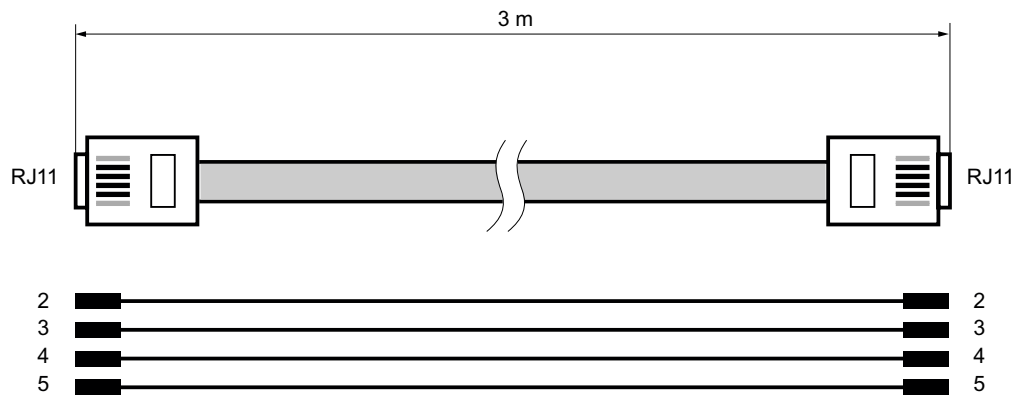
Figure 5-1 TS Module Modem

Pin assignment and signal description of analog modem port

Figure	Pin no.	Signal name	Signal direction	Comments
 <p>P RES</p>	1	-		
	2	-		
	3	b1	Bi-directional	Incoming wire pair
	4	a1		
	5	-		
	6	-		

Analog phone cable

Using the supplied analog phone cable, you connect the RJ11-socket to a phone socket.



Note

Use the supplied cable with ferrite to comply with EMC values and make sure that the ferrite is on the module side.

Note

How to connect the RJ11 connector:

1. Grasp the cable just below the RJ11 connector.
 2. Make sure the RJ11 connector engages audibly.
-

Note

To use the TS Module Modem outside Germany, you can fit a country-specific TAE connector onto the RJ11 connector of the phone cable. For Germany, a TAE6N connector is supplied. In some countries phone sockets with RJ11 ports are available, so you can use the phone cable without a TAE connector.

See also

LED display of the TS Module modem (Page 27)

5.3 LED display of the TS Module modem

Overview

The following image shows the LEDs on the front side of the TS Module Modem. The LEDs, DCD, RxD and TxD are located behind the upper front panel. The TS Module Modem is illustrated in the image without front panels.

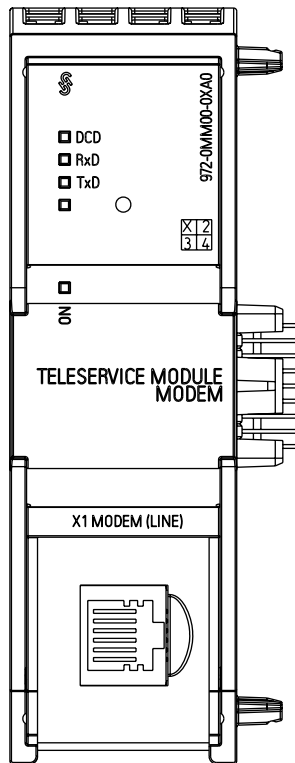


Figure 5-2 LEDs and interface of the TS Module Modem

Meanings of the LEDs

Designation	Color	Meaning
ON	Green	Lights up if the TS Module Modem is supplied with electricity.
DCD	Yellow	Lights if a remote connection is established through the internal analog modem. Off when the remote connection is down.
RxD	Green	Displays the data transfer to the receive path of the TS Module Modem. The LED flickers during data transmission.
TxD	Green	Displays the data transfer to the transmission path of the TS Module Modem. The LED flickers during data transmission.

Start-up characteristics

The LED ON is switched on when the power is restored.

5.4 Technical data of the TS Module modem

Specifications

- Dimensions: Approx. H 100 x L 30 x W 75 mm
- Weight: Approx. 98 g
- ITU transmission standards:
V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.34x, K56flex, V.90, V.92
- Error correction and data compression
- a/b port
- 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 | • Iceland | • Poland |
| • Belgium | • Italy | • Portugal |
| • Bulgaria | • Canada | • Romania |
| • Denmark | • Latvia | • Sweden |
| • Germany | • Lithuania | • Switzerland |
| • Estonia | • Luxembourg | • Slovakia |
| • Finland | • Malta | • Slovenia |
| • France | • New Zealand | • Spain |
| • Greece | • Netherlands | • Czech Republic |
| • Great Britain | • Norway | • Hungary |
| • Ireland | • Austria | • USA |
| | | • Cyprus |

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

Note

The TS Module Modem is designed so that it can be used worldwide. Ensure compliance with national laws and country-specific requirements when installing and operating the TS Module Modem.

You can find the general technical specifications of the TS Module Modem in the section Technical Specifications (Page 57).

TS Module ISDN

6.1 Scope of delivery and replacement parts of the TS Module ISDN

Product package

Designation	Order number
TS Module ISDN	6ES7 972-0MD00-0XA0
ISDN phone cable with 2 RJ45 connectors length 3 m	A5E00243651

Spare parts

Designation	Order number
ISDN phone cable with 2 RJ45 connectors length 3 m	A5E00243651

Please order the spare parts from your local Siemens representative.

6.2 Properties of the TS module ISDN

Properties

The TS Module ISDN has an internal terminal adapter with an S0 interface.

The S0 port is the 8-pin RJ45 socket behind the lower front panel. See the image in the chapter LED display of the TS Module ISDN (Page 34)

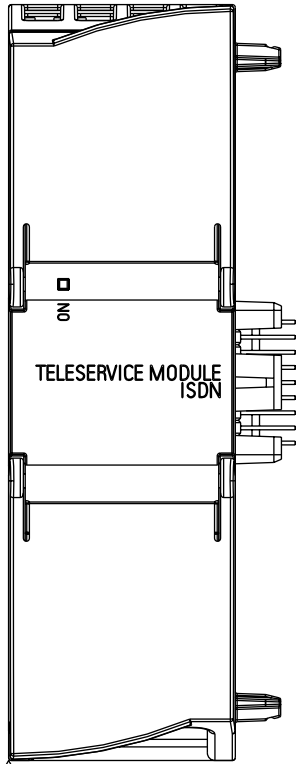
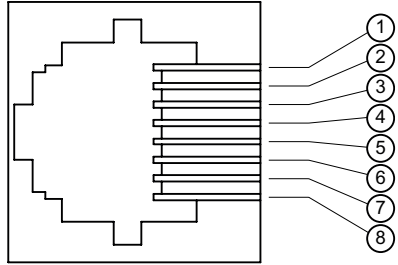


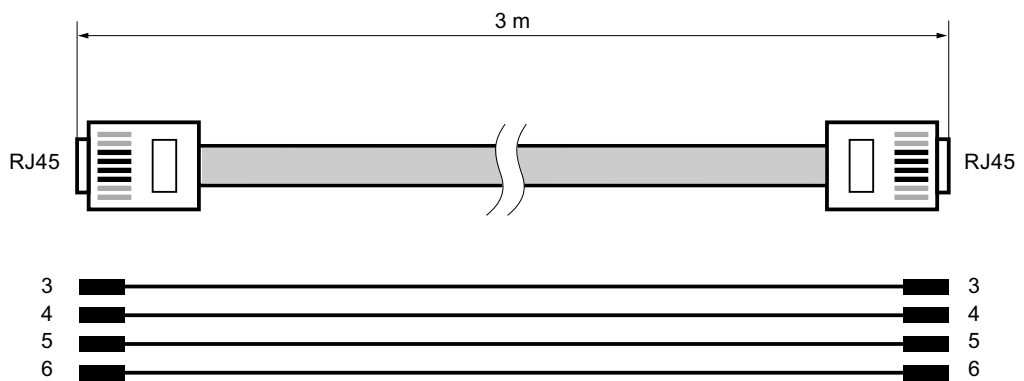
Figure 6-1 TS Module ISDN

Pin assignment and signal description of S0 port/ISDN port

Figure	Pin number	Signal name
	1	-
	2	-
	3	TX+
	4	RX+
	5	RX-
	6	TX-
	7	-
	8	-

ISDN phone cable

Using the supplied ISDN phone cable, you connect the RJ45-socket to an ISDN S0 socket.



Note

How to connect the RJ45 connector:

1. Grasp the cable just below the RJ45 connector.
2. Make sure the RJ45 connector engages audibly.

6.3 LED display of the TS Module ISDN

Overview

The following image shows the LEDs on the front side of the TS Module ISDN. The LEDs, DCD, RxD and TxD are located behind the upper front panel. The TS Module ISDN is illustrated in the image without front panels.

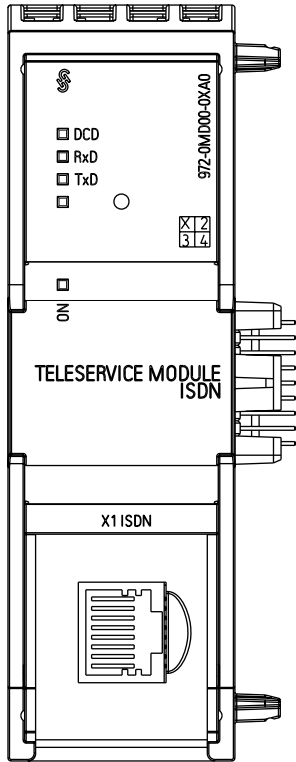


Figure 6-2 LEDs and interface of the TS Module ISDN

Meanings of the LEDs

Designation	Color	Meaning
ON	Green	Lights up if the TS Module ISDN is supplied with electricity.
DCD	Yellow	Lights if a remote connection is established through the internal terminal adapter. Off when the remote connection is down.
RxD	Green	Displays the data transfer to the receive path of the TS Module ISDN. The LED flickers during data transmission.
TxD	Green	Displays the data transfer to the transmission path of the TS Module ISDN. The LED flickers during data transmission.

Start-up characteristics

The LED ON is switched on when the power is restored.

6.4 Technical data of the TS Module ISDN

Specifications

- Dimensions: H 100 x L 30 x W 75 mm
- Weight: Approx. 92 g
- D-channel protocols DSS1 (Euro-ISDN), 1TR6
- Multiple subscriber number (MSN)
- Support of the most important B-channel-protocols:
 - V.110 (9600 bit/s, 19200 bit/s, 38400 bit/s)
 - V.120 (64 Kbit/s)
 - X.75 (64 Kbit/s)
- AT command interpreter

Country list

You will find the current list of countries online at:

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

Procedure

Proceed as follows:

1. Select the entry "Product support".
2. In product support, look for the term "TS Adapter IE Basic" or "TS Module ISDN".
3. Select the "List of contributions" tab.
4. Enter "Certificates" in the "Contribution type" selection box.

Explicit telecommunications approvals have been obtained for the following countries:

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

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 Module ISDN.

You can find the general technical specifications of the TS Module ISDN in the section Technical Specifications (Page 57).

TS Module RS232

7.1 Scope of deliver of the TS module RS232

Product package

Designation	Order number
TS Module RS232	6ES7 972-0MS00-0XA0

7.2 Properties of the TS module RS232

Properties

The TS Module RS232 has a COM interface that serves exclusively for the connection of the external modem.

The COM interface, a 9-pin RS232 plug connector, is located behind the lower front panel. See the image in the chapter LED display of the TS Module RS232 (Page 43).

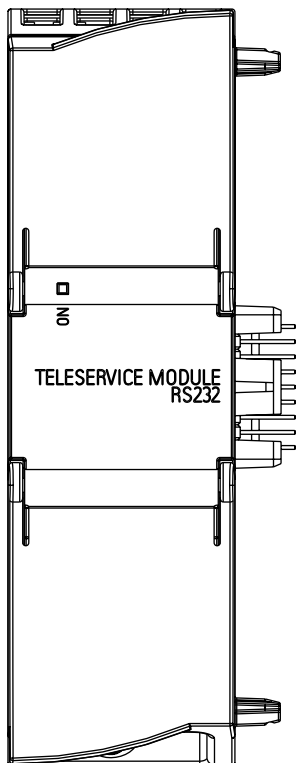


Figure 7-1 TS Module RS232

You can operate the following devices from the COM port:

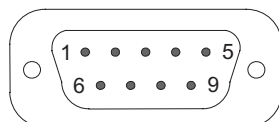
- Standard modems
- ISDN terminal adapters
- GSM wireless modems with an RS232 port

NOTICE

The specifications relating to interference immunity and interference emission apply only when using devices, lines and connectors conforming to industrial requirements in accordance with EN 61000-6-4:2001 and EN 61000-6-2:2001.

Pin assignment and signal description of RS232 port

The RS232 plug connector has the following pin out:



Pin no.	Short description	Meaning	Inputs/ outputs
1	DCD	Received signal level - the DCE signals to the DTE the reception of a carrier and 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	Ready to send - the DTE signals this to the DCE.	Output
5	GND	Internal reference ground	
6	DSR	Ready to operate - 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 (ready-to-send) signal from the DCE.	Output
8	CTS	Ready to send - the DCE is able to transfer the data incoming from the DTE.	Input
9	-	-	-
Shield		On connector housing	-
¹ DCE = Data Communication Equipment (modem or ISDN-TA) ² DTE = Data Terminal Equipment (TS Adapter)			

Note

Sub D connector design

Please observe the maximum plug dimensions specified in the following image.

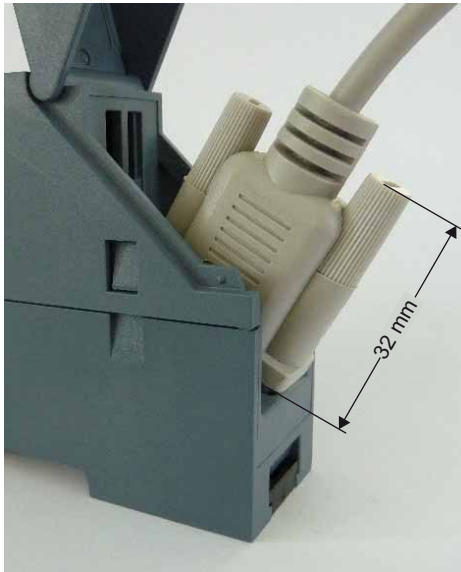
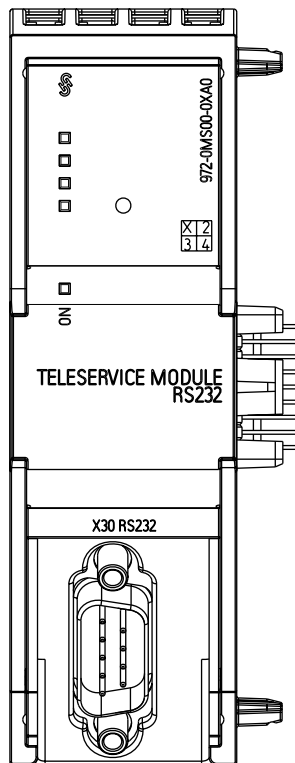


Figure 7-2 TS Module RS232 plug dimensions

7.3 LED display of the TS Module RS232

Overview

The following figure shows the front side of the TS Module RS232 without front covers.



LED and interface of the TS Module RS232

Meaning of the LEDs

Designation	Color	Meaning
ON	Green	Lights up if the TS Module RS232 is supplied with electricity.

The TS Module RS232 does not have any other LED displays. The statuses of the DCD, RxD and TxD signals are displayed in the connected modem.

Start-up characteristics

The LED ON is switched on when the power is restored.

7.4 Technical data of the TS Module RS232

Specifications

- Dimensions: H 100 x L 30 x W 75 mm
- Weight: Approx. 100 g
- Operating mode: Full duplex, asynchronous
- Signals: TXD, RXD, DSR, CTS, RTS, DTR, DCD
- Data transmission rate: 2400...115 200 bit/s
- Telegram: 8 data bits (LSB first), no parity bit, 1 stop bit
- Rule: according to RS232 standard
- Connectors: D-sub 9-pin, male (PC COMx)

You can find the general technical specifications of the TS Module RS232 in the section Technical Specifications (Page 57).

TS Module GSM

8.1 Scope of delivery and accessories for the TS Module GSM

Note

The device is designed for industrial use.

Product package

Designation	Order number
TS Module GSM	6GK7 972-0MG00-0XA0

Accessories

Designation	Order number
Antenna ANT794-4MR	6NH9 860-1AA00

Please order the accessories from your local Siemens representative.

Detailed information can be found online on the sites from the Siemens Industrial Automation Customer Support under the following ID: 2311905

<http://support.automation.siemens.com/WW/view/en/23119005>

8.2 Properties of the TS module GSM

Properties

The TS Module GSM has a port for the connection of a GSM/GPRS antenna and a slot for a SIM card..

The antenna connection and the slot for the SIM card are located behind the lower front panel. Refer to the image in the LED display of the TS Module GSM (Page 50).

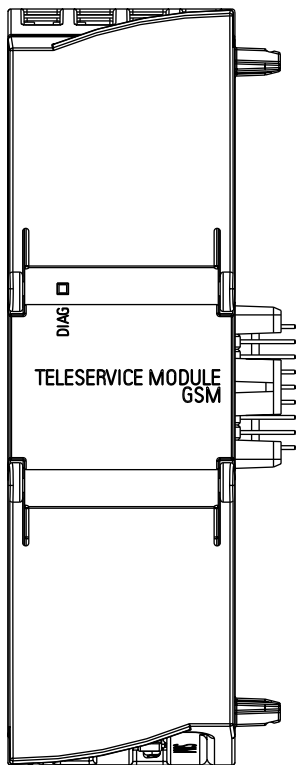


Figure 8-1 TS Module GSM

8.3 Activation of the SIM card for a CSD data connection

CSD data connection (Circuit Switched Data)

The TS Adapter IE Basic with TS Module GSM supports GPRS and CSD data connections for outgoing calls. For incoming calls, only CSD data connections are accepted.

To allow incoming calls, the SIM card inserted in the TS Module GSM must enable CSD data connections. You can check with your network provider whether your SIM card enables CSD data connections.

You can request CSD data connection enabling from your network provider.

Note

As a rule, the network provider allocates a separate number (data number) for the CSD data connection.

8.4 SIM card installation

The SIM card slot is on the underside of the TS Module GSM.

NOTICE

The SIM card may only be removed or inserted if the TS Module GSM is de-energized.

SIM card installation

1. Use a sharp object to press the SIM card tray's eject button (in the direction of the arrow) and remove the SIM card tray.

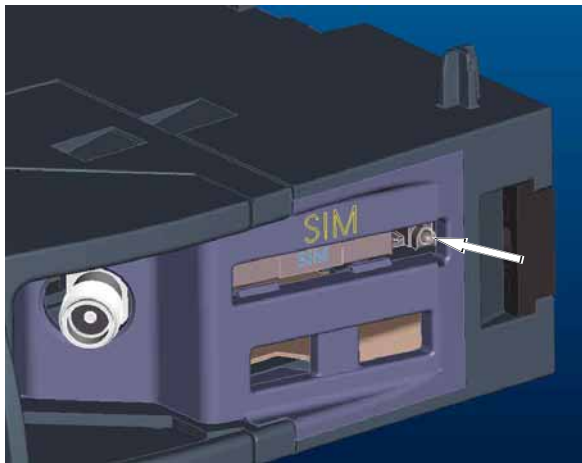
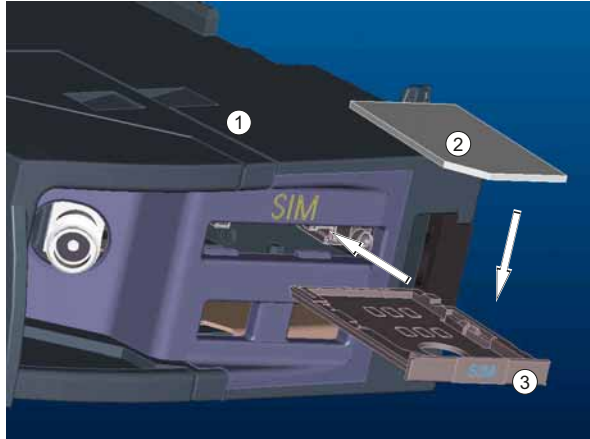


Figure 8-2 TS module GSM with inserted SIM card

2. Place the SIM card in the SIM card tray as shown and put the SIM card tray back into its slot.



- ① GSM module
- ② SIM card
- ③ SIM card tray

Figure 8-3 SIM card installation

Note

Ensure that the SIM card tray is inserted in the guide intended in precisely the right mounting position. If this is not done, the SIM card will not have the right contact and the SIM card tray can no longer be removed using the eject button.

8.5 LED display of the TS Module GSM

Overview

The following image shows the LEDs on the front side of the TS Module GSM. The CONNECTED and SIGNAL QUALITY LEDs are behind the top front flap. The TS Module GSM is illustrated in the image without the upper front panels.

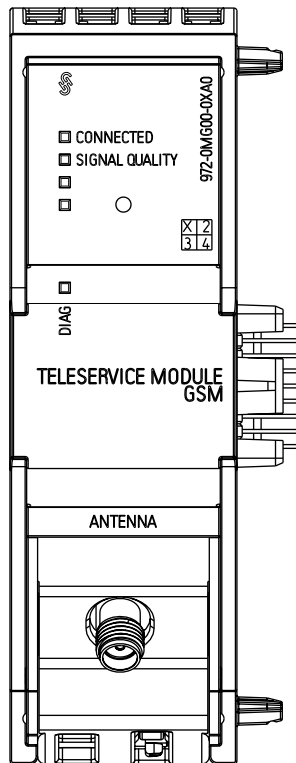


Figure 8-4 LEDs from the TS Module GSM

Start-up characteristics

The LEDs are first activated after the initialization and are thus turned on a few seconds later corresponding to the current operating state.

Meanings of the LEDs

Designation	Color	Meaning
DIAG	Off	The TS Module GSM has not yet been initialized. The power supply for the TS Module GSM is missing.
	Green	Blinks if the TS Module GSM is booked into the GSM/GPRS-network. Lights if the TS Module GSM is booked into the GSM/GPRS-network.
	Red	Blinks if the TS Module GSM recognizes a faulty condition.
CONNECTED	Off	There is no data connection (incoming/outgoing call).
	Green	Lights up when there is a data connection.
	Red	Blinks if an incorrect PIN was entered. Lights if the SIM card is not inserted or if it is faulty.
SIGNAL QUALITY	Off	The TS Module GSM does not have a GSM/GPRS network.
	Yellow	Lights if the TS Module GSM is booked into a weak GSM/GPRS-network. Lights if the TS Module GSM is booked into a sufficient GSM/GPRS-network.
	Green	Lights if the TS Module GSM is booked into a good GSM/GPRS-network.

Using the TS Module GSM

The TS Module GSM automatically searches for the GSM/GPRS network of the provider whose SIM card you are using and will book when it locates it.

If it does not find this GSM/GPRS network, the TS Module GSM searches for another GSM/GPRS network approved by the provider and books into it.

If it does not find a GSM/GPRS network here, it is not able to book.

Causes:

- It cannot receive the desired network (or alternative network).
- The antenna connection is faulty.
- The antenna is not adjusted correctly.

8.6 Technical data of the TS Module GSM

Specifications

- Dimensions: H 100 x L 30 x W 75 mm
- Weight: Approx. 118 g
- Speed
 - GPRS Multislot Class 10:
 - Up to 2 uplinks: GPRS: 13.4 kBit/s - 27 kBit/s Upload gross
 - Up to 4 downlinks: GPRS: 40 kBit/s - 54 kBit/s download gross
- Interfaces
 - SIM interface: 3 V / 1.8 V
 - Antenna connector: 1 x SMA antenna socket (50 Ohm)
- Frequency area; quad band: 850, 900, 1800, 1900 MHz
- Transmit output power:
 - 2 W at 850, 900 MHz
 - 1 W at 1800, 1900 MHz

Standards

The TS Module GSM satisfies the requirements of the following standards:

99/05/EC	Directive of the European Parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (in short referred to as R&TTE Directive 1999/5/EC).
3GPP TS 51.010-1	Digital cellular telecommunications system (Phase 2); Mobile Station (MS) conformance specification
ETSI EN 301 511 V9.0.2	Candidate Harmonized European Standard (Telecommunications series) Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC) (GSM 13.11 version 7.0.1 Release 1998)
GCF-CC V3.31	Global Certification Forum - Certification Criteria
ETSI EN 301 489-1 V1.6.1	Candidate Harmonized European Standard (Telecommunications series) Electro Magnetic Compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common Technical Requirements

ETSI EN 301 489-7 V1.3.1	Candidate Harmonized European Standard (Telecommunications serie Electro Magnetic Compatibility and Radio spectrum Matters (ERM); Eletro Magnetic Compatibility (EMC) standard for radio equipment and ser vices; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications system (GSM and DCS)
IEC/EN 60950-1	of information technology equipment

Country list

Explicit telecommunications approvals have been obtained for the following countries:

- EEA (European Economic Area)
- Canada
- China
- USA
- Russia
- Argentina
- Bosnia
- Brazil
- Chile
- Ecuador
- India
- Israel
- Croatia
- Mexico
- Nicaragua
- Peru
- Philippines
- Serbia
- Taiwan
- Ukraine
- UAE (United Arab Emirates)

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

NOTICE
In principle the approvals stated on the TS Module GSM apply.

You will find the current list of countries online at:

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

Proceed as follows:

1. Select the entry "Product support".
2. In product support, look for the term "TS Adapter IE Basic" or "TS Module GSM".
3. Select the "List of contributions" tab.
4. Enter "Certificates" in the "Contribution type" selection box.

Note

Ensure compliance with national laws and country-specific requirements when installing and operating the TS Module GSM.

You can find the general technical specifications of the TS Module GSM in the section Technical Specifications.

Safety information

Note

Take the following safety notes into account:

- **Radio**
Never use the unit in areas in which the operation of radio equipment is not permitted. The device contains a radio transmitter, which can hinder electronic devices like hearing aids or pacemakers. Your doctor or the manufacturer of such devices can give you information about this. IN order to make sure that no data carriers are demagnetized, please do not store any discs, credit cards or other magnetic data carriers near the device.
 - **Antenna assembly**
The compliance with the recommended radiation thresholds of the Radiological Protection Commission from September 13/14, 2001, must be guaranteed.
 - **Assembly of an exterior antenna**
With the installation of an antenna outdoors, it is necessary that the antenna is properly installed by a professional. The compliance with the lightning protection standard VDE V 0185 part 1 to 4 in its current edition and further standards are prescribed here.
 - **The building lightning protection class (SK)**
With an outdoor installation, the antenna may only be installed within the lightning protection zones O/E and 1. These lightning protection zones are predefined through the lightning protection ball radius.
 - **The EMV lightning protection zones concept**
The EMV lightning protection zones concept must be complied with. In order to avoid large induction loops, a lightning protection potential compensation must be used. If the antenna or the antenna cable is installed near the lightning protection system, the minimum clearance to the lightning protection system must be complied with. If this is not possible, an insulated assembly is required as described in the lightning protection standard VDE V 0185 part 1 to 4 in its current edition.
-

NOTICE

Ensure compliance with national laws and country-specific requirements when installing and operating the TS Module GSM.

Technical data

9.1 General Specifications

Modular TS Adapter	
Power supply	Through the internal voltage of the TS Adapter IE Basic.

Horizontal and vertical mounting


Comply with the general installation guidelines for SIMATIC. Cabinet installation is stipulated. You can install the modular TS Adapter vertically or horizontally. Permitted ambient temperatures:
 Vertical mounting: 0 to 40° C
 Horizontal mounting: 0 to 60° C.

① Vertical mounting of a S7-300
 ② Horizontal mounting of a S7-300
 ③ Profile rail

9.2 Electromagnetic Compatibility

Definition of "EMC"

Electromagnetic Compatibility (EMC) defines the capability of electrical equipment to operation satisfactorily in its electromagnetic environment without influencing this environment.

 WARNING
<p>Injury to persons or damage to property may occur.</p> <p>Any installation of expansion units which are not approved for the modular TS Adapter may violate requirements and standards relating to safety and electromagnetic compatibility.</p> <p>Always use expansions approved for the system.</p>

NOTICE
<p>The specifications relating to interference immunity and interference emission apply only when using devices, lines and connectors conforming to industrial requirements in accordance with EN 61000-6-4:2007 and EN 61000-6-2:2005.</p>

Pulsed interference

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

Table 9- 1 Pulsed interference

Pulsed interference	Test voltage	Equivalent to severity
Electrostatic discharge according to IEC 61000-4-2	Air discharge: ±8 kV Contact discharge: ±6 kV	3
Burst pulses to IEC 61000-4-4	2 kV (power supply line) 2 kV (signal line >30 m) 1 kV (signal line < 30 m)	3
Powerful single pulse (surge) according to IEC 61000-4-5		3
<ul style="list-style-type: none"> Asymmetric coupling 	2 kV (power supply line) DC with protective elements ¹ 1 kV (signal/data line only >30 m), with protective elements as required	
<ul style="list-style-type: none"> Symmetric 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 modular TS Adapter in relation to sinusoidal interference.

Table 9- 2 Sinusoidal interference

Sinusoidal interference	Test values	Equivalent to 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. 1 V/m with 80% amplitude modulation of 1 kHz in the range from 2 GHz to 2.7 GHz	3
RF current coupling on cables and cable shields 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

Radio interference emission

Interference emission of electromagnetic fields in accordance with EN 61000-6-4.

Additional measures

If you wish to operate the modular TS Adapter in an office area, you must implement additional measures to meet the requirements of EN 61000-6-3.

Take suitable additional measures if you need to increase the interference immunity of the system due to high external interference levels.

9.3 Transportation and Storage Conditions

Transportation and storage of modules

The modular TS Adapter exceeds requirements to IEC 61131-2 with respect to transportation and storage conditions. The following specifications apply to TS Adapter and TS Modules, which are transported and stored in their original packaging.

Climatic conditions compliant with IEC 60721-3-3, class 3K7 for storage and IEC 60721-3-2, class 2K4 for transportation.

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

Table 9- 3 Transportation and storage conditions for modules

	Permitted range
Temperature	-40 to +70° C
Barometric pressure	1080 to 660 hPa (corresponding to an altitude of -1000 to 3500 m)
Relative humidity (at +25° C)	5 to 95%, without condensation
Sinusoidal vibration to IEC 60068-2-6	5 - 9 Hz: 3.5 mm 9 - 500 Hz: 9.8 m/s ²
Shock impact to IEC 60068-2-29	250 m/s ² , 6 ms, 1000 shocks

9.4 Mechanical and climatic environmental conditions

Operating conditions

The modular TS Adapter is designed for weather-protected, stationary use. The modular TS Adapter complies with the operational requirements to DIN IEC 60721-3-3:

- Class 3M3 (mechanical requirements)
- Class 3K3 (climatic ambient conditions)

Operation with additional measures

In the following environments the modular TS Adapter must not be operated without additional measures:

- In locations with high levels of ionizing radiation
- In locations subject to difficult 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

A suitable additional measure might be installation of the device in a cabinet or cubicle for example.

Mechanical ambient conditions

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

Table 9- 4 Mechanical ambient conditions

Frequency range in Hz	Test values
$5 \leq f < 9$	3.5 mm amplitude
$9 \leq f < 150$	9.81 m/s ² constant acceleration

Reduction of vibration

Where the modular TS Adapter is subject to major shock impact or vibration, you must take suitable measures in order to reduce the acceleration or amplitude.

Testing of mechanical environmental conditions

The table below provides information on the type and scope of testing of mechanical ambient conditions.

Table 9- 5 Testing of mechanical environmental conditions

Test of ...	Test standard	Comments
Vibration	Vibration test to IEC 60068-2-6 (sine wave)	Vibration type: Frequency sweeps at a rate of change of 1 octave per minute. 5 Hz ≤ f < 9 Hz, constant amplitude 3.5 mm 9 Hz ≤ f < 150 Hz, constant acceleration 9.81 m/s ² Vibration period: 10 frequency sweeps per axis on each of the 3 perpendicular axes
Shock	Shock impact test to IEC 60068-2-29	Type of shock: Half-sine shock pulse Shock intensity: 150 m/s ² peak value, 11 ms period Direction of shock: 100 pulses on each of the 3 perpendicular axes

Climatic ambient conditions

The modular TS Adapter can be operated under the following climatic ambient conditions:

Table 9- 6 Climatic ambient conditions

Ambient conditions	Permitted range	Comments
Temperature	0 to +60° C 0 to +40° C	Horizontal installation Vertical installation
Temperature change	Max. 3° C per min.	
Relative humidity	Max. 95% at +25° C	No condensation, corresponding to RH loading level 2 to IEC 61131-2.
Barometric pressure	1080 to 795 hPa (corresponding to an altitude of -1000 to 2000 m)	-
Pollutant concentration	SO ₂ : <0.5 ppm; RH <60%, no condensation H ₂ S: <0.1 ppm; RH <60%, no condensation	Test: 10 ppm; 4 days Test: 1 ppm; 4 days

9.5 Specifications for insulation, safety class, and degree of protection

Insulation requirements

The TS Adapter IE Basic with TS Module Modem can also be used in TNV-3 networks. The separation between the telephone side and the rest of the electronics was checked during the type test according to the requirements set forth in the IEC/EN 60950-1 and UL 60950-1 standards.

The ISDN interface was checked according to the IEC/EN 60950-1 standard with TS Module ISDN.

All other galvanic isolations were designed to meet the requirements of IEC/EN 61131-2.

Protection class

The modular TS Adapter meets protection class III according to EN 61140:2002 (VDE 0140-1).

Protection against foreign bodies and water

The modular TS Adapter

- meets the protection type IP20 according to IEC 60529,
- is protected against contact with standard probes,
- is not protected against water incursion.

9.6 Standards, Approvals, Certificates, Guidelines, Labels and Declarations

Note

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

Safety requirements

- The modular TS Adapter meets the requirements and criteria of the IEC/EN 61131-2 standard.
- The IT interface is subject to the IEC 60950 standard (TS Module Modem / TS Module ISDN).

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:

- TS Module RS232
2004/108/EC "Electromagnetic Compatibility" (EMC Directive)
- 94/9/EC "Equipment and protective systems intended for use in potentially explosive atmospheres" (Explosion Protection Directive)
- 1999/5/EC "Radio and telecommunications terminal equipment" (RTTE Directive)
(TS Module Modem / TS Module ISDN / TS Module GSM)

The EC declaration of conformity is held on file available to competent authorities at:

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

EMC Directive

For the TS Module RS232 , the following guidelines apply:

Fields of application	Requirement for	
	Interference emission	Interference immunity
Industry	EN 61000-6-4 : 2007	EN 61000-6-2 : 2005

Explosion Protection Directive



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

II 3 G Ex nA II T4

RTTE Directive

The following guidelines apply to Module Modem, TS Module ISDN und TS Module GSM:

- Safety: Telecommunications interface tested to EN 60950-1:2006 + A11:2009
- EMC:

Fields of application	Requirement for	
	Interference emission	Interference immunity
Industry	EN 61000-6-4 : 2007	EN 61000-6-2 : 2005

Network compatibility

- TS Module ISDN: TBR3
- TS Module Modem:
 - ETSI ES 203021 V2.1.1
Part 1 General aspects, August 2005
Part 2 Basic transmission and protection of the network from harm, August 2005
Part 3 Basic Interworking with the Public Telephone Networks, August 2005
 - ETSI ES 201787 V1.1.1
Loop Disconnect (LD) dialling specific requirements
 - ETSI ES 201729 V1.1.1
Timed break recall (register recall)

Marking for Australia and New Zealand



The TS Module RS232 meets the requirements of standard EN 61000-6-4.

Note

Which of the following approvals has been issued in respect of your product is indicated by the markings on the rating plate.

cULus approval



Underwriters Laboratories Inc. to

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

cULus approval, Hazardous Location



HAZ. LOC.

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

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

- 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 modular TS Adapter must be installed in a cubicle with minimum IP54 protection to IEC 60529.

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

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

Injury to persons or damage to property may 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 modular TS Adapter is in operation.

Do not disconnect live circuits, except where the risk of explosion can be safely excluded.

For use under FM conditions, the modular TS Adapter must be installed in a cubicle with minimum IP54 protection to IEC 60529.

Safety requirements for mounting

The modular TS Adapter is "open equipment" in accordance with the IEC 61131-2 standard, 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 cubicle
- • Installation in an appropriately equipped closed switchroom

Compliance with 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.

EU approval

The TS Adapter IE Basic in connection with the TS Module Modem /TS Module ISDN / TS Module GSM has been approved in accordance with Council Decision 98/4827EG 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.

9.7 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 side of this equipment also contains the product ID (US: **CO4MM04B081TSMM** for the TS Module Modem). 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 a analog telephone line. If the number of RENs on a 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 Module Modem: US: **CO4MM04B081TSMM**.

REN is set to NAN. 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 Module Modem 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 Module Modem 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 Module Modem 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 Module Modem is used as intended (dual channel mode).

Canada

IC: 4030A-081TSMM

This product meets the applicable Industry Canada technical specifications.

The Ringer Equivalence Number (REN=0.4) is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices not exceed five.

9.8 Technical Support

Technical support

How to contact Technical Support for all Industry Automation products

- Using the web form to request support
<http://www.siemens.com/automation/support-request>

Additional information about Siemens Technical Support is available on the Internet at
<http://www.siemens.com/automation/service&support>

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:

- our Newsletter which continuously provides the latest information about your products.
- Relevant documentation for your application, which you can access via the search function in Product Support.
- The bulletin board, a worldwide knowledge exchange for users and experts.
- Your local partner of Industry onsite.
- Information about repairs, spare parts and consulting.

Additional support

If you have any questions about using the products described in the manual and do not find the correct answers in this document, please contact your Siemens representative at your local Siemens office.

You can find your local partner at:

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

A guide to our technical documentation for the various SIMATIC products and systems is available at:

<http://www.siemens.com/simatic-doku>

The online catalog and online ordering systems are available at:

<http://www.siemens.com/automation/mall>

Training Centers

Siemens offers corresponding courses to get you started with the SIMATIC S7 automation system. Please contact your regional training center or the central training center in 90327 Nuremberg, Germany.

<http://www.siemens.com/sitrain>

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