SIEMENS

SIMATIC HMI

**TD17
Text Display**

Equipment Manual

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Edition 06/97

Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:

Warning

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

Caution

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

Note

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

Qualified Personnel

Equipment may be commissioned and operated only by **qualified personnel**. Qualified personnel within the meaning of the safety notices in this manual are persons who are authorized to commission, ground and identify equipment, systems and circuits in accordance with safety engineering standards.

Correct Usage

Note the following:

Warning

The equipment may be used only for the applications stipulated in the catalog and in the technical description and only in conjunction with other equipment and components recommended or approved by Siemens.

Startup must not take place until it is established that the machine, which is to accommodate this component, is in conformity with the guideline 89/392/EEC.

Faultless and safe operation of the product presupposes proper transportation, proper storage, erection and installation as well as careful operation and maintenance.

Trademarks

SIMATIC® is a registered trademark of Siemens AG.

Some of the other designations used in these documents are also registered trademarks; the owner's rights may be violated if they are used be third parties for their own purposes.

Impressum
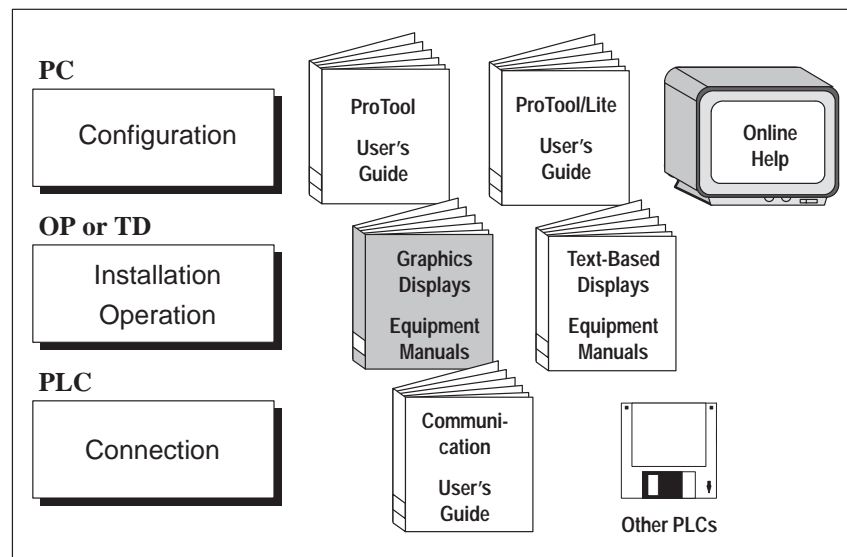
Editor and Publisher: AUT 91

Preface

Purpose   This equipment manual provides operators, fitters, configurers and supervisors with information on functionality and the technical design of the TD17 text display.

How it fits in   The manual is part of the SIMATIC HMI documentation. The documentation includes the manuals for the configuration software, operator panels or text displays and communication between the PLC and the OP or TD.

Below, you will find an overview diagram and a description of when you require the different manuals.

Documentation	target Group	Contents
Getting Started Product Brief	Beginners	This documentation guides you step by step through the configuration of • a screen containing static text • a screen containing an input/output field and a bar graph • changing from one screen to another • a message. This documentation is available for – OP3, OP5, OP15, – OP7, OP17 and – OP25, OP35, OP37.
ProTool User's Guide	Configurer	Provides information for working with the ProTool configuration software. It contains • basic rules for configuration • a detailed description of objects and functions that you can configure • examples of configuring objects. This document is valid for OPs having graphics displays.
ProTool/Lite User's Guide	Configurer	Same contents as the ProTool User's Guide. This document is valid for TDs and OPs having text-based displays.
ProTool Online Help	Configurer	Provides information on your computer (PU or PC) screen for working with the ProTool configuration software. The online Help is context-sensitive and contains • a general description of the editor to be found in ProTool • a detailed description of the different fields in the dialog boxes • a comprehensive description of functions.
Application Example Commissioning Instructions	Beginners	Example configurations are supplied with ProTool together with the associated PLC programs. This document describes • how you load examples onto the TD or OP and the PLC • how you can run the examples and • how you can upgrade the connection for your application.

Documentation	target Group	Contents
TP37 Equipment Manual OP37 Equipment Manual OP25, OP35, OP45 Equipment Manual OP7, OP17 Equipment Manual OP5, OP15 Equipment Manual TD 17 Equipment Manual	Commissioning engineers, users	Describes the OP hardware and general operation. It contains • installation and commissioning • a description of the TD or OP device • electrical connection with connection of the PLC, printer and configuration computer • TD or OP modes • TD or OP operation • description of the standard screens supplied with the software and their usage • how to install options • maintenance and replacement of spare parts
OP3 Equipment Manual	Commissioning engineers, users, programmers	Describes the OP hardware, general operation and the connection to a SIMATIC S7.
Communication User's Guide	Programmers	Provides information on connecting TDs and OPs to the following PLCs: • SIMATIC S5 • SIMATIC S7 • SIMATIC 500/505 • drivers for other PLCs. This document describes • the configuration and parameters required to connect the TD or OP to the PLC and to the network • the user data areas used for exchanging data between OP and the PLC
Other PLCs Online Help	Programmers	Provides information on connecting TDs or OPs to PLCs such as: • Mitsubishi • Allen Bradley • Telemecanique The drivers for connections to these PLCs are located on separate floppy disks and are referred to as NATIVE drivers. Installation of a driver also installs the associated online Help.

How the Manual is organized

Chapters	Contents
1 - 2	Overview of the TD17 and its range of functions in tabular form. You should read this chapter before using individual functions.
3 - 5	Step-by-step instructions on how to operate the TD17 using standard screens.
6 - 7	– Mechanical and electrical installation – Commissioning
8	Detailed information on the TD17, its options and its maintenance. This part is primarily intended for installation and commissioning personnel.
Appendices	– System messages – Technical data

Conventions

The following conventions are used in this manual:

`Motor off`	Text on the display of the TD is shown in "typewriter style".
Variable	Symbolic names representing variable values on the display are shown in italic "typewriter style".
System	Standard screens that you can select are shown in normal italics.
`ESC`	The names of buttons are shown in a different typeface.

Other support

For technical questions, get in touch with your local Siemens representative and branch. You will find the addresses at the end of this manual.

In addition, you can reach us by:

Telephone	+49-911 895-7000 (Help Desk)
Fax	+49-911 895-7001 (Hot Fax)
Internet • Current information: • TD/TP/OP Home Page:	http://www.aut.siemens.de/ http://www.aut.siemens.de/hmi/html_00/opmar.htm
Mailbox (BBS)[1]	+49-911 895-7100 (SIMATIC Customer Support)
CompuServe	go: sieaut
E-Mail • Internet • CompuServe • MS-Mail	simatic.support@nbgm.siemens.de simatic support 101640,704 Hotline_Simatic#Tel7000

[1] For connecting to our BBS, use a modem of not more than 28,800 Bd. Set the following parameters: 8, N, 1, ANSI or connect via ISDN.

Abbreviations

The abbreviations used in the TD17 Equipment Manual have the following meanings:

AS 511	Driver at PU interface to the SIMATIC S5
EM	Event Message
CPU	Central Processing Unit
EEPROM	Electrically erasable/programmable read-only memory
FB	Function block
HMI	Human Machine Interface
IF	Interface ID
LED	Light Emitting Diode
LCD	Liquid Crystal Display
MPI	Multipoint Interface
OP	Operator Panel
PLC	Programmable Logic Controller
PU	Programming Unit
PPI	Point-to-Point Interface
RAM	Random Access Memory
TD	Text Display

Contents

Product Description

<div style="text-align: right; font-size: 2em;">1</div>

Applications of TD17

With text display TD17, you can visualize the operating states, malfunctions and current process values of a connected PLC.

The Text Display features a number of standard functions. The displays and operation of the device can be optimized by the configurer to meet the requirements of the process.

The TD17 is suitable for installation in cabinets and consoles.

1.1 Configuration and Process Control Phases

Creating data areas

Before the TD17 can be commissioned, it has to be prepared for its job of visualizing data from the PLC; in other words, it has to be configured. This means that you have to create data areas in the PLC memory in your configuration which can be used by the TD to communicate with the PLC.

Configuring with ProTool

The configuration for your TD17 is created on a computer (PC or PU) using the ProTool configuration software under Microsoft® Windows™. Once the configuration is ready, it is downloaded to the TD. For this you have to connect your computer the TD. After the configuration has been downloaded, you have to connect the TD to the PLC.

The TD now communicates with the PLC and reacts to program flows on the PLC on the basis of the configured requirements.

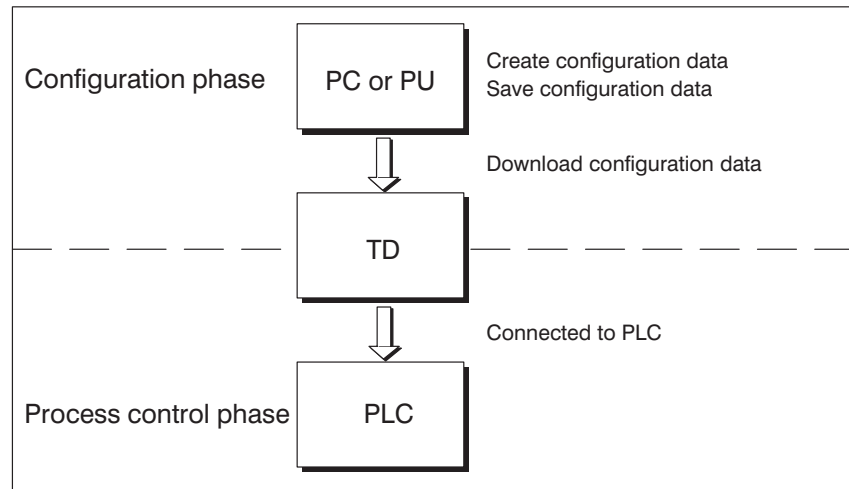Figure 1-1 outlines the configuration and process control phases.

Figure 1-1   Configuration and Process Control Phase

Static and variable text components

Text which is required to be displayed on the TD17 has first to be created on the PC or PU with ProTool and then downloaded to the Text Display. If, for example, the text you wish to display has to consist of static and variable components, the variables have to be configured and the static text for explaining the variables has to be entered – for example:

```
Temperature Variable1 °C of Furnace1
```

where `Temperature °C of Furnace1` is the static text and `Variable1` is the variable that is read from the memory area of the PLC.

Further information

You will find information on configuring the TD in the *ProTool/Lite User's Guide*. The *Communication User's Guide* provides information on connecting the TD to the PLC.

1.2   Functions of a Text Display

Display functions   The basic function of a Text Display consists in displaying process states. The following display functions can be configured for the TD17:

- event messages

- information text

- languages.

Event messages   Event messages are information and operating notes on current machine or process states. Event messages may contain process values. Process values are displayed either numerically – for example,

        Motor running at 3000 revs.

or symbolically – for example,

        Motor running normally,

where a specific control value is assigned to `normally`.

You classify a message as an event message when you are configuring.

Information text   Information text is additional information and hints on operation referring to the current display. This means that additional information can be displayed when an event message is issued.

Languages   Message text, information text and system messages may be displayed in several languages. Up to three of the following languages can be loaded simultaneously on the TD17 and selected in online mode by the operator:

- German

- English

- French

- Italian

- Spanish and

- Russian (Cyrillic characters).

1.3   Design of the TD17

TD17 versions   The TD17 has a plastic housing with a touch-sensitive front and is thus suit-
able for ungrounded installation. The coloring of the universal front foil com-
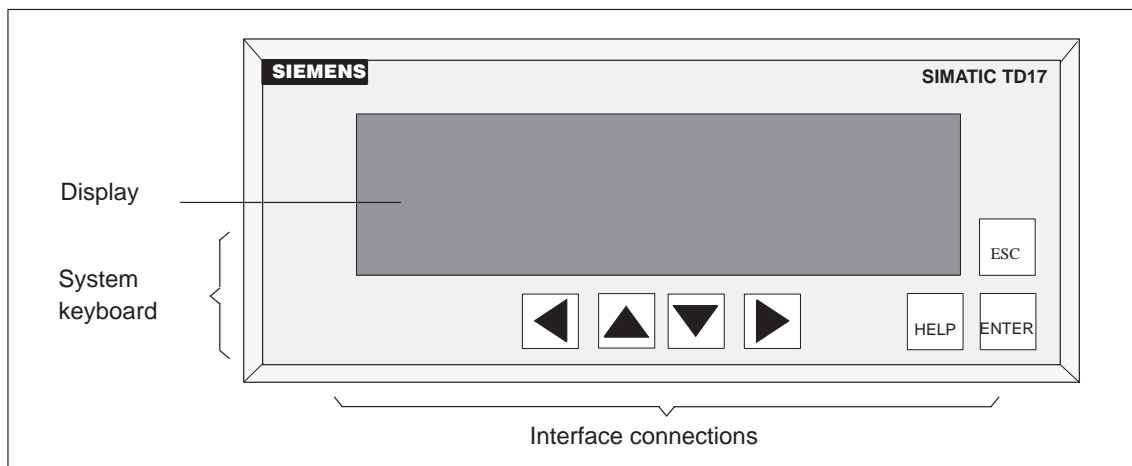plies with machinery directive EN 60204. Figure 1-2 shows the design of the
TD17.

Figure 1-2   Design of the TD17

LC display   High-contrast LC display with LED back lighting. The following displays
can be configured:

- 4 lines of 20 characters; 11 mm character height or
- 8 lines of 40 characters; 6 mm character height or

System keyboard   7 keys for calling universal standard functions by means of standard screens
stored in the firmware.

Data buffer   The TD17 works without a battery and is thus maintenance-free. Operating
data are retained in a non-volatile state in the flash memory on the TD. The
internal hardware clock has reserve power for several days after the power is
turned off.

The TD17 can be upgraded with an optional lithium battery to back up the
message buffer and the hardware clock (longer than the reserve power). The
battery is not supplied with the TD.

Interfaces   - 1 x RS232/TTY for connecting to the PLC or computer
- 1 x RS422/485 for connecting to the PLC or computer.

Fuse   Maintenance-free electronic fuse.

Functionality

2

Overview

Table 2-1 provides an overview of the functions of the TD17.

Table 2-1   Functionality of TD17

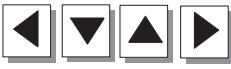| Function	TD17
Display	
– Technology	LCD
– Configurable lines x characters per line/ character height	4x20/11 mm 8x40/6 mm
– Contrast adjustment	x
Event messages	
– Maximum number	999
– Maximum length (characters)	80
– Maximum number of entries in event buffer	256
– View event buffer	x
– Delete event buffer	x
Message acquisition	
– In buffer with date, time and status	x
Actual value display (numerical and symbolic)	x
Information text	
– Maximum length (characters)	320
Configurable OP languages	
German, English, French, Italian, Spanish, Russian (Cyrillic characters)	x

Table 2-1   Functionality of TD17, continued

Function	TD17
Online languages (switchable)	3
Communication with	
SIMATIC S5 using	
– AS511	x
– FAP	x
– PROFIBUS-DP up to 1.5 MBd	x
– PROFIBUS-DP up to 12 MBd	x
SIMATIC S7/M7 using	
– PPI	x
– MPI	x
– PROFIBUS-DP up to 1.5 MBd	x
– PROFIBUS-DP up to 12 MBd	x
SIMATIC 500/505	
– NITP	x
Loadable NATIVE drivers for	
– Allen Bradley (DF1)	x
– AEG/Modicon (Modbus)	x
– Telemecanique (Adjust and Uni-Telway)	x
– Mitsubishi (FX)	x

General Operation

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

3.1   Keyboard

System keys

The TD17 is operated by means of the keyboard. The keyboard consists of seven system keys.

Key	Function	Purpose
HELP	**Display informa-tion text (Help)**	You can view information text configured for a message by pressing HELP.
ENTER	**Select, confirm (Enter)**	Selects items from standard screens, confirms a selection of symbolic values on standard screens.
ESC	**Escape**	ESC has the following functions: • **Hide system message** Cancels display of a non-serious system message. • **Cancel information text display** Cancels display of information text to revert to the previous display. • **Reset scrolling in messages** Cancels scrolling in queuing messages to reset the display to the current message. • **Cancel Download mode** Cancels Download mode provided data are not currently being downloaded to the TD. The TD acknowledges cancellation by issuing a system message.
◀ ▼ ▲ ▶	**Move cursor**	Depending on the operating situation, the cursor is moved one character or field at a time to the left, right, up or down.

Note

Pressing several keys simultaneously may result in incorrect entries.

Key combinations

Keys	Function
ESC ▶ ▼	**Overall reset** This key combination deletes the configuration memory when the TD's power supply is turned on.

3.2   Information Text

Purpose

Information text provides information, for example, on what action to take when a particular event message is displayed.

It is created at the time of configuring with ProTool and provides additional information on the language set on the TD. Information text may be configured for event messages.

Calling information text

Configured information text can be read out by pressing HELP on the TD. Information text is shown for the topmost event message on the display.

Scrolling in information text

You can use the following keys to scroll in information text:

▲ ▼   Scroll within information text.

ESC   Cancel information text display. The former display contents are shown once more.

Standard Functions

4

Loading a configuration	After the operating voltage has been turned on, a configuration has to be loaded onto the TD so that it can be operated. The TD remains in Download mode until a configuration is loaded.
Using standard screens	The TD17's firmware contains a number of standard screens. You use these standard screens to select all the functions necessary for operating the TD. The individual functions are described in this manual by means of the standard screens.

4.1 Operating Levels

Message level and standard screen level	When operating the TD, you have to distinguish between two different operating levels, it being possible to switch from one to the other.

- **Message level**:
  The message level is the highest level on the TD. All waiting event messages and system messages are displayed at message level. Following startup, the TD is always at message level.

- **Standard screen level**:
  At standard screen level, functions are selected, processed and executed. When you select standard screen level, the directory of the standard screens appears from which you can branch to the different standard screens.

If a system message is queuing and the TD is at standard screen level, the TD changes immediately to message level.

Changing operating levels

Changes of operating level are performed either manually or automatically by the TD (refer to Figure 4-1).

- **Operator-initiated change:**

  Press the following key:

  ENTER   to change from message level to standard screen level

  ESC   to change from standard screen level to message level.

- **Forced change to message level:**

  You exit from standard screen level automatically as soon as a system message is waiting to be displayed. The TD then goes to message level.

  To hide a system message, press ESC .

  Once the system message has been hidden, the TD17 reverts to the point from which it previously went to message level.
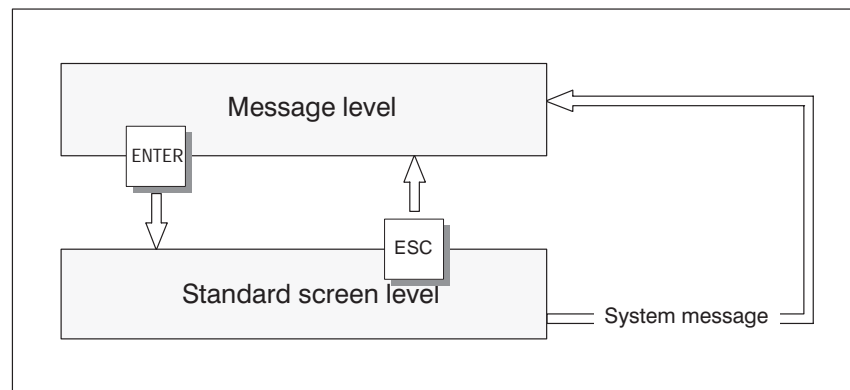
Figure 4-1   Changing between Message and Standard Screen Level

4.2   Password protection

Access protection   To prevent the OP from being operated by unauthorized persons, there is a feature for instituting access protection by way of the supervisor password. This is possible for the standard screen functions

- Delete event buffer

- Language and

- Mode Change.

Supervisor password   The supervisor password is set during configuration. It consists of numeric characters. The default settings is 100.

Entering a password   Use the keys listed below to enter a password.

Select numerals (0 to 9) for the password. For example, for the first character of password 100 select the numeral 1.

Move to the next character of the password.

ENTER   Terminate password entry.

4.3   System settings by standard screens

Standard screens

In standard screens, functions are implemented that are required to operate the TD17. The different functions in this manual are described with reference to the standard screens.

The table provides an overview of the functions available on the different standard screens.

Standard Screen	Function
Display event message buffer (Section 5.4.1)	• Display event messages in event buffer • Display message text relating to a message selected in the event buffer
Delete event message buffer (Section 5.5.1)	Delete all event messages from the event buffer that have arrived or departed
Display system message buffer (Section 5.4.2)	• Display system messages contained in system buffer • Display message text relating to a message selected in the system message buffer
Set language & contrast	• Select one of the three languages contained in the configuration for the TD • Adjust display contrast
Set date & time	Set date and time
Change modes	TD operating modes: Online, Offline, Download

Changing to standard screen level

To use standard screen functions, change from message level to standard screen level by pressing ENTER. You are then in the standard screens directory.

Calling a standard screen

Call a standard screen using the following keys:

▲ ▼   Select a standard screen from the directory.

ENTER   Call the standard screen you selected.

Language setting

Messages and information text can be displayed in several languages. Up to three of the following languages can be loaded simultaneously on the TD and selected in online mode by the operator:

Step	Action
1	Select the standard screen called *Set Language & Contrast*. The standard screen is displayed. Contrast: 2 Language: English
2	▶ ◀ Using the arrow key, go to the entry for the currently selected language.
3	▲ ▼ Chose the language you require using the arrow keys. The selection list contains only those languages which have been loaded onto the TD.
4	ENTER Confirm your input. The TD restarts and shows all the pieces of language-dependent text in the new language.

Adjusting contrast

With the TD17, you can change the contrast of the LC display by means of a standard screen. Perform the following steps to do this:

Step	Action
1	Select the standard screen called *Set Language/Contrast*. The standard screen is displayed. Contrast: 2 Language: English
2	▲ ▼ Select the contrast you require by means of the arrow keys (range of values: 1 – 16).
3	ENTER Confirm your input.
4	ESC Exit from the standard screen.

Setting date and time

The current date and time can be set on the TD in order, for example to perform a correction for summer or winter time. Any change affects all messages in which a date/time variable is displayed. The display format for date and time is set in the configuration and cannot be changed later on the TD.

Step	Action
1	Select the standard screen called *Set Date & Time*. The standard screen is displayed. Date: Fr 04.18.00 Time: 11:59:00
2	▶ ◀ Go to the entry fields you require.
3	▲ ▼ Set the date and time by means of the arrow keys.
4	ENTER Confirm your input.
5	ESC Exit from the standard screen.

Note

Without a backup battery (optional upgrade), the TD17 continues to count the date and time for several days following interruption of the power supply. If the TD17 is restarted subsequent to this stored energy time, the internal hardware clock has to be updated.

Mode setting   The following TD operating modes can be set by means of a standard screen:

- Online
  In Online mode, there is a logical connection between the TD and the
  PLC or the TD attempts to establish a connection.

- Offline
  In Offline mode, there is no logical connection between the TD and the
  PLC. Neither does the TD attempt to establish a connection. You can con-
  tinue to operate the TD .

- Download
  In Download mode, data are downloaded from the PU or PC to the TD. In
  this mode there is no logical connection between the PLC and the TD.
  You cannot operate the TD while downloading is in progress.

To set TD operating modes, perform the following steps:

Step	Action
1	Select the standard screen called *Change modes*. The standard screen is displayed. Operating mode Online
2	▲ ▼ Set the operating mode by means of the arrow keys.
3	ENTER Confirm your input.
4	ESC Exit from the standard screen.

You will find further information about TD operating modes in Chapter 7.

4.4 Operating the TD from the PLC

Shared data areas

The TD and the user program communicate by alternately writing and reading data areas in the PLC's memory. This means that the PLC and the TD can induce each other to perform different actions by evaluating these user data areas.

PLC jobs

PLC jobs are functions triggered by the PLC on the TD – for example, transferring date and time from the TD to the PLC. A job is stored together with its job number and parameters on the PLC.

You will find a complete list of all PLC jobs and their parameters, together with a description of all the user data areas you have to create on the PLC, in the *Communication User's Guide*.

System keyboard assignment

One bit is permanently assigned to every key on the system keyboard in the data area for system keyboard bits. The bit remains set over the period of time the corresponding key is pressed. Releasing the key resets the bit.

By evaluating this data area, the operator's attention can be drawn to incorrect operation of a key by means of an error message, for instance.

Date and time

Transfer of the time and date from the TD can be initiated by means of a PLC job in order to synchronize the TD and the PLC.

Messages

<div style="text-align: right; font-size: 3em; font-weight: bold;">5</div>

Message types Messages are used to display events and states in the control process on the TD. A message consists of static text as a minimum. It may also contain variables.

The following types of message are displayed on the TD:

- event messages and
- system messages.

Event messages Event messages are initiated by the PLC. They are configured and contain process-related information.

Issued event messages are stored in a separate message buffer on the TD. Messages contained in the buffer can be displayed.

System messages System messages are initiated by the TD. They do not have to be configured. System messages provide information on operating states of the TD and on maloperations or malfunctions in communication.

5.1 Event messages

Definition Event messages are messages which draw attention to regular sequences of events or states such as

```
Temperature reached or

Motor running.
```

You can configure hints on operation as event messages, in addition to status messages of this kind. If, for example, the machine operator wishes to start the filling operation but has forgotten to open the water intake valve on the mixer, he can be prompted by a message such as

```
Open water intake valve
```

to rectify the error.

Presentation

Event messages can be configured so that any of their text components flash to distinguish them from the remaining message text.

Messages may contain static text or variable fields. The variable fields, for example, display current PLC actual values in numerical or symbolic form. In addition, the date and time can also be output in messages.

An event message consists of up to 80 characters.

Message bit procedure

If the condition is met in the current process for issuing a message – for example, a variable has been reached – a bit is set in the data area by the PLC user program for event messages. The TD reads the data area after a configured polling time. In this way, a message is detected as having "arrived". The bit is reset by the PLC when the condition for issuing the message no longer exists. The message is then regarded as having "departed".

Event buffer

Event messages are written to the event buffer on the TD upon arrival. The following details are entered in the buffer in chronological order:

- times of incidents
- arrivals and departures of events
- message numbers
- values of variables at the time of arrival or departure.

The message buffer on the TD can store up to 256 events. Events are:

- arrival of a message.
- departure of a message.

Overflow warning

During configuration, you can define a remaining buffer space. When this remaining buffer space has been reached, an automatic overflow warning is issued – for example

```
EM remaining buffer.
```

This overflow warning is a system message. Messages continue to be entered in the buffer even after the remaining buffer size has been reached.

Standby message

A sub-category of the event message is the standby message. The standby message is event message number 0. It appears on the display when the TD is operating at message level and event messages are not waiting.

The standby message is stored in the firmware and, by default, contains the firmware version and the device type – for example

```
TD17       Vx.xx
4 x 20 char.
```
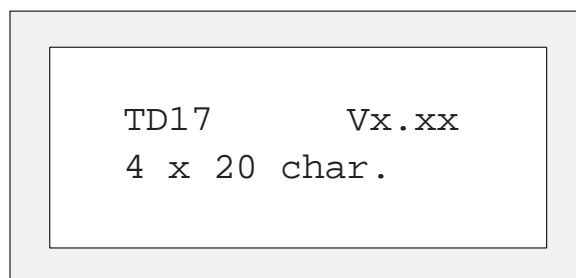
Figure 5-1   Example of Default Standby Message on TD17

Depending on the configuration, the standby message can be represented by other text – for example, a company logo. It may contain the date and time but not variables.

5.2   System Messages

Definition

System messages draw attention to internal operating states of the TD. For example, they indicate maloperations or communication malfunctions. This type of message has highest display priority. If a relevant malfunction occurs on the TD, the event message currently being displayed is hidden and a system message is issued in its place.

Once the system message has been hidden, the TD returns to the point from which it branched.

Serious and non-serious system messages

System messages are classified as serious or non-serious system messages. A serious system message is based on an error which can be eliminated only by a cold or warm restart of the TD.

All other errors generate a non-serious system message – for example, the remaining size of the event buffer has been reached.

The display of a message is terminated automatically if the configured duration of display has expired. Alternately, you can cancel the display of a message by pressing ESC.

You will find a list of system messages and their explanations in Appendix A.

Inhibiting system messages

Display of system messages (with the exception of internal errors 7xx) can be inhibited at the configuration stage. System messages whose display has been inhibited continue to be included in the system message buffer and thus can be viewed on the display.

System message buffer

The system message buffer can store up to 100 messages. System messages are entered in the buffer with their message numbers and their arrival. Message departure is not recorded. Some minor errors and operating errors are not logged in the system message buffer, either. Messages from the system message buffer are displayed in the same order as they arrive.

5.3   Displaying Messages

Display

Event messages are always output to the TD at message level and are displayed according to display and message priorities.

Display priorities

System messages always have top priorities in so far as display is concerned.

Message priority

Depending on their importance, message priorities can be set within event messages in the configuration as follows

- 1 (low) to
- 4 (high).

If several messages having the same display priority are waiting, they are displayed according to their message priority – the highest first and the lowest last.

First/last message display

If several event messages and system messages having identical display and message priorities are waiting simultaneously, the most recent message is displayed.

5.3.1   Scrolling in Waiting Messages at Message Level

Meaning of keys

If there are no system messages waiting, you can scroll at message level through the messages which have not yet departed. To do so, use the following keys:

◀   Back to previous event message

▶   Forward to more recent event message,

ESC   Back to current (most recent) message.

If the TD has not been operated for more than a minute, the current (most recent) message is displayed again.

Example

The event messages (EMs) illustrated below are waiting on the TD:

Message level

```
11:50   EM 02  ◀─────┐
                     │
12:00   EM 04   ◀  ▶ │
                     │
12:08   EM 07  ◀─────┘
```
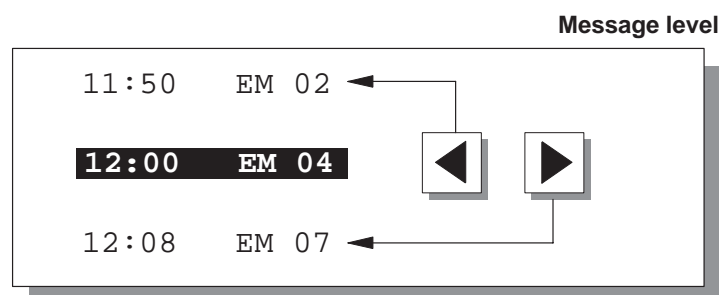
5.4   Message Buffer

Purpose

Messages displayed on the TD are written to the message buffer for event messages. To view the message history, you can call the message buffer by means of standard screens.

Back-up time

The data in the message buffers are lost when the TD17 is turned off or following an interruption of the power supply. If back-up is required, you must connect an optionally available battery.

5.4.1 Event Buffer

Viewing the event buffer
Select the standard screen *Display event message buffer.* The messages stored in the event buffer are shown on the display (Figure 5-2).

```
Message No: 045    A
on 12.09.96 10:23:50
Message No: 031    D
on 12.09.96 09:51:43
```
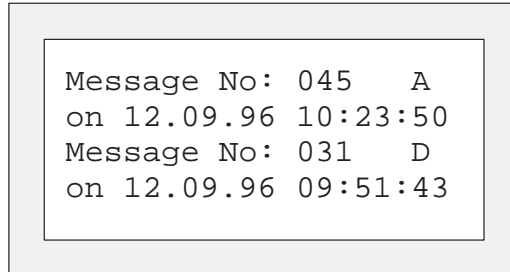
Figure 5-2   Display of Event Buffer (Example: 4x20 representation)

Explanation of example display (first message):

`Message No.`	Message number of the event message.
`045`	The displayed event message is number 045.
`A`	The message has arrived (D: departed).
`on date and time`	Date and time of arrival/departure of the event message.

Arrow keys:

▶   Display message text of selected event message.

◀   Back to event message list.
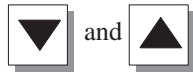
▼ and ▲   Scroll in event message list.

5.4.2 System Message Buffer

Viewing the system message buffer
Select the standard screen *Display system message buffer*
The messages stored in the buffer are shown on the display. Operation and display are the same as for the event buffer.

5.5   Deleting Messages

Avoiding buffer overflow

Event messages are stored automatically in the event buffer. Each of these buffers can hold as many as 256 events. Event messages should be deleted from the buffer to avoid buffer overflow.

Messages from the event buffer are deleted

- by means of a standard screen or
- automatically upon buffer overflow

System messages are deleted automatically only upon buffer overflow.

5.5.1   Deleting the Event Buffer by Means of Standard Screens

Procedure

You can delete all event messages by means of standard screens.

To delete, perform the following steps:

Step	Action
1	Select the standard screen *Delete event message buffer*.
2	Press ENTER if you wish to delete the buffer ESC if you do **not** wish to delete the buffer.
3	Enter the password and press ENTER
4	Exit from the standard screen by pressing ESC

5.5.2 Automatically Deleting the Event Buffer upon Buffer Overflow

Remaining buffer size and buffer overflow

An overflow warning is output to the display when the event buffer reaches the configured remaining buffer size. If the event buffer cannot accept any more messages, those which have already departed are the first to be deleted automatically.

If the remaining buffer size is not freed by this action, as many as the oldest event messages are deleted – irrespective of priority and message status (arrived, departed) – as are necessary to restore the remaining buffer size.

5.5.3 Automatically Deleting the System Message Buffer upon Buffer Overflow

Procedure

If the system message buffer is completely full, the oldest message is deleted automatically from the buffer when a new system messages is issued. There is no overflow warning.

Installation

6

Installation location and conditions

The TD17 is suitable for installation in cabinets and consoles. The front panel has to be provided with a mounting cutout for this purpose refer to Chapter 8). The front panel must not be thicker than 6 mm. No other drilled holes are required for mounting. You will find details about the mounting depth in Chapter 8.

Make sure at the location where you plan to install the TD that there is a clearance of at least at 50 mm beneath the housing of the TD for protruding connectors.

Caution

- The TD must be brought to room temperature before it is commissioned. In the event of moisture condensation, do not turn the TD on until it is absolutely dry.

- The TP subjected to function testing before shipping. Should a fault occur for all that, please enclose a full account of the fault when returning the TD.

- To prevent the TD from overheating in operation,

  – the device must not be exposed to direct sunlight (this simultaneously prevents fading of the foil front),

  – the ventilation slits in the housing must remain free after installation.

- On opening the panel, certain parts of the system become accessible that may conduct hazardous voltage.

Note

The IP65 degree of protection on the front panel can be guaranteed only when the gasket on the front panel of the TD fits properly.

6.1 Mechanical Installation

Installing the TD

Step	Action
1	Insert the retaining hooks of the screw type clamps ①enclosed with the TD into the corresponding recesses in the housing of the TD.
	You require five screw type clamps for the TD17.
2	Tighten the TD from behind in the front panel ②using a screwdriver. Note:
	– Make sure the gasket fits properly on the front plate.
	– Avoid excessively high torques and thus prevent damage.
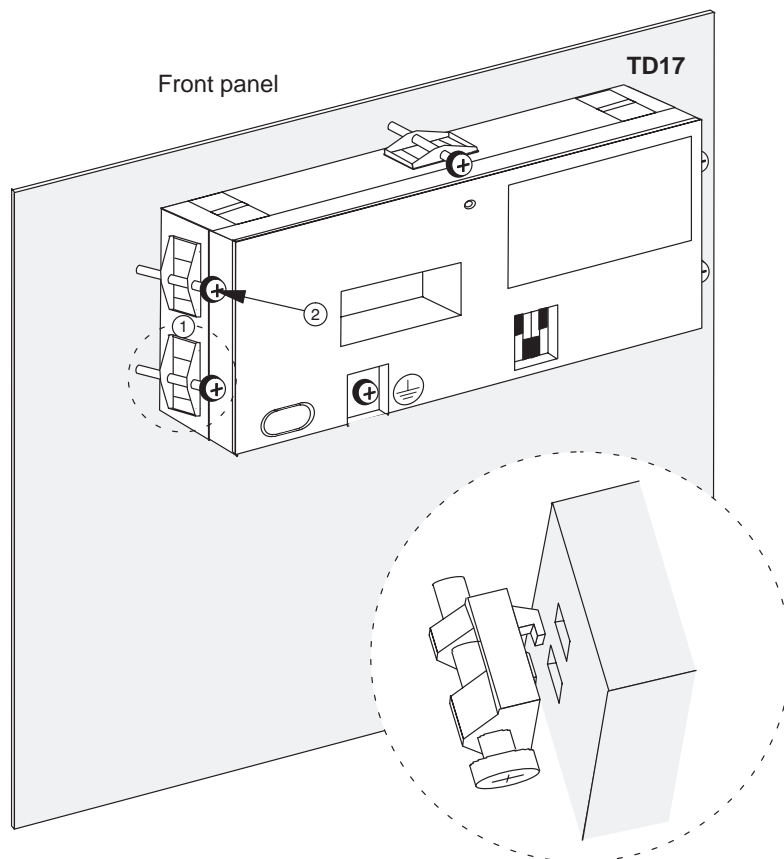
6.2   Electrical Installation

Electrical connections

The TD requires electrical connections

- to the power supply

- to the configuration computer (PU or PC)

- to the PLC.

The electrical connection to the configuration computer is required only to download the firmware and configuration to the TD.

Electromagnetic compatible design

The basis for interference-free operation is electromagnetic compatible hardware design of the PLC and the use of interference-proof cables.

The directives described in the "SIMATIC S5 Directives for the Interference-Free Design and Installation of Programmable Logic Controllers" (Order No. 6ES5998-7AB11) apply to the interference-proof design and installation of the TD.

Caution

- Use only shielded cables for all signal links.

- Screw or lock all plug connections.

- Do not install signal lines in the same cable ducts as power cables.

6.2.1   Connecting the Power Supply

Terminal block   There is a two-pin terminal block on the underside of the housing for connecting the power supply. The terminal block is designed for cables having a cross-section not larger than 2.5 mm^2.

Figure 6-1 shows the position of the terminal block.
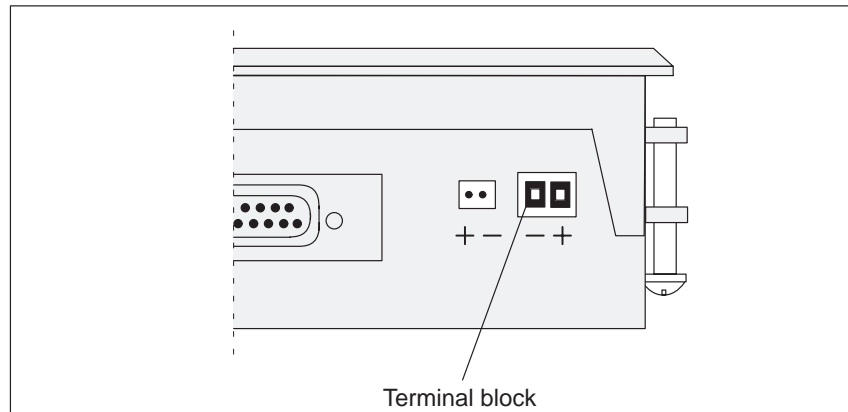
Figure 6-1   Connecting the Power Supply (View of Underside of TD)

The terminal screws are accessed by means of a hole drilled in the rear panel.
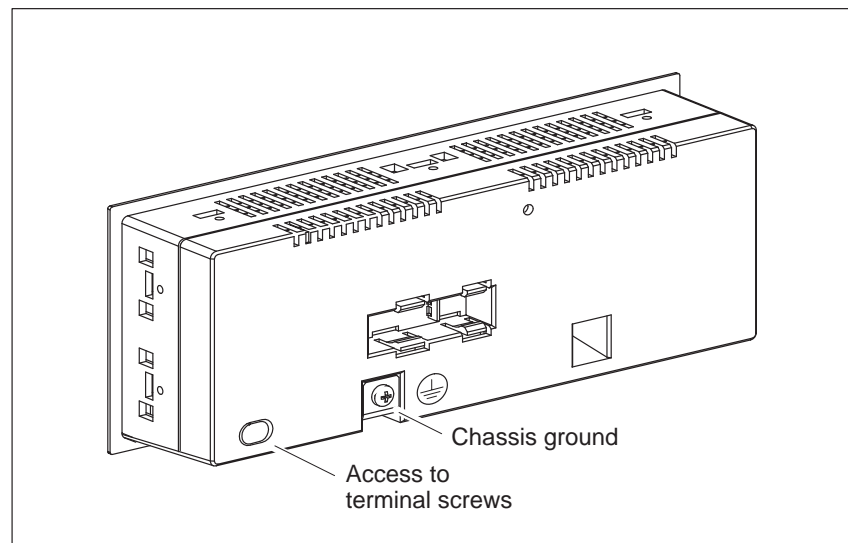
Figure 6-2   Accessing Terminal Screws and Chassis Ground

⚠️ **Caution**

- With a 24 V supply, make sure that the extra-low voltage is isolated safely. Use only power supplies complying with IEC 364-4-41 or HD 384.04.41 (VDE 0100. Part 410) Usage

- The supply voltage must be within the voltage range specified above. If not, there may be functional failures on the TD.

Chassis ground Connect the chassis ground ⏚ on the rear panel of the TD to the cabinet ground.

6.2.2 Connecting a Configuration Computer

Connection configuration diagram

Figure 6-3 shows you how to connect a configuration computer (PU or PC) temporarily to the TD17 to download the firmware and the configuration data. Standard cables are available for the connections shown (refer to the ST80.1 catalog).
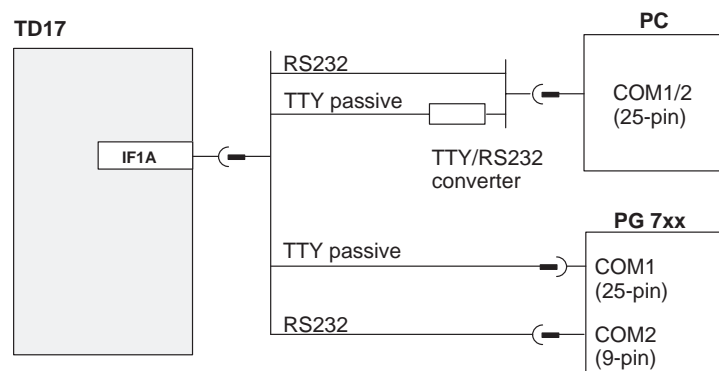
Figure 6-3   Connection Configuration Diagram for Configuration Computer

6.2.3 Connecting a PLC

Connection configuration diagram

Figure 6-4 shows the basic options for connecting the TD to a PLC. For further details refer to Table 8-1 in Chapter 8. Standard cables are available for the connections shown (refer to the ST80.1 catalog).
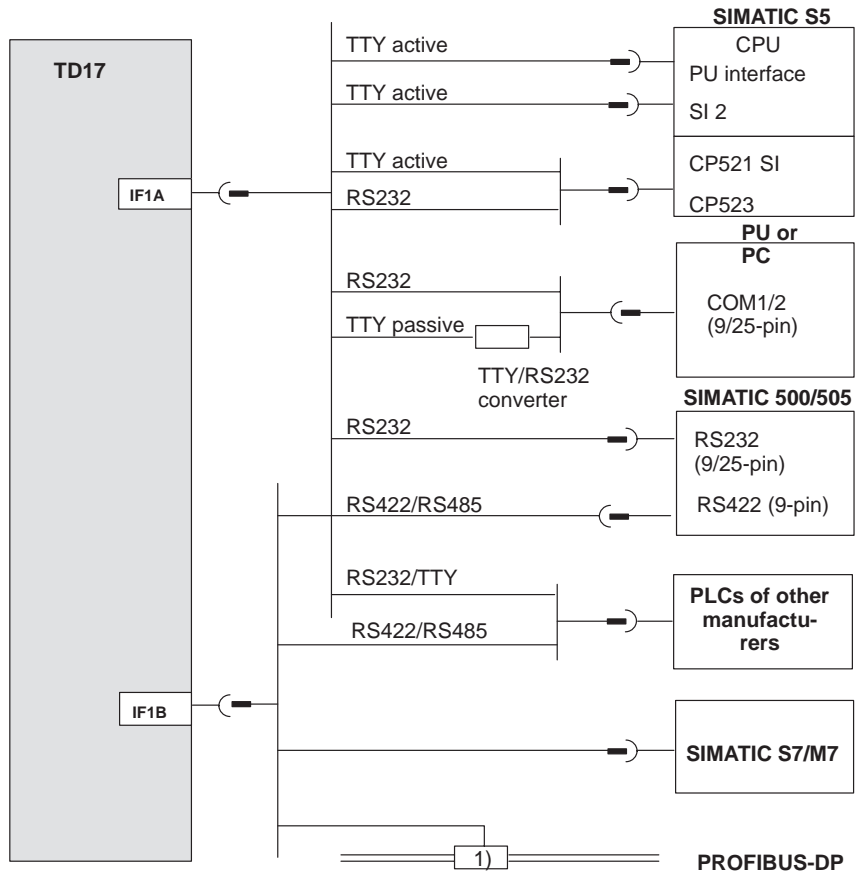
1) Any PROFIBUS bus terminal (apart from FSK)

Figure 6-4 Connection Configuration Diagram for PLCs

**Configuring
Interface IF1B**

You can use the DIP switch at the rear of the TD17 to configure interface
IF1B.
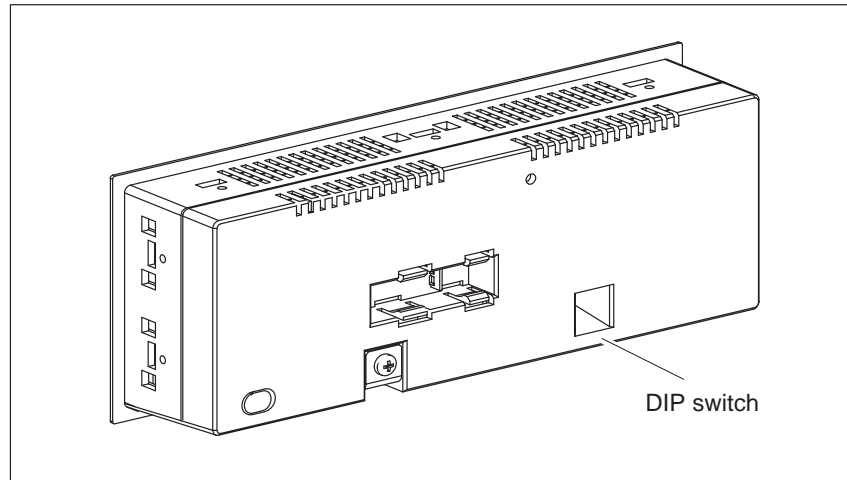
Figure 6-5   DIP Switch of the IF1B Interface

This involves changing over the RS422 receive data and the RTS signal. By
default, the RTS signal is not required by the communication peer.

The table shows the permissible DIP switch settings.

Communication	Switch Setting
TD17 — RS422/RS485 — PLC	1 2 3 4 ON/OFF
TD17 ⊣ PPI/MPI/PROFIBUS ⊢ PLC	1 2 3 4 ON/OFF RTS on pin 4 (default)
	1 2 3 4 ON/OFF RTS on pin 9 (such as PU)
	1 2 3 4 ON/OFF No RTS on the connector
TD17 — PPI/MPI Standard cable — PLC	1 2 3 4 ON/OFF

The interface assignment of the TD will be found in Section 6.3 of this
manual.

6.3 Interface Assignment

Overview   The following tables show the interface assignment of the TD17.

Table 6-1   IF1A Pin Assignment of the 15-pin Sub D Socket
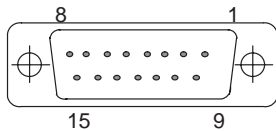
Pin	General	RS232	TTY
1	Not assigned		
2			RxD–
3		RxD	
4		TxD	
5		CTS	
6			TxD+
7			TxD–
8	Not assigned		
9			RxD+
10		RTS	
11			+20 mA
12	GND		
13			+20 mA
14	+5 V		
15	GND		

Table 6-2   IF1B: Pin Assignment of the 9-pin Sub-D Socket
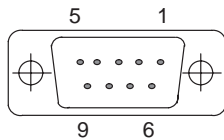
Pin	General	PROFIBUS-DP	RS422	RS485
1	Not assigned			
2	(GND)[1]			
3		Data B	TxD (B)	Data B
4		RTS[2]	RxD (B)[2]	
5	GND (floating)			
6	+5 V (floating)			
7	(P24-In)[1]			
8		Data A	TxD (A)	Data A
9		RTS[2]	RxD (A)[2]	

[1]) Reserved for future applications. From current-limited source < 1 A only
[2]) Can be switched by means of the DIP switch (for switch settings refer to Section 6.2.3)

Commissioning

7

Flowchart

Figure 7-1 shows the most important steps for initial startup, recommissioning and normal operation of the TD. The commissioning guide which follows explains the different steps that have to be taken to commission the TD.
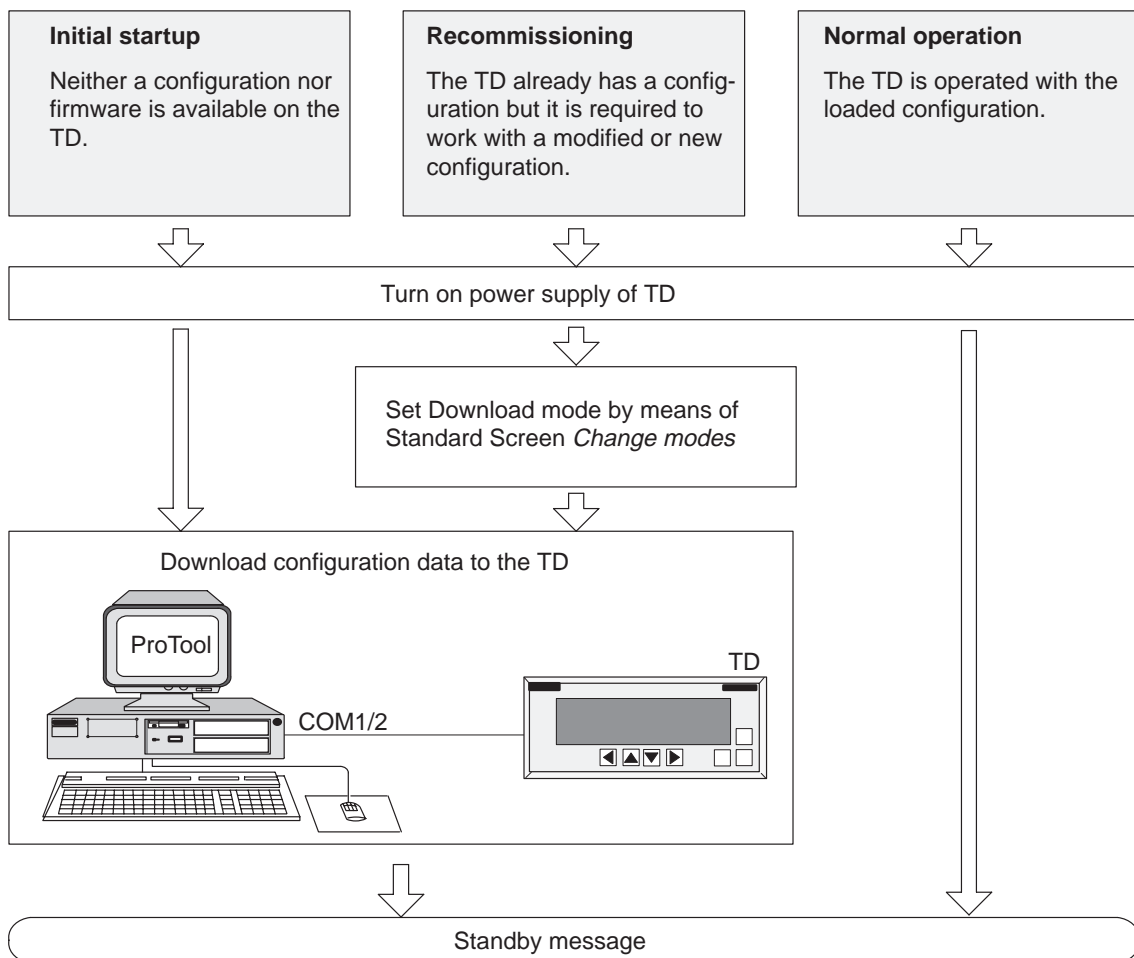
Figure 7-1   Commissioning Flowchart

**Before
commissioning**

Before commissioning the TD, take note of the following:

Caution

- With the SIMATIC S5, compression of the internal program memory on
  the PLC (PU "Compress" function, integrated FB COMPR) is not al-
  lowed when a TD is connected. Compression modifies the absolute ad-
  dresses of the blocks in the program memory. As the TD reads the ad-
  dress list only during startup, it does not detect any address modifications
  and accesses the wrong memory areas.

  If compression is inevitable during routine operation, turn off the TD
  prior to compression.

- De-energize theTD in hazardous areas before removing connectors.

7.1   Commissioning Guide

Initial startup

During initial startup, you have to load the firmware required for operation and the configuration onto the TD. Perform the following steps to do this:

Step	Action
1	Connect the interface of the TD17 by means of a suitable standard cable to the configuration computer (PU or PC).
2	Turn on the power supply of the TD. Since a configuration has yet to be loaded at this stage, the TD automatically goes to Download mode, displaying the message ”Ready for Transfer” and waits for the data to be transferred from the PC or PU. You cannot operate the TD in this mode.
3	Start the download operation on the PC or PU to the TD. The TD checks the connection to the PC or PU. If a connection is not available or if it is not functioning properly, the TD issues a corresponding error message. If the connection is in order, downloading of the configuration from the PC or PU is initiated to the TD. As long as data are not being downloaded to the TD, you can cancel Download mode by pressing ESC

Note

Refer to the *ProTool/Lite User's Guide* for the settings required in ProTool for the download operation.

Once the configuration has been successfully downloaded, the TD restarts. The TD shows the standby message.

Recommissioning If you wish to replace a configuration on the TD with another one, proceed as follows:

Step	Action
1	Connect interface IF1A by means of a suitable standard cable to the Configuration computer (PU or PC).
2	Turn on the power supply of the TD.
3	Call the standard screen *Changes modes* to transfer the TD to Download mode. If necessary, enter the supervisor password beforehand. The TD then changes, with the message "Ready for Transfer" to Download mode and waits for data to be downloaded from the PC or PU. ESC ▶ ▼
4	Start the download operation on the PC or PU to the TD. The TD checks the connection to the PC or PU. If a connection is not available or if it is not functioning properly, a corresponding error message is issued on the PC or PU. If the connection is in order, downloading of the configuration from the PC or PU is initiated to the TD. The configuration residing on the TD is overwritten by the new one during the download operation. You can cancel the download operation to the TD by pressing ESC

Once the configuration has been successfully downloaded, the TD restarts. The TD shows the standby message.

Fault diagnosis Any fault occurring during commissioning or in operation is normally displayed on the TD by means of a system message.

The Appendix to this manual lists some of the most important system messages with notes on troubleshooting.

7.2 Startup Behavior
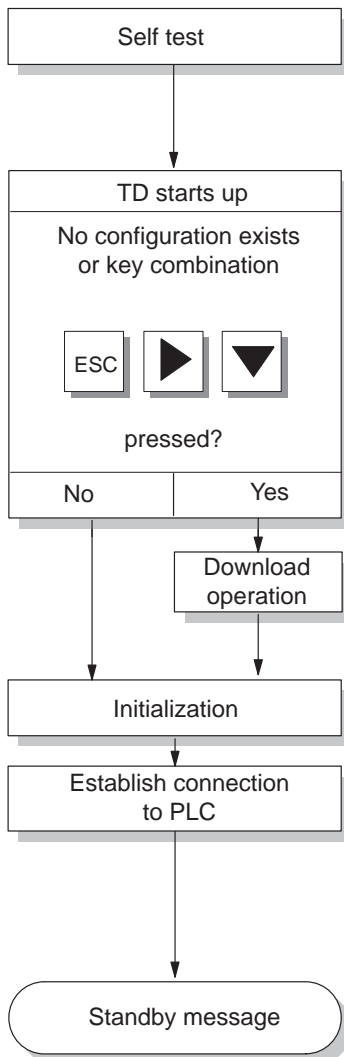
Self test

After the power supply has been turned on, the TD performs a self test. In the test, it checks the operability of the most important TP components and displays the test results.

TD starts up

No configuration exists
or key combination

ESC	▶	▼

pressed?

No	Yes

Download operation

Initialization

The TD now performs various internal initializations.

Establish connection to PLC

If there is not a configuration on the TD, the TD goes automatically to Download mode.

In this phase of startup, the TD attempts to establish a connection to the PLC.

If communication is not possible – for example, because the cable to the PLC has not been inserted – the TD displays a system message.

(Standby message)

After startup, the TD displays the standby message.

7.3 Testing the Configuration in Conjunction with the PLC

Testing with PLC connected

You can test the TD17 in conjunction with the connected PLC in ONLINE mode. In this way you check that the correct data areas have been configured.

Procedure

Step	Action
1	Connect the TD to the PLC.
2	A message on the TD indicates that it has been connected successfully.
3	You can now test all the items contained in your configuration that are necessary for communication with the PLC. Depending on the configuration, these might be: • event messages • area pointers.

7.4 Testing Communication via the PROFIBUS-DP

Bus fault LED

There is a bus fault LED on the rear of the TD (Figure 7-2). When on, the LED indicates that communication is in progress between the TD and the PLC via the PROFIBUS-DP. A permanently dark LED indicates disrupted communication.

The LED can be used to perform a rapid diagnosis of any problems that may occur during communication.
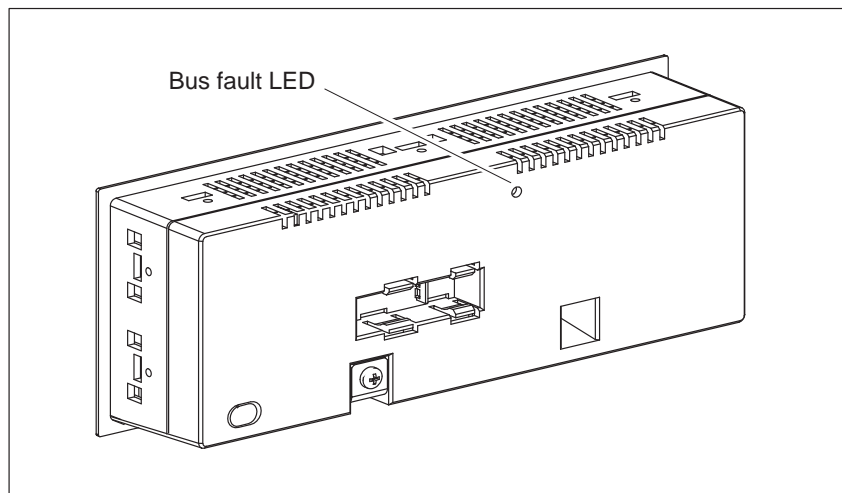
Figure 7-2   Location of the Bus Fault LED at the Rear of the TD

Device Description

<div style="text-align: right; font-size: 2em;">**8**</div>

In this chapter   This chapter describes the dimension drawings and connection elements of the TD17.

Dimensions
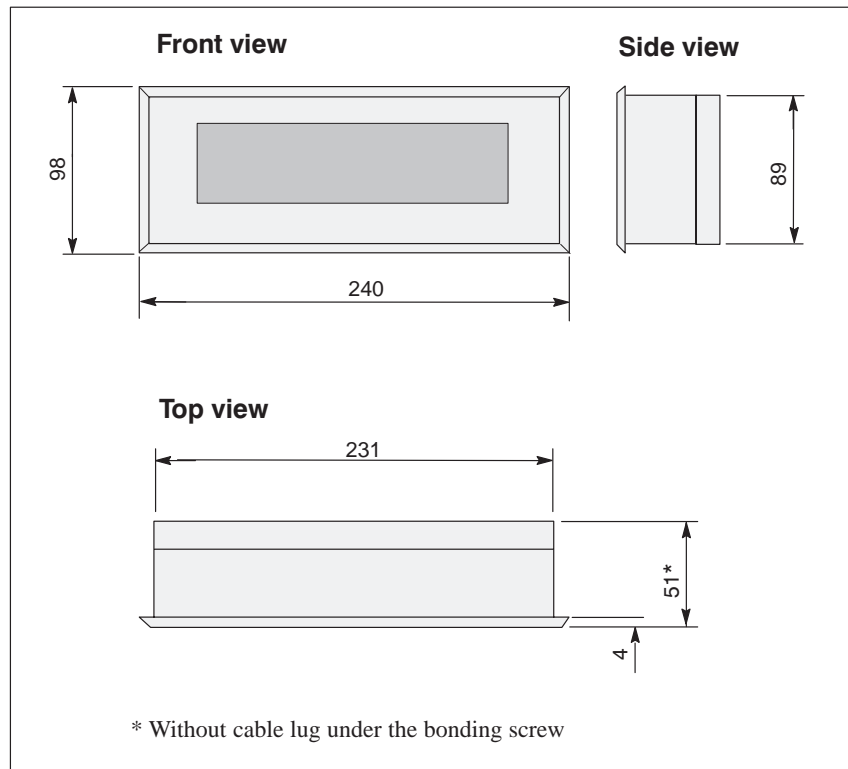
Mounting cutout   The TD17 requires a mounting cutout (WxH) of 231^{+1} mm x 89^{+1} mm.

**Connection
elements**

The TD17 features various communication options (refer to Table 8-1). Figure 8-1 shows the connection elements on the underside of the TD.
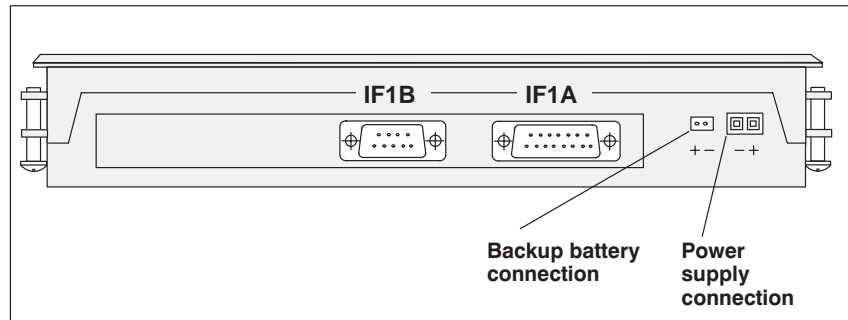
Figure 8-1   Locations of the Connection Elements on the Underside of the TD17

Table 8-1   Communications Options Featured by the TD17

Connection	Interface
SIMATIC S5	
– AS511 (TTY)	IF1A
– FAP (TTY/RS232)	IF1A
– PROFIBUS-DP	IF1B
SIMATIC S7/M7	
– PPI	IF1B
– MPI	IF1B
– PROFIBUS-DP	IF1B
SIMATIC 500/505	
– RS232	IF1A
– RS422/RS485	IF1B
Other PLCs	
– RS232/TTY	IF1A
– RS422/RS485	IF1B
PC/PG (TTY/RS232)	IF1A

8.1   Optional Backup Battery

Function

You can upgrade the TD17 with an optional backup battery. When the power supply is interrupted, the backup battery ensures that

- the operating data in the TD17 message buffer are retained and
- the TD17 hardware clock continues top run on its internal reserve power.

Source of supply

You can obtain the battery from Siemens spare parts service. It is shipped ready for installation with a cable and a connector. Refer to our catalog ST80.1 for the order number.

Installing the battery

To install the battery, proceed as follows:

Step	Action
1	Insert the battery in the battery compartment at the rear of the TD. The snap-in plastic bracket secures the battery in the battery compartment.
2	Insert the connector on the battery lead in the two-pin plug connector on the underside of the TD (refer to Figure 8-1). The connector is coded and thus protected against polarity reversal.
3	Stow any excess lead in the battery compartment.
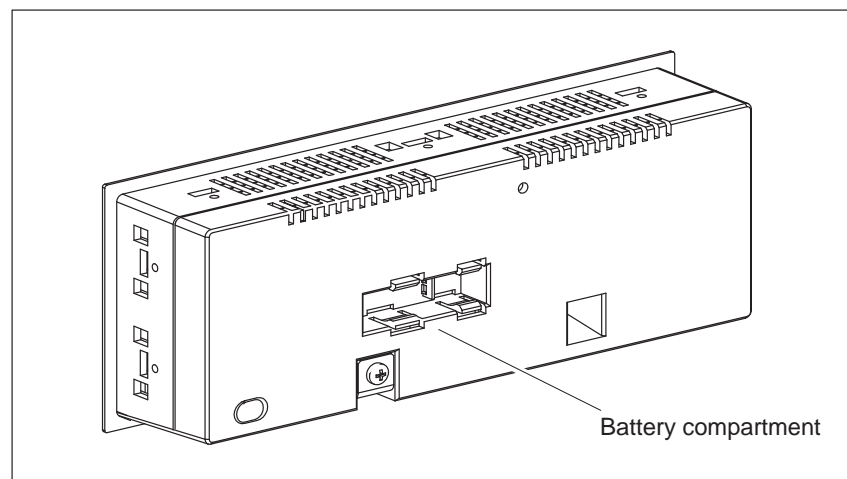
Figure 8-2   Battery Compartment for Optional Battery

Service life   A typical service life under normal operating conditions is approximately four years. The discharge degree of the backup battery is not monitored by the TD17.

Note

Please comply with the safety notes on the proper handling and disposal of lithium batteries, which are enclosed with batteries.

8.2   Maintenance

Scope   The TD17 is designed for low-maintenance operation. Maintenance of the TD is limited to

- regular cleaning of the keyboard overlay and the display

- changing the optional backup battery (refer to Section 8.1).

Cleaning   Clean the keyboard overlay and the TD display at regular intervals with a damp cloth. Use only water for dampening the cloth. Avoid using aggressive cleaners which may result in damage to the foil front.

System Messages

A

Message number

TD system messages can be assigned to different categories.

The information concerning the category to which a message belongs is included in the message number:

Message number

☐☐☐ message text

0	Driver error
1	Startup message
2	Warning
3	Note
4	Operating error
5	Other message
6	Configuration error
7	Internal error
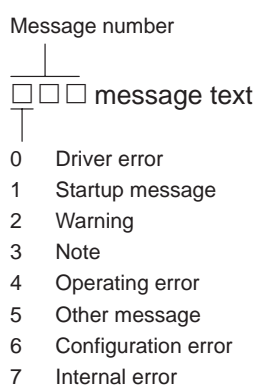
The message category allows you approximately to localize the cause of an error message. A list is provided in the following of the occasions on which selected important messages occur and how the cause of the different errors can be eliminated. Self-explanatory system messages have not been included.

Note

If configuration data are not available to the TD, messages are displayed in English.

Procedure for "internal errors"

Comply with the following procedure for all system messages referring to "internal errors":

a) Turn off the TD, return the PLC to STOP and then let both restart.

b) Place the TD during startup in Download mode (refer to Section 7.1), download the configuration once again and let the TD and the PLC restart.

c) Should the error still occur, please contact your local branch office. Should you do so, quote the number of the error message that occurred, together with any variables that may be contained in the message.

No.	Cause	Remedy
5	Error message if nothing is configured for a system message.	
40	Driver error. If FAP is set, the character delay time may also be set too short.	Check physical connection to PLC, change character delay time.
45	Connection cannot be established to PLC.	Set different CPU at "PLC –> Parameters".
136	PLC not responding.	Check program execution on the PLC and the physical connection.
138	Data block not present on PLC.	Create a suitable memory area.
201	Hardware fault in clock module.	Return device for repair.
202	Error upon reading date.	Return device for repair.
210	The TD or OP coordination area cannot be received during startup.	Restart by pressing the key. Press key.
212	The bit for changing the operating mode has been erroneously inverted.	Restart the TD or OP.
213	Offline mode currently unavailable.	Repeat mode change later.
214	The job number sent by the PLC or configured in a function field is too high.	Check the PLC program.
222	Warning: The event buffer is full right up to the remaining size.	Delete buffer or configure smaller remaining buffer size.
303	The connection to the PLC is faulty.	Check the state of the PLC.
305	The data block number is missing.	Create data block, modify configuration.
306	The wrong PLC has been set under "PLC –> Parameters".	Modify the configuration and download it once again.
307 to 311	Variable not present on the PLC.	Check the configuration for the process interfacing.
317	Input inhibited by password.	Enter password.
322	The password you entered is too short.	Enter a password containing at least three characters.
323	<– Statistics or Message Text–> was pressed on a buffer screen but there is no entry for the current message.	—
342	Unauthorized node address.	Maximum addresses: S7-MPI: 32 PROFIBUS-DP: 128
359	The CPU is at STOP.	A critical message when S7 messages are not present.
500 to 503	The scheduler, counter, date or time cannot be sent.	The error may occur if the PLC is temporarily overloaded or if the function block has not been called up for more than 1.5 sec.
504	Free ASCII protocol: It was not possible to send the operator input value.	The error may occur if the PLC is temporarily overloaded or if the function block has not been called up for more than 1.5 sec.

No.	Cause	Remedy
512	The data block has been configured too short.\n\nThe variable transferred with the message identifies the number of a data block which has been made too short.	Modify the configuration and download it once again.
541 to 550	The specified variable is not present on the PLC.	Modify the configuration and download it once again.
551	No MPI/PPI connection to the PLC can be established with the specified station address.	Check the MPI station addresses and cables.
570	Variable is faulty: The parameter used is the variable name from ProTool.	Check the configuration: Occurs frequently with NC variables and multiplexing.
602	Configuration for remaining buffer size incorrect.	Correct the remaining buffer size and download the configuration once again.
604	Message does not exist.	Configure message.
606	Too many message variables configured.	Modify the configuration and download it once again.
607	The configured data type is invalid.	Modify the configuration and download it once again.
609	Special object or operator object for message text is not present or is illegal.	Modify the configuration and download it once again.
613	Data block not present or too short.	Create data block of requisite length on PLC.
616	Wrong data format in process link.	Correct data format.
617	Wrong word length in process link.	Correct word length.
620	Illegal keyboard ID: too high module number or total number of keys differs from keyboard ID.	Enter configuration complying with hardware.
621	Wrong parameter transferred: message type.	Set required value by means of standard screen or PLC.
627	Configured keyboard block number too high.	Correct block number.
630	Keyboard assignment area too small.	Make keyboard assignment area larger in keeping with bit numbers used.
631	Message configuration #@\005 incomplete or incorrect.	Make addition to configuration.\nIf the error is not corrected following a restart, contact the SIMATIC help desk.
636	Event message No. @ not configured.	Configure event message (–> message number) in full.
637	Configuration for a event message missing.	Configure event message (–> message number) in full.

No.	Cause	Remedy
645	The PLC coordination area cannot be received during startup.	Restart by pressing the key. If the error is not corrected following a restart, contact the SIMATIC help desk.
649	The configured driver number cannot be interpreted.	If the error is not corrected following a restart, contact the SIMATIC help desk.
650	Area pointer missing.	Configure an area pointer.
652	Configuration is not compatible with S5.	Modify the configuration and download it once again. If the error is not corrected following a restart, contact the SIMATIC help desk.
668	Incorrect configuration. Meaning of variables: 1: Non-combinable PLC types configured. 2: No PLC configured. 3: Wrong baud rate configured.	Modify the configuration and download it once again.
701	Job cannot be executed: Internal actual value error.	Change interface or configure area pointer.
703	The wrong PLC has been set under "PLC –> Parameters".	Modify the configuration and download it once again.
734	Illegal RIO function.	The following are allowed: Read, write, (LEDs, outputs) and initialization.
779	Internal error upon MPI download; possibly buffer problems.	Reset and retry.

Technical Data

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

Housing	
External dimensions W x H x D (mm)	240 x 98 x 51[3)]
Mounting cutout W x H (mm)	231^{+1} x 89^{+1}
Mounting depth (mm)	47[1)]
Degree of protection – Front – Rear	IP65 IP20
Weight approx. (kg)	0.960

[1)] Without cable lug under the bonding screw

Memory	
Flash memory for configuration data and data records	128 KB

Display	
Type	LCD with LED back lighting
Number of lines	4 or 8 (configurable)
Characters per line	20 or 40 (depending on number of lines)
Character height (mm)	11 or 6 (depending on number of lines)

Keyboard	
Type	Membrane keyboard
Number of system keys	7

Power supply	
Rated voltage	+ 24 V DC
Permissible range	+18 to +30 VDC
Maximum permissible transients	35 V (500 msec)
Time between two transients	50 sec minimum
Power input (at 24 V) – typically – maximum continuous current	340 mA 390 mA
Fuse – internal – external	electronic fuse 1.6 A, quick-blow

Backup	
Internal	Several days at 40 °C [4]
External backup battery [5] (optional)	Lithium battery 3.6 V/approx. 1.5 Ah > 4 years

[4] The specified backup times apply only when the power supply has been connected for more than 12 hours.

[5] Subject to change.

Interfaces	
RS232	1
TTY	1
RS422/485	1
PPI/MPI/PROFIBUS-DP (up to 1.5 MBd)/RS422/485	1
PPI/MPI/PROFIBUS-DP (up to 12 MBd)/RS422/485	1

Ambient conditions	
Operating temperature – Vertical installation – Horizontal installation Shipping, storage	0 °C to 50 °C 0 °C to 35 °C –25 °C to 70 °C
Relative humidity – Operation – Shipping, storage	≤ 95% no moisture condensation ≤ 95%
Shock load – Operation – Shipping, storage	5 g/11 ms 25 g/6 ms
Vibration Operation Shipping, storage	0.075 mm (10 Hz to 58 Hz) 1 g (58 Hz to 500 Hz) 3.5 mm (5 Hz to 12 Hz) 1 g (12 Hz to 500 Hz)
Maximum difference in pressure (front/rear)	2 hPa
Air pressure – Operation – Shipping, storage	706 to 1030 hPa 581 to 1030 hPa

Noise immunity EN 50082-1	
Static discharge (contact discharge)	EN 61000-4-2 Class 3
RF irradiation	ENV 50140 Class 3
Pulse modulation	ENV 50204 (900 MHz ± 5 MHz)
RF conduction	ENV 50141 Class 3
Burst interference	EN 61000-4-Class 3

Radio interference	
RFI suppression level to EN 55011	Class A

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