

SIMATIC HMI

Multi Panel MP270

Equipment Manual

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Release 03/01

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 marked as follows according to the level of danger:



Danger

indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.



Warning

indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.



Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Attention

indicates that unwanted events or unwanted status can occur if the relevant information is not observed.

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/ECC.

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

Approvals

The approvals that apply to the device are detailed in Appendix A.

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Preface

This manual

The MP270 equipment manual is part of the SIMATIC HMI documentation. It provides operation, installation, configuration and system personnel with information concerning installation, functionality, operation and technical design of the MP270.

An overview of the entire SIMATIC HMI documentation is provided in Appendix E.

Organization of the manual

The MP270 equipment manual is organized into the following chapters:

Chapter	Contents
1 - 2	Overview of features and functional scope of the MP270
3 - 5	Commissioning and operation
6 - 7	Recipes and archives
8	System settings
9 - 12	Mechanical and electrical installation, unit description, retrofitting of options as well as maintenance and upkeep of the MP270
13	Information on updating the operating system.
Appendix	• Technical Data • Interface Assignments • System Messages • ESD Guidelines • SIMATIC HMI Documentation

Conventions

The following conventions are used throughout this manual:

Motor off	Text in the operating unit display is presented in this typewriter font.
Tag	Symbolic names representing tag values on the screen are presented in this italic typewriter font.
Screens	Functions available for selection are presented in this italic font.
ESC	The names of keys and buttons are displayed in a different font.

History

The various editions of this manual relate to the following modifications to the device:

Edition	Comment
01/99	First release of the MP270 equipment manual.
12/99	Recipes, archives, new screen objects, MPI transfer, network operation, Alarm_S
03/01	New key combinations, communication options, functions for data records, system messages

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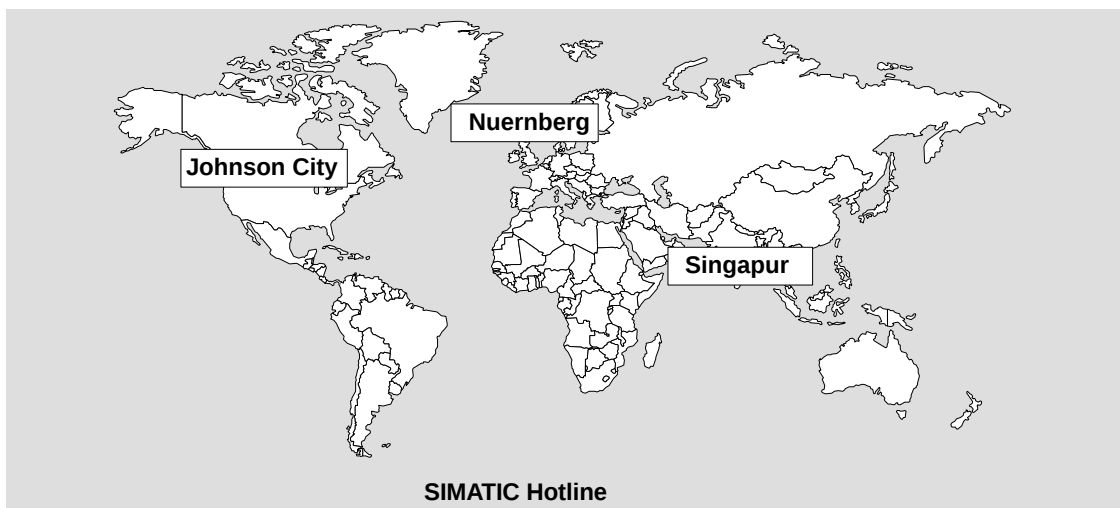
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 - in **Internet** under <http://www3.ad.siemens.de/partner/search.asp>

Abbreviations

The abbreviations used in this equipment manual have the following meaning:

AG (PLC)	Programmable Logic Controller
ANSI	American National Standards Institute
AS 511	Protocol of the PU interface to SIMATIC S5
ASCII	American Standard Code for Information Interchange
CCFL	Cold Cathode Fluorescence Lamp
CF	Compact Flash
CPU	Central Processing Unit
CSV	Comma Separated Values
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
DP	Decentralized Periphery
DSN	Data Source Name
EMC	Electromagnetic compatibility
ESD	Electrostatically Sensitive Device
HMI	Human Machine Interface
IF	Interface
LCD	Liquid Crystal Display
LED	Light Emitting Diode

MP	Multi Panel
MPI	Multipoint Interface (SIMATIC S7)
OP	Operator Panel
PC	Personal Computer
PCL	Printer Control Language
PLC	Programmable Logic Controller
PPI	Point to Point Interface (SIMATIC S7)
PU	Programming Unit
STN	Super Twisted Nematic
TCP/IP	Transmission Control Protocol/Internet Protocol
TFT	Thin Film Transistor
TTL	Transistor-Transistor Logic
UNC	Universal Naming Convention
WINS	Windows Internet Name Service

A list of all the specialist terms together with their explanations is provided in the Glossary at the end of this manual.

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Introduction

Multifunctional platform

The SIMATIC Multi Panels are included in the new product category “*Multifunctional Platform*”. This product category is positioned in the product hierarchy between the optimized process and application components, such as operator panels and PLCs on the one hand, and industrial PCs on the other.

The multifunctional platform is based on the innovative standard operating system Microsoft Windows CE. It combines the robustness of the dedicated hardware solutions with the flexibility of the PC world.

Multi Panels include the following features:

- Clear display and easy operation of the process by means of a Windows-based user interface
- Large selection of predefined screen objects during configuration
- Uncomplicated and quick handling of recipes and data records in recipe screens and recipe views
- the archiving of messages and process values
- Dynamic use of screen objects (e.g. moving objects)
- Simulation of the configuration on a configuration computer
- Creation of vector graphics using the SIMATIC ProTool CS configuration software without an external graphics editor
- Visual Basic Script for the realization of customized functions
- Alarm_S message procedure in connection with the SIMATIC S7
- Downloading:
 - Automatic switchover to Download mode
 - Downloading via MPI and PROFIBUS/DP
 - Serial downloading
 - Downloading via TeleService
- Standard connections to SIMATIC S5, SIMATIC S7 and SIMATIC 505 as well as to PLCs from other manufacturers

A complete overview of the functional range of the MP270 is provided in Chapter 2.

Area of use of the MP270

The MP270 has been conceived for easy machine operation and monitoring. It provides a realistic graphical representation of the machine or system to be monitored. Their area of use include implementation in machine and apparatus construction as well as in the packing and electronics industry.

The high degree of protection (IP65 on the front side) and non-implementation of moving storage media, such as hard disks and floppy disks, ensure the MP270 is also suitable for use in rough industrial environments and directly on site on the respective machine.

Installation locations for the MP270:

- Panels/Consoles
- 19" cabinets/racks

Due to the fact that the MP270 is equipped with high performance basic hardware and has a minimum installation depth means that it fulfills all the requirements for operation in the vicinity of the machine.

Easy to operate and observe

The MP270 enables operating statuses, current process values and errors concerning a connected PLC to be graphically displayed and the relevant machine or system to be easily monitored and operated. Display and operation of the MP270 can be adapted optimally for the respective process requirements by using the ProTool CS configuration software and, for example, extended by user-defined functions with the user's own scripts.

The MP270 can be used to:

- control and monitor the process by means of the menu system. Setpoint values or control element settings, for instance, can be modified by entering values or activating configured function keys;
- display processes, machines and systems on full-graphic, dynamic screens;
- display and edit messages and process tags e.g. in output fields, bar graphs, trend views or status views;
- intervene directly in the running process by using the integrated keyboard.

Configuration using ProTool CS

Graphics, texts, customized functions and operating and display elements which need to be represented on the MP270 must first be created on a configuration computer (PC or PU) using the configuration software.

In order to download the configuration to the MP270, the configuration computer must be connected to the MP270 (refer to “Configuration phase” in Figure 1-1). The connection can be either direct or established via an MPI/PROFIBUS-DP network, for example.

Once the configuration has been successfully downloaded, connect the MP270 to the PLC. Communication is then possible between the MP270 and PLC and the MP270 can subsequently respond to the program process in the PLC according to the configured instructions (refer to “Process running phase” in Fig. 1-1).

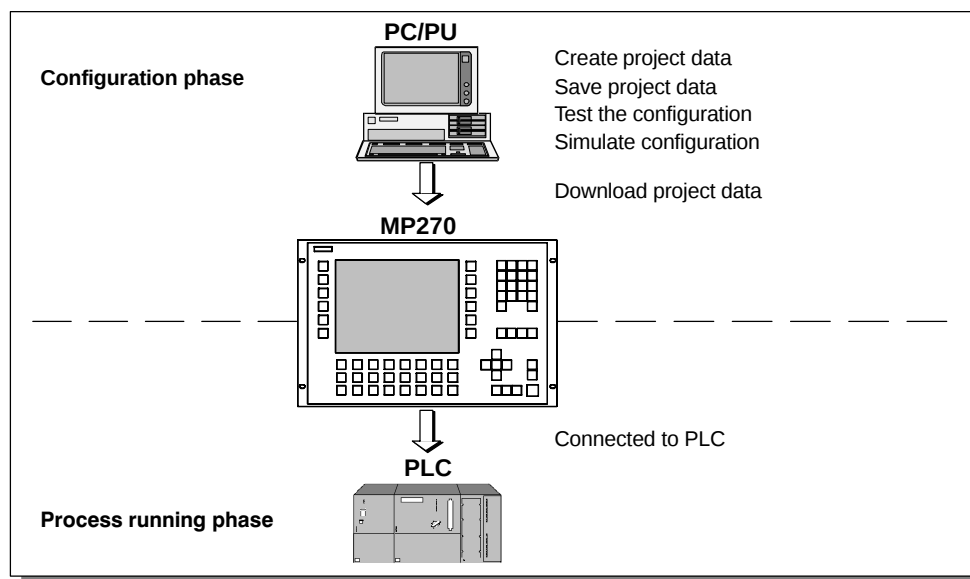
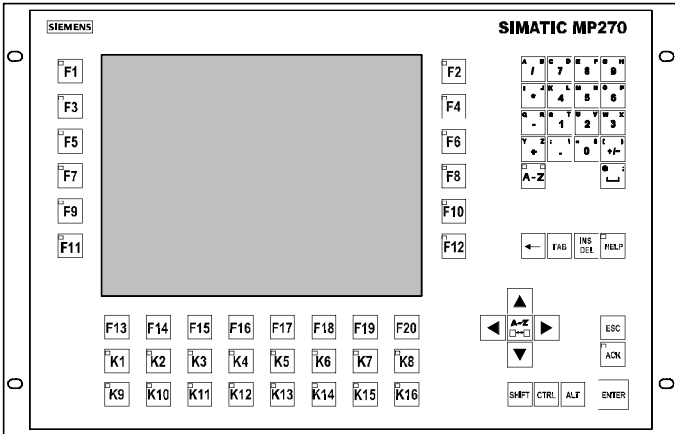


Figure 1-1 Configuration and process running phase

General overview of the MP270

			
Overview: MP270 version			
Processor	Type	32 bit CPU	
Configuration memory	Capacity	To 4 Mbyte	
Software	Operating system	Microsoft Windows CE	
Interfaces	Serial interface for connection to PLC, PC/PU, printer	1 × RS232/TTY (active/passive) 1 × RS232 (9-pin) 1 × RS422/RS485	
Display	Type	TFT LCD	STN LCD
	Active screen area (W × H) in mm	211 × 158 (10.4 ")	
	Resolution (pixels)	640 × 480	
	Colors	256	
	Back-lighting	CCFL tube	
	Service life, approx. (h)	40,000	50,000
Membrane keyboard	System keys with dedicated functions	33 (3 with LEDs)	
	Function keys with configurable functions	36 (28 with LEDs)	
	Those usable as softkeys	20	
	Labeling the function keys	System-specific with labelling strips	
Special features	- External memory extension: - Slot for PC card - Slot for CF card - Optional network card	✓ ✓ ✓	

Further information

Detailed information on the technical data of the MP270 is provided in Appendix A of this manual.

Detailed descriptions of the creation of projects for the MP270 and configuration software functions are provided in the *ProTool Configuring Windows-based Systems* user's guide and in the online help for ProTool CS.

Connection of the MP270 to the PLC is described in the *Communication for Windows-based Systems* user's guide.

Any new information which could not be taken into account for printing in the guides is provided in the *Readme.wri* file on the ProTool CD.

Functionality

The following table summarizes the range of functions provided by the MP270. The values specified are the maximum values which can be managed by the MP270. These values are not accumulative, i.e. 4000 messages can be configured if no further objects are used. However, it is not possible to define 4000 messages and 200 pictures each with 200 tags simultaneously. The defined values are limited by the size of the configuration memory.

Function		Comment
Messages	Number	4,000
	Display	In message line/message window/message view
	View all pending messages	Message page/Message view
	Message length	70 characters
	Process values in message text	8
	Color-coding of different message states	✓
	Event messages	✓
	Alarm messages - Type of display - Acknowledge individual messages - Acknowledge several alarm messages simultaneously (group acknowledgement)	✓ first/last, selectable ✓ 16 acknowledgment groups
ALARM_S	Display S7 messages	✓
Message logging	Output to printer	✓
Volatile message buffer	Capacity	1,024 message events
	View messages	✓
	Delete	✓
	Print	✓
	Message events queued simultaneously (max.) - Event messages - or - Alarm messages/ALARM_S	500 250
Message buffer archive	Memory location	CSV file
	Capacity	Limited by storage medium (PC card, CF card, network drive)

Function		Comment
Message acquisition	Time of occurrence	Date and time
	Message events	Arrived, departed, acknowledged
Screens	Number	200
	Fields per screen	200
	Tags per screen	200
	Complex elements per screen (trends, bar graphs, etc.)	10
	View	✓
	Print (hardcopy)	✓
	Screen objects	• Text • Graphics • Output field • Input field • Symbolic output field • Selection field • Date and time • Graphics list • Vector graphic • Button • Status button • Switches • Hidden button • Trend view • Bar • Message view • Simple message view • Status/Force • Password list • Recipe display • Slider controls • Analog display • Digital/Analog clock
	Operator prompting • Help text • Dynamic attributes • Call/Hide objects • Icons for softkeys • TAB sequence • LEDs in function keys	✓ ✓ ✓ ✓ ✓ ✓
	Fixed window	✓
Tags	Number	2,048
Limit value monitoring	Inputs/outputs	✓

Function		Comment
Conversion functions	Inputs/outputs	✓
Help text	Lines/characters	7/35
	For messages	✓
	For screens	✓
	For screen objects	
	• Input field	✓
	• Selection field	✓
	• Button	✓
Archiving	• Status button	✓
	• Switches	✓
	• Hidden button	✓
	Messages	✓
	Tags	✓
	Number of archives (without follow-on archives)	20
Lists	Number	500
	Graphic lists	400
	Text lists	400
Print functions	Hardcopy of screen content	✓
	Direct message logging	✓
	Shift report	✓
Password protection	Number of passwords	50
	Password level	10 (0..9)
Recipes	Number	100
	Data records per recipe	100 ¹⁾
	Entries per recipe	500
	Total number of entries	5,000
Online language change	Number of languages	3
PU functions (Status/Force)	SIMATIC S5	✓
	SIMATIC S7	✓
Screen settings	Blanking circuit	✓
	Brightness	✓
	Contrast	✓ (STN displays only)
	Screen saver	✓
Scheduler	Trigger functions cyclically or once	✓

Function		Comment
VB Script	User-specific expansions of functionality	✓
	Number of scripts	50
	Number of lines per script	20
Connections ²⁾	Number	6
Communication	SIMATIC S5	
	• AS511	✓
	• PROFIBUS-DP	✓
	SIMATIC S7	
	• MPI	✓
	• PROFIBUS-DP	✓
	SIMATIC 505	
	• NTP	✓
	• PROFIBUS-DP	✓
	SIMOTION	✓
	Connection to PLCs from other manufacturers	
	Allen Bradley (PLC-5, SLC 500)	
	• DF1	✓
	• DH+ ³⁾	✓
	• DH485 ³⁾	✓
	LG (Lucky Goldstar)	
	• GLOFA GM	✓
	Modicon	
	• Modbus	✓
	Mitsubishi FX	✓
	Telemecanique TSX	
	• Adjust	✓
	• Uni-Telway	✓

1) The internal Flash memory has a maximum storage capacity of 64 kByte

2) With SIMATIC S7

3) Via external module

Commissioning

In this chapter

This chapter provides information on:

- Initial start-up of the MP270 (Page 3-3)
- Recommissioning the MP270 (Page 3-4)
- Options for download mode (Page 3-7)
- Testing the configuration on the MP270 (Page 3-11)
- Downloading the configuration back 3-13)
- Backup/Restore the internal Flash memory (Page 3-15)

Notice

In the case of the Initial start-up, please observe the safety notes concerning reverse poling protection on Page 9-6.

Switch off voltage supply

Caution

Always terminate the runtime software before switching off the voltage supply in order to prevent loss of data.

To terminate the runtime software, press the operating element assigned the *Exit_runtime* function in the configuration. Wait until the MP270 start menu (Figure 3-1, Page 3-7) appears and then switch off the power supply.

Operating the MP270 in the start-up phase

During the MP270 start-up phase it is possible to set the options for Download mode and to modify various system settings.

Step	Action
1	Select the object to be operated (button, check box or input field) using the Tabulator key. The object currently selected is marked by a border or a different color. 
2	• Buttons/Check boxes: Press the Enter key in order to trigger the marked button or activate/deactivate the marked check box. • Input fields: Complete the modification/input and confirm the entry by pressing the Enter key.

Further information on operating the MP270 is provided in the following chapters:

- General Operation: Chapter 4
- Operating Special Screen Objects: Chapter 5

3.1 Initial Startup

Action

When the operating unit is started up for the first time, no configuration has been loaded on it. In order to download the necessary project data and the runtime software from the configuration computer to the MP270, proceed as follows, observing the sequence:

Step	Action
1	Switch on the MP270's power supply. Please observe the safety notes concerning reverse poling protection on Page 9-6.
2	Connect the MP270 to the configuration computer according to the settings in the Config Settings menu (Figure 3-2, Page 3-8) via the IF2 (serial) or IF1B (MPI/PROFIBUS-DP) interface using a standard cable.
3	If necessary, check the interface settings in the Config Settings menu (Figure 3-2, Page 3-8) and adapt them as required.
4	If data should be downloaded via an MPI connection, set the following parameters on the configuration computer: • OP address: 1 • Transmission rate: 187.5 kBaud
5	Start downloading the configuration on the configuration computer. Further settings necessary on the configuration computer for the download operation are provided in the <i>ProTool Configuring Windows-based Systems</i> user's guide. The configuration computer checks the connection to the MP270. If the connection is not available or defective, the corresponding error message appears. If downloading from the configuration computer is terminated as a result of a compatibility conflict, please continue as described in Chapter 13. If the connection is correct, the project data is downloaded to the MP270. When downloading has been completed successfully, the MP270 starts the new configuration.

Set date/time

When the MP270 is disconnected from the power supply for a longer period without the backup battery being used, the date and time must be updated. Information on this is available on Page 5-30.

3.2 Recommissioning

Purpose

During recommissioning, a configuration already loaded on the MP270 is replaced by another. In this case, the project data is downloaded from the configuration computer to the MP270.

The following options are available to switch the MP270 to Download mode:

- Start downloading during the start-up phase of the MP270 manually (Page 3-4)
- Start downloading during normal operation of the MP270 automatically (Page 3-5)
- Start downloading via a correspondingly configured operating element while the MP270 is in operation (Page 8-3)

3.2.1 Start downloading manually

Start downloading during the start-up phase of the MP270 manually:

Step	Action
1	Switch on the MP270's power supply. Please observe the safety notes concerning reverse poling protection on Page 9-6.
2	Connect interface IF2 (serial) or IF1B (MPI/PROFIBUS-DP) of the MP270 using an appropriate standard cable.
3	If necessary, check the interface settings in the Configuration menu (Figure 3-2, Page 3-8) and adapt them as required.
4	During the start-up phase of the MP270, the menu depicted in Figure 3-1 (Page 3-7) appears briefly. Press the <i>Download</i> button to set the operating unit to Download mode before the start-up routine is completed. The operating unit continues to display the message <i>Connecting to host</i> until it receives data from the configuration computer or the <i>Cancel</i> button is pressed. If the message <i>Connecting to host</i> does not appear, it is probable that the options for download mode have been incorrectly set (refer to Page 3-8).
5	If downloading is to be performed via an MPI connection, set the OP address and transmission rate currently valid for the MP270 on the configuration computer (refer to Step 4 on Page 3-3).
6	Start downloading the configuration on the configuration computer. The configuration computer checks the connection to the MP270. If the connection is not available or defective, the configuration computer issues the corresponding error message. If downloading from the configuration computer is terminated as a result of a compatibility conflict, please continue as described in Chapter 13. If the connection is correct, the new configuration is downloaded to the MP270. When downloading has been completed successfully, the MP270 starts the new configuration.

3.2.2 Start downloading automatically

Configuration menu settings

The MP270 can be switched to download mode automatically when in normal operation as soon as downloading is started on the connected configuration computer. This option is particularly recommended for the test phase involving a new configuration project because the data is transferred without having to intervene on the MP270. A condition for this is that the following settings have been defined in the Config Settings menu (Figure 3-2, Page 3-8):

Connection via MPI/PROFIBUS-DP:

- Option *MPI/DP Transfer Enable* is activated
- Option *MPI/DP Transfer Remote Control* is activated

Serial connection:

- Option *Serial Transfer Enable* is activated
- Option *Serial Transfer Remote Control* is activated

A detailed description of the settings possible in the Config Settings menu is provided on Page 3-8.



Warning

Following the start-up phase, switch the automatic download option off to prevent inadvertently switching the MP270 to Download mode in a system which is running. Deactivate the options *MPI/DP Transfer Remote Control* and *Serial Transfer Remote Control* in the MP270 Configuration (Figure 3-2, Page 3-8).

Notice

The bus parameters (e.g. MPI address, baud rate etc.) currently loaded on the MP270 are read out of the configuration.

Only use these parameters when downloading a new configuration via MPI, even if different parameters are configured for the new configuration, because the new parameters only take effect after downloading has been completed successfully.

Notice

If the MP270 should switch to Download mode automatically via the configuration computer connected, no “modal dialogs” may be active on the MP270 at that moment. Modal dialogs e.g. Login Dialog) are dialogs which must be closed before other dialogs can be operated.

In such cases, close the dialog or interrupt downloading on the configuration computer.

3.2.3 Minimizing downloading times

Load configuration from external memory card

Downloading configurations on the MP270 can take quite a long time, particularly in the case of large configurations. The downloading times can be minimized, e.g. for commissioning, by loading modified configurations onto the MP270 from an external memory card (PC or CF card).

Condition

The following conditions must be fulfilled in order to download a configuration from an external memory card to the MP270:

- The memory card is defined in the Config Settings menu (Fig. 3-2, Page 3-8) under the item *Projectfile path*.
- The configuration has already been downloaded once to the MP270 via MPI/DP or serial transfer.
- The modifications, in relation to the version already downloaded, do not contain any new object types, PLCs or languages.

Action

Proceed as follows to download a configuration to the MP270 from an external memory card:

Step	Action
1	Copy the project file (*.fwd) generated to the configuration computer in pdata.fwd.
2	Switch off the voltage supply for the MP270.
3	Remove the memory card from the MP270 and insert it in the configuration computer.
4	Overwrite the pdata.fwd file on the memory card with the new project file.
5	Insert the memory card back in the MP270.
6	Switch on the voltage supply for the MP270.

Notice

In the case of comprehensive modifications, always download the configuration using the configuration software ProTool because this is the only method by which the functionality of the new objects can be guaranteed.

3.3 Options for Download Mode

Overview

The following options can be set for download mode:

- Automatic switching to download mode from normal operation when data transfer is initiated from the connected configuration computer
- Download mode can be restricted to a specific connection type so that downloading can only occur either via a serial connection or an MPI/PROFIBUS-DP connection.

Call in Configuration menu

The options for download mode can only be set during the MP270 start-up phase. During the start-up phase the Start menu depicted in Figure 3-1 appears. Press the *Config* button to call in the Config Settings menu depicted in Figure 3-2.

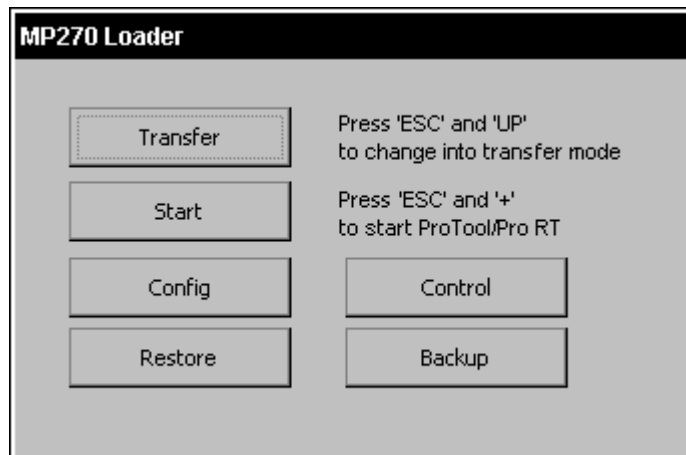


Figure 3-1 MP270 Start menu

The configuration can be started manually by pressing the *Start* button. Otherwise, the MP270 starts the configuration automatically approx. 10 seconds after switching it on.

Use the *Control* button to open the Windows CE Control Panel in which to modify system settings. Information on this is provided on Page 8-5.

Information concerning the two buttons *Backup* and *Restore* is provided on Page 3-15.

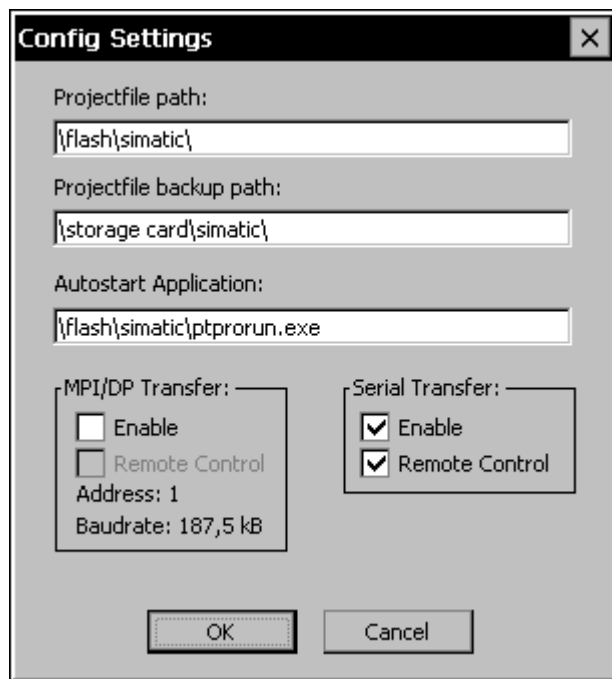


Figure 3-2 MP270 Configuration menu

Download mode settings

Setting the download options in the Configuration menu has the following effects:

- **Option *MPI/DP Transfer Enable*:**
If this option is deactivated, the MP270 Download mode does not permit data transfer via an MPI/PROFIBUS-DP. Activate the option to enable connection only via MPI MPI or PROFIBUS-DP (SIMATIC S7).
- **Option *MPI/DP Transfer Remote Control*:**
This option is only available if the option *MPI/DP Transfer Enable* is activated. If this option is activated, the MP270 automatically switches from normal operation to download mode in the case of a transmission via MPI/PROFIBUS-DP from the configuration computer.
- **Option *Serial Transfer Enable*:**
If this option is deactivated, the MP270 Download mode does not permit data transfer via a serial connection.
- **Option *Serial Transfer Remote Control*:**
This option is only available if the option *Serial Transfer Enable* is activated. If this option is activated, the MP270 automatically switches from normal operation to download mode in the case of a serial transmission from the configuration computer.

Press the *OK* button to confirm the settings currently defined for the download options. The Configuration menu is closed and the Start menu depicted in Figure 3-1 appears.

Press the *Cancel* button to close the Configuration menu and access the Start menu depicted in Figure 3-1. Any modifications made to the settings are rejected.

The group *MPI/DP Transfer* displays both bus parameters, *Address* and *Baud Rate*. This parameters are valid for the configuration currently loaded on the MP270.



Warning

When the option *Remote Control* is active, ensure that the MP270 is not inadvertently switched to download mode from the configuration computer when in normal operation.

Notice

- If the two options *MPI/DP Transfer Enable* and *Serial Transfer Enable* are deactivated, it is not possible to download a configuration from the configuration computer to the MP270.
- Deactivate the *Serial Transfer Remote Control* option if a serial printer is connected to the MP270.

Further settings in the Configuration menu

In addition to the setting options for download mode, the MP270 Configuration menu also contains input fields for the following paths:

- *Projectfile path:*
The predefined storage location for your project file can be changed here. The internal Flash memory, PC card and CF card can be defined. During the next downloading operation, the configuration is stored in the specified storage location.
- *Projectfile backup path:*
The predefined storage location for a backup of the source file of your configuration can be changed here. This file can be used for restoring (downloading back) the configuration (*.pdb). The internal Flash memory, PC card and CF card can be defined.
Information on downloading back is provided on Page 3-13.
- *Autostart application:*
This defines the storage location for the ProTool runtime software. This is the application with which the configuration runs under Windows CE on the MP270.

Notice

Do not change the setting in this field when working with ProTool. Otherwise, the MP270 can no longer start your configuration.

Exit Start menu

If the MP270 still has no configuration, it automatically switches to Download mode approx. 10 seconds after switching it on. The MP270 can be switched to Download mode manually by pressing the *Download* button.

If the MP270 already contains a configuration it is started automatically approx. 10 seconds after switching it on. The configuration can be started immediately by pressing the *Start* button.

3.4 Test the Configuration on the MP270

Conditions

In order to switch the operating unit between the operating modes *OFFLINE* and *ONLINE*, the function *Change_mode* must be linked to an operating element in the configuration.

Tip

During the test phase, it is recommended to enable switching to download mode from normal operation. Further information on this is provided on Page 3-5.



Warning

After the test phase, do not forget to deactivate the *Remote Control* option to prevent inadvertently switching to Download mode from the configuration computer when in normal operation.

Testing on the configuration computer

The material supplied with ProTool contains a simulation program which can be used to test the configuration on the configuration computer without the necessity of connecting a PLC or operating unit. Detailed information on this is provided in the *ProTool Configuring Windows-based Systems* and in the online help to ProTool CS.

Testing without a PLC connected (OFFLINE mode)

After setting the MP270 to operating mode *OFFLINE*, the individual project functions can be tested without them being affected by the PLC. PLC tags are not updated in *OFFLINE* mode.

Step	Action
1	Switch the MP270 to operating mode <i>OFFLINE</i> (refer to Page 8-3).
2	Check all the configured screens in respect of correct representation.
3	Check the screen hierarchy.
4	Check the input fields.
5	Test the function keys.

Testing with a PLC connected (ONLINE mode)

When a PLC is connected, it is possible to test the communication between the MP270 and PLC in ONLINE mode. This includes checking that the correct data areas have been configured.

Step	Action
1	Connect the MP270 to the PLC.
2	Test all the items in the configuration for which communication with the PLC is necessary e.g.: • messages, • print functions, • automatic message logging, • selecting screens etc.

3.5 Download Back

Purpose

During downloading, generally only the run-capable configuration (*.fwd) which has been generated is downloaded on the MP270. If the original project file is to be used for further development of the configuration or for fault analysis, it must remain on the configuration computer.

Not only the generated configuration can be stored on the MP270, but also the source file (*.pdb) of the configuration, so that it can be retrieved (downloaded back) from the MP270 later, if necessary.

Advantage

After downloading a configuration back, it can be analyzed and modified even if the original configuration computer cannot be accessed or the source file (*.pdb) on it for the configuration is no longer available.

Conditions

The following conditions must be fulfilled in order to retrieve the source file from the run-capable project file:

- Sufficient memory space must be available on the MP270 for the additional source file.
- The storage location of the source file must be defined on the MP270 (refer to Page 3-9 under "Projectfile backup path")
- Downloading of the current project file from the configuration computer to the MP270 must be performed using the option *Download Back Enabled*.

Proceed as follows:

1. Select the menu option *File → Download*
2. in the ProTool configuration software
3. Define the download mode
4. Activate the checkbox *Download Back Enabled* in the *Download Selection*
5. dialog.

What happens during download/download back?

In the case of downloading including transfer of the source file, the configuration is compressed from the source format (*.pdb) and downloaded to the MP270 as a *.pdz file. After downloading back, the file is decompressed in the ProTool CS configuration software.

Give the configuration a new name on the configuration computer (refer to instructions on Page 3-14).

Notice

- The downloaded back, decompressed file can only be opened with a ProTool CS whose version number is greater or equal to that of the configuration software with which the project was created.
- ProTool CS cannot check whether the source file on the MP270 matches the configuration actually run on it. If downloading is performed at any time without the option *Download Back* being activated, it is possible that old project data is on the MP270 which no longer matches the current project.

Instructions

Downloading a configuration back from the MP270:

Step	Action
1	Select the menu option <i>File Download Back</i> in ProTool CS on the configuration computer.
2	Select one of the two following connection types between the MP270 and configuration computer in the <i>Download Back Settings</i> dialog: • Serial • MPI/PROFIBUS-DP (via network connection)
3	Click on <i>Edit</i> and set the connection parameters: • for serial: connection and baud rate • for MPI/PROFIBUS-DP: OP address of the MP270 The settings are saved and correspondingly reapplied when downloading back is triggered at a later date.
4	Switch the MP270 to download mode manually or using <i>Remote Control</i> according to the setting in the Configuration menu.
5	Start downloading back with <i>OK</i> . Download back automatically switches the MP270 to download mode. Condition: The download type used is set on the MP270 (refer to Page 3-8). Following successful downloading back, the <i>Save as</i> dialog opens.
6	Enter a new name or select an existing configuration to be overwritten and click <i>Save</i> . The configuration retrieved is saved and automatically opened in ProTool CS.

Alternative for large project files

Download the project file as a compressed *.arj file, on a CF card, for example. To do this, use the backup function of the ProTool configuration software.

Switch ProTool to Stand-alone mode prior to doing this if you are working in STEP 7 which has been integrated. To do this, press the Switch ProTool Integration in STEP 7 button in the ProTool Setup.

3.6 Backup/Restore the Internal Flash Memory

Purpose

The functions *Backup* and *Restore* provide the following options:

- creating a copy of the entire configuration on a memory card
- restoring a stored configuration in the case of a fault
- updating a configuration regardless of where the MP270 is in use, without a configuration computer

Conditions

The two functions *Backup* and *Restore* are only available in the Start menu (Figure 3-1, Page 3-7) during the start-up phase of the MP270. In order to access the Start menu, either the *Exit_runtime* function must be called in or the unit restarted.

Insert the memory card in the relevant expansion slot before starting the Backup/Restore process:

- PC card: Slot A
- CF card: Slot B

Notice

- Before inserting the memory card, please observe the safety notes concerning reverse poling protection on Page 9-6.
 - The MP270 uses a plug-in memory card for Backup/Restore. If both slots are occupied when Backup/Restore is initiated, the PC card (Slot A) is used first. In case of doubt, remove the memory card not to be used from the MP270.
-

Information on the memory cards which can be used is provided in Chapter 11.2.

Backup

During a backup process, the operating system, application and data are copied from the internal Flash memory to an external storage medium.

Proceed as follows to create a backup copy of the internal Flash memory:

Step	Action
1	Deactivate the write protection on the memory card, if set.
2	Insert the memory card in one of the two slots, A or B, according to the target medium (refer to Figure 9-1, Page 9-5).
3	Call in the MP270 Start menu (Figure 3-1, Page 3-7).
4	Start the Backup process by using the Backup button.
5	Confirm the deletion of any existing backup files beforehand.
6	When the data has been completely downloaded, the MP270 issues a message.
7	Remove the memory card from the MP270.
8	Activate the write protection on the memory card, if available.
9	Label the memory card e.g. with the date and version of the configuration saved and keep it in a safe place.

Restore

In the case of a restore process, the content of a Flash memory stored on an external storage medium is reloaded into the internal Flash memory. Both system data and configuration data are copied. Prior to this, the MP270 Flash memory is completely cleared following confirmation.

Proceed as follows to restore the content of the internal Flash memory:

Step	Action
1	Activate the write protection on the memory card, if available.
2	Insert the memory card in one of the two slots, A or B, according to the target medium (refer to Figure 9-1, Page 9-5).
3	Call in the MP270 Start menu (Figure 3-1, Page 3-7).
4	Start the restore process by clicking on the Restore button.
5	Before starting the Restore process, the MP270 checks the compatibility with the data to be restored. In the case of incompatibility, the MP270 terminates the process and issues the relevant message.
6	Confirm that the internal Flash memory.
7	When the data has been completely downloaded, the MP270 issues a message.
8	Remove the memory card from the MP270.
9	Switch on the voltage supply for the MP270.

MP270 Operation

Operating concept

The operating status of the machine or system to be monitored can be observed on the MP270 screen and the running process directly influenced by using the keyboard.

This chapter provides information on the general operating procedures for the MP270. Information regarding operation of screens and screen objects is provided in Chapter 5.

4.1 Integrated Keyboard

Keypads

The MP270 consists of two functional blocks (Figure 4-1):

- Function keys/Softkeys (Keys K1 to K16 and F1 to F20)
- System keys

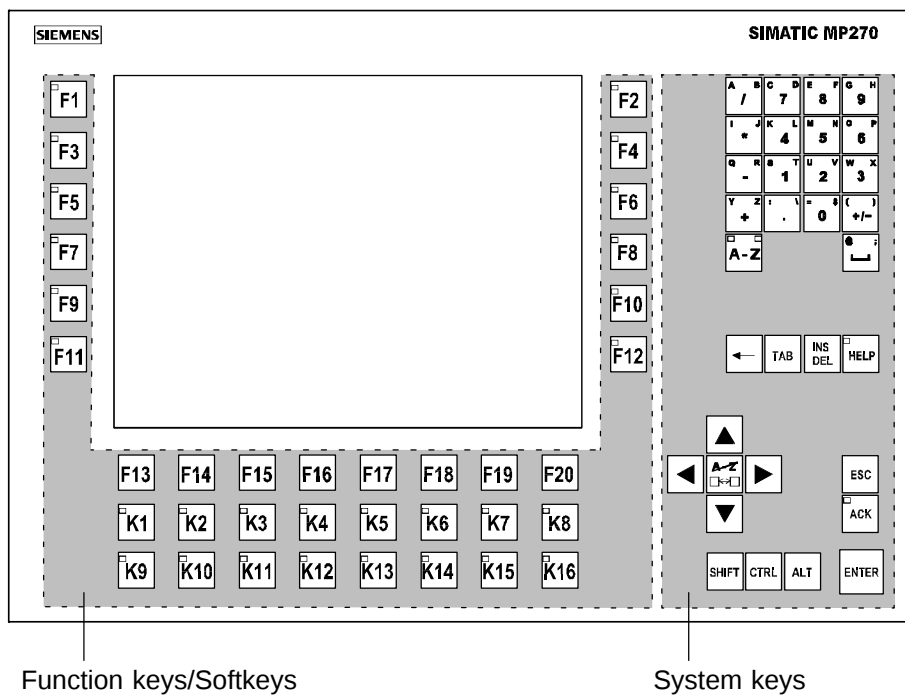


Figure 4-1 Assignment of the keypads

4.1.1 Function keys/Softkeys



Caution

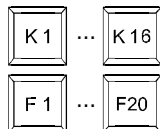
Do not press more than one function key/softkey at a time. Doing so may inadvertently trigger certain functions in some circumstances.

Function keys for global function assignment

A function key for **global** function assignment always triggers the same action on the MP270 or in the PLC regardless of the screen currently open (global significance on the MP270). These actions could include:

- Open screen
- Display current alarm messages
- Print screen (hardcopy)

The following function keys can be assigned during configuration:



Function keys for local function assignment (softkeys)

A function key for **local** function assignment (softkey) can trigger different actions on the MP270 or in the PLC according to the screen currently open (local significance of current screen). If configured, the function of a softkey is indicated by an icon located at the edge of the current screen (refer to Page 5-2).

All the function keys located directly at the edge of the screen can be assigned globally or locally significant functions during configuration. This concerns the following keys in the case of the MP270:



Caution

If a function key is pressed directly following changing screens, the corresponding function associated with the new screen is triggered before the screen is generated.

LED assignment

The Light Emitting Diodes (LEDs) in the function keys can be controlled from the PLC. A luminous or flashing LED can indicate to the operator which key to press according to specific situations, for example.

In order to trigger LEDs, the corresponding data areas – so called mappers – must be set up in the PLC and specified as area pointers in the configuration. The assignment of the individual LEDs to the bits in the database must be defined by the project engineer when configuring the function keys. In this case, the bit number within the mapping area is specified for each LED.

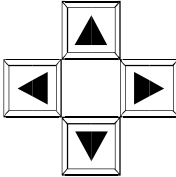
Detailed information on LED control is provided in the *Communication for Windows-based Systems* user's guide.

4.1.2 System keys

Table 4-1 Functions of the system keys

Key	Function	Purpose
	Shift (numeric/alphanumeric)	Switches the assignment of the input keys from digits to letters. • No LED lights up: The numeric keyboard assignment is active. Press the key once to switch to alphanumeric assignment. • An LED lights up: The left or right-hand letter assignment is activated. Each time the key is pressed switches the assignment between the left and right letter assignment.
	Shift (letters/digits)	Switches the assignment of the input keys from letters to digits.
	Activate editing mode/Delete character	• Activates editing mode • Deletes an individual character Delete character in the numeric keyboard assignment. To insert characters, press the Shift (digits/letters) key to access alphanumeric assignment.
	Cancel	• Deletes the character of a value entered and resets the original value. • Closes the active window.

Table 4-1 Functions of the system keys, continued

Key	Function	Purpose
	Acknowledge	Acknowledges the currently displayed alarm message or all messages in an acknowledgment group (group acknowledgement). The LED lights up as long as unacknowledged alarm messages are queued.
	Display help text	Opens a window with help text in respect of the selected object (message, input field). The LED indicates if help text exists for the selected object.
	Acknowledge	• Accepts and ends the input • Opens a selection field for symbolic input • Triggers the function on the selected button
	Tabulator	Moves to the next screen object available for selection in the configured tabulation sequence.
	Delete character	Deletes the character to the left of the cursor.
	Move cursor	• Move to the next screen object available for selection to the right, left, above or below the current screen object. • Navigation in the screen object.
	Shift (upper/lower case)	Use in combination with other keys, e.g. Shift, switch to capital letters.
	General control function	Use in combination with other keys, e.g. navigation in trend view
	General control function	Use in combination with other keys, e.g. Status/Force

4.2 Key Combinations

Special characters

Use the following key combinations with the SHIFT key pressed to enter additional characters on the MP270. Press the **Shift (letters/digits)** key beforehand to switch to the digit assignment.

Key combination	Character	Unicode
 	}	125
 	!	033
 	“	034
 		124
 	~	126
 	%	037
 	&	038
 	{	123
 	[	091
 	]	093
 	#	035
 	>	062
 	<	060
 	?	063
 	—	095

General operation

Key combination	Function
Navigation	
 	Moves to the previous screen object available for selection in the configured tabulation sequence.
    	Positions the cursor within a screen object, e.g. in an input field.
 	Opens a selection field.
Screen settings	
 	Increases the screen contrast (for STN displays only).
 	Reduces the screen contrast (for STN displays only).
 	Increases the screen brightness.
 	Reduces the screen brightness.
During the start-up phase	
  	Switches the MP270 to download mode. As long as no data transfer is taking place, it is possible to exit from download mode.
Other functions	
 	Accepts the selected value in the selection field without closing it.
 	- Changes the active window. - Switches between basic area and window.
 	Mark all
 	Display the properties of the marked element.

Navigation in the operating system

Key combination	Function
 	Opens the operating system Start menu.
 	Open the Task Manager.
Explorer:	
	Switch to superordinate level.
	Switches the display area.
	Activates the menu bar.
Dialogs:	
	Move to next field.
 	Move to previous field.
	Opens the next tab control. ¹⁾
	Opens the previous tab control. ¹⁾
	Close the dialog without saving.

1) When the name of the tab control has the focus.

Cursor control compatibility

The type of cursor control, e.g. within tabular structured screen objects (message view, recipe view and status/force), can be configured. Two variants can be configured in ProTool CS:

- Cursor control as with V 5.10
- New cursor control

All the examples in this manual relate to the **new** cursor control. The new cursor control enables navigation within tables and selection fields simply by using the cursor keys without having to simultaneously implement the SHIFT key.

Navigation using function keys

If the following functions are linked to function keys or softkeys in the configuration, it is also possible to navigate through the MP270 using the function keys:

- *Page_Up*
Simulates the function assigned to the *Page Up* key.
- *Page_Down*
Simulates the function assigned to the *Page Down* key.
- *Go_to_Home*
Simulates the function assigned to the *Home* key.
- *Go_to_End*
Simulates the function assigned to the *END* key.

These functions are compiled in ProTool CS within the *Keyboard* group.

Operating screen objects using function keys

Screen objects assigned to buttons, e.g. message view, trend view, recipe view or status/force, can also be operated by means of function keys or softkeys. A condition for this is that each relevant function has been linked to a function key or softkey in the configuration.

These functions are compiled in ProTool CS within the *Keyboard action for screen objects*.

4.3 Entering Values

Marking

On selecting an input field, the entire field content is marked by changing color. After pressing a key (except a cursor key), the field content is deleted and the new input displayed.

After selecting a field, press the SHIFT key and a cursor key simultaneously to clear the marking on the field contents and enable the cursor to be moved freely within the field.

Operation

Proceed as follows to enter values in an input field:

Step	Action
1	Use the cursor keys to position the cursor on the desired input field.
2	Enter the value in the following form, according to the configuration: • Numeric (Page 4-10) • Alphanumeric (Page 4-11) • Symbolic (Page 5-11)
3	Confirm the entry. 

4.3.1 Enter numeric values

Action

Numeric values are entered character by character using the input keys on the keyboard. If a value already exists in the field, this is deleted on entering the first character. After beginning entering a value, it is impossible to exit from the field without either confirming the entry or canceling it.

Possible values

The following values are possible in numeric input fields:

Values	Keys	Description
Decimal	 ...   , 	The input keys are numerically assigned.
Hexadecimal	 ...   ... 	To enter the characters A...F switch the input keys to alphanumeric assignment. 
Digits	 , 	The input keys are numerically assigned.

Limit value check

Limit values can be configured for numeric input fields. In this case, values entered are only accepted when they lie within the limits configured. If an attempt is made to enter a value which is outside the configured limits, it is rejected and the original value automatically reinserted. In this case, the MP270 issues a system message.

4.3.2 Enter alphanumeric values

Principle

Alphanumeric values are entered character by character using the input keys on the keyboard. After entering a character, the cursor moves one space to the right.

Action

Proceed as follows to enter alphanumeric values:

Input	Keys	Description
Digits	 ...   , 	The numeric assignment is active when no LED is on. 
Letters	 ... 	The alphanumeric assignment is active when one of the two LEDs is on.  

4.4 Call Help Text

Purpose

Help texts consist of additional information and operating instructions provided by the configuration planner concerning messages, screens and operable screen objects. Help text, concerning an input field for example, may provide information on permissible value ranges (refer to Figure 4-2) or, in the case of an alarm message, information related to the cause and its elimination.

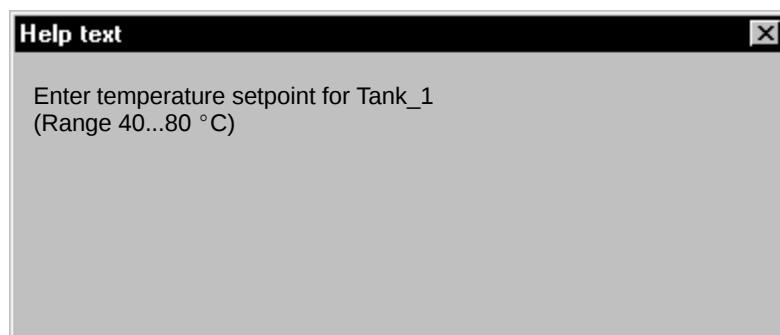


Figure 4-2 Help text for an input field (example)

Action

Proceed as follows in order to call in the configured help text e.g. for an input field:

Step		Action	
1	Select input field	 (e.g.)	The input field is marked.
2	Call in the help text		The LED in the key lights up, indicating that help text is available. Press the key to call in the help text. The configured help text is displayed in the language currently set on the MP270. If help text is also configured for the current picture, it is displayed after pressing the key again.
3	Close help window		The help window is closed.

Operating Screens and Screen Objects

5

In this chapter

Operation of the visualization processes on the MP270 is dependent on the configuration created with the ProTool CS configuration software. This chapter provides general information on screens and on the basic operation of predefined screen objects.

Information on the general operation procedures for the MP270 is provided in Chapter 4.

5.1 Operating Screens

What is a screen?

Screens visualize the progress of processes and display specified process values. A screen contains logically related process data which the MP270 can both display and modify by operating the individual values.

Screens display the current process status in the form of numeric values, bar graphs or trend curves for example. Dynamic screen objects enable, for instance, the current position of a production process to be tracked on the MP270.

Screen partitions

A screen is basically composed of static and dynamic sections. The terms “static” and “dynamic” do not refer to the possibility of dynamically positioning screen partitions but to the connection to the PLC.

Static partitions, e.g. text and graphics, are not updated by the PLC. Dynamic partitions, e.g. input and output fields, trend curves and bars, are linked to the PLC and display current values constantly read in from the PLC memory. Their connection to the PLC is established by means of tags.

A summary of all the screen objects which a ProTool configuration may contain for an MP270 is provided on Page 5-6.

Fixed window

The fixed window is an area at the top of the screen. The height of the fixed window can be configured. Since the content of the fixed window is independent of the screen currently displayed, it is especially suited for displaying important process magnitudes or date and time.

Icons

Icons are graphics of a fixed size located at the bottom and sides of the screen. They are defined during configuration and clearly indicate the screen-specific functions of the softkeys in graphic form.

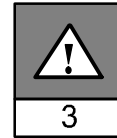
After pressing the respective softkey, F1 to F20 the function symbolized by the icon is activated either on the MP270 or on the PLC.

Message indicator

The message indicator is a configurable graphical symbol which is displayed on the screen when at least one alarm message is present or needs to be acknowledged on the MP270.

The indicator continues to blink as long as unacknowledged messages are present.

The number (in this case 3) represents the number of alarm messages present.



Message window

System messages

The MP270 displays internal operating statuses in the system message window. System messages indicate, for example, incorrect operations or communication faults. A summary of some of the most important system messages and explanations on how to eliminate the causes are provided in Appendix C of this manual.

The MP270 closes the system message window automatically after the configured display period. Press the key depicted to close the system message window prematurely.



Event messages

The MP270 uses the event message window to display operating statuses and faults concerning the machine or system connected to the PLC. The position of the window can be configured.

Alarm messages

The MP270 uses the alarm message window to display faults concerning the machine or system connected to the PLC. The position of the window can be configured.

Since alarm messages indicate abnormal operating statuses, they must be acknowledged. Press the key depicted to do this.



More options for displaying messages are described from Page 5-16. Detailed information regarding the message window is provided on Page 5-19.

Changing active window

Several windows can be opened simultaneously when the MP270 is running in normal operation. In order to operate a window, use the key combination depicted on the right to move between the basic screen area and the windows. Each time the combination is pressed, the cursor moves to the next window.



The window in which the cursor is located is the active window. Input/Operations are possible in the active window. It is not possible to change to a window which contains no operable objects.

Select screen

Screens on the MP270 can be viewed, edited and printed. The relevant screen must have been selected beforehand. There are several ways in which to select a screen:

- **Function key/Button**
Pressing a function key or button opens the corresponding screen defined in the configuration.
- **Input field**
Enter the corresponding number of the screen to be viewed in the input field.
- **Edit messages**
When configured, pressing the Edit button calls in the message assigned to the screen in the message window or message view, for example.

Dim back-lighting

The brightness of the back-lighting for the screen is reduced with increasing operational use for technological reasons. To increase the service life, the MP270 automatically dims the back-lighting if no key is pressed for a specified period of time (approx. 5 minutes). The period of time cannot be configured.

After pressing any key, the MP270 switches the back-lighting to its original intensity. The function assigned to the key is triggered.

Screen saver

In addition to the dimming of the back-lighting described above, it is also possible to define a time on the MP270 after which the screen saver is automatically activated. The screen saver settings are defined using the Control Panel. Information on opening the Control Panel is provided on Page 8-5.

Select the *OP* icon on the Control Panel and use the *OP Properties* dialog to open the *Screensaver* tab control.



Define the time (in minutes) for automatic activation of the screen saver. The screen saver is automatically activated if the MP270 is not operated within the defined time. On entering the value 0, the screen saver is deactivated permanently.

The screen saver is switched off after pressing any key. The function assigned to that key is not triggered.

5.2 Logging On and Off from the MP270

Purpose

Operable screen objects, such as input fields and buttons, can be assigned passwords during configuration to prevent them being modified by unauthorized personnel. Important parameters and settings can then only be modified by authorized personnel.

Information on the *Password List* screen object is provided on Page 5-33.

Login

In order to access password protected operating elements, it is necessary to log in on the MP270. In this case, the function *Logon_User* must be linked with an input field, for example, in the configuration. The user then has access to all the protected operating elements on the MP270 for which the password level is valid until logging off.

When correspondingly configured, it is also possible to log on via an input field for confidential password entry (Page 5-9). The character string entered is represented by placeholders (*).

Logoff

In order to rule out operation by unauthorized personnel, the login should not remain active on the operating unit for too long a period of time. The following options are available with which to log off from the MP270:

- **Configured logout time expires**
If the MP270 is not operated by the user within the configured period (logout time), the user is automatically logged off.
- **Logging off on the MP270**
If the configuration links the function *Logoff_User* with an operating element, the element can be used log off from the MP270.

Tip

It is possible to log off by entering an incorrect password.

5.3 Overview of Screen Objects

A summary of the screen objects which an MP270 configuration may contain is provided in the following table.

Screen object	Use/Description
Text	Texts are used in the configuration to label display and operating elements, for example. Text cannot be changed on the MP270. The importance of different texts within a screen can be distinguished by assigning different fonts and formats. Texts can be configured to cover several lines and in different languages.
Graphics	Graphics can be used in the configuration, for example, to display the system or as explanatory symbols for display and operating elements which have been configured.
Output field	An output field displays current values from the PLC in numeric or alphanumeric form.
Input field (refer to Page 5-9)	The input field is used to enter values which are then transferred to the PLC. The values can be in numeric or alphanumeric form. Entries which lie outside the specified value range are rejected according to the limit values which have been configured. The input can be protected by means of a password.
Symbolic output field	A symbolic output field displays current values from the PLC as plain text. Example: Instead of the values 0 and 1 the symbolic output field displays the texts Motor OFF and Motor ON.
Selection field (refer to Page 5-11)	Values are not entered in the selection field character by character but are selected from a text list. This enables, for example, a motor to be switched on and off by means of the entries ON and OFF.
Date/Time (refer to Page 5-30)	This screen object is used to display and enter the calendar date and time. The way in which the date and time are displayed is dependent on the MP270 language setting.
Graphics list	A graphic list displays current values from the PLC in the form of a graphic. Example: Instead of the values 0 and 1, the graphics list displays graphical representations for open and closed valves.

Screen object	Use/Description
Vector graphics	The following vector graphic objects can be configured: • Line • Rectangle/Square • Rounded rectangle/square • Circle/Ellipse • Polyline/Polygon These objects are combined to form vector graphics with simple, basic geometrical shapes in your configuration. The type, color and width of the lines and their transparency, color filling, rounding radius, etc. can be configured as desired.
Button (refer to Page 5-12)	A button is a virtual key located on the MP270 screen which can be assigned with one or more functions, according to the configuration. After pressing the button, the functions configured for the event <i>press</i> are triggered. On releasing the button, the functions configured for the event <i>release</i> are triggered.
Status button (refer to Page 5-13)	A Status button is a display and operating element which has one of two states: <i>Touched</i> and <i>Untouched</i>. The states can be indicated by means of text or graphics. The Status button can be configured to be locking (switch function) or non-locking (keying function).
Switch (refer to Page 5-15)	A switch serves to enter and display a binary status. It can only be switched on or off.
Invisible button (refer to Page 5-12)	A hidden (invisible) button is a transparent button which is not displayed on the MP270. If invisible buttons are located over graphics, for example, it is possible to operate part of the graphic, e.g. a motor or valve. After pressing the button, the functions configured for the event <i>press</i> are triggered. On releasing the button, the functions configured for the event <i>release</i> are triggered.
Trend view (refer to Page 5-26)	A trend view provides a particularly clear representation of process data when displayed as a continual progression. Several different trend curves can be displayed simultaneously in the trend view, e.g. current and archived trend curves.

Screen object	Use/Description
Bar (refer to Page 5-25)	Bars represent values from the PLC as rectangular areas. The MP270 thus provides a clear indication of how far the current value is from the limit values, or if a setpoint value has been reached, at a glance. Bars are often used to represent fill levels or workpiece numbers. Direction, scaling, bar and background color and labeling the Y-axis can be configured as required. In order to identify limit values, limit value lines can be called in.
Message view (refer to Page 5-23)	Special filter criteria are configured in the message view for displaying the volatile message buffer and/or message archive.
Simple message view (refer to Page 5-24)	A simple message view can provide a subset of the functionality of a message view. It can be used, for example, to simply realize a message line in a screen.
Status/Force (refer to Page 5-36)	By implementing Status/Force, the MP270 can be used to access the connected PLC (SIMATIC S5 and SIMATIC S7) in order to read and write values directly. PLC operands can be monitored and modified without having to connect an additional programming unit or PC to the PLC. This facility is of special use during the testing and commissioning phases of the configuration.
Password List (refer to Page 5-33)	The password list can be used to display, enter and modify passwords on the MP270.
Recipe view (refer to Page 6-7)	A recipe view can be used to create, save and transfer data records on the MP270.
Slider control (refer to Page 5-28)	Use a slider control to enter and display numerical values in analog form. To enter values, move the slider to the required position. When used as a display element, the value is represented by the position of the slider.
Analog display (refer to Page 5-29)	An analog display indicates numerical values by means of a pointer instrument.
Digital/Analog clock (refer to Page 5-32)	A digital/analog clock enables the system time to be displayed either as digits or as a traditional clock with hands.

5.4 Input Field

Purpose

Numeric or alphanumeric values are entered character by character in an input field. A numeric value is a number, e.g. 80 as a setpoint value for a temperature. An alphanumeric value can contain text and digits e.g. Valve_12.

Limit value check

If limit values are configured for the input field tags, the values entered are only accepted when they are within the configured limits. If an attempt is made to enter a value which is outside the configured limits, it is rejected and the original value automatically reinserted. In this case, the MP270 issues a system message.

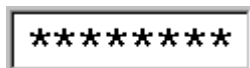
Display

Input fields can be configured differently according to their purpose, e.g.:

- **Numeric input field**
to enter numeric values in decimal, hexadecimal or binary format.
- **Alphanumeric input field**
to enter character strings.
- **Input Field for date and time**
to enter the calendar date and time. The format is dependent on the language currently set on the MP270. The figure below illustrates examples of input fields for date and time in English language format.



- **Input field for confidential password entry**
to enter passwords confidentially. The character string entered is represented by placeholders (*). The figure below illustrates an example.



Operation

Proceed as follows to operate an input field:

- Select the input field required. The field content changes color when the field is accessed.
- Use the cursor keys to position the cursor and then enter the required value.
- Confirm the entry



(e.g.)

or

- Discard the entry



Detailed information on entering values is provided on Page 4-9.

5.5 Selection Field

Purpose

Values are entered in a selection field not character-by-character but are selected from a list provided (Figure 5-1).

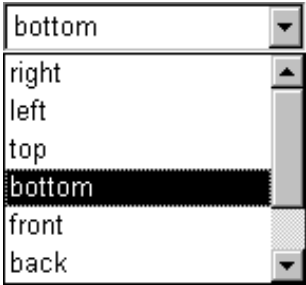


Figure 5-1 Selection field in opened state (example)

Operation

Proceed as follows to operate a selection field:

Step		Procedure	
1	Select the selection field	 (e.g.)	The selection field is marked.
2	Open selection list		The selection list opens up.
3	Select entry	 , 	Moves cursor line by line.
4	Apply selection or Cancel selection	 	The selected entry becomes valid. The selection field is closed. The original value is reapplied. The selection field is closed.

Tip

After pressing an alphanumeric key, the first list entry which begins with that letter appears.

5.6 Buttons

Purpose

A button is a virtual key located on the MP270 screen. Functions which have been assigned to buttons can be triggered, for example, by the following, configurable events:

- Clicking
- Pressing
- Releasing

Display

- **Labeling**
Buttons can be labeled statically or dynamically. In the case of dynamic labeling, the text or graphic on the button changes during runtime according to the value of a configured tag.
- **Operation acknowledgement**
As soon as the operating element detects a valid operation, it responds with a visual acknowledgement. The acknowledgement, however, does not infer that the required action is actually being executed.

Figure 5-2 illustrates examples of buttons which are pressed (right) and not pressed (left).

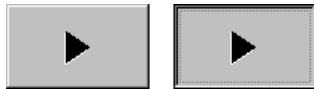


Figure 5-2 Example of a button

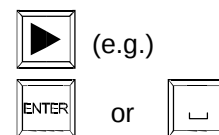
Hidden buttons

Hidden buttons are transparent buttons which may lie over graphics, for example. This enables plant parts which are graphically displayed on the MP270 to be operated easily (e.g. a motor or valve). If a hidden button is selected on the MP270, its contour becomes visible as long as the button remains selected. The contour enables the user to detect the operable area of the button.

Operation

Proceed as follows to operate a button:

- Select the required button, e.g. using a cursor key.
- Press either the Enter key or the Spacebar.



5.7 Status Button

Purpose

The Status button is an operating and display element with the two states *Pressed* and *Released*. Status buttons indicate the status of a device which cannot be determined from the MP270 (e.g. a motor). At the same time, it is also possible to change the status of the device concerned on the MP270.

Behavior

The behavior of the Status button can be configured:

- **Switch:**
The switch has two stable states. It toggles from one state to the other each time it is operated, and remains in the respective state until it is operated again.
- **Key:**
The button has a fixed, stable home position. When operated, it switches to the status *pressed* and remains in this state as long as it is kept pressed. When released, it automatically switches back to its *released* position.

Functions which have been assigned to the Status button can be triggered, for example, by the following configurable events:

- Change of status
- Pressing
- Releasing

If the status of a *switch* type Status button changes as a result of a modification of configured tags, not through operation, the corresponding function is not executed.

Display

The two indicator statuses of the types *Switch* and *Button with acknowledgement* can be assigned different texts or graphics in ProTool CS which are then displayed on the Status button during runtime.

Figure 5-3 illustrates an example of a Status button of the type *Switch* when pressed (left) and not pressed (right).

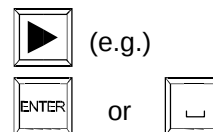


Figure 5-3 The two statuses relate to the Status button when the Switch option is set

Operation

Proceed as follows to operate a Status button:

- Select the Status button e.g. using a cursor key.
- Press either the Enter key or the Spacebar.



5.8 Switch

Purpose

A switch serves for the input and out of a binary status. It can only be switched on or off. It is linked to a tag to do this. The status *OFF* corresponds to the value 0 (a logical FALSE) of the tag linked to the switch. All tag values other than zero (a logical TRUE) are interpreted as the status *ON*.

Behavior

Functions which have been assigned to the switch, can be triggered, for example, by the following, configurable events:

- Change of status
- Switch on
- Switch off

If the switch status changes as a result of a modification of configured tags, not through operation, the corresponding function is not executed.

Display

Figure 5-4 illustrates an example of two switches with different orientation.

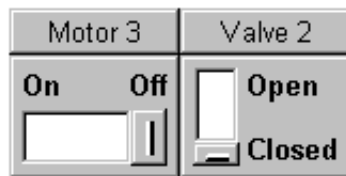
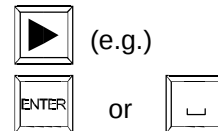


Figure 5-4 Switches with different orientation

Operation

Proceed as follows to operate a switch:

- Select the Status button , e.g. using a cursor key.
- Press either the Enter key or the Spacebar.



5.9 Messages

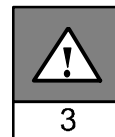
Message categories

Messages on the MP270 indicate events and statuses related to control processes. The MP270 differentiates between the following message categories:

- **Event messages**
indicate a status in the process, for example, Motor ON. Event messages are configured.
- **Alarm messages**
indicate an equipment failure, for example, Motor temperature too high. Alarm messages are configured. Alarm messages must be acknowledged due to their critical nature.
- **System messages**
are triggered by the MP270. They are not configured. System messages indicate, for example, incorrect operations or communication faults.
The MP270 fades out system messages automatically after the configured duration of display has elapsed.
A selection of important system messages is provided in Appendix C.
- **S7 system messages**
provide information on the status of the SIMATIC S7. They are not configured in the ProTool CS configuration software. Refer to the S7 manual for the error number indicated on the MP270 to determine the cause of the error.

Acknowledging alarm messages

Alarm messages must be acknowledged due to their importance. This can be done manually on the MP270 or automatically by the PLC. The message indicator depicted continues to be displayed as long as messages still need to be acknowledged when this feature has been configured.



In order to acknowledge alarm messages manually, press the key depicted on the right. The LED integrated in the key lights up when unacknowledged messages are present.



Buffering messages

All message events (arrived, departed, acknowledged) are stored in an internal volatile buffer. If a message archive has been configured, the message events are also stored in this message archive.

Display messages

The events stored in the message buffer can be displayed according to different criteria. The following predefined objects are available for display purposes:

- Message line (Page 5-19)
- Message window (Page 5-19)
- Message page (Page 5-21)
- Message buffer (Page 5-22)
- Message view
 - Message view with full functionality (Page 5-23)
 - Simple message view with restricted functionality (Page 5-24)

Deleting messages

All message events concerning event and alarm messages are automatically stored in the message buffer. There are two methods of deleting messages from the buffer:

- **Automatic deletion on buffer overflow**

When the message buffer is no longer capable of accepting new message events, the MP270 automatically deletes a number of message events until the configured remaining buffer capacity is reached. In this case, the oldest messages are deleted first.
- **Deletion by operating the MP270**

In order that messages can be deleted manually from the message buffer, the function *Clear_message_buffer* must be available in the configuration, e.g. linked to a button or function key. In this way, the following message categories can be selected for deletion according to the configuration:

 - All messages
 - Alarm messages
 - Event messages
 - System messages
 - S7 diagnostics messages

Print messages

When correspondingly configured, event messages can be printed out directly when the message events *Arrived* and *Departed* occur, and also alarm messages when the event *Acknowledged* occurs. System messages are not logged.

Information on setting printer parameters is provided in Chapter 8.

Notice

When printing non-West European messages, some characters are not printed correctly. The result of printing is also dependent on the printer used.

5.9.1 ALARM_S

Definition

ALARM_S is an active message procedure. If an alarm occurs, the CPU actively issues the respective message to all the network participants which are logged on. This means that the MP270 is relieved of continuous polling of the message area.

Configuring ALARM_S messages

ALARM_S messages are not configured in ProTool CS but in STEP 7. The message numbers are automatically assigned during configuration in STEP 7. The unique assignment of the message text is made according to these numbers.

The display of ALARM_S messages on the MP270 can only be configured when a SIMATIC S7 PLC is used and the ProTool CS configuration software has been integrated in STEP 7.

Detailed information on the configuration of ALARM_S messages is available in the *ProAgent/MP and ProAgent/PC* user guides.

Restarting S7 CPUs

Depending on the hardware configuration of the CPUs, it is possible that under certain circumstances all queued ALARM_S messages will be deleted when S7 CPUs are restarted. Older stocks of S7 300 CPUs cannot inform the operating units involved of the restart. The result of this is that messages are indicated on the operating unit as being queued although the CPU has already deleted them.

Remedy:

Disconnect the connection between MP270 and CPU and then reconnect them again. Use the function *PLC_Connect_Isolate* if configured.

5.9.2 Message line

Purpose

When a message line has been configured it is always displayed, regardless of the screen selected. The message line displays the last alarm or event message received.

Display priorities

Alarm messages always have priority over event messages. If no alarm messages are present or they have all been acknowledged, event messages are displayed.

In order to differentiate between event and alarm messages, alarm messages can be configured to flash in the display.

5.9.3 Message window

Purpose

The message window displays messages which are present or still have to be acknowledged. It is possible to configure how the alarm messages are sorted. It is also possible to select whether the latest or oldest message is displayed first.

Alarm messages

If one of the display modes *Window/Window*], *Window/Line* or *Window/Off* is configured, the message window for alarm messages opens automatically as soon as an alarm message arrives. Figure 5-5 illustrates an example.

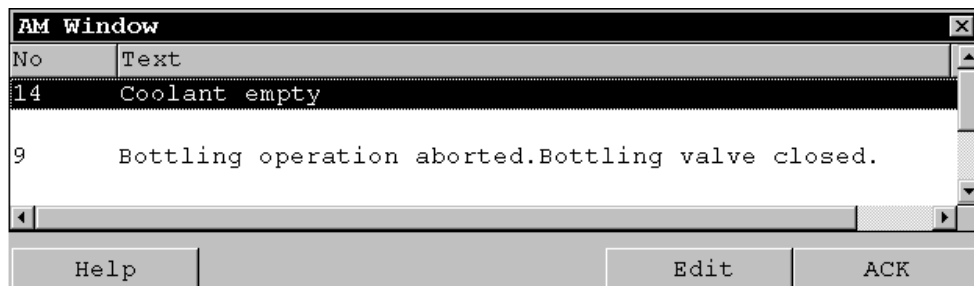


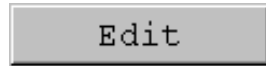
Figure 5-5 Alarm window (example)

Significance of the buttons



Call Help text

Use this button to call in the help text configured for the selected message.



Edit Message

Use this button to trigger the function assigned to the Edit Message event for the selected message.



Acknowledge alarm messages

Use this button to acknowledge unacknowledged alarm messages.

Event messages

In order to be able to open the event message window by means unit operation, the function *Display_event_message_window* must be linked to a function key or button in the configuration.

System messages

The message window for system messages opens automatically as soon as a system message arrives. The window closes automatically after the configured duration of display has elapsed.

Close message window manually

Use the ESC key to close the message window manually.



5.9.4 Message page

Purpose

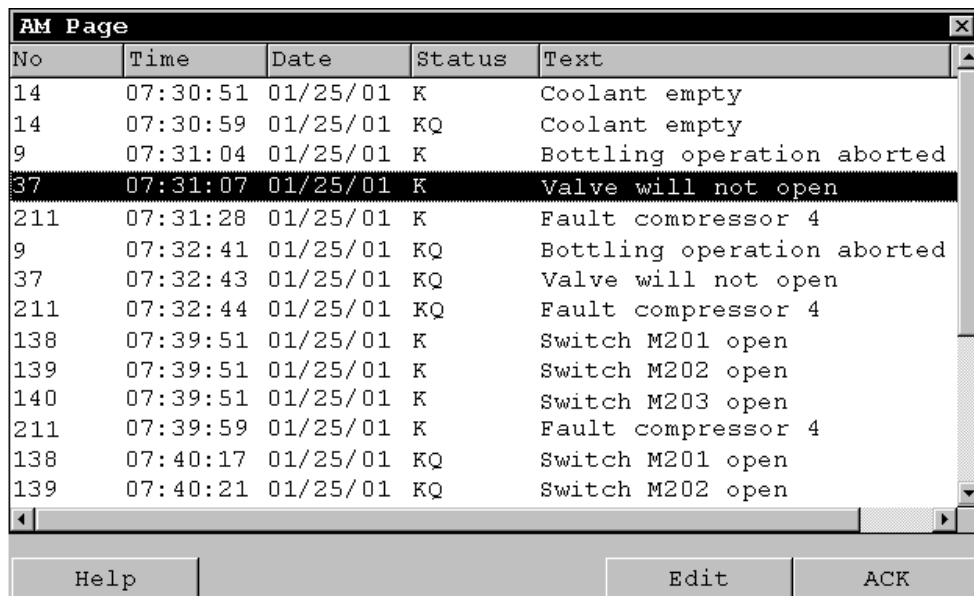
The message page displays all messages allocated a time stamp. It is possible to configure how the alarm messages are sorted. It is also possible to select whether the latest or oldest message is displayed first. Open message pages are constantly updated.

Structure

In order to have access to the message page for event messages and/or alarm messages, the following functions must have been configured:

- for event messages: *Show_event_message_page*
- for alarm messages: *Show_alarm_message_page*

Figure 5-6 illustrates an example of the message page for alarm messages.



No	Time	Date	Status	Text
14	07:30:51	01/25/01	K	Coolant empty
14	07:30:59	01/25/01	KQ	Coolant empty
9	07:31:04	01/25/01	K	Bottling operation aborted
37	07:31:07	01/25/01	K	Valve will not open
211	07:31:28	01/25/01	K	Fault compressor 4
9	07:32:41	01/25/01	KQ	Bottling operation aborted
37	07:32:43	01/25/01	KQ	Valve will not open
211	07:32:44	01/25/01	KQ	Fault compressor 4
138	07:39:51	01/25/01	K	Switch M201 open
139	07:39:51	01/25/01	K	Switch M202 open
140	07:39:51	01/25/01	K	Switch M203 open
211	07:39:59	01/25/01	K	Fault compressor 4
138	07:40:17	01/25/01	KQ	Switch M201 open
139	07:40:21	01/25/01	KQ	Switch M202 open

Figure 5-6 Alarm message page (example)

Information on the significance of the buttons is provided on Page 5-19.

5.9.5 Message buffer

Purpose

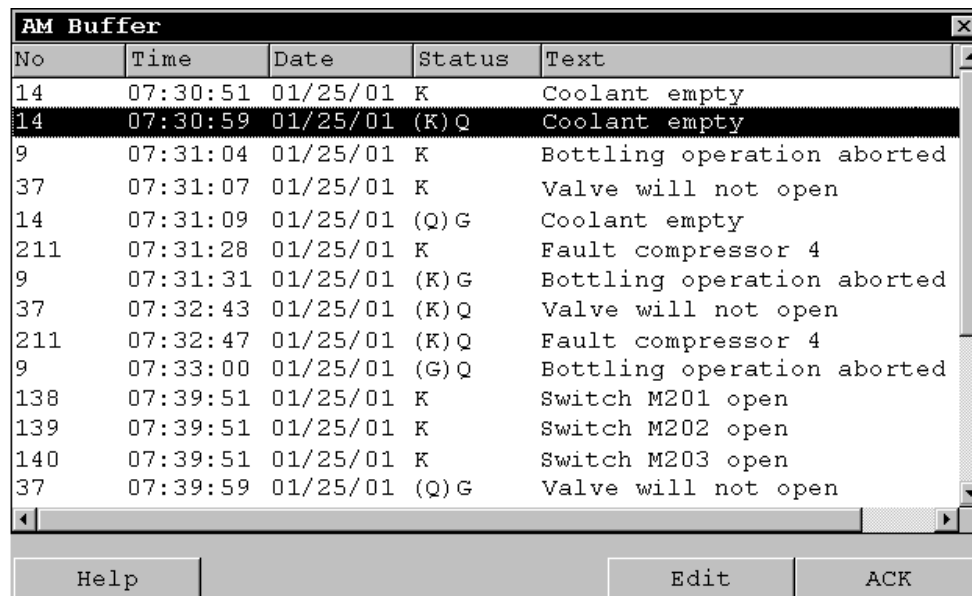
The message buffer displays all message events allocated a time stamp. It is possible to configure how the alarm messages are sorted. It is also possible to select whether the latest or oldest message is displayed first. Open message buffers are constantly updated.

Structure

In order to have access to the message buffer for event messages and/or alarm messages, the following functions must have been configured:

- for event messages: *Show_event_message_buffer*
- for alarm messages: *Show_alarm_message_buffer*

Figure 5-7 illustrates an example alarm message buffer.



No	Time	Date	Status	Text
14	07:30:51	01/25/01	K	Coolant empty
14	07:30:59	01/25/01	(K)Q	Coolant empty
9	07:31:04	01/25/01	K	Bottling operation aborted
37	07:31:07	01/25/01	K	Valve will not open
14	07:31:09	01/25/01	(Q)G	Coolant empty
211	07:31:28	01/25/01	K	Fault compressor 4
9	07:31:31	01/25/01	(K)G	Bottling operation aborted
37	07:32:43	01/25/01	(K)Q	Valve will not open
211	07:32:47	01/25/01	(K)Q	Fault compressor 4
9	07:33:00	01/25/01	(G)Q	Bottling operation aborted
138	07:39:51	01/25/01	K	Switch M201 open
139	07:39:51	01/25/01	K	Switch M202 open
140	07:39:51	01/25/01	K	Switch M203 open
37	07:39:59	01/25/01	(Q)G	Valve will not open

Buttons: Help, Edit, ACK

Figure 5-7 Alarm buffer (example)

Information on the significance of the buttons is provided on Page 5-19.

5.9.6 Message view

Purpose

Certain views are defines for messages which are queued or still to be acknowledged or for message events in the message buffer (volatile or archive) in the message indicator. Various filter criteria are available in ProTool CS for this purpose.

Structure

The message view (Figure 5-8) displays messages that are queued on the MP270 or still have to be acknowledged. The message view can be used to acknowledge the messages.

The message view can also be used to display a history of message events.

	No	Time	Date	Status	Text
\$	140004	07:30:51	01/25/01	K	Connection has been estab
\$	140001	07:30:51	01/25/01	K	Connection has been clear
\$	110001	07:30:51	01/25/01	K	Change to offline mode.
\$	240000	07:30:51	01/25/01	K	Demo version!

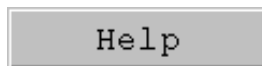
Help

Edit

ACK

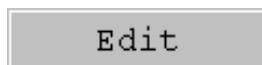
Figure 5-8 Example of a message view

Significance of the buttons



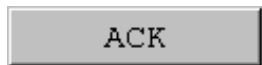
Call Help text

Use this button to call in the help text configured for the selected message.



Edit Message

Use this button to trigger the function assigned to the Edit Message event for the selected message.



Acknowledge alarm messages

Use this button to acknowledge unacknowledged alarm messages.

Message categories

In order to be able to distinguish between the different message categories, they are marked in the first column of the message view:

!	Alarm messages
Empty	Event messages
\$	System messages
S7	S7 messages

5.9.7 Simple message view

Purpose

A simple message view provides a subset of the functionality of a message view (Page 5-23). This provides a simple method with which, for example, to create a message line to display event and system messages in a screen.

Structure

The figure below provides an example of a simple message view with the following columns configured:

- Date
- Time
- Message number
- Message states
- Message text

```
25.01.01 14:27:06 110001 K
Change to operating status 'online'

25.01.01 14:27:07 140001 K
Connection discontinued: Station 2, Rack 0, Slot 0
```

5.10 Bar Graphs

Purpose

Bar graphs present a value in the form of a rectangular area. The MP270 thus provides a clear indication of how far the current value is from the limit values, or if a setpoint value has been reached, at a glance. Bar graphs can be used to display fill levels or quantities, for example.

Display

It is possible to configure minimum and maximum values and the direction bar graph moves by increasing the tag value:

Figure 5-9 depicts the various states of a horizontal bar graph:

1. Value drops below the minimum value configured
2. Value lies within the configured display range
3. Value exceeds the maximum value configured
4. Value lies within the configured limit range

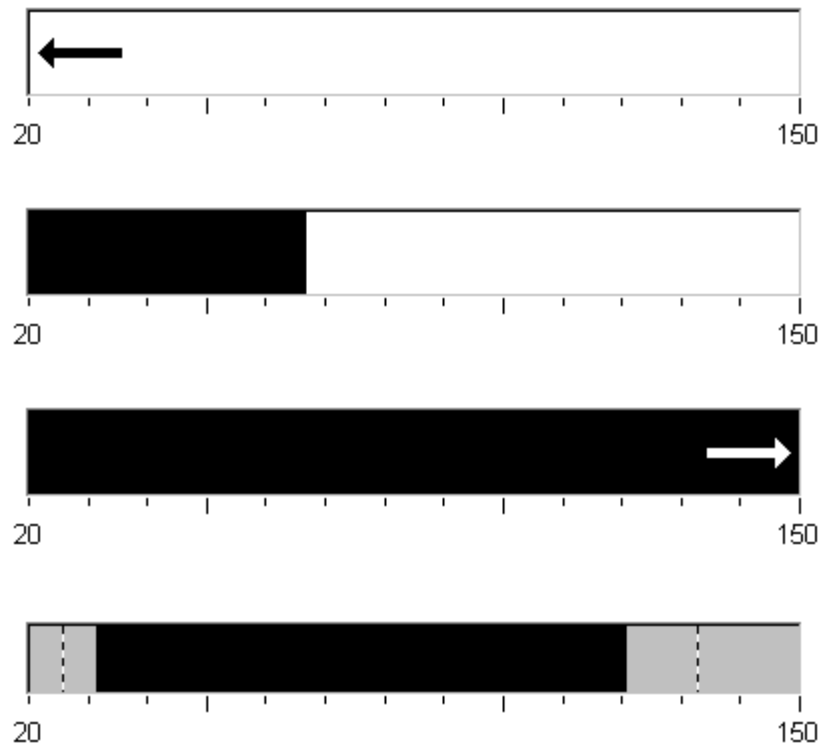


Figure 5-9 Different bar states

5.11 Trend View

Purpose

The trend view is a particularly clear form of displaying process data in a continuous manner. In the case of processes that only change slowly, the trend view can visualize events that have already occurred and provides access to, and estimate of trends in the process sequence. On the other hand, data issued concerning processes which run quickly can be easily evaluated using this form of trend view.

Configurable properties

A number of different trends can be displayed simultaneously in the trend view. The following properties are among those which can be configured for a trend graphic:

- **Trend type:** *Realtime trend* or *History trend*
- **Triggering:** *Cycle triggering* or *Bit triggering*
- **Limit values:**
The MP270 displays the points at which configured limit values are reached or exceeded by changing the color of the trend view.

Structure

Figure 5-10 illustrates an example of a trend view with a realtime trend and buttons configured for navigating within the trend.

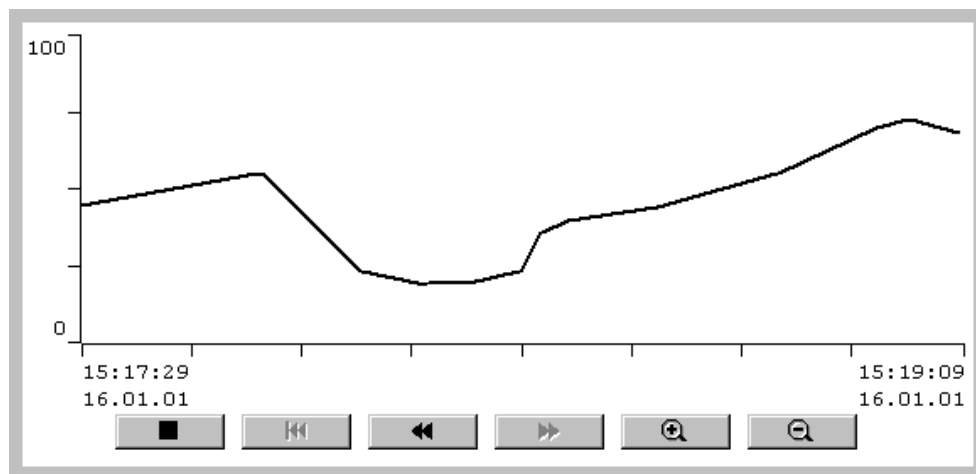


Figure 5-10 Operable trend view (example)

Navigation using buttons

It is possible to navigate through the trend using the configured buttons. The individual buttons have the following significance:

Button	Significance
 Start/Stop update	Interrupts the current updating process for the trend until the button is pressed again.
 Back to start	Scrolls back to the start of the trend recording.
  Scroll	Shifts the trend section half a window width to the left/right.
 Zoom in/out section	Expands/compresses the trend view horizontally.

Navigation using the keyboard

If no buttons are configured for the trend view, use the MP270 keyboard to navigate through the trend. A condition for this is that the configuration supports navigation using the keyboard.

Keys	Significance
  Back to start	Scrolls back to the start of the trend recording.
  Scroll back	Shifts the trend curve section half a window width to the left .
  Scroll forward	Shifts the trend section half a window width to the right.
  Zoom section	Expands the trend horizontally.
  Reduce section	Compresses the size of the trend horizontally.

Notice

It is not possible to interrupt the updating of the trend using the keyboard.

Display archive data as a trend

If data stored in an archive is displayed in the trend view, it is represented as history trends, i.e. the trend data is read out of the archive and displayed according to events. Application for trends of this kind are power-on processes or temperature patterns on heating up an oven.

The trend view is not updated when the archive data changes.

5.12 Slider Control

Purpose

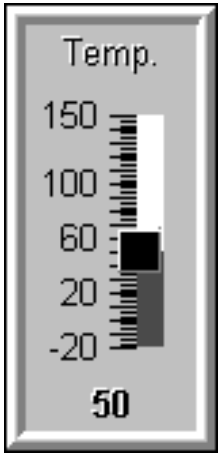
Use a slider control to enter and display numerical values in analog form. To enter values, move the slider to the required position. When used as a display element, the value is represented by the position of the slider.

Function

The slider control is linked to a tag. On moving the user-controlled slider, the corresponding value is written to the tag. Conversely, when the tag value is changed, the position of the moving slider is changed correspondingly, unless it being moved by the operator at that moment.

Display

The figure on the right illustrates an example of a slider for setting and displaying temperature values. The current value (in this case: 50) appears as plain text and as a bar graph.



Operation

In order to operate the slider, select it using a cursor key, for example. Use the following keys to actually move the slider:

Significance	Keys
Increase value continually	SHIFT ▲ / SHIFT ▶
Decrease value continually	SHIFT ▼ / SHIFT ◀



Caution

In the following cases, it is possible that the value indicated by the slider control differs from the real value of the related tag:

The value range configured for the password protected slider control (minimum and maximum values) does not correspond with the limit values configured for the slider control tag.

5.13 Analog Display

Purpose

An analog display indicates numerical values as a pointer instrument.

Function

The analog display is linked to a tag. When the tag value changes, the pointer position changes correspondingly. The display can be configured to include a non-return pointer. At runtime, the non-return pointer indicates the maximum value reached so far by the value being displayed. It is reset when the current window is opened.

The analog display is purely a display element. It cannot be used to enter values on the MP270.

Display

Figure 5-11 illustrates an example of an analog display indicating temperatures.

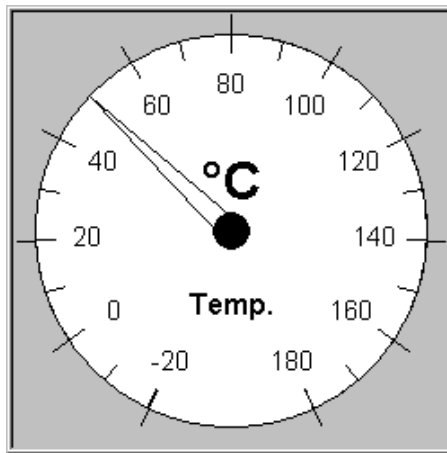


Figure 5-11 Example of a typical analog display

Note on instrument scale

Any color-code differentiations configured for various scale ranges are not displayed on the MP270.

5.14 Date/Time

Purpose

The screen object *Date/Time* displays the current values for the time and/or date. The time can be modified online if the corresponding feature is configured.

The calendar date and time values are synchronized with the system values in the operating system. The MP270 accesses these values, for example, to assign time stamps to message events.

Notice

Without the optionally available backup battery (Chapter 11), the MP270 only stores the system time for a few hours¹⁾. If the unit is disconnected from the power supply for a longer period, the date and time must be updated following recommissioning.

- 1) The unit must have been in operation for approx. 6–8 hours, without any interruptions, beforehand.

Format

The format of the date and time depends on the language currently set. It corresponds to the standard international conventions:

Table 5-1 Examples of language-dependent formats for Date/Time

Language	Example		
	Date		Time
	long	short	
German	Samstag, 25. November 2000	25.11.00	12:59:32
English (USA)	Saturday, November 25, 2000	11/25/00	12:59:32 PM
French	samedi 25 novembre 2000	25/11/00	12:59:32
Italian	sabato 25 novembre 2000	25/11/00	12.59.32
Spanish (traditional)	sábado 25 de noviembre de 2000	25/11/00	12:59:32

The format for date and time can be modified in the Control Panel. To do so, select the icon depicted on the right.



Information on opening the Control Panel is provided on Page 8-5.

Notice

- When entering the date and time, ensure that the two values are separated by a space.
 - If the operating system does not support the language set on the operating unit, the language predefined for the operating system is used.
-

Synchronizing date/time with the PLC

The date and time in the MP270 and PLC can be synchronized if this feature is defined in the configuration and PLC program. To do this, the PLC jobs **14** (*Set Time*) and **15** (*Set Date*) are provided. Use PLC jobs **40** and **41** to transfer the date and time from the MP270 to the PLC.

Further information on this is available in the *Communication for Windows-based Systems* user's manual.

5.15 Digital/Analog Clock

Purpose

The digital/analog clock provides the option of displaying the system time in numbers (digital) or as a clock with hands (analog). The digital display also includes the current date. The display format is language dependent. It is based on the format defined by the MP270 operating system.

Display

The digital/analog clock is purely a display element. This means that the date and time cannot be set using the MP270. In order to set the date and time, use the *Date/Time* screen object (refer to Page 5-30).

Figure 5-12 illustrates an example of a configured analog clock.

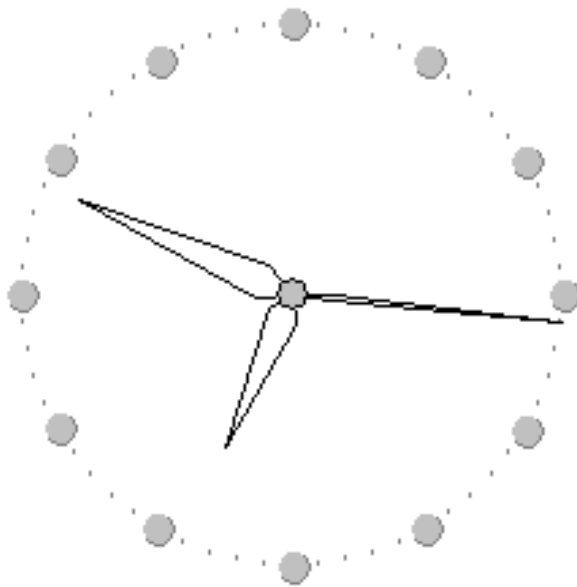


Figure 5-12 Example of a typical analog clock

5.16 Password List

Purpose

While the system is being configured using ProTool CS, operating elements can be protected against unauthorized use by means of passwords. Important parameters and settings can then only be modified by authorized personnel.

Password hierarchy

Hierarchically defined password levels from 0 to 9 exist for password protection purposes. When a password is assigned to an individual user or to a whole user group, the permission to execute functions at a specific level is assigned simultaneously. If, for example, a user is assigned to password level 4, he or she is authorized to execute functions of password levels 0 to 4.

Password level

Password level 0:

This minimum password level is assigned to functions that have no, or only a minimal effect on the course of the process. In order to trigger functions assigned to Password Level 0, no password needs to be entered.

Password levels 1 to 8:

Functions are assigned to levels 1 to 8 according to their increasing importance. Before triggering a function with a password level greater than 0, the MP270 requests the corresponding password to be entered.

Password level 9

Only the supervisor (system support specialist or service technician) is granted authorization to execute functions assigned to password level 9. The superuser has access to all the MP270 functions.

Logging in on the MP270

After calling a function protected by a password, the MP270 automatically requests the entry of a password. Once entered, the password need not be entered again in order to call in other functions of this password level or lower.

When correspondingly configured, it is also possible to log in on the MP270 via an input field for confidential password entry (Page 5-9). The character string entered is represented by placeholders (*).

Logging off from the MP270 (logout)

In order to rule out operation by unauthorized personnel, a password level greater than 0 should not remain active on the MP270 over too long a period of time. The following options are available to explicitly reset passwords levels:

- **Configured logout time expires**
If the MP270 is not operated within the period of time configured (logout time), the current password level is automatically reset to 0.
- **Manual logout**
If the function *Logoff_user* is linked to an operating element in the configuration, it can be used to reset the current password level to 0.

Tip

It is also possible to reset the current password level to 0 by entering an incorrect password.

5.16.1 Password management

Purpose

Individual users can be entered in a password list on the MP270 and assigned a password level according to specific responsibilities. When processing the list, conclude each field entry by pressing the Enter key . The password list contains all the passwords configured on the MP270. The list is coded and stored on the MP270, protected against a power failure.

Figure 5-13 illustrates an example of a password list with six entries.

Password	Level
12F19	9
1B33AC	2
514D	4
7BFC91	1
8473128	4
CDA3FB2	3

Figure 5-13 Example of a password list

View password list

Only those passwords are displayed which have a password level equal to or lower than that with which the user is currently logged in. The MP270 displays the password list entries in alphabetic order.

Creating a password

The user can only edit the password list up to the level with which he is currently logged in. All passwords used in the system must be unique. It is not possible to assign the same password to different password levels. However, there are no restrictions in assigning different passwords to the same password levels.

Deleting a password

To delete a password from the password list, overwrite the password level assigned to it with 0.

5.16.2 Export/Import password list**Purpose**

If a system includes several operating units which are accessed by the same users, the same passwords must be installed on each operating unit. In order that the password list need not be re-entered on each operating unit, it can be created on one unit and then exported and imported on other units.

Condition

In order to be able to export/import password lists on the MP270, the function *Import_Export_Passwords* must be linked to a button or function key, for example. The file name of the password list to be exported/imported must be specified as the function parameter during configuration.

Notice

- The password list is coded. It cannot be edited with external tools.
 - Do not export a password list directly after it has been modified. Exit the screen object *Password List* after changing it and wait with the export function until modifications have been written in the internal Flash memory.
-

5.17 Status/Force

Purpose

The MP270 can be used to access the connected PLC and periphery to read and write values. PLC program operands can be monitored and modified easily without having to connect an additional programming unit or PC to the PLC.

This option is particularly useful during the testing and commissioning phase of the configuration.

Condition

The following conditions must be fulfilled in order to be able to access values in the PLC directly from the MP270:

- The connected PLC is a SIMATIC S5 or SIMATIC S7
- The configuration must contain the screen object *Status/Force* (Figure 5-14)

Structure

Figure 5-14 illustrates the basic structure of the screen object *Status/Force*. Each line represents an operand.

Connection	Type	DB Number	Offset	Bit	Data Type	Format	Status Value	Force Value
PLC_1	E		0		CHAR	BIN	0000 0...	
PLC_1	DB	10	10		WORD	DEC	42994	
PLC_1	M		25	0	BOOL	HEX	0	
PLC_1	A		34		WOR	DEC		

Figure 5-14 Status/Force: Example for SIMATIC S7

The table indicates the significance of the individual columns and buttons.

Column/Button	Significance
Connection	Select the PLC whose address area is to be displayed and/or modified.
Type, DB number, Offset, Bit	Specify the address in this column.
Data type, Format	This column is used to change the format of the output.

Column/Button	Significance
Status value	The MP270 uses this column to display the values of the operands read from the PLC.
Force value	Use this column to enter the values to be written to the operands.
	This button is used to update the display in the column <i>Status value</i> . The button is locked after being pressed. None of the input fields can then be used until the button is pressed again, thus stopping the update.
	This button is used to apply the new value specified in the column <i>Force value</i> . The value is then written to the PLC.

Operation

The table lists the key combinations for operating the *Status/Force* screen object:

Keys	Significance
 	Operate button Write.
 	Operate button Read.
  /  	Select first/last field in current line.
  /  	Select first/last field in current column.
  	Increase width of current column.
  	Reduce width of current column.
 	Delete current line. Alternatively: Do not select a PLC from the <i>Connection</i> column.
 	Optimize column width.
	Open selection field.

Recipes

6.1 Overview

Purpose

The purpose of recipes is to transfer of quantities of **related data** together and **synchronously** from the MP270 to the PLC and vice versa.

Principles of operation

Using the example of the filing cabinet (Figure 6-1), the two terms *Recipe* and *Data Record* should be defined because they are important for subsequent understanding of the process.

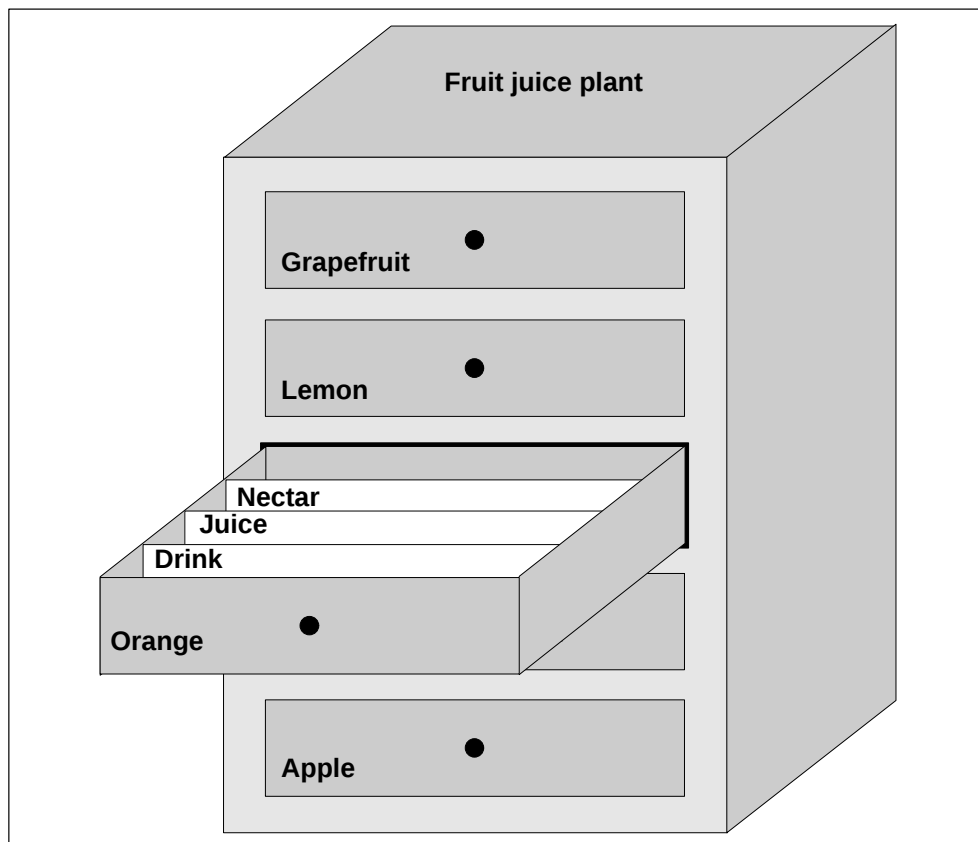


Figure 6-1 Recipe and Data Record, using a filing cabinet as an analogy

- **Recipe**

Recipes correspond to the individual drawers of the filing cabinet illustrated (e.g. grapefruit or lemon). The reference value fields (tags) belonging to the particular recipe are defined in each drawer. The recipes define the data structure in ProTool CS. This structure cannot be subsequently modified on the MP270.

- **Data record**

Data records correspond to the filing cards in the individual drawers of the cabinet (e.g. Drink, Juice and Nectar). A data record contains the values for a recipe. Data records are created, modified and deleted on the MP270. The data records are also stored on the MP270. This saves storage space on the PLC.

The Import/Export function provides the additional option of using external tools to edit exported data records and then reimporting them on the MP270.

Example of a recipe

An example for use of a recipe is its application on a filling station of a fruit juice system. The same filling station is used to produce orange drink, orange juice and orange nectar. The mixing ratios are different for each product. The ingredients are always the same.

Assume that a recipe called Mixture is created, which has the following data structure:

Tag	Name
Var_2	l orange
Var_3	l water
Var_4	kg sugar
Var_5	g flavor

The designations l Orange, g Aroma etc. of the tags are the so called *entry names*. The entry names are also displayed on the MP270. In this way, for example, the tag Var_2 can be identified as the tag designating the mixture component Orange.

The data records contain the values for the different drink types. The data records may appear as follows, for instance:

Orange drink		Orange juice		Orange nectar	
l orange	90	l orange	95	l orange	70
l water	10	l water	5	l water	30
kg sugar	1.5	kg sugar	0.5	kg sugar	1.5
g flavor	200	g flavor	100	g flavor	400

6.2 Recipe Configuration

Basic procedure

The basic steps to configuring a recipe are listed below:

1. **Define the structure of the recipe:**

Assign tags to the recipe structure. These tags are provided with entries from the data records.

Define a name for the recipe. This name is used to select the recipe in the configuration and on the MP270.

2. **Set recipe tag properties**

The following options can be configured in ProTool CS:

– *Synchronize tags*

This option defines that the data from a data record has been read from the PLC or data medium and written in the tag or read from the tags configured for the recipe. This establishes a connection between the tags configured in the recipe and the tags in the screens. When a data record is loaded, the values are written to the tags used in the screens.

– *Tags offline*

If this option is also activated, the values entered are only stored in the tags, and not transferred to the PLC. Otherwise, values entered are transferred directly to the PLC.

3. **Define storage location for data records on the MP270**

The data storage location for data records can be configured. The following settings are possible:

Storage location	Setting in ProTool CS
Internal Flash memory	\Flash\...
Memory card • PC card • CF card	• \Storage Card\... • \Storage Card2\...
Network	Any path in the network, e.g. \PC_Name\... (target computer)

Caution

Cyclical writing access is not permitted for the internal Flash memory because it reduces the service life of the Flash memory and thus the service life of the unit. Use an external memory card instead.

4. Set download synchronization

It is possible to configure whether the data records are downloaded to the PLC with or without synchronization.

5. Creating a recipe screen

Configure one or more screens in order to create, store and download data records on the MP270.

Notice

If tags are configured for recipe and data record numbers, the values for the data record are neither loaded nor displayed in the recipe view when the recipe display is opened. As soon as a data record is selected in the recipe view the current values are transferred from the data record memory into the recipe tags.

Further information

Detailed information on how to create a recipe is provided in the online help to the ProTool CS configuration software and in the *ProTool Configuring Windows-based Systems* user's guide.

System limits

The table provides an overview of the system limits for recipes.

Elements	Number
Number of recipes	100
Data records per recipe	Limited by storage medium
Entries per recipe	500
Total number of entries	5,000

Memory requirements for data records

The memory requirements per recipe (in kByte) is calculated from the three summands D1 + D2 + D3.

$$D1 = [(no. of entries \times 20) + 4] : 1024$$

$$D2 = [(no. of data records \times 12) + 4] : 1024$$

$$D3 = [no. of data records \times (data record length + N) + 4] : 1024$$

D1, D2 and D3 are rounded up to the next whole number.

A data record length is the sum of all the tag lengths configured for the data record in bytes. For example, a tag of the type *FLOAT* has a length of 4 byte.

The following applies for N:

Data record name < 13 characters: N = 12

Data record name > 12 characters: N = 40

Notice

The internal Flash memory has a maximum storage capacity of 64 kByte.

Tip:

In the interest of optimizing the service life of the unit and achieving a better performance, use either the network or an external memory card to store data records.

6.3 Editing Data Records

In this chapter

This chapter provides information on how to edit data records on the MP270. The following information is also included:

- Layout of the recipe view (Page 6-7)
- Displaying data records (Page 6-10)
- Creating new data records (Page 6-10)
- Copying data records (Page 6-11)
- Modifying data records (Page 6-12)
- Renaming data records (Page 6-13)
- Deleting data records (Page 6-13)
- Reading data records from the PLC (Page 6-14)
- Downloading data records to the PLC (Page 6-14)
- Editing data records in recipe screens (Page 6-15)
- Functions and PLC jobs (Page 6-17)
- Exporting/Importing data records (Page 6-18)
- Exporting, editing and importing data records (Page 6-20)
- Response following modification of recipe structure (Page 6-21)

Methods

Data records can be edited on the MP270 either in tables or screens:

- **Tabular editing**

The recipe view is available for the tabular editing of data records (Page 6-7). The recipe view enables recipes and data records to be handled in an uncomplicated, quick way.

It is typically used to edit data records of smaller recipes. Values entered on the MP270 are not directly transferred to the PLC when entered.

- **Editing in recipe screens**

The project engineer can use recipe screens (Page 6-15) to customize the user interface for editing data records and, for example, simulating the system visually, providing graphics and individual masks for entering data records.

This method is typically used for processing medium and large data records offline in the recipe view. The values entered on the MP270 are only saved in the tags, but not transferred directly to the PLC on input.

6.3.1 Recipe view

Purpose

The recipe view is typically used to edit recipe data records in tabular form. This provides an uncomplicated method of displaying, creating, copying, modifying, deleting and downloading data records on the MP270.

All descriptions on editing data records provided in this Chapter 6.3.1 relates purely to the use of the recipe view. Information on editing data records in recipe screens is provided on Page 6-15.

Display

Figure 6-2 illustrates an example of the layout of the recipe view. Some of the operating and display elements can be configured so that they are faded out on the MP270.

The screenshot shows the Recipe view interface with the following elements and callouts:

- 1**: Recipe Name dropdown menu (currently showing 'Orange').
- 2**: Data Record Name dropdown menu (currently showing 'Juice').
- 3**: Table with columns 'Entry Name' and 'Value'. The table contains four rows: 'l orange' (95), 'l water' (5), 'kg sugar' (0.5000000), and 'g aroma' (100).
- 4**: Action buttons (new, save, delete, print, and download).
- 5**: New button (lightbulb icon).
- 6**: Save button (floppy disk icon).
- 9**: Delete button (X icon).
- 7**: Print button (printer icon).
- 8**: Download button (download icon).

Figure 6-2 Layout of the recipe view (example)

Significance of the operating and display elements

No.	Function
	Select recipe If the corresponding function is enabled in ProTool CS, it is possible to select a configured recipe in this selection field. The number of the selected recipe is displayed to the right of the selection field. This number is only relevant during the configuration. It cannot be modified on the MP270.
	Select data record As soon as a recipe has been selected, the data records available are displayed in this field. In addition, the data record number is displayed to the right. The number field only becomes active when the input of a data record number is permitted, e.g. after changing the data record number or creating a new data record.
	View /Edit entries This table contains all the entries which are configured in the selected data record. Sorting complies to the configured sequence. The right-hand column displays the associated values. The entry names cannot be edited on the MP270.
	 Create new data record This button initiates the creation of a new data record. The setpoint values are predefined with default values configured as start values for the respective tags. Key combinations:  
	 Save data record This button is used to save the current values of the data record displayed on the MP270 data medium. The memory location is defined in ProTool CS. The data record is stored under the currently defined name and number. Key combinations:  
	 Delete data record This button is used to delete the data record currently displayed for the defined recipe from the MP270 data medium. Key combinations:  
	 Read data record from the PLC This button is used to read the data record related to the currently set recipe from the PLC and display the values on the MP270. Key combinations:  

No.	Function
8	 Write data record in the PLC This button is used to write the current data record values in the PLC. Key combinations:  
9	Status bar The MP270 displays the status of the current operation in this line, e.g. Downloading.



Caution

- If the two options *Synchronize Tags* and *Tags Offline* are activated in the configuration, the values from the table are applied when values in the tables and screens are changed simultaneously.
- If the data record currently being edited in the recipe view is changed in the background (e.g. by means of a PLC job), the recipe view is not automatically updated.

Tips on operating the recipe views

- **Quick selection of recipes and data records**
 When the selection field is opened up, enter the first letter of the recipe or data record to be selected to access the relevant area of long lists, thus speeding up the selection procedure.
- **Edit entries**
 If the value marked in the recipe view is to be modified, it is initially deleted by pressing one of the alphanumeric keys. This occurs with regard to all list elements in Windows. In order to prevent this, proceed as follows:
 - After selecting the value to be changed, press the Enter key.
 - Move the text cursor to the relevant position by pressing the cursor key or *SHIFT* and cursor key.
 - Insert the modifications.
 - Confirm the changes, e.g. by pressing the Enter key.

Displaying data records

Proceed as follows to display data records on the MP270 data medium:

Step		Procedure
1	Select recipe	Step 1 is only possible when recipe selection has been configured. • Select the selection field for the configured recipes (Position 1 in the figure on Page 6-7). • Open the selection field and mark the required recipe in the opened selection list. • Confirm the selection.
2	Select data record	• Select the selection field for the existing data records (Position 2 in the figure on Page 6-7). • Open the selection field and mark the required data record in the opened selection list. • Confirm the selection. The selected data record is loaded. The configured entries are displayed in table form with name and setpoint value.

Creating new data records

Proceed as follows to create new data records on the MP270:

Step		Procedure
1	Select recipe	• Select the required recipe, as described in Step 1 on Page 6-10.
2	Create data record	• Press the key depicted on the left. The name and number of the data record displayed are deleted. The entries in the table are assigned the configured start values.
3	Enter data record name	• Enter a new data record name in the selection field for data records (Position 2 in the figure on Page 6-7). • After entering the data record name, the next free data record number is automatically entered on the right. This number can be changed, if necessary.
4	Change values	• Enter a setpoint value for each entry configured in the table (Position 3 in the figure on Page 6-7).
5	Save data record	• Press the key depicted on the left. The new data record is written on the data medium. The MP270 responds with a system message if the name or number entered already exist. The writing process is not executed in this case.

Storage location for new data records

The data storage location for the new data record can be configured. The following settings are possible:

- Internal Flash memory
- Memory card
 - PC card
 - CF card
- Any path in the network, if configured (refer to Page 8-9)

Copying data records

In order to copy data records, save them under new names. Proceed as follows:

Step		Procedure
1	Select recipe and data record	Select the required recipe and the data record to be copied as described in Steps 1 and 2 on Page 6-10.
2	Enter data record name	- Enter a new data record name in the selection field for data records (Position 2 in the figure on Page 6-7). - After entering the data record name, the next free data record number is automatically entered on the right. This number can be changed, if necessary.
3	Save data record 	Press the key depicted on the left. The new data record is written on the data medium. The MP270 responds with a system message if the name or number entered already exist.

Changing data records

Proceed as follows to change existing data records:

Step		Procedure
1	Select recipe and data record	Select the required recipe and the data record to be changed as described in Steps 1 and 2 on Page 6-10.
2	Change values	Change the setpoint value in the table (Position 3 in the figure on Page 6-7). The entry names cannot be edited on the MP270.
3	Save data record 	Press the key depicted on the left. The modified data record overwrites the original data record on the data medium.

Notice

If large-scale modifications have been carried out in recipes in ProTool CS and, after downloading the modified project, the data records on the MP270 data medium deviate a great deal from the original recipe structure, it is recommended to:

- reorganize the data medium:
Export the data records, delete the files with the prefix PTRCP_¹⁾ from the data medium and import the data records again
or
- delete the files with the prefix PTRCP_¹⁾ from the data medium:
In this case, use Windows Explorer.
(Note: After the files have been deleted, the relevant data must be re-entered)

In this way, all the tags no longer used are deleted.

1) If necessary, only delete the files of the modified recipes

Renaming data records

Proceed as follows to rename existing data records:

Step		Procedure
1	Select recipe and data record	Select the required recipe and the data record to be copied as described in Steps 1 and 2 on Page 6-10.
2	Enter data record name	- Enter a new data record name in the selection field for data records (Position 2 in the figure on Page 6-7). - After entering the data record name, the next free data record number is automatically entered on the right. Reset this number to its original value.
3	Save data record 	Press the key depicted on the left. The data record is written on the data medium under the new name. The MP270 responds with a system message if the name or number entered already exist.

Deleting data records

Proceed as follows to delete data records on the MP270:

Step		Procedure
1	Select recipe and data record	Select the required recipe and the data record to be changed as described in Steps 1 and 2 on Page 6-10.
2	Delete data record 	Press the key depicted on the left. The data record is deleted from the data medium after confirming a confirmation request.

Reading data records from the PLC

Proceed as follows to update data records in the MP270 working memory with values from the PLC:

Step		Procedure
1	Select recipe	Select the required recipe, as described in Step 1 on Page 6-10.
2	Read values 	- Press the key depicted on the left. - The current values are read from the PLC and displayed.
3	Edit data records	The data can then be edited, e.g. values modified, saved, downloaded to PLC, etc. The MP270 responds with a system message if downloading from the PLC is not possible because, in cases where synchronization with the PLC is configured, for example, the data mailbox is currently locked.

Downloading data records to the PLC

In order that a modified or new data record can take effect in the PLC, it must be downloaded to the PLC.

Proceed as follows to download data records to the PLC:

Step		Procedure
1	Select recipe and data record	Select the required recipe and the data record to be downloaded as described in Steps 1 and 2 on Page 6-10.
2	Write values 	Press the key depicted on the left. The values are written in the PLC. The MP270 responds with a system message if downloading from the PLC is not possible because, in cases where synchronization with the PLC is configured, for example, the data mailbox is currently locked.

6.3.2 Recipe screens

Purpose

Recipe screens are typically representations of the system. The screens provide display and operating elements with which to create, save, modify, delete and download data records. Large recipes can be split into several topic-specific screens and clearly displayed, e.g. with graphic elements.

Components for editing data records

In order to be able to edit data records in recipe screens on the MP270 the corresponding components, e.g. input/output fields and functions, must be configured:

- **Recipe view:**
Recipe screens can contain a recipe view (Page 6-7) not only to enable the easy selection of recipes and data records but also for editing data records. The configured functional scope of the recipe view can vary, according to the intended purpose.

Information on editing data records in recipe screens is provided on Page 6-7. The instructions stipulated there generally also apply for editing data records in recipe screens. However, in this case, input is performed in the screens.

- **Functions:**
Depending on whether a recipe view is configured in the project or not, and on the properties assigned to it, there are various functions available to transfer data records between MP270 and PLC, e.g.:

- *Load_Data_Record*
- *Save_Data_Record*
- *Data_Record_PLC_to_Tags*
- *Data_Record_Tag_to_PLC*

Further functions for data records:

- *Delete_Data_Record_Memory*
- *Change_Data_Record_Number_To_Name*

More functions and PLC jobs, which are linked to the downloading of data records, are described on Page 6-17.

Editing data records offline

The way in which data records are edited on the MP270 is defined during configuration. It is typically used for the offline editing of data records in recipe screens. Values entered on the MP270 are not directly transferred to the PLC when entered.

Proceed as follows to edit data screens in recipe screens offline:

Step	Procedure
1	Select a data record.
2	Trigger reading of the selected data record from the storage medium: • With recipe view It is automatically loaded on selecting the data record. • Without recipe view Activate the operating element linked with the <i>Load_Data_Record</i> function. The function parameters must have been set accordingly beforehand.
3	The data of the data record is written to the tags.
4	Edit the tags using the configured input/output fields.
5	Save the modified tags. • With recipe view Click the Save button. If necessary, you must first specify a new name. • Without recipe view Activate the operating element linked with the <i>Save_Data_Record</i>. The function parameters must have been set accordingly beforehand.

Editing data records online

In order to edit data records online, the option must either be defined during configuration or the *Recipe_Tags_Online_Offline* function defined in the configuration. In the case of online editing, the values entered are transferred directly to the PLC. This method is normally used when commissioning the machine/system in order to test, run-up and position.

Proceed as follows to edit data records on the MP270 online:

Step	Procedure
1	Select a data record.
2	Trigger reading of the selected data record from the storage medium: • With recipe view It is automatically loaded on selecting the data record. • Without recipe view Activate the operating element linked with the <i>Load_Data_Record</i> function. The function parameters must have been set accordingly beforehand.
3	The data of the data record is written to the tags and thus also to the PLC.
4	Edit the tags using the configured input/output fields. This will simultaneously change the values in the PLC as well.

Step	Procedure
5	Save the modified tags. • With recipe view Click the Save button. If necessary, you must first specify a new name. • Without recipe view Activate the operating element linked with the <i>Save_Date_Record</i>. The function parameters must have been set accordingly beforehand.



Warning

When editing data records online, the entered values are transferred to the PLC without synchronization. Therefore, when changing individual values, ensure that no impermissible operating statuses occur in the machine/system.

6.3.3 Functions and PLC jobs

Functions

The following functions can be used to import and export recipe data records for editing with external tools:

- *Export_Data_Records*
- *Import_Data_Records*

They can be used to either import and export either individual data records or all data records in a recipe, according to the configured parameters.

The following functions can be used to transfer data records between the PLC and MP270 data medium.

- *Data_Record_DAT_to_PLC*
- *Data_Record_PLC_to_DAT*

The data medium is either the internal Flash memory, the memory card or, if configured, any network path (refer to Page 8-9). Both the recipe and data record must be specified as parameters in which the values should be written.

PLC jobs

The following two PLC jobs can be used to transfer data records between the PLC and MP270 automatically:

- No. 69: "SPS → DAT" (read data record from PLC)
- No. 70: "DAT → SPS" (write data record in PLC)

Information on PLC jobs is provided in the *Communication for Windows-based Systems* User's Guide.

6.3.4 Import/Export data records

Purpose

When the appropriate features have been configured, data records on the MP270 can be exported as CSV files to the data medium. This feature can be used to edit data records with external tools, e.g. with a spreadsheet program or text editor and import them on the MP270 again.

Condition

In order to export and import data records during runtime, the configuration must contain the following functions:

- *Export_Data_Records*
- *Import_Data_Records*

These functions must be linked in the ProTool CS configuration software, e.g. to a function key or button.

File format CSV

With file format CSV, the table columns (entry name and value) are separated by a separator (e.g. semicolon). Each table row (entry) is terminated by a line feed.

The example in Figure 6-2 (Page 6-7) appears as follows in CSV format for the individually exported data record *Juice*:

```
Orange;Juice
3;2
Var_2;95
Var_3;5
Var_4;0.5
Var_5;100
```

Additional information is stored in the first two lines:

- Line 1:
Name of the recipe and data record
- Line 2:
Number of the recipe and data record

The MP270 interprets the information on importing the file.

Notice

When the CSV files are edited with an external text editor, the modifications are saved in text format (without control codes).

Export/Import all data records in a recipe

When appropriately configured, all the data records in a recipe can be imported/exported together. The CSV file for the example on Page 6-2 then appears as follows:

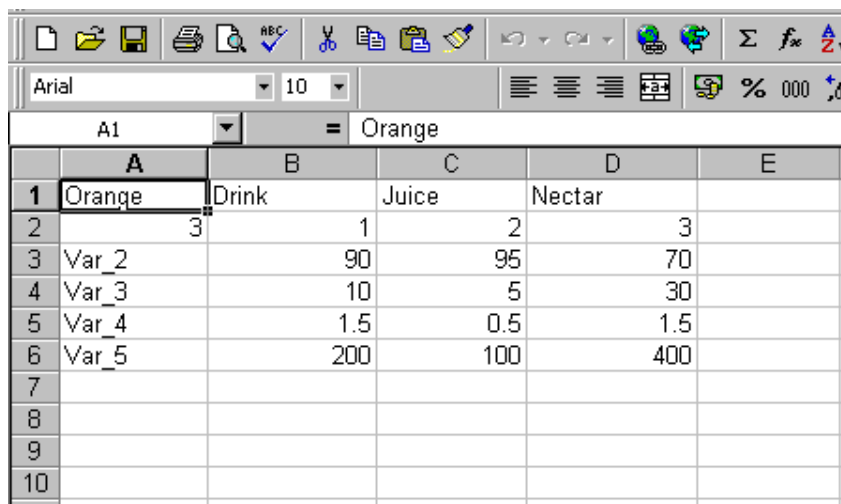
```
Orange;Drink;Juice;Nectar
3;1;2;3
Var_2;90;95;70
Var_3;10;5;30
Var_4;1.5;0.5;1.5
Var_5;200;100;400
```

Additional information is stored in the first two lines:

- Line 1:
Name of the recipe and all the configured data records
- Line 2:
Number of the recipe and all the configured data records

The MP270 interprets the information on importing the file.

In this way, the CSV file can be used, for example, to create new data records by means of a spreadsheet program (Figure 6-3). After importing the modified file, the new data records can be used on the MP270.



	A	B	C	D	E
1	Orange	Drink	Juice	Nectar	
2	3	1	2	3	
3	Var_2	90	95	70	
4	Var_3	10	5	30	
5	Var_4	1.5	0.5	1.5	
6	Var_5	200	100	400	
7					
8					
9					
10					

Figure 6-3 Create data records externally (example: Microsoft Excel)

Exporting, editing and importing data records

Proceed as follows in order to export data records on the MP270 in a CSV file, edit it using with an external tool (e.g. spreadsheet program or text editor) and import it back on the MP270:

Step	Procedure
1 Export data record	- Press the operating element linked with the <i>Export_Data_Records</i> function (e.g. function key or button). Depending on the parameterization, either all the data records are exported to the data medium or only the data record defined in the configuration. - The data records are exported in the file which was configured in the parameter <i>File Name</i> in the function <i>Export_Data_Records</i>. - Copy the CSV file onto a transferable data medium (e.g. disk) or in a directory which can be accessed by the external tool.
2 Edit CSV file	- Carry out the modifications in the CSV file with an external tool, e.g. Microsoft Excel or a text editor. - Save the modifications on the data medium. - Copy the CSV file back to the original directory.
3 Import data records	- Activate the operating element linked with the <i>Import_Data_Records</i> function. - The data records are copied in the data storage area configured for the recipe.

Notice

If data records should be exported and the CSV files edited on a different Windows system using a spreadsheet program (e.g. Microsoft Excel), ensure that the decimal separator and list separator are identical on the two different systems.

These settings can be modified from the Windows Start menu using: *Settings* → *Control Panel* → *Language* on the *Numbers* tab control (refer to Page 8-7).

The MP270 is supplied with the German language variants set.

6.3.5 Reaction on changing the recipe structure

Standard behavior

The following section describes the standard behavior of the MP270 when it detects differences between the data record structure stored on the data medium and the recipe structure currently loaded on the MP270.

Load and export data records, and write in the PLC

- The data record on the data medium contains additional tags:
The values are rejected.
- The data record on the data medium contains values which cannot be converted to the assigned tag type:
The configured start value for the tag is used.
- Tags are missing in the data record on the data medium:
The configured start value for the tag is used.



Warning

The assignment is lost on changing the tag name.

Import data records

- The imported data record contains additional tags:
The values are rejected.
- The imported data record contains values which cannot be converted to the assigned tag type:
The configured start value for the tag is used. This occurs, for example, when the tag type has been changed in the configuration.
- Tags are missing in the imported data record:
The configured start value for the tag is used.

Tip

Export the data record after changing the recipe structure and check the exported values. Please observe the related safety notes provided on Page 6-12.

Archives

Overview

Process data can be archived on the MP270, i.e. stored permanently and evaluated. The following process data can be archived:

- Tags
- Messages

The properties of an archive, e.g. memory location and archive size, is defined by the configuration planner in ProTool CS.

Archive file format

Each archive is stored as an individual file. Data is stored in the archive file in CSV format. This enables archived data to be processed and evaluated using external tools, e.g. with a spreadsheet program or text editor.

In file format CSV, table columns are separated by a separator (e.g. semicolon). Each table row is terminated by a line feed.

Notice

When the CSV files are edited with an external text editor, the modifications are saved in text format (without control codes).

Storage location

The memory location for archive files is defined during configuration. Possible targets are:

- Memory card
- Any path in the network

Caution

The internal FLASH memory is not permissible as the memory location for archive files because cyclic archiving reduces the service life of the FLASH memory and thus that of the MP270.

Archive functions

The following functions are available in the ProTool CS configuration software in order to be able to work with archives on the MP270:

- *Open_archive*
The connection between the MP270 and archive files is established.
- *Close_archive*
All archive files are closed and the connection between the MP270 and archive files is disconnected.
- *Start_archive*
Starts the archiving process in the selected archive.
Normally, messages and tags are archived throughout the entire process. The function can be used to start the archiving to the specified archive by pressing an operating element on the MP270 and stopped with the function *Stop_archive*.
- *Stop_archive*
Stops the archiving process in the selected archive.
Normally, messages and tags are archived throughout the entire process. This function can be used to stop the archiving to the specified archive by pressing an operating element.
- *Delete_archive*
Deletes all the entries in the selected archive.
- *Start_sequence_archive*
Switches from the current archive to the following one. If no sequence archive has been configured, the function is not executed.
- *Archive_tag*
Archives the status of a tag in the archive configured for the tag. This function can be used to trigger the archiving of a tag to the specified archive by pressing an operating element on the MP270. The archive must have been started beforehand.

Note on performance

If a network is not used when archiving on the MP270, but an ATA-Flash card is used as the archive data medium instead, the archive memory space available is limited. The archiving performance of a FLASH PC card is also very limited. FLASH modules cannot be read from or written to in fine tracks, as opposed to a hard disk. Each access to a FLASH card requires copying large sectors of the FLASH card which greatly reduces the performance.

For this reason, the MP270 should not be used primarily for the cyclical archiving of data. The MP270 is more suitable for archiving non-cyclically occurring fault states (alarm and event messages).

The MP270 has not been conceived for archiving tasks with high demands on quantity structure or performance.

Examples of performance

The table provide examples for the maximum performance possible:

Task	ATA FLASH
Recording rate [in entries per second]	5
View of a message archive (10 messages from 2,000 entries)	12 s
Trend view of a tag archive (300 trend values from 2,000 entries)	15 s

Tip:

The time required for reading and displaying is reduced considerably when several sequence archives are configured rather than one large cyclic archive. A new sequence archive is recommended following approx. 10,000 entries.

Deactivate MP270 with memory card inserted

Caution

Always terminate the runtime software before switching off the voltage supply in order to prevent loss of data.

Operate the operating element linked to the *Exit_runtime* function in the configuration. Wait until the MP270 start menu (Figure 3-1, Page 3-7) appears and then switch off the power supply.

If the voltage supply is inadvertently interrupted during operation, the MP270 checks the memory card when the power supply is returned and displays a dialog window asking whether defect sectors should be repaired.

Remove memory card

Caution

Before removing the memory card, either use the operating element linked with the *Close_archive* function in the configuration or stop the runtime software. Operate the operating element linked to the *Exit_runtime* function in the configuration.

Closing the archive or terminating the runtime software may take several minutes, depending on the size and number of the archives stored.

System Settings

Overview

The general settings, listed below, can be modified on the MP270:

- Language (Page 8-2)
- Operating mode (Page 8-3)
- Screen settings (Page 8-4)
- Settings on Windows CE Control Panel (from Page 8-5)
 - Communication
 - Date/Time
 - Network
 - Unit properties
 - Language settings
 - Printer
- Network operation (Page 8-9)

8.1 Set Language

Language-dependent objects

When downloading the configuration from the configuration computer, up to three languages can be loaded on the MP270 simultaneously. It is possible to switch between the languages, online, at any time and display language-dependent objects (texts and formats) in other languages.

The following are language-dependent, for example

- Messages
- Screens
- Text lists
- Help texts
- Date/Time
- Decimal separating character

Condition

In order to change languages on the MP270 while it is in operation, the following conditions must be fulfilled:

- The editing language must be available on the MP270. The languages available during runtime are defined during configuration in ProTool CS under *System* → *Language Assignment: OP Languages*.
- The *Language* function must be linked to an operating element, e.g. to a button or a selection field.

Each time the unit is started up, all language dependent texts are displayed in the language set at the top of the configured languages list.

Change language

Immediately after activating the function, all the language dependent objects are displayed in the new language.

Two different types of language change can be configured:

1. Each time the function is activated, the MP270 switches one language further, cyclically.
2. After activating the function, the language can be explicitly selected.

8.2 Setting an Operating Mode

Conditions for changing operating modes

In order to switch the MP270 between the operating modes described below, the *Change_mode* function must be linked to an operating element in the configuration.

Operating modes

It is possible to switch between various operating modes on the MP270:

Offline mode

In this operating mode, there is no logical connection between the MP270 and PLC. The MP270 can be operated but processes cannot be operated or visualized.

Online mode

When using this mode, processes can be operated and visualized without restriction. There is a logical connection between the MP270 and PLC or the MP270 attempts to establish one. Online mode is the automatically activated after the MP270 has started up.

Download mode

This operating mode is used to transfer a configuration from the configuration computer to the MP270. Further information on download mode is provided in Chapter 3.3.

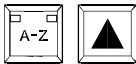
8.3 Screen Settings

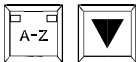
Purpose

In order to be able to view the screen well, even with changing lighting conditions, the brightness can be adjusted during operation and, when using units with an STN display, the screen contrast can also be adjusted.

Set brightness

The screen brightness can be adjusted by means of the following key combinations:

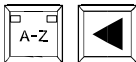
 Increases the brightness.

 Reduces the brightness.

Set contrast

The following key combinations can be used to adjust the screen contrast of units with STN displays:

 Increases the contrast.

 Reduces the contrast.

Notice

In the case of units with TFT displays, the screen contrast is fixed.

Save settings

The MP270 saves the current settings, which are backed up should a power failure occur, and sets them automatically when the unit is switched on again.

8.4 Control Panel Settings

The WindowsCE Control Panel

The following settings can be defined for the system using the WindowsCE Control Panel:

- Communication
- Date/Time
- Network
- Unit properties
- Language settings
- Printer

Open Control Panel

The following options are available to open the Control Panel:

- **During the start-up phase**
In the Start menu, press the *Control* button (Fig. 8-1).
- **During normal operation**
 - Select *Start* → *Settings* → *Control Panel* in the toolbar.
Use the key combination depicted to open the operating system Start dialog.
 - If configured, use the operating element assigned to the *Start_Control_Panel* function.

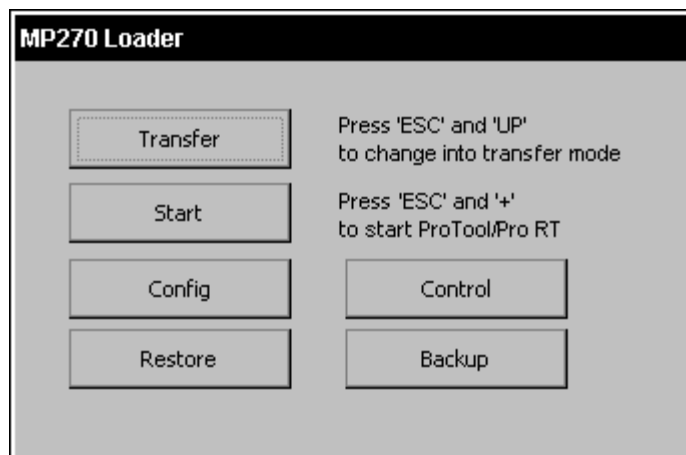


Figure 8-1 MP270 start menu

Change settings



Caution

Stop the runtime software before starting to change any system settings.

Notice

Changes in the system settings only take effect when they are permanently stored in the OP Properties (Chapter 8.4.4) in the *Registry* tab control.

Proceed as follows to change settings in the Control Panel:

Step	Procedure
1	Exit runtime Before changing any system settings, stop the runtime software.
2	Open Control Panel Open the Control Panel as described on Page 8-5.
3	Change settings Change the settings for the system in the Control Panel.
4	Save registration Save the current settings permanently (refer to Page 8-7).
5	Close Control Panel Close the Control Panel using the menu bar.
6	Restart runtime Start the runtime software using the MP270 Start menu (refer to Page 3-7).

8.4.1

Communication



The name of the MP270 can be modified here in order, for example, to identify it within a network. Further information regarding configuration of the network operation is provided on Page 8-10.

8.4.2

Set date/time



Enter the values to set the current date and time. The way in which these settings are modified directly in the active configuration is explained on Page 5-30.

8.4.3 Network

The specific network properties of the network card can be configured here. Information concerning configuration of the network operation is provided on Page 8-10.

8.4.4 OP properties

The *OP Properties* dialog provides the following tab controls:

- **Registry**
The current registration setting can be stored permanently in the Flash memory. The registration contains information such as printer settings.
- **Screensaver**
Define the time (in minutes) for automatic activation of the screen saver. The screen saver is automatically activated if the MP270 is not operated within the defined time.
On entering the value 0, the screen saver is deactivated permanently.

8.4.5 Language setting

Language-specific settings can be defined here, e.g.

- Date and time format (refer to Page 5-30)
- Decimal separator and list separator (refer to Page 6-20)

The MP270 is supplied with the German language variants set.

8.4.6

Set printer



A printer can be selected and options defined at this point. Some settings are only relevant for printing a hardcopy of the screen contents and have no influence on the message logging, e.g. the quality of graphics printing.

Information on connecting printers is provided on Page 9-11.

Adjustable options

The setting possibilities available are dependent on the printer selected:

- **Printer**
Select the printer from the list to which the MP270 is connected.
- **Port**
Select the port and baud rate used by the MP270 to transfer data to the printer, e.g. COM2: 9600.
- **Net Path**
If a network has been configured (refer to Chapter 8.5), enter a path for a network printer here. Select "Network" as the port.
- **Paper Size**
Select the paper size used in the printer, e.g. A4 or Letter.
- **Draft mode**
Define the quality of the printout of graphics. If the option is activated, printout is performed in draft quality, if deactivated printout is in high quality.
- **Print range**
Define whether only the selected area should be printed or the entire contents.
- **Orientation**
Define whether the page should be printed in Portrait)or Landscape format.
- **Margins**
The values entered here for the margins are ignored by the MP270.

Default settings

When the MP270 is supplied, the following default settings are defined:

- Printer: EPSON 9 matrix printer
- Port: COM2
- Baud rate 9600 bit/s

8.5 Network Operation

Purpose

using the network function enables the MP270 to be used for

- archiving data via the network
- printing via a network printer
- storing recipe data records in the network
- exporting recipe data records in the network
- importing recipe data records from the network

Information on the physical installation of the network card is provided on Page 11-3.

Notice

- The MP270 can only be implemented in TCP/IP networks.
 - The MP270 can only access files from other units which have a TCP/IP server functionality (client functionality). It is not possible to access MP270 files on a PC connected via Ethernet (server functionality).
-

8.5.1 Conditions for network operation

Network card compatibility

Only use NE2000-compatible network cards. Ensure that the network card really is compatible with the NE2000 standard hardware and the compatibility is not restricted to a Win95/98/NT software driver supplied. Siemens recommends SIMATIC NET CP1511.

Server

Within a TCP/IP network, computers are addressed by means of network names. These network names are translated from a DNS or WINS server to TCP/IP addresses. Therefore, to ensure the functionality of the MP270 in a TCP/IP network, it is useful to employ a DNS or WINS server. Appropriate servers are available in common TCP/IP networks. Please contact your network administrator.

Printing via a network printer

The MP270 operating system does not support the direct message logging via a network printer. All other printer functions, such as hardcopy or shift log, are possible via the network without restriction.

8.5.2 Configure MP270

Overview

Before inserting the network card, the MP270 must be configured for network operation. The configuration is basically divided into the following steps:

- Set computer name of the MP270
- Configure network address
- Set login information
- Save settings

Information on the individual steps is provided on Page 8-10.

Preparation

Before beginning with the configuration, request the specific network parameters from the network administrator. The following information is of particular interest:

- Does the network use DHCP for dynamic assignment of network addresses? If not: Instigate the assignment of a new TCP/IP network address for the MP270.
- What is the TCP/IP address of the default gateway?
- What are the DNS addresses of the name server?
(if DNS is used in the network)
- Which WINS addresses has the name server?
(if WINS is used in the network)

Procedure

The following instructions describe how to define the general settings. Additional steps or procedures may be necessary depending on the network infrastructure.

Information on navigating in the operating system is provided on Page 4-7.

Step	Procedure
Open Control Panel	
1	Open the Control Panel as described on Page 8-5.
Set computer name of the MP270	
2	In order to identify the MP270 within the network, it must be assigned a unique name (device name) within the network using the Control Panel via the <i>Communication</i> icon. Do not use the predefined name. Apply the settings and close the dialog by pressing ENTER. 

Step	Procedure
Configure network address	
3	Use the <i>Network</i> icon to call in the network configuration. 
4	Press the <i>Properties</i> button in order to configure the network characteristics of the network card used. Complete the <i>NE2000 Compatible Ethernet Driver Settings</i> dialog. If the network implements DHCP, skip Step 5.
5	Select the tab control <i>IP Address</i> then option <i>Specify an IP Address</i> . Enter the TCP/IP address of the MP270 (e.g. 233.239.2.100), subnet mask (e.g. 255.255.255.0) and default gateway (B. 223.239.2.200).
6	Enter the name server address of the network in the tab control <i>Name Servers</i> . Close the dialog with ENTER or OK in order to apply the settings.
Set login information	
7	In order to login correctly into the network, enter your user permissions in the <i>Identification</i> tab control. Then enter the valid user name and associated password for the network or network server. If the network administrates users via domain controllers, enter the relevant domain controller name. Close the dialog with ENTER or OK in order to apply the settings.
Save settings	
8	All the settings defined to date only remain valid until the MP270 is switched off. In order to save settings permanently, select the <i>OP</i> icon in the Control Panel and press the <i>Save</i> button provided in it.  Close the dialog using ENTER or OK.
9	Switch the MP270 off.
10	Insert the network card in the MP270. Use slot A for SIMATIC NET CP1511 ¹⁾ (refer to Page 9-5).
11	Before switching the MP270 on, insert the network cable in the network card so that a unique IP address can be assigned during the start-up phase.
12	Switch the MP270 on again.

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8.5.3 Test network

Procedure

It is then possible to access the network. To test it, assess the network server via the Explorer. Proceed as follows:

Step	Procedure
1	Start Explorer via the Windows Start menu. Use the key combination depicted, select program group <i>Programs</i> and then the <i>Windows Explorer</i> application. 
2	Use the <i>Address</i> input field to enter the UNC name of the directory/drive provided on the server. Example The server is called: mrnbg2 The name provided is: daten The resulting UNC name is: \\mrnbg2\daten
3	After entering the UNC name, press the ENTER key. When all the network settings are correct, Explorer displays the files located under the directory provided on the TCP/IP server.

8.5.4 Configure network functions

Condition

Before accessing the network, it must be set up on the MP270 (refer to Page 8-10).

Procedure

In order to be able to use the network functions in the ProTool CS configuration software, it is only necessary to specify the relevant UNC assigned names at those points where paths have been entered for files or directories.

Example 1: Archives

If, for example, it is necessary to carry out archiving on the server in the example above (Step 2 in the table on Page 8-12), replace the predefined archive memory location `\Storage Card\ProCSVarc` by the UNC assigned name for the server, i.e. `\\mrnbq2\daten\ProCSVarc`.

Example 2: Recipe data records

In order to store recipe data records in the network, replace the predefined path name `\Flash\ProCSVdata` by the UNC assigned name for the server, i.e. `\\mrnbq2\daten\ProCSVarc`.

The same applies for exporting and importing recipe data records using the functions *Export_Data_Records* and *Import_Data_Records*. In this case, too, replace the parameter *File name* with the UNC assigned name for the server.

Installation

In this chapter

This chapter provides information on:

- installation of the MP270 (from Page 9-2)
- electrical connections to
 - the power supply (Page 9-7)
 - the configuration computer (Page 9-8)
 - the PLC (Page 9-9)
 - the printer (Page 9-11)

9.1 Mechanical Installation

Installation location and conditions

The MP270 is designed for installation in 19" cabinets/racks and in the front panels of switching cabinets and consoles. Cut a mounting cut-out in the front panel prior to installation. The thickness of the front panel must not exceed 6 mm. Additional fixation holes are not necessary due to the tensioning mechanism used.

Details regarding the mounting depth and mounting cut-out are provided on Page 10-2.

Degree of protection

The IP65 degree of protection for the front panel can only be ensured when the seal on the front plate of the MP270 is fitted correctly.



Warning

When the cabinet is opened, certain parts of the system that may conduct hazardous voltage are exposed.



Caution

- The unit must be brought to room temperature before it is commissioned. If condensation forms, do not switch the unit on until it is absolutely dry.
 - To prevent the MP270 from overheating during operation,
 - the angle of inclination from vertical installation may not exceed a maximum of $\pm 35^\circ$,
 - do not expose the operating unit to direct sunlight,
 - ensure that the ventilation slits in the housing remain free after installation.
-

Notice

The unit was function-tested before shipping. If a fault occurs nevertheless, please enclose a full account of the fault when returning the unit.

Before installation

If the labeling of the function keys needs to be modified, replace the labeling strips before installing the MP270. Information on this is provided on Page 10-3.

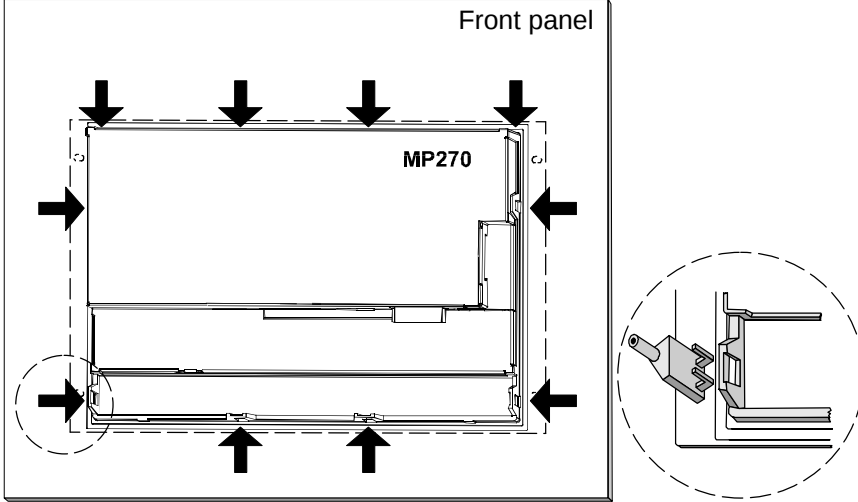
Installation in 19" cabinets/racks

Use the profiles provided by the respective cabinet or rack manufacturer to install the unit in a 19" cabinet/rack.

Installation dimensions of standard 19" cabinets:

- Width: 19" (482.6 mm)
 - Height: 7 HE (310 mm)
- Fixing the MP270: To the profiles using four screws

Installation in front panels

Step	Procedure
1	Working from the front, insert the MP270 in the mounting cut-out provided. Make sure the unit cannot drop out of the front panel before it has been secured.
2	Insert the hooks of the ten screw-type clamps enclosed in the corresponding recesses in the housing of the MP270. The individual positions are indicated in the figure by means of arrows. 
3	Tighten the MP270 to the front panel, from the rear, using a hexagonal socket-head screw key. Caution • Make sure the seal is seated correctly against the front panel. • Do not overtighten the screws to avoid damage.

9.2 Electrical Installation

Electrical connections

The MP270 requires electrical connections

- to the power supply,
- to the configuration computer (PU or PC),
- to the PLC,
- to the printer.

An electrical connection to the PU/PC is only required for downloading the project data. Following the configuration and test phases, a serial printer can be connected to the MP270 instead of the configuration computer.

EMC compatible installation

A precondition for error-free operation is an EMC compatible hardware design of the PLC and the use of interference-proof cables. The guidelines on interference-free design of the PLCs apply equally to installation of the MP270.



Caution

- Only shielded cables are permitted for all signal connections.
 - Screw or lock all plug connections.
 - Do not install signal lines in the same cable ducts as power cables.
 - Siemens AG refuses to accept liability for malfunctions and damage arising from use of self-made cables or cables from other manufacturers.
-

Grounding connection



Connect the grounding connection of the MP270 to the rack ground. To do this, use the grounding screw supplied and a conductor cross-section of $\geq 2.5 \text{ mm}^2$.

Connection elements

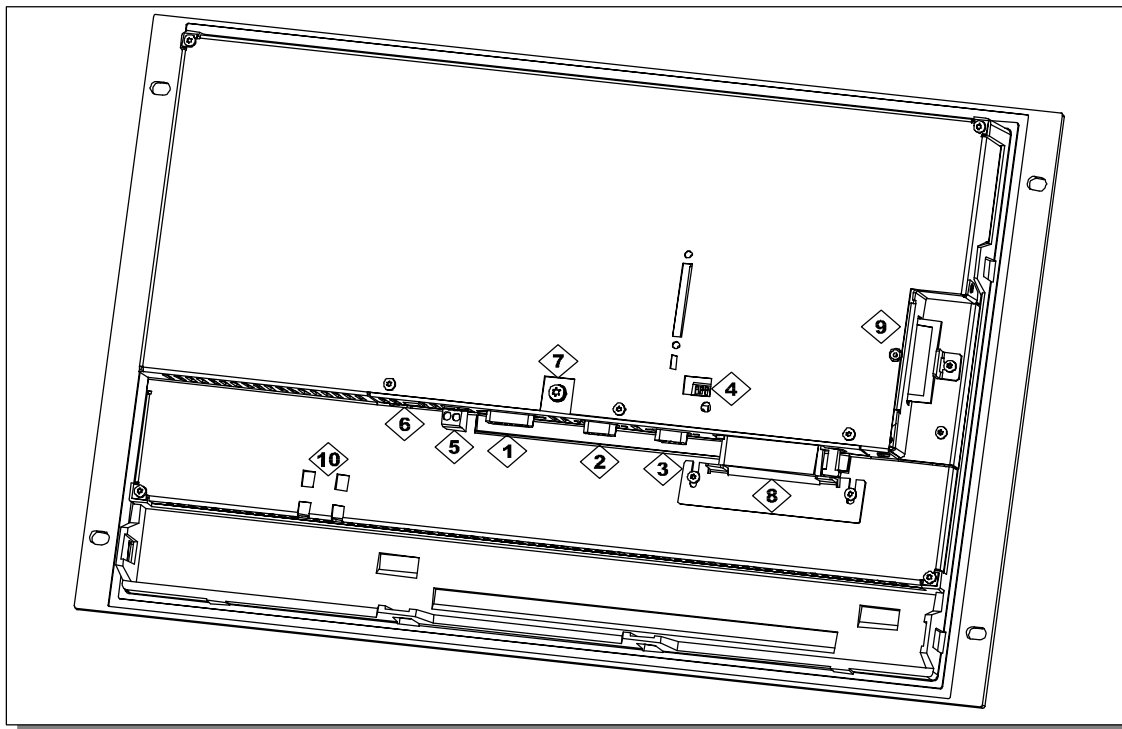


Figure 9-1 Arrangement of connection elements

No.	Name	Description/Use	
	Interfaces ¹⁾ :	Level:	Usage:
1	• IF1 A	RS232/TTY (active/passive)	PLC
2	• IF2	RS232	PC, PU, printer
3	• IF1B ²⁾	RS422/RS485 (floating)	PLC
4	Switch ³⁾	To configure interface IF1B	
5	Power supply ⁴⁾	Connection for power supply (+24 V DC)	
6	Backup battery	Connection for optional backup battery	
7	Grounding connection	For connection to cabinet ground	
8	Slot A	For PC card or network card	
9	Slot B	For Compact Flash or network card	

Communication options

Device	Connection	Interface
SIMATIC S5	• AS511 (TTY)	IF1 A
	• PROFIBUS-DP	IF1 B
SIMATIC S7	• MPI	IF1 B
	• PROFIBUS-DP	IF1 B
SIMATIC 505	• RS232	IF1 A
	• RS422/RS485	IF1 B
Other PLCs	• RS232/TTY	IF1 A
	• RS422/RS485	IF1 B
Configuration computer	• RS232	IF2
Printer		
• Local printer	• RS232	IF2
• Network printer	• Network card	Slot A or Slot B

Reverse battery protection

Caution

The MP270 is equipped with reverse poling protection. This has no effect when a connection already exists to another unit or a card is inserted in Slot A or Slot B.

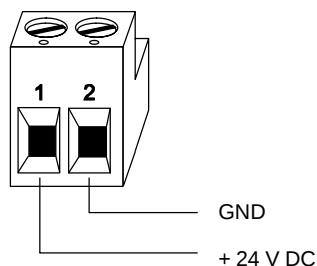
Proceed as follows when commissioning:

1. Disconnect all connections to external units and remove any cards from Slot A or Slot B.
2. Connect the MP270 to the power supply.
3. Switch on the power supply.
If the MP270 does not start up, the connections are probably reversed. Swap the connections over in this case.
4. When the MP270 has been powered up, connect the configuration computer or other periphery equipment to it.

Power supply

The power supply for the MP270 is connected at the 2-pin plug connector on the underside of the unit. Use the 2-pin terminal block supplied for this purpose. The terminal block is designed for cables with a cross-section not larger than 2.5 mm².

The figure illustrates the pin assignment of the terminal block.



Please refer to the technical data in Appendix A for information on the power supply requirements.



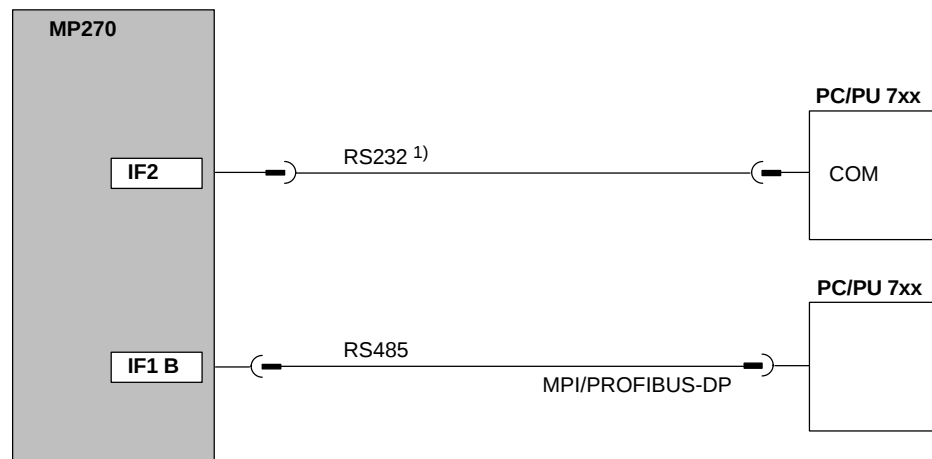
Caution

- When using a 24 V supply, make sure that the extra-low voltage is isolated safely. Use only power supply units complying with IEC 364-4-41 or HD 384.04.41 (VDE 0100, Part 410)!
- The supply voltage must be within the specified voltage range. Voltages outside this range can cause malfunctions.

9.2.1 Connect configuration computer

Connection configuration

Figure 9-2 illustrates how to connect a configuration computer (PU or PC) to the MP270 for downloading project data. Standard cables are available for the connections shown (refer to the ST80 catalog).



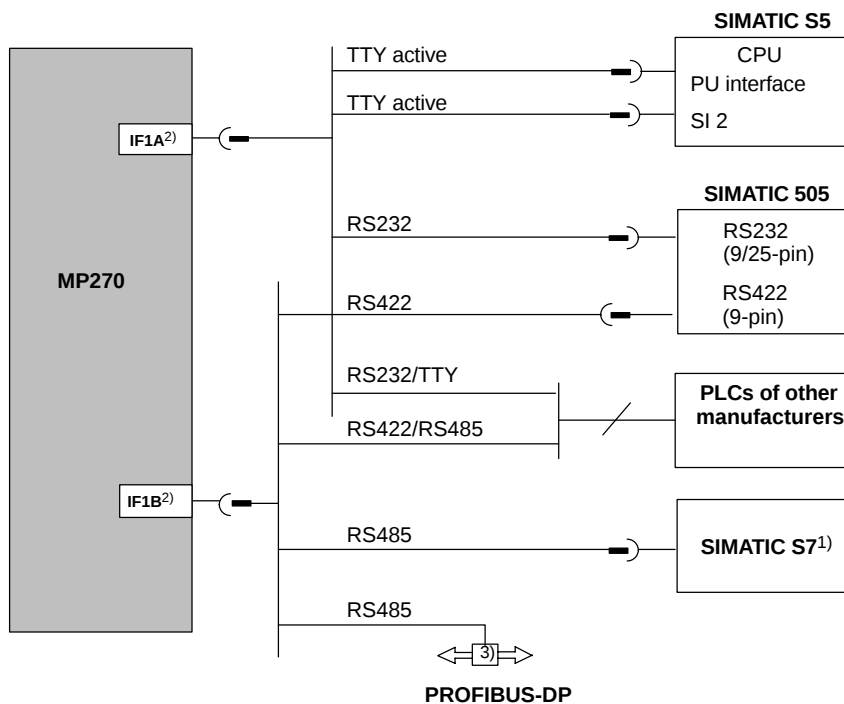
¹⁾ Operating system update only via RS232 (refer to Chapter 13)

Figure 9-2 Connection configuration diagram for configuration computer

9.2.2 Connect PLC

Connection configuration

Figure 9-3 illustrates the basic connection possibilities between the MP270 and PLC. Standard cables are available for the connections shown (refer to the ST80 catalog).



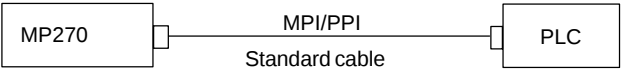
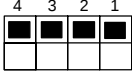
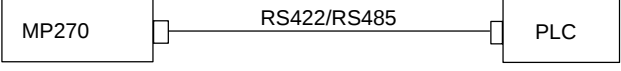
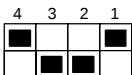
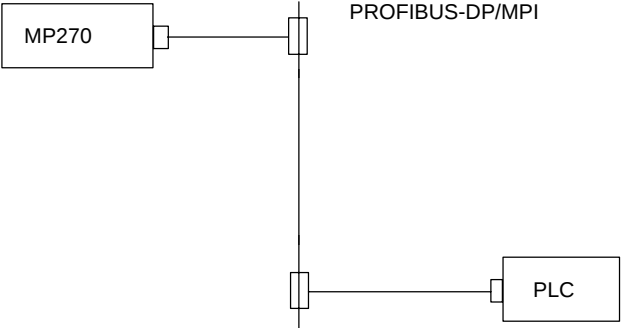
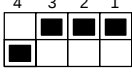
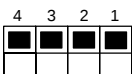
- ¹⁾ Use only the approved cables for connection to the SIMATIC S7.
- ²⁾ To enable operation using the serial interface, connect either the IF1A (RS232/TTY) or IF1B (RS422/485), but not both. The IF1B interface can be configured by means of the switch (Page 9-10).
- ³⁾ Any PROFIBUS-DP bus terminal

Figure 9-3 Connection configuration for PLCs

Configure interface IF1B

The IF1B interface can be configured via the switches on the rear side of the unit. In this case, the RTS signal is interchanged for RS485 and the RS422 receive data. By default, the RTS signal is not required by the communication peer.

The table shows the permissible switch settings.

Communication	Switch Setting
	 ON No RTS on connector ¹⁾
	 ON
	 ON RTS on pin 4 (default)
	 ON RTS on pin 9 (same as PU)
	 ON No RTS on connector ¹⁾

1) State on delivery

Compressing the internal program memory with SIMATIC S5



Warning

With the SIMATIC S5, compression of the internal program memory on the PLC (PU “Compress” function, integrated FB COMPR) is not permitted when an operating unit is connected. Compression modifies the absolute addresses of the blocks in the program memory. Since the operating unit only reads the address list during startup, it does not detect any address modifications and subsequently accesses the wrong memory areas.

If compression is inevitable during running operations, the operating unit must be switched off before compressing.

9.2.3 Connect printer

Connection configuration

Figure 9-4 illustrates how to connect a printer to the MP270. The MP270 supports the following printer standards:

- compatible with ESC/P, 9-pin ESC/P or ESC/P2 (EPSON)
e.g. EPSON FX850
- compatible with PCL3 (Hewlett Packard)
e.g. HP LaserJet 5M

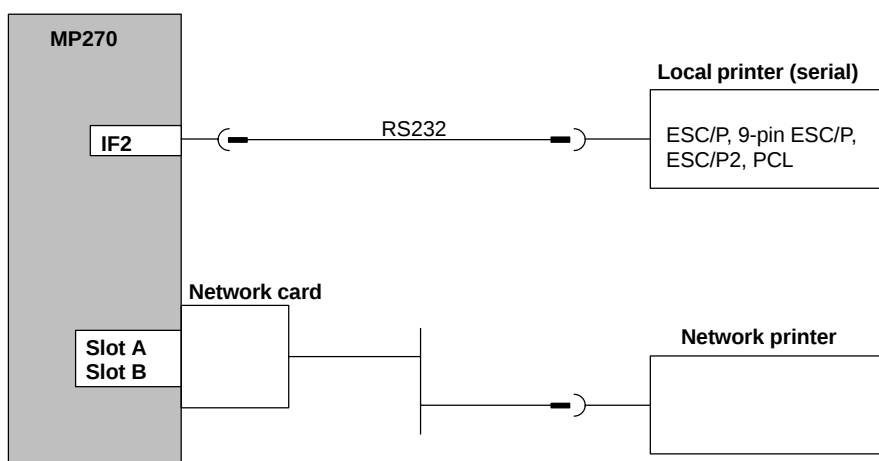


Figure 9-4 Printer connection configuration

Information on printer settings is provided on Page 8-8.

Notice

- Only use a cable with braided metal screening grounded at each end for connecting the MP270 and printer.
- Deactivate the (Page 3-8) *Serial Transfer Remote Control* option in the Configuration menu if a serial printer is connected to the MP270 via the IF2 interface.
- Some printers may require that the ASCII character set used in the configuration is defined on the printer as well.

10

Unit Description

In this chapter

This chapter provides information on:

- Dimensions (Page 10-2),
- Labeling the function keys (Page 10-3).

10.1 Dimensions

Mounting cut-out

For installation in the front panel, the MP270 requires a mounting cut-out (WxH) of 436^{+1} mm x 295^{+1} mm. The thickness of the front panel must not exceed 6 mm.

Unit dimensions

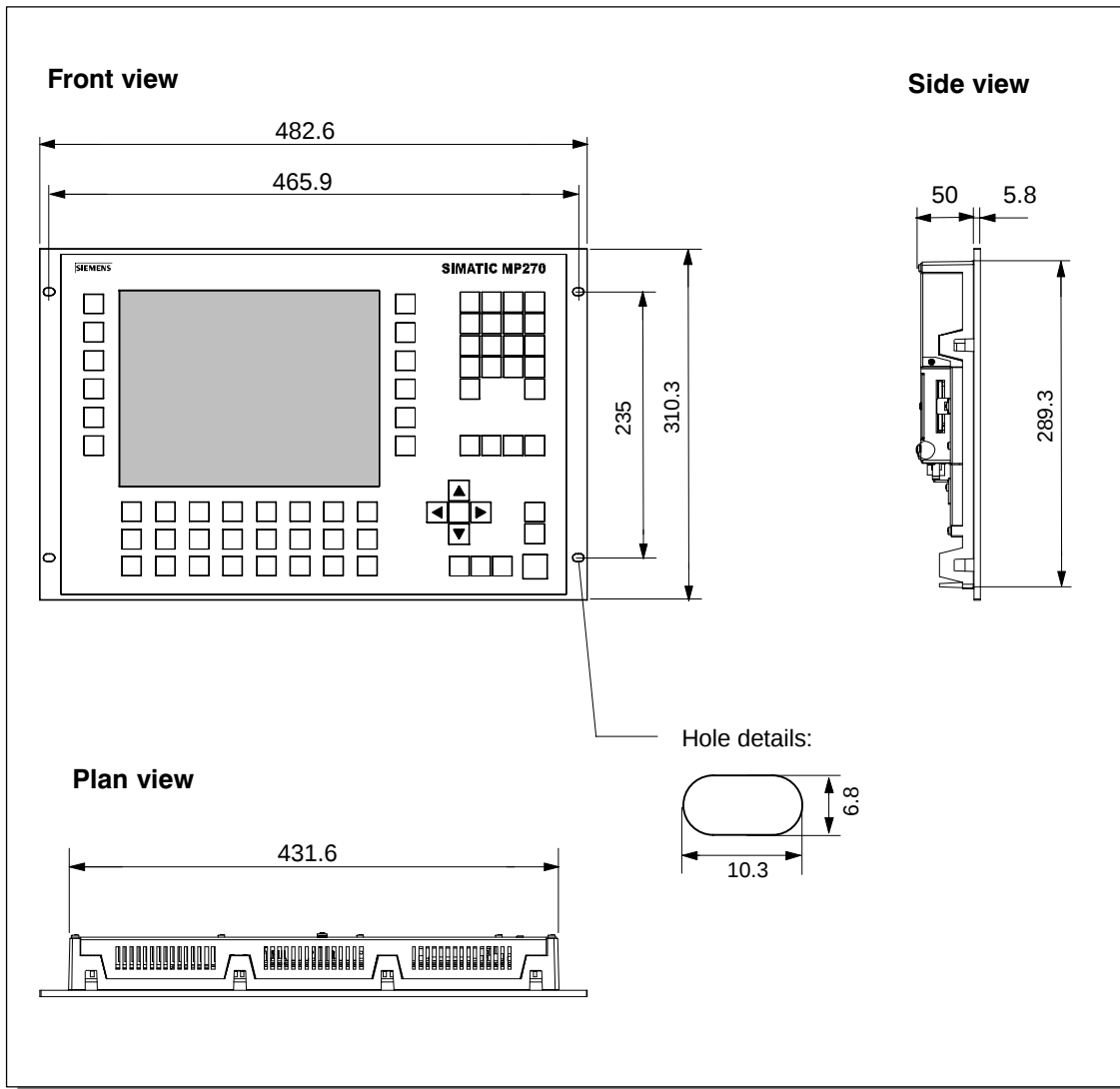


Figure 10-1 MP270 dimensions

10.2 Labeling Function Keys

Labeling

The MP270 function keys are labeled as follows on supply:

- **F1 to F20** and
- **K1 to K16**.

The function keys are labeled by means of 10 labeling strips which are inserted in the unit from the rear. These strips can be exchanged in order to label the MP270 specifically for the system.

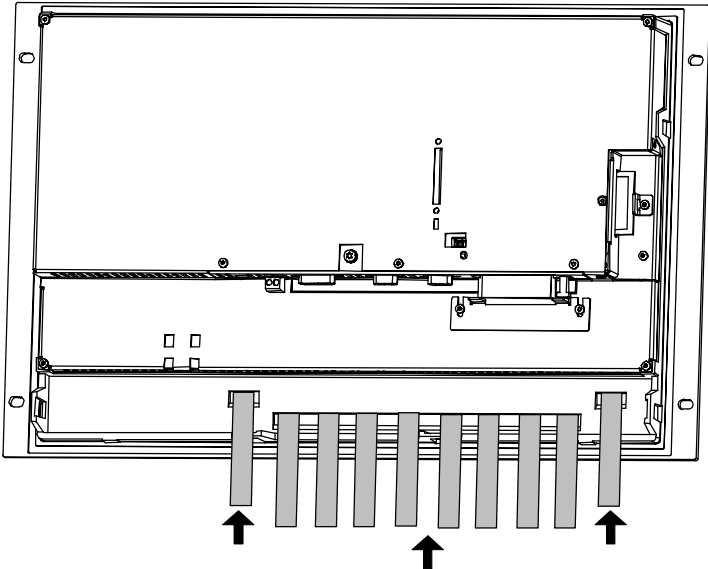
Exchange labeling strips



Caution

Make sure that the MP270 is disconnected from the power supply.

Proceed as follows:

Step	Procedure
1	Place the unit down with the front plate at the bottom.
2	Remove the labeling strips already inserted.
3	Insert the newly labeled strips in the slots in the front plate with the inscription facing down. The individual positions are indicated in the figure by means of arrows. Caution Before inserting the strips, wait until the inscription is dry. A keyboard foil which is dirty on the inside cannot be cleaned and can only be replaced at the manufacturer's factory. 

Create labeling strips

Only use transparent foil to create your own labeling strips so that the LEDs in the function keys remain visible. Label the foil either with a printer or a waterproof felt-tip pen. Cut the strips according to the specifications depicted in Figure 10-2 .

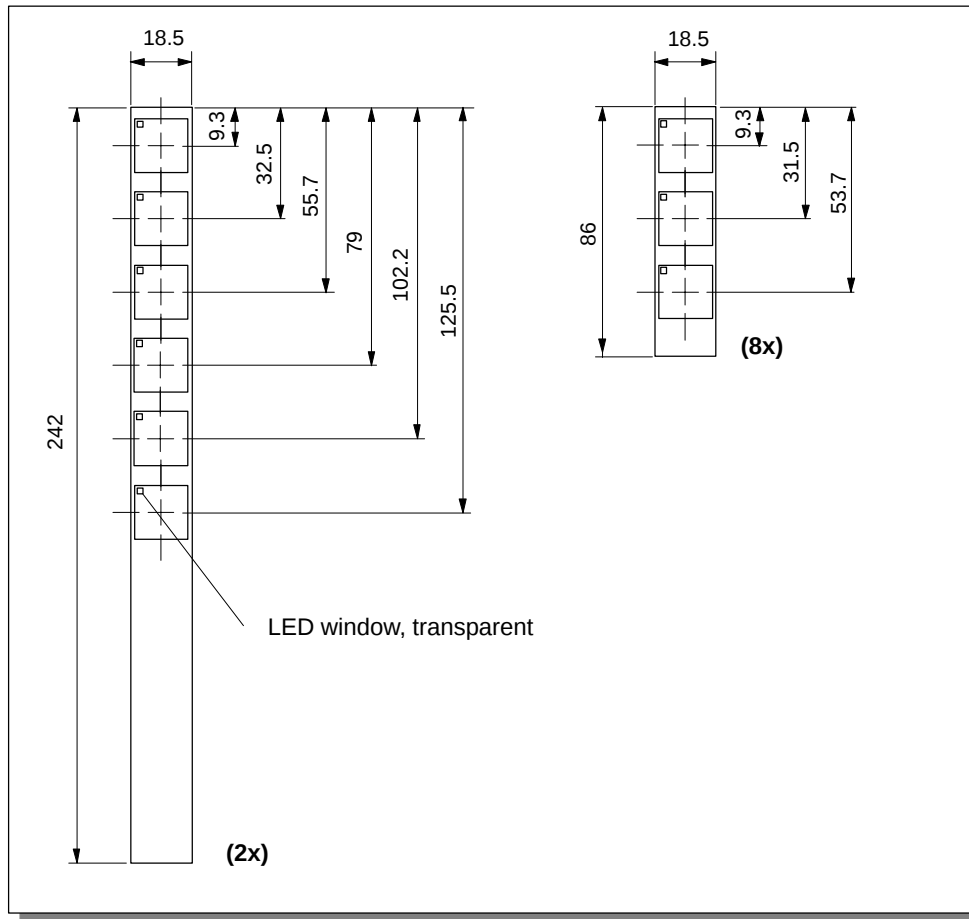


Figure 10-2 Labeling strip dimensions

File

The ProTool CS configuration software contains formatted patterns for labeling function keys individually for various SIMATIC operating units.

The patterns for the MP270 are stored on the ProTool installation CD under \UTILITY\SLIDE270.DOC in Word format. This enables labeling strips to be created for the MP270 for specific systems without extensive design and printing operations.

Options

11

In this chapter

This chapter provides information on the options available with which to retrofit the MP270. The following options are available:

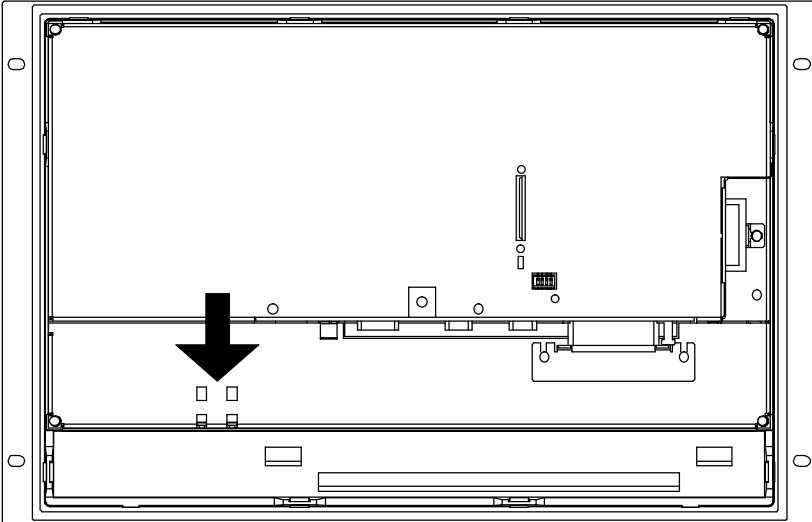
- Backup battery (Page 11-2)
- Memory card/Network card (Page 11-3)

11.1 Backup Battery

Backup battery function

The battery ensures that the internal hardware clock of the MP270 continues to run even when the power supply is interrupted. The clock is only backed up for a few hours if no battery is available.

Installation

Step	Procedure
1	Secure the new battery by means of two cable ties on the rear side of the MP270. The relevant position is indicated in the diagram below by an arrow. 
2	Insert the battery lead connection plug in the two-pole pin array. The connector is coded and thus protected against polarity reversal.

Further information

Information concerning replacing the battery, supply source and related safety notes on handling and disposing of the batteries is provided on Page 12-2.

11.2 Memory Card/Network Card

Purpose

Two slots are provided, namely *Slot A* and *Slot B* (Figure 11-1) located on the rear side of the unit in which to insert changeable storage media or network cards.

The interchangeable memory cards can be used, for example, to archive important process data or execute a backup/restore of the internal Flash memory (refer to Page 3-15). Information on using the network card is provided in Chapter 8.5.

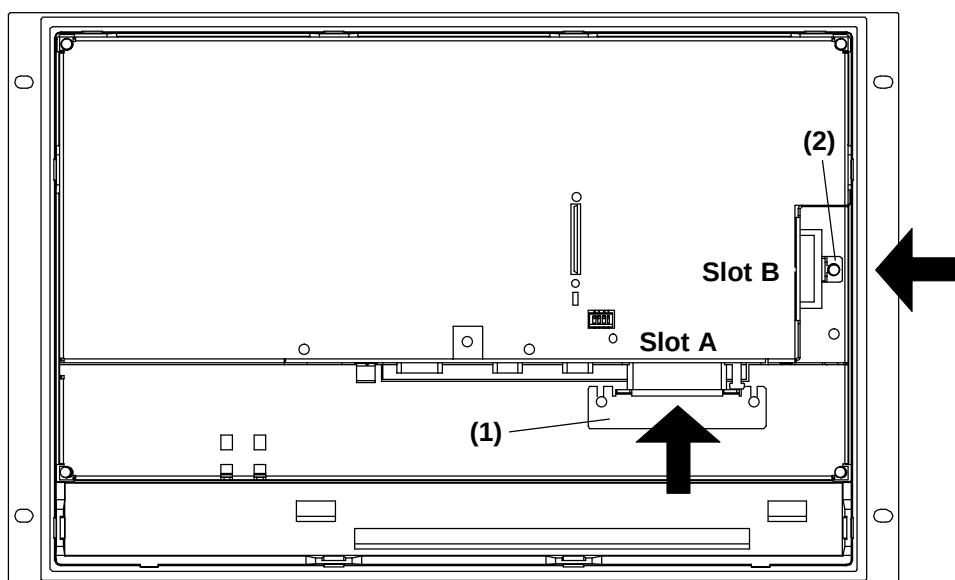


Figure 11-1 Position of the slots

Cards supported

The MP270 supports the use of all standard cards which operate with a programming voltage of 5 V (types I and II), e.g.:

- **Slot A** (PC card):
 - ATA Flash card
 - NE2000 compatible network card (SIMATIC NET CP1511)
- **Slot B** (Compact Flash card):
 - ATA Flash card
 - NE2000 compatible network card

Installation

Proceed as follows to install a card:

Step	Procedure
1	Remove bracket (1) or (2) , depending on the slot concerned.
2	Insert the card in Slot A or Slot B according to the card type.
3	Reinstall the bracket, (1) or (2) , to secure the card.

Caution

Stop the runtime software before inserting the card. Operate the operating element linked to the *Exit_runtime* function in the configuration.

Please observe the related safety notes provided on Page 9-6.

Remove the card

Caution

Before removing a card, ensure that the MP270 does not access the card during the removal process.

Before removing the card, either use the operating element linked with the *Close_archive* function in the configuration or stop the runtime software. Operate the operating element linked to the *Exit_runtime* function in the configuration. Wait until the MP270 Start menu (Figure 3-1, Page 3-7) is displayed. This may take several minutes, depending on the size and number of archives stored.

Switch MP270 off with card inserted

Caution

Always terminate the runtime software before switching off the voltage supply in order to prevent loss of data.

To terminate the runtime software, press the operating element assigned the *Exit_runtime* function in the configuration. Wait until the MP270 start menu (Figure 3-1, Page 3-7) appears and then switch off the power supply. Changeover to the Start menu may take several minutes depending on the size and number of archives stored.

If the voltage supply is inadvertently interrupted during operation, the MP270 checks the memory card when the power supply is returned and displays a dialog window asking whether defect sectors should be repaired.

Maintenance/Upkeep

Scope

The MP270 has been designed for low maintenance operation. Maintenance of the unit is limited to

- regular cleaning of the keyboard foil and screen,
- changing the optional backup battery.

12.1 Clean Screen and Keyboard Foil

Preparation

Clean the MP270 screen and the keyboard foil at regular intervals. Use a damp cloth.



Caution

Do not clean the unit while it is turned on. This ensures that functions are not inadvertently triggered on touching the keys.

Cleaning agents

Only use water and washing up liquid or screen cleaning foam to dampen cloths. Never spray the cleaning agent directly onto the screen, but onto the cleaning cloth. Never use aggressive solvents or scouring powder.

12.2 Replacing the Optional Backup Battery

Backup battery function

An optional backup battery is available for the MP270 (refer to Chapter 11). The battery ensures that the internal hardware clock continues to run even when the power supply is interrupted.

Under normal operating conditions, the battery has a service life of approx. 4 years. It is not part of the material supplied with the MP270.

Supply source

The battery can be ordered from the Siemens spare parts service. It is shipped ready for installation with a lead and connector. Please refer to our catalog *ST80* for the order number.

Before replacing

Observe the following before changing the battery:



Caution

- Change the battery while power is still being supplied to ensure the internal hardware clock continues to run.
 - The battery must be changed by a properly qualified person.
 - Before replacing the battery, refer to the ESD Guidelines in Appendix D.
-

Procedure

Step	Procedure
1	Remove the battery lead connector from the two-pin plug connector on the unit.
2	The battery is normally secured by means of two cable ties on the rear side of the MP270. Cut the cable ties, using pliers for instance, and remove the empty battery.
3	Secure the new battery by means of two cable ties on the rear side of the MP270.
4	Insert the battery lead connector back into the socket. The connector is coded and thus protected against polarity reversal.

General notes

Please observe the following safety notes to ensure correct handling and disposal of lithium batteries:



Warning

- If the lithium battery is not handled properly, there is a risk of explosion.
- Batteries
 - should never be charged
 - should not be opened
 - should not be short-circuited
 - should be safeguarded against polarity reversal
 - should not be exposed to temperatures in excess of 100 °C
 - should be protected against direct sunlight.
- Do not allow condensation to form on batteries.
- Should shipping become necessary, ensure compliance with the Dangerous Chemicals Ordinance for the carrier concerned (coding obligation).
- Treat used lithium batteries as special waste. Pack them in separate leakproof plastic bags to dispose of them.

Operating System Update

Purpose

If there is a conflict between the configuration software version and current operating system on the MP270, downloading of a configuration from the configuration computer to the MP270 is terminated and a compatibility conflict is indicated.

In this case, synchronize the MP270 operating system with the version of the SIMATIC ProTool CS configuration software. The procedure is described below.

Note

Updating the operating system causes all the existing data on the MP270 to be deleted!

Tip:

Before updating the operating system, export the user data (passwords and recipes) on the internal Flash memory to an external data medium. Import the data again after updating the operating system.

Procedure

Proceed as follows in order to adapt the operating system on the MP270 to the configuration software version used:

Step	Procedure
1	Switch off the power supply for the MP270.
2	Connect the IF2 (RS232) interface on the MP270 to a serial interface on the configuration computer via a commercially available serial zero modem cable.
3	Start the <i>PTUpdate</i> utility program on the configuration computer. It is contained on the configuration software installation CD. It is located in the directory \Images.
4	Select menu item <i>File</i> → <i>Open</i> and open the image file (file extension .img) appropriate for the MP270. The image file are located in the same directory as the <i>PTUpdate</i> utility program. The file name contains the character string MP270. When the image file has been opened successfully, various information related to the version status appears on the screen.

Step	Procedure
5	Select the menu item <i>File → Settings</i> . Set the interface and applicable baud rate (max. 115200) on the designated interface for the download.
6	Start downloading with the menu option <i>File → Download</i> . When the appropriate message appears on the screen, switch on the power supply for the MP270.

If downloading is unsuccessful, repeat the above procedure.

When downloading is successful, the MP270 contains no project data. The behavior of the MP270 when no configuration has been loaded is described in Chapter 3.1.

APPENDICES

- A Technical Data**
- B Interface Assignments**
- C System Messages**
- D ESD Guidelines**
- E SIMATIC HMI Documentation**

Technical Data

A

In this Appendix

This Appendix contains the following technical data for the MP270:

- Housing
- Processor
- Memory
- Software
- Display
- Keyboard
- Power supply
- Backup battery (option)
- Network card (option)
- Ambient conditions
- Noise immunity / Noise transmission
- Approvals

Housing	
External dimensions (W x H)	482.6 mm x 310.3 mm
Mounting cut-out (W x H)	436+1 mm x 295+1 mm
Mounting depth	50 mm
Degree of protection	
• Front panel	IP65/NEMA 4
• Rear panel	IP20
Weight	Approx. 5 kg

Processor	
Type	32 bit CPU

Memory	
Configuration memory	To 4 Mbyte
Storage media	
• Expansion slot for PC card	e.g. ATA Flash card
• Slot for Compact Flash card	e.g. ATA Flash card

Software	
Operating system environment	MS Windows CE

Color display		
LCD type	STN LCD	TFT LCD
Active screen diagonal	10.4"	
Resolution (pixels)	640 x 480 (VGA)	
No. of colors	256	
Back-lighting	CCFL tube	
Half Brightness Life ¹⁾	Approx. 50,000 h	Approx. 40,000 h

1) Time period after which the brightness of the lighting tube only achieves 50 % of its original value. The specified value is dependent on the operating temperature.

Keyboard	
Type	Membrane keyboard
System keys with dedicated functions	33 (3 with LEDs)
Configurable function keys	
• Number	36 (28 with LEDs)
• Those usable as softkeys	20
• Labeling	System-specific with labeling strips

Power supply	
Rated voltage	+ 24 V DC
Permissible voltage range	+18.0...+30.0 V DC
Max. permissible transients	35 V (500 msec)
Time between two transients	50 sec minimum
Power consumption	
Typical	Approx. 0.6 A
Max. constant current	Approx. 0.9 A
Switch-on current I^2t	Approx. 0.5 A ² s
Fuse, internal	Electronic

Backup battery (option)	
Type	Lithium battery
Voltage/Capacity ²⁾	3.6 V/approx. 1.5 Ah
Service life	Approx. 4 years

2) Technical details subject to change without notice.

Network card (option)	
Type	NE2000-compatible, e.g. SIMATIC NET CP1511 ³⁾

3) From Edition 4

Ambient conditions		
Location Max. permissible angle of inclination without external ventilation	Vertical $\pm 35^\circ$	
Max. permissible ambient temperature • Operation – Vertical installation – Installation angled from the perpendicular to max. 35° • Shipping, storage	STN display 0...+45 °C 0...+35 °C	TFT display 0...+50 °C 0...+35 °C –20...+60° C
Relative humidity Operation Shipping, storage	20...85%, no condensation 5...85%, no condensation	
Shock resistance Operation Shipping, storage	15 g/11 msec 25 g/6 msec	
Vibration Operation Shipping, storage	0.035 mm (10 – 58 Hz) 1 g (58 – 500 Hz) 3.5 mm (5 – 8.5 Hz) 1 g (8.5 – 500 Hz)	
Max. pressure difference (front/rear side)	2 hPa	
Barometric pressure Operation Shipping, storage	706 to 1030 hPa 581 to 1030 hPa	

Compliance of the named products with the regulations of Directive 89/336 EEC is verified by conformance with the following standards:

Noise immunity	
Static discharge (contact discharge/air discharge)	EN 61000-4-2 6 kV/8 kV
RF irradiation	EN 61000-4-3 10 V/m, 80% AM, 1 kHz
Pulse modulation	ENV 50204 900 MHz $\pm$ 5 MHz 10 V/meff., 50% ED, 200 Hz
RF conduction	EN 61000-4-6 150 kHz – 80 MHz 10 V, 80% AM, 1 kHz
Burst interference Mains lines Supply lines Process data lines Signal lines	EN 61000-4-4 2 kV 2 kV 2 kV 1 kV

Radio interference	
Radio interference level complying to EN 55011	Class A

The following approvals have been applied for or already granted on supply.
Please refer to the rating plate on the rear of the unit for identification.

Approvals	
UL approval	UL Recognition Mark ⁴⁾ Underwriters Laboratories (UL) complying with Standard UL 508, File E 120869
cUL approval	In accordance with the UL/CSA Approval Agreement
FM Approval	FM Approval Complying with Factory Mutual Approval Standard Class Number 3611 Hazardous (classified) Locations Class I, Division 2, Group A, B, C, D
	 Warning: Personal injury and equipment damage can occur. Personal injury and equipment damage can occur in hazardous areas if a plug connection is disconnected from the operating unit while the system is running. In hazardous areas, always switch off the power supply to the operating unit before disconnecting plugs.
	 Warning: DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS LOCATION IS KNOWN TO BE NON- HAZARDOUS.

4) The UL and CSA file numbers are dependent on the production site. The numbers specified here changes according to the change of production site.

Interface Assignment

IF1A

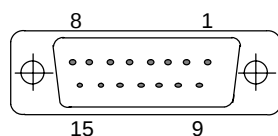


Table B-1 15-pin Sub-D socket

Pin	RS232	TTY	General
1	Screening		
2	–	RxD–	RxD–
3	RxD	–	–
4	TxD	–	–
5	CTS	–	–
6	–	TxD+	–
7	–	TxD–	RTS
8	Screening		
9	–	RxD+	–
10	RTS	–	–
11	–	+20 mA	–
12	GND		
13	–	+20 mA	–
14	+5 V/100 mA		
15	GND		

IF1B

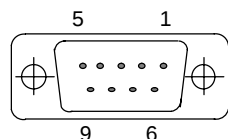


Table B-2 9-pin Sub-D socket (configuration via switch, see Page 9-10)

Pin	RS422	RS485 / PROFIBUS-DP / MPI
1	N. c.	
2	N. c.	
3	TxD+	Data B
4	RxD+	–
5	GND (floating)	GND (floating)
6	+5 V (floating)	+5 V (floating)
7	N. c.	
8	TxD–	Data A
9	RxD–	–

IF2

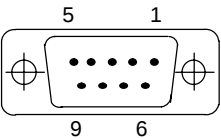


Table B-3 9-pin Sub-D plug (pin)

Pin	RS232
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

System Messages

In this chapter

This chapter contains a selection of important system messages for Windows-based systems. The table indicates when the messages occur and how they, or their cause, can be cleared. Not every message is relevant for each operating unit.

System message parameters

The system messages may contain parameters which are not decoded for the user but which are relevant in respect of the cause of an error since they provide a reference to the source code from ProTool/Pro Runtime. These parameters are issued according to the text "Error code:"

Notice

System messages are issued in the language currently set on the operating unit.

Number	Effect/Cause	Remedy
10000	The print job could not be started or was terminated for an unknown reason. The printer is incorrectly configured. Or: There are no rights for a network printer available.	Configure the printer again. Initiate the assignment of rights for a network printer.
10001	No printer has been installed or no standard printer configured.	Install a printer and/or mark one as standard printer.
10002	The intermediate buffer for printing graphics is full. Up to two graphics can be buffered.	Do not issue print jobs so quickly in succession.
10003	Graphics can be buffered again.	—
10004	The intermediate buffer for printing lines in text mode (e.g. messages) is full. Up to 1000 lines can be buffered.	Do not issue print jobs so quickly in succession.
10005	Lines of text can be buffered again.	—
10006	The Windows print system reports an error. For information on the cause, refer to the text printed and, if available, the error number. Printing is not performed or it is incorrect.	Repeat the action, if necessary.

Number	Effect/Cause	Remedy
20010	A fault has occurred in the script line called in from the specified script. Execution of the script function was, therefore, terminated. In this case, it is advisable to check any previous system messages too.	Select the specified script line in the configuration. Check tags, whether the types used are permissible. Check Functions, whether the number and types of parameter are correct.
20011	An error has occurred in a script called in by the script specified. Execution of the script function has, therefore, been terminated in the subscript. In this case, it is advisable to check any previous system messages too.	Select the scripts from the configuration which were directly or indirectly called in via the specified script. Check tags, whether the types used are permissible. Check Functions, whether the number and types of parameter are correct.
20012	Inconsistent configuration data is present. Therefore, the script could not be created.	Compile the configuration again.
20013	VBScript.dll is not correctly installed. Therefore, no scripts can be executed.	Re-install ProTool/Pro RT.
20014	A value is returned by the script function which is not written in any configured return tag.	Select the specified script in the configuration. Check whether the script name has been assigned a value.
20015	Too many scripts have been triggered in quick succession. If more than 20 scripts are queued to be processed, any subsequent scripts are rejected. In this case, the script indicated in the message is not executed.	Check where the scripts are being triggered from. Extend the times, e.g. the polling time of the tags, which trigger the scripts.
30010	The tag could not accept the function result, e.g. in the case of exceeding the value range.	Check the tag type of the function parameter.
30011	A function could not be executed because the function was assigned an invalid value or type in the parameter.	Check the parameter value and tag type of the invalid parameter. If a tag is used as a parameter, check its value.
40010	The function could not be executed since the parameters could not be converted to a common tag type.	Check the parameter types in the configuration.
40011	The function could not be executed since the parameters could not be converted to a common tag type.	Check the parameter types in the configuration.
50000	The operating unit receives data faster than it is capable of processing. Therefore, no further data is received until the data currently available has been processed. Data exchange then resumes.	—
50001	Data exchange has been resumed.	—

Number	Effect/Cause	Remedy
60000	This message is generated by the function "Display system messages". The text to be displayed is transferred to the function as a parameter.	–
60010	The file could not be copied in the direction defined because one of the two files is currently open or the source/target path is not available. It is possible that the Windows NT user has no access rights to one of the two files.	Restart the function or check the paths of the source/target files. Using Windows NT with NTFS: The user executing ProTool/Pro RT must be granted access rights for the files.
60011	An attempt was made to copy a file to itself. It is possible that the Windows NT user has no access rights to one of the two files.	Check the path of the source/target file. Using Windows NT with NTFS: The user executing ProTool/Pro RT must be granted access rights for the files.
70010	The application could not be started because it could not be found in the path specified or insufficient memory space was available.	Check whether the application exists in the specified path or close other applications.
70011	The system time could not be modified. Possible causes: • an impermissible time was transferred in the PLC job, • the Windows NT user has no user rights to modify the system time.	Check the time which is to be set. Under Windows NT: The user executing ProTool/Pro RT must be assigned the rights to modify the system time from Windows NT (administration/user manager, guidelines).
70012	An error occurred when executing the function "Exit Runtime" with the option "Exit also Windows". Windows and ProTool/Pro RT are not terminated. A possible cause is that other applications cannot be terminated.	Terminate all applications currently running. Then terminate Windows.
70013	The system time could not be modified because an invalid value was entered. Incorrect separators may have been used.	Check the time which is to be set.
70014	The system time could not be modified. Possible causes: • an impermissible time was transferred • the Windows NT user has no user rights to modify the system time, • Windows rejects the setting request.	Check the time which is to be set. Under Windows NT: The user executing ProTool/Pro RT must be assigned the rights to modify the system time from Windows NT (administration/user manager, guidelines).
70015	The system time could not be read because Windows rejects the reading function.	–
70016	An attempt was made to select a screen by means of a function or job. This is not possible because the screen number specified does not exist. Or: a screen could not be generated due to insufficient system memory.	Check the screen number in the function or job with the screen numbers configured. Refer the number to a screen, if necessary.

Number	Effect/Cause	Remedy
70017	Date/Time is not read from the area pointer because the address set in the PLC is either not available or has not been set up.	Change the address or set up the address in the PLC.
70018	Acknowledgement that the password list has been successfully imported.	–
70019	Acknowledgement that the password list has been successfully exported.	–
70020	Acknowledgement for activation of message recording.	–
70021	Acknowledgement for deactivation of message recording.	–
70022	Acknowledgement to starting the "Import Password List" action.	–
70023	Acknowledgement to starting the "Export Password List" action.	–
80001	The archive specified is filled to the size defined (in percent) and must be stored elsewhere.	Store the file or table by executing a 'move' or 'copy' function.
80002	A line is missing in the specified archive.	–
80003	The copying process for archiving was not successful. In this case, it is advisable to check any subsequent system messages, too.	–
80006	Since archiving is not possible, this causes a permanent loss of the functionality.	In the case of databases, check whether the corresponding data source exists and start up the system again.
80009	A copying action has been completed successfully.	–
80010	Since the path was incorrectly entered in ProTool, this causes a permanent loss of the functionality.	Configure the path for the respective archive again and restart the system when the full functionality is required.
80012	Archive values are stored in a buffer. If the values are read to the buffer faster than they can be physically written (e.g. using a hard disk), overloading may occur and recording is then stopped.	Archive less values. Or increase the recording interval.
80013	The overload status no longer applies. Archiving resumes the recording of all values.	–
80014	The same action was triggered twice in quick succession. Since the process is already in operation, the action is only carried out once.	–
80016	The archives are separated by the function <i>Close archive</i> and the incoming entries exceed the defined buffer size. All the jobs in the buffer are deleted.	Reconnect the archives.

Number	Effect/Cause	Remedy
80017	The incoming entries cause the defined buffer size to be exceeded. This can be caused, e.g. by several copying actions being activated at the same time. All the copy jobs in the buffer are deleted.	Terminate the copy process.
80018	All the archives are reconnected by means of the DB layer, e.g. after executing the function <i>Open_archive</i> . Values are then written back into the tables.	–
80019	All the archives are separated from the DB layer and all connections terminated, e.g. after executing the function <i>Close_archive</i> . Values are temporarily buffered and written in the tables when the connection is re-established. There is no connection to the storage medium and a change can take place.	–
80020	The max. number of simultaneously activated copy actions has been exceeded. Copying is not executed.	Wait until the current copying actions have been completed and restart the last copy action.
80021	An attempt was made to delete an archive which is still involved with a copy action. Deletion has not been executed.	Wait until the current copying action has been completed and restart the last action.
80022	An attempt was made to start a sequence archive, which is not a sequence archive, from an archive using the function <i>Start_sequence_archive</i> . No sequence archive is created.	Check the project for the following: - the function <i>Start_sequence_archive</i> is correctly configured. - the variable parameters are being correctly provided at the operating unit.
80023	An attempt was made to copy an archive to itself. The archive is not copied.	Check the project for the following: - the function <i>Copy_archive</i> is correctly configured. - the variable parameters are being correctly provided at the operating unit.
80024	The function <i>Copy_archive</i> is configured not to permit copying when the target archive already contains data (Parameter: <i>Write mode</i>). The archive is not copied.	Modify the function <i>Copy_archive</i> in the project, if necessary. Before initiating the function, delete the target archive.
80025	The copy action is interrupted. Data written up to this point is retained. Deletion of the target table (if configured) is not executed. The cancellation is documented by an error entry <i>\$RT_ERR\$</i> at the end of the target table.	–

Number	Effect/Cause	Remedy
80026	The message is issued after all the archives have been successfully initialized. Values are written in the archives from this moment on. Prior to this, no values are archived even though the runtime software is operating.	–
80027	The internal Flash memory has been specified as the memory location for an archive. This is not permissible. No values will be archived for this archive and the archive will not be created.	Configure "Storage Card" as the memory location or a network path.
80028	The message serves as a status acknowledgment that initialization of the archives is currently running. No values are archived until system message 80026 is issued.	–
80029	The number of archives specified in the message could not be initialized. Initialization of the archives has been completed. The faulty archives are not available for archiving jobs.	Evaluate the additional system message, related to this message, which is also issued. Check the configuration, the ODBC (Open Database Connectivity) and the specified drive.
110000	The operating mode status has been changed. The operating mode is now <i>offline</i> .	–
110001	The operating mode status has been changed. The operating mode is now <i>online</i> .	–
110002	The operating mode status has not been changed.	Check the connection to the PLCs. Check whether the address area for the area pointer "Coordination" in the PLC is available.
110003	The operating status of the PLC specified is changed by the function <i>Connect/Disconnect PLC</i> . The operating mode is now <i>offline</i> .	–
110004	The operating status of the PLC specified is changed by the function <i>Connect/Disconnect PLC</i> . The operating mode is now <i>online</i> .	–
110005	An attempt was made to use the function <i>Connect/Disconnect PLC</i> to switch the specified PLC to operating mode <i>online</i> although the entire system is in operating mode <i>Offline</i> . This switch-over is not permissible. The PLC remains in operating mode <i>offline</i> .	Switch the complete system to operating mode <i>online</i> and execute the function again.
120000	The trend is not displayed because an incorrect axis to the trend, or incorrect trend, has been configured.	Change the configuration.
120001	The trend is not displayed because an incorrect axis to the trend, or incorrect trend, has been configured.	Change the configuration.

Number	Effect/Cause	Remedy
120002	The trend is not displayed because the tag assigned tries to access an invalid PLC address.	Check whether the data area for the tag exists in the PLC, the configured address is correct or the value range for the tag is correct.
130000	The action was not executed.	Close other applications. Delete files no longer required from the hard disk.
130001	The action was not executed.	Delete files no longer required from the hard disk.
130002	The action was not executed.	Close other applications. Delete files no longer required from the hard disk.
130003	No target data carrier is inserted. The process is stopped.	Check, for example, whether: • access has been made to the correct data carrier • the data carrier has been inserted
130004	The target data carrier is write-protected. The process is stopped.	Check whether access has been made to the correct data carrier. Remove the write protection.
130005	The file is write-protected. The process is stopped.	Check whether access has been made to the correct file. Modify the file attributes, if necessary.
130006	No access to file is possible. The process is stopped.	Check, for example, whether: • access has been made to the correct file • the file exists • a different action prevents simultaneous access to the file
140000	Online connection to the PLC has been successfully established.	–
140001	Online connection to the PLC has been disconnected.	–
140003	No tag updating or writing is executed.	Check the connection and whether the PLC is switched on. Check the parameter definitions in the Control Panel using "Set PU/PC interface". Restart the system.
140004	No tag updating or writing is executed because the access point or the subrack configuration is incorrect.	Check the connection and whether the PLC is switched on. Check the access point or the subrack configuration (MPI, PPI, PROFIBUS) in the Control Panel with "Set PU/PC interface". Restart the system.

Number	Effect/Cause	Remedy
140005	No tag updating or writing is executed because the address of the operating unit is incorrect (possibly too high).	Use a different operating unit address. Check the connection and whether the PLC is switched on. Check the parameter definitions in the Control Panel using "Set PU/PC interface". Restart the system.
140006	No tag updating or writing is executed because the baud rate is incorrect.	Select a different baud rate in ProTool/Pro (according to subrack, profile, communication peer, etc.).
140007	No tag updating or writing is executed because the bus profile is incorrect (see %1). The following parameters could not be entered in the registry: 1: Tslot 2: Tqui 3: Tset 4: MinTsdr 5: MaxTsdr 6: Trdy 7: Tid1 8: Tid2 9: Gap Factor 10: Retry Limit	Check the user defined bus profile. Check the connection and whether the PLC is switched on. Check the parameter definitions in the Control Panel using "Set PU/PC interface". Restart the system.
140008	No tag updating or writing is executed because the configuration data is incorrect: The following parameters could not be entered in the registry: 0: General errors 1: Incorrect version 2: Profile cannot be entered in the registry. 3: Sub-network type cannot be entered in the registry. 4: Target rotation time cannot be entered in the registry. 5: Highest address (HSA) incorrect.	Check the connection and whether the PLC is switched on. Check the parameter definitions in the Control Panel using "Set PU/PC interface". Restart the system.
140009	No tag updating or writing is executed because the module for the S7 communication was not found.	Re-install the module in the Control Panel using "Set PU/PC interface".
140010	No S7 communication peer could be found because the PLC is switched off. DP/T: The option "Is not active as the only master" is set in the Control Panel under "Set PU/PC interface".	Switch the PLC on. DP/T: If only one master is connected to the network, deactivate the option "Is not active as the only master" in "Set PU/PC interface". If the network has more than one master, switch this master on. Do not modify any settings here, otherwise a bus fault may occur.
140011	No tag updating or writing is executed because communication is interrupted.	Check the connection and that the communication peer is switched on.

Number	Effect/Cause	Remedy
140012	There is an initialization problem (e.g. when ProTool/Pro RT has been terminated in the Task Manager). Or: another application (e.g. STEP7, WINCC) is active with different bus parameters and the driver cannot be started with the new bus parameters (e.g. baud rate).	Restart the operating unit. Or start ProTool/Pro RT first and then the other applications.
140013	The MPI cable is not plugged in and, thus, there is no power supply.	Check the connections.
140014	–	Modify the operating unit address in the configuration in <i>PLC</i> .
140015	Incorrect baud rate Or: incorrect bus parameter (e.g. HSA) Or: OP address HSA Or: incorrect interrupt vector (interrupt does not arrive at the driver)	Correct the incorrect parameters.
140016	–	Change the interrupt number.
140017	–	Change the interrupt number.
150000	No more data is read or written. Possible causes: • The cable is defective. • The PLC does not respond, is defective, etc. • Connection is established via the wrong interface. • The system is overloaded.	Check that the cable is plugged in, the PLC is operational, the correct interface is used. Reboot the system if the system message is displayed continuously.
150001	Connection is re-established because the cause of the interruption has been eliminated.	–
160000	No more data is read or written. Possible causes: • The cable is defective. • The PLC does not respond, is defective, etc. • Connection is established via the wrong interface. • The system is overloaded.	Check that the cable is plugged in, the PLC is operational, the correct interface is used. Reboot the system if the system message is displayed continuously.
160001	Connection is re-established because the cause of the interruption has been eliminated.	–
160010	There is no connection to the server because the server identification (CLS-ID) cannot be established. Values cannot be read or written.	Check the access rights.

Number	Effect/Cause	Remedy
160011	There is no connection to the server because the server identification (CLS-ID) cannot be established. Values cannot be read or written.	Check, for example, whether: - the server name is correct - the computer name is correct - the server is registered
160012	There is no connection to the server because the server identification (CLS-ID) cannot be established. Values cannot be read or written.	Check, for example, whether: - the server name is correct - the computer name is correct - the server is registered Information for experienced users: Interpret the value from HRESULT.
160013	The specified server was started as InProc Server. This has not been released and may possibly lead to incorrect behavior because the server is running in the same process area as the ProTool/Pro RT runtime software.	Configure the server as OutProc Server or Local Server.
170000 ¹⁾	S7 diagnostics messages are not displayed because it is not possible to logon to the S7 diagnostics with this unit. The service program is not supported.	–
170001 ¹⁾	The S7 diagnostics buffer cannot be displayed because communication with the PLC has been switched off.	Switch the PLC <i>online</i>
170002 ¹⁾	The S7 diagnostics buffer cannot be displayed because reading in the diagnostics buffer (SZL) was terminated due to an error.	–
170003 ¹⁾	The display of an S7 diagnostics message is not possible. An internal error %2 has been reported.	–
170004 ¹⁾	The display of an S7 diagnostics message is not possible. An internal error with error class %2, error number %3 has been reported.	–
170007 ¹⁾	It is not possible to read in the S7 diagnostics buffer (SZL) because it was terminated with an internal error with error class %2 and error code %3.	–
180000	A component/OCX receives configuration data with a version identification which is not supported.	Install a newer component.
180001	The system is overloaded because too many actions have been activated simultaneously. Not all the actions can be executed, some are rejected.	- Increase the configured cycle times or basic clock. - Generate the messages slower (polling). - Trigger the scripts and functions at greater intervals. - If the message appears more frequently: Restart the operating unit.

Number	Effect/Cause	Remedy
180002	The screen keyboard could not be activated. Possible causes: - The screen keyboard is not generally supported under Windows 95. - The file "TouchInputPC.exe" was not registered due to an incorrectly executed Setup.	If Windows 95 is not available: Install the runtime software again.
190000	It is possible that the tag will not be updated.	–
190001	The tag is updated following an error status after the cause of the last error state has been eliminated (return to normal operation).	–
190002	The tag is not updated because communication to the PLC has been switched off.	Switch on communication via the function "Set Online".
190004	The tag is not updated because the configured address is not available for this tag.	Check the configuration.
190005	The tag is not updated because the configured PLC type does not exist for this tag.	Check the configuration.
190006	The tag is not updated because it is not possible to map the PLC type in the tag type.	Check the configuration.
190007	The tag values are not modified because the connection to the PLC has been terminated or the tag is offline.	Switch <i>Online</i> or re-establish connection to the PLC.
190008	The threshold values configured for the tag have been violated, e.g. by - an entered value, - a function, - a script.	Observe the configured or current threshold value of the tag.
190009	An attempt has been made to assign a value to a tag which is outside the value range permitted for this type. E.g. a value of 260 entered for a byte tag or a value of -3 for a signless word tag.	Observe the value range for the tag type.
190010	The tag is described with values too often (e.g. in a loop triggered by a script). Values are lost because the maximum of 100 event have been stored in the buffer.	Increase the time interval between the multi-writing tasks.
190011	Possible causes: - The value entered could not be written to the configured PLC tag because it was either above or below the value range. The input is rejected and the original value is reset. - Connection to the PLC has been interrupted.	Ensure that the value entered is within the value range of the PLC tags. Check the connection to the PLC.

Number	Effect/Cause	Remedy
190012	It is not possible to convert a value from a source format to a target format, e.g.: • A value should be assigned to a counter which is outside the valid, PLC-dependent value range. • A tag of the type <i>Integer</i> should be assigned a value of the type <i>String</i>.	Check the value range or type of the variable.
190100	The area pointer is not updated because the configured address for this area pointer is not available. Type: 1 Event messages 2 Alarm messages 3 PLC acknowledgment 4 Operating unit acknowledgment 5 LED assignment 6 Trend request 7 Trend transfer 1 8 Trend transfer 2 No.: is the consecutive number displayed in ProTool/Pro.	Check the configuration.
190101	The area pointer is not updated because it is not possible to map the PLC type in the area pointer type. Parameter type and no.: See message 190100	–
190102	The area pointer is updated following an error status after the cause of the last error state has been eliminated (return to normal operation). Parameter type and no.: See message 190100	–
200000	Coordination is not executed because the address configured in the PLC does not exist/has not been set up.	Change the address or set up the address in the PLC.
200001	Coordination is not executed because the address configured in the PLC cannot be written.	Change the address or set up the address in the PLC in an area which can be written.
200002	Coordination is not carried out at the moment because the address format of the area pointer does not match the internal storage format.	Internal error
200003	Coordination can be executed again because the last error status has been eliminated (return to normal operation).	–
200004	It is possible that coordination is not executed.	–

Number	Effect/Cause	Remedy
200005	No more data is read or written. Possible causes: • The cable is defective. • The PLC does not respond, is defective, etc. • The system is overloaded.	Check that the cable is connected and the PLC is in order. Reboot the system if the system message is displayed continuously.
210000	Jobs are not processed because the address configured in the PLC does not exist/has not been set up.	Change the address or set up the address in the PLC.
210001	Jobs are not processed because the address configured in the PLC cannot be written to/read from.	Change the address or set up the address in the PLC in an area which can be written to/read from.
210002	Commands are not executed because the address format of the area pointer does not match the internal storage format.	Internal error
210003	The job mailbox is processed again because the last error status has been eliminated (return to normal operation).	–
210004	It is possible that the job mailbox is not processed.	–
210005	A PLC job was triggered by an impermissible number.	Check the PLC program.
210006	A fault occurred while attempting to execute the PLC job. The PLC job is, therefore, not executed. Observe the subsequent/previous system message, if appropriate.	Check the parameter types in the PLC job. Compile the configuration again.
220000 ²⁾	See footnote	See footnote
220001	The tag is not downloaded because the associated channel/the unit does not support downloading the data type bool/bit.	Change the configuration.
220002	The tag is not downloaded because the associated channel/the unit does not support downloading the data type byte.	Change the configuration.
220003	The associated driver could not be uploaded. It is possible that the driver is not installed.	Install the driver by re-installing ProTool/Pro RT.
220004	Communication is terminated and no update is executed because the cable is not connected or is defect etc.	Check the connection.
220005	Communication is running.	–
220006	The connection is established to the specified PLC at the specified interface.	–

Number	Effect/Cause	Remedy
220007	The connection to the specified PLC at the specified interface is disconnected.	Check that: - the cable is plugged in - the PLC is OK - the correct interface is used - the configuration is OK (interface parameters, protocol settings, PLC address). Reboot the system if the system message is displayed continuously.
220008	The PLC driver cannot access the specified interface or open it. It is possible that another application is using this interface or an interface is used which is not available on the target device. There is no communication with the PLC.	Terminate all the programs which access the interface and reboot the computer. Use another interface which is available in the system.
230000	The value entered could not be accepted. The entered value is rejected and the previous value is specified again. Either the value range has been exceeded or impermissible characters were entered.	Enter a permissible value.
230002	Since the current password level is inadequate or the password dialog box was closed with ESC, the entry is rejected and the previous value is specified again.	Activate an adequate password level using Login.
230003	Changeover to the specified screen is not executed because the screen is not available/configured. The current screen remains selected.	Configure the screen. Check the selection function.
240000 ³⁾	Runtime is operating in Demo mode. There is either no Stopcopy license or it is defect.	Load the license.
240001 ³⁾	Runtime is operating in Demo mode. Too many tags are configured for the installed version.	Load an adequate license / powerpack.
240002 ³⁾	Runtime is operating with a time-limited standby authorization.	Restore the full authorization.
240003	Authorization cannot be executed. ProTool/Pro RT is running in Demo mode.	Restart ProTool/Pro RT or reinstall it.
240004	Error during reading the standby authorization. ProTool/Pro RT is running in Demo mode.	Restart ProTool/Pro RT, install the authorization or repair the authorization (see Commissioning Instructions Software Protection).
250000	The tag in the specified line in Status/Control is not updated because the address configured for this tag is not available.	Check the set address and then check that the address has been set up in the PLC.
250001	The tag in the specified line in Status/Control is not updated because the PLC type configured for this tag is not available.	Check the set address.

Number	Effect/Cause	Remedy
250002	The tag in the specified line in Status/Control is not updated because it is not possible to map the PLC type in the tag type.	Check the set address.
250003	No connection could be established to the PLC. The tags will not be updated.	Check the connection to the PLC. Check that the PLC is switched on and <i>online</i> is activated.
260000	A password has been entered which is unknown to the system. Therefore, the lowest password level has been set. This corresponds to the status following <i>Logout</i> .	Enter a known password in the password input field (with corresponding level).
260001	A password has been entered whose assigned level does not permit execution of the function. The password level currently set is displayed for information purposes.	Modify the password level in the password input field enter a password with a sufficiently high level.
270000	A tag is not displayed in the message because it attempts to access an invalid address in the PLC.	Check whether the data area for the tag exists in the PLC, the configured address is correct or the value range for the tag is correct.
270001	There is a unit-dependent limit as to how many messages may be queued simultaneously in order to be displayed (see GHB). This limit has been exceeded. The display no longer contains all the messages. However, all the messages are recorded in the message buffer.	–
270002	Messages are displayed from an archive are displayed for which there is no data in the current project. Placeholders are issued for the messages.	Delete older archive files, if necessary.
280000	Connection is re-established because the cause of the interruption has been eliminated.	–
280001	No more data is read or written. Possible causes: • The cable is defective. • The PLC does not respond, is defective, etc. • Connection is established via the wrong interface. • The system is overloaded.	Check that the cable is plugged in, the PLC is operational, the correct interface is used. Reboot the system if the system message is displayed continuously.
280002	A connection is used which requires a function module in the PLC. The function block has replied. Communication can now proceed.	–

Number	Effect/Cause	Remedy
280003	A connection is used which requires a function module in the PLC. The function block does not reply.	Check that the cable is plugged in, the PLC is operational, the correct interface is used. Reboot the system if the system message is displayed continuously. The remedy is dependent on the error code: 1: The function block must set the COM bit in the response container. 2: The function block may not set the ERROR bit in the response container 3: The function block must respond within the specified time (timeout) 4: Establish an online connection to the PLC
280004	The online connection to the PLC has been interrupted. There is no data exchange at present.	Check the PLC parameters in ProTool Pro: baud rate, block length, station address. Check that the cable is plugged in, the PLC is operational, the correct interface is used. Reboot the system if the system message is displayed continuously.
290000	The tag could not be read or written. It is assigned the start value. The message can be entered in the message buffer for up to four more failed tags, if necessary. After that, the message number 290003 is issued.	Check in the configuration that the address has been set up in the PLC.
290001	An attempt has been made to assign a value to a tag which is outside the value range permitted for this type. The message can be entered in the message buffer for up to four more failed tags, if necessary. After that, the message number 290004 is issued.	Observe the value range for the tag type.
290002	It is not possible to convert a value from a source format to a target format. The message can be entered in the message buffer for up to four more failed tags, if necessary. After that, the message number 290005 is issued.	Check the value range or type of the variable.
290003	This message is issued when message number 290000 is triggered more than five times. In this case, no further individual messages are generated.	Check in the configuration that the tag addresses have been set up in the PLC.
290004	This message is issued when message number 290001 is triggered more than five times. In this case, no further individual messages are generated.	Observe the value range for the tag type.

Number	Effect/Cause	Remedy
290005	This message is issued when message number 290002 is triggered more than five times. In this case, no further individual messages are generated.	Check the value range or type of the variable.
290006	The threshold values configured for the tag have been violated by values entered.	Observe the configured or current threshold value of the tag.
290007	There is a difference between the source and target structure of the recipe currently being processed. The target structure contains an additional data record tag which is not available in the source structure. The data record tag specified is assigned its start value.	Insert the specified data record tag in the source structure.
290008	There is a difference between the source and target structure of the recipe currently being processed. The source structure contains an additional data record tag which is not available in the target structure and therefore cannot be assigned. The value is rejected.	Remove the specified data record tag in the specified recipe from the project.
290010	The storage location configured for the recipe is not permitted. Possible causes: Impermissible characters, write protected, data medium full or does not exist.	Check the path specification configured.
290011	The data record specified by the number does not exist.	Check the source for the number (constant or variable value).
290012	The recipe specified by the number does not exist.	Check the source for the number (constant or variable value).
290013	An attempt was made to save a data record under a data record number which already exists. The process is not executed.	• Check the source for the number (constant or variable value). • Delete the data record beforehand. • Change the function parameter "Overwrite".
290014	The file specified to be imported could not be found.	• Check the file name. • Ensure that the file is in the specified directory.
290020	Acknowledgement that downloading of data records from operating unit to PLC has started.	—
290021	Acknowledgement that downloading of data records from operating unit to PLC has been completed without any errors.	—

Number	Effect/Cause	Remedy
290022	Acknowledgement that downloading of data records from operating unit to PLC has been terminated due to an error.	Check the configuration: • have the tag addresses been set up in the PLC? • does the recipe number exist? • does the data record number exist? • has the function parameters "Overwrite"?
290023	Acknowledgement that downloading of data records from the PLC to the operating unit has started.	–
290024	Acknowledgement that downloading data records from the PLC to the operating unit has been completed without any errors.	–
290025	Acknowledgement that downloading of data records from the PLC to the operating unit has been terminated due to an error.	Check the configuration: • have the tag addresses been set up in the PLC? • does the recipe number exist? • does the data record number exist? • has the function parameters "Overwrite"?
290026	An attempt has been made to read/write a data record although the data mailbox is not free at present. This error may occur in the case of recipes for which downloading with synchronization has been configured.	Set the data mailbox status to zero.
290027	No connection to the PLC can be established at present. Therefore, the data record can neither be read nor written. Possible causes: No physical connection to the PLC (no cable plugged in, cable is defect) or the PLC is switched off.	Check the connection to the PLC.
290030	This message is issued after reselecting a screen that contains a recipe display in which a data record has already been selected.	Reload the data record from the data medium or retain the current values.
290031	While saving, it was detected that a data record with the specified number already exists.	Overwrite the data record or cancel the process.
290032	While exporting data records, it was detected that a file with the specified name already exists.	Overwrite the file cancel the process.
290033	Confirmation request before deleting data records.	–

Number	Effect/Cause	Remedy
290040	A data record error with error code %1 has occurred which cannot be described in more detail. The action was canceled. It might be that the data mailbox has not been installed correctly on the PLC.	Check that the data carrier, the data record, the data mailbox and, if necessary, the connection to the PLC. Trigger the action again after waiting a short period. If the error occurs again, please contact the Customer Support. Specify the error code displayed.
290041	A data record or file cannot be saved because the data medium is full.	Delete files no longer required.
290042	An attempt was made to execute several receipt actions simultaneously. The last action was not executed.	Trigger the action again after waiting a short period.
290044	The data store for the recipe has been destroyed and will be deleted.	—
290050	Acknowledgement that the exportation of data records has started.	—
290051	Acknowledgement that the exportation of data records has been completed successfully.	—
290052	Acknowledgement that the exportation of data records has been terminated due to errors.	Ensure that the structure of the data records on the data medium and the current recipe structure on the operating unit are identical.
290053	Acknowledgement that the importation of data records has been started.	—
290054	Acknowledgement that the importation of data records has been completed successfully.	—
290055	Acknowledgement that the importation of data records has been terminated due to errors.	Ensure that the structure of the data records on the data medium and the current recipe structure on the operating unit are identical.
290056	The value in the specified line/column could not be read/written without errors. The action was canceled.	Check the specified line/column.
290057	The tags of the recipe specified have been switched from operating mode "offline" to "online". Each modification of a tag in this recipe is now immediately transferred to the PLC.	—
290058	The tags of the recipe specified were switched from operating mode "online" to "offline". Modifications to tags in this recipe are no longer immediately transferred to the PLC but must be transferred there explicitly by means of downloading a data record, if necessary.	—
290059	Acknowledgement that the specified data record has been stored successfully.	—

Number	Effect/Cause	Remedy
290060	Check-back message that the data record memory has been successfully erased.	–
290061	Check-back message, that erasing the data record memory was aborted with errors.	–
300000	Process monitoring (e.g. using PDiag or S7-Graph) has been incorrectly programmed: More messages are queued than specified in the technical data of the CPU. No further ALARM_S messages can be managed by the CPU and reported to operating systems.	Change the CPU configuration.
310000	An attempt is being made to print too many protocols simultaneously. Since only one protocol can be printed at a time, the print job is rejected.	Wait until printout of the last active protocol has been concluded. Repeat the print job, if necessary.
310001	An error occurred on triggering the printer. The protocol is either not printed or printed with errors.	Evaluate the additional system message, related to this message, which is also issued. Repeat the print job, if necessary.
320000	The movements have already been indicated by another device. The movements can no longer be served.	Select the movements on the other display units and select the movement screen on the required display unit.
320001	The network is too complex. The defective operands cannot be displayed.	Display the network in AWL.
320002	No diagnostics-capable alarm messages have been selected. The units related to the alarm messages could not be selected.	Select a diagnostics-capable alarm message in the message screen ZP_ALARM.
320003	No alarm messages exist in respect of the selected unit. No network can be displayed in the detail display.	Select the defective unit in the general view screen.
320004	The required signal statuses could not be read by the PLC. The defective operands cannot be established.	Check the consistency between the configuration on the display unit and the PLC program loaded.
320005	The project contains ProAgent partitions which are not installed. No ProAgent diagnostics can be performed.	In order to run the project, install the ProAgent option packet.

- 1) The optional parameter %1 at the start of the message may contain an identification for the S7 connection when several S7s are in parallel operation and are connected to diagnostics equipment.
- 2) A WinCC channel provides the message texts via an interface. This text is issued via this message. ProTool/Pro RT has no influence on this texts.
- 3) The specified text comes from the component resources.

Procedure in the case of “internal errors”

Please proceed as follows in the case of all system messages related to “internal errors”:

1. Start up the operating unit again.
2. Download the configuration again.
3. Switch the operating unit off, stop the PLC and then restart both.
4. If the error occurs again, please contact the SIMATIC Customer Support. Make reference to the specified error number and message tags.

ESD Guidelines

What does ESD mean?

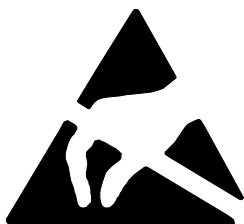
Virtually all present-day modules incorporate highly integrated MOS devices or components. For technological reasons, these electronic components are very sensitive to overvoltages and consequently therefore to electrostatic discharge:

These devices are referred to in German as Elektrostatisch Gefährdeten Bauelemente/ Baugruppen: "EGB"

The more frequent international name is:

"ESD" (Electrostatic Sensitive Device)

The following symbol on plates on cabinets, mounting racks or packages draws attention to the use of electrostatic sensitive devices and thus to the contact sensitivity of the assemblies concerned:



ESDs may be destroyed by voltages and energies well below the perception threshold of persons. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged . Devices exposed to such overvoltages cannot immediately be detected as defective in the majority of cases since faulty behavior may occur only after a long period of operation.

Precautions against electrostatic discharge

Most plastics are capable of carrying high charges and it is therefore imperative that they be kept away from sensitive components.

When handling electrostatic sensitive devices, make sure that persons, workplaces and packages are properly grounded.

Handling ESD assemblies

A general rule is that assemblies should be touched only when this cannot be avoided owing to the work that has to be performed on them. Under no circumstances should you handle printed-circuit boards by touching device pins or circuitry.

You should touch devices only if

- you are grounded by permanently wearing an ESD wrist strap or
- you are wearing ESD shoes or ESD shoe-grounding protection straps in conjunction with an ESD floor.

Before you touch an electronic assembly, your body must be discharged. The simplest way of doing this is to touch a conductive, grounded object immediately beforehand – for example, bare metal parts of a cabinet, water pipe etc.

Assemblies should not be brought into contact with charge-susceptible and highly insulating materials such as plastic films, insulating table tops and items of clothing etc. containing synthetic fibers.

Assemblies should be deposited only on conductive surfaces (tables with an ESD coating, conductive ESD cellular material, ESD bags, ESD shipping containers).

Do not place assemblies near visual display units, monitors or television sets (minimum distance to screen > 10 cm).

Measuring and modifying ESD assemblies

Perform measurements on ESD assemblies only when

- the measuring instrument is grounded – for example, by means of a protective conductor – or
- the measuring head has been briefly discharged before measurements are made with a potential-free measuring instrument – for example, by touching a bare metal control cabinet.

When soldering, use only grounded soldering irons.

Shipping ESD assemblies

Always store and ship assemblies and devices in conductive packing – for example, metallized plastic boxes and tin cans.

If packing is not conductive, assemblies must be conductively wrapped before they are packed. You can use, for example, conductive foam rubber, ESD bags, domestic aluminum foil or paper (never use plastic bags or foils).

With assemblies containing fitted batteries, make sure that the conductive packing does not come into contact with or short-circuit battery connectors. If necessary, cover the connectors beforehand with insulating tape or insulating material.

SIMATIC HMI Documentation



Target groups

This manual is part of the SIMATIC HMI documentation. The documentation is aimed at the following target groups:

- Newcomers
- Users
- Configurers
- Programmers
- Commissioning engineers

How the documentation is organized

The SIMATIC HMI documentation consists of the following components:

- User's Guides for:
 - Configuration software
 - Runtime software
 - Communication between PLCs and operating units
- Equipment Manuals for the following operating units:
 - SIMATIC PC
 - MP (Multi Panel)
 - OP (Operator Panel)
 - TP (Touch Panel)
 - TD (Text Display)
 - PP (Push Button Panel)
- Online Help on the configuration software
- Start-up Guides
- First Steps

Overview of complete documentation

The following table provides an overview of the SIMATIC HMI documentation and shows you when you require the different documents.

Documentation	Target Group	Content
First Steps with ProTool Product Brief	Newcomers	This documentation guides you step by step through the configuration of • a screen with various objects • changing from one screen to another • a message. This documentation is available for: • Text-based Displays • Graphics Displays • Touch Panels • Windows-based Systems
ProTool Configuring Windows-based Systems User's Guide	Configurers	Provides information on working with the configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for Windows-based systems.
ProTool Configuring Graphics Displays User's Guide	Configurers	Provides information on working with the configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for graphic display operating units.
ProTool Configuring Text-based Displays User's Guide	Configurers	Provides information on working with the configuration software. It contains • information on installation • basic principles of configuration • a detailed description of configurable objects and functions. This documentation is valid for text-based display operating units.
ProTool Online Help	Configurers	Provides information on the configuration computer while working with ProTool. Online Help contains • context-sensitive help • detailed instructions and examples • detailed information • all the information from the user guide.
ProTool/Pro Runtime User's Guide	Commissioning engineers, Users	Provides information on working with ProTool/Pro Runtime software. It contains • installation of the ProTool/Pro Runtime visualization software • commissioning and running the software on Windows-based systems.

Documentation	Target Group	Content
Copy Protection Start-up Guide	Commissioning engineers, Users	The ProTool/Pro Runtime visualization software is a copyright product. This manual contains information on the installation, repair and uninstallation of authorizations.
Application Example Start-up Guide	Newcomers	ProTool is supplied with example configurations and the corresponding PLC programs. This documentation describes how you • load the examples onto the operating unit and PLC • run the examples and • upgrade the connection to the PLC to suit your own specific application.
SIMATIC Panel PC 670 Equipment Manual	Commissioning engineers, Users	Describes the computer unit and operating unit of the SIMATIC Panel PC 670.
MP370 Equipment Manual MP270 Equipment Manual TP170 A, TP170 B, OP170 B Equipment Manual TP070 Equipment Manual	Commissioning engineers, Users	Describes the hardware and the general operation of Windows-based Panels: • installation and commissioning instructions • a description of the equipment • operating instructions • instructions for connecting the PLC, printer and programming computer, • maintenance instructions.
OP37/Pro Equipment Manual	Commissioning engineers, Users	Describes the hardware, installation and inclusion of upgrades and options for the OP37/Pro.
TP27, TP37 Equipment Manual OP27, OP37 Equipment Manual OP25, OP35, OP45 Equipment Manual OP7, OP17 Equipment Manual OP5, OP15 Equipment Manual TD17 Equipment Manual	Commissioning engineers, Users	Describes the hardware and general operation. It contains • installation and commissioning instructions • a description of the equipment • instructions for connecting the PLC, printer and programming computer, • operating modes • operating instructions • description of the standard screens supplied with the operating unit and how to use them • fitting options • maintenance and fitting of spare parts.
OP3 Equipment Manual	Commissioning engineers, Users, Programmers	Describes the hardware of the OP3, its general operation and the connection to the SIMATIC S7.
PP7, PP17 Equipment Manual	Commissioning engineers, Users	Describes the hardware, installation and commissioning of push-button panels PP7 and PP17.

Documentation	Target Group	Content
Communication User's Guide	Programmers	Provides information on connecting text-based and graphics displays to the following PLCs: • SIMATIC S5 • SIMATIC S7 • SIMATIC 500/505 • drivers for other PLCs This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Communication for Windows-based Systems User's Guide	Programmers	Provides information on connecting Windows-based systems to the following PLCs: • SIMATIC S5 • SIMATIC S7 • SIMATIC 505 • SIMATIC WinAC • drivers for other PLCs This documentation describes the • configuration and parameters required for connecting the devices to the PLC and the network • user data areas used for exchanging data between operating unit and PLC.
Other PLCs Online Help	Programmers	Provides information on connecting devices to PLCs, such as: • Allen Bradley • GE Fanuc • Lucky Goldstar GLOFA GM • Mitsubishi FX • Modicon Modbus • Omron • OPC • Telemecanique When the drives are installed, the relevant Online Help is installed at the same time.
ProAgent for OP User's Guide ProAgent/MP and ProAgent/PC User's Guide	Configurers	Provides the following information about the ProAgent optional package (process diagnosis) • configuring system-specific process diagnosis • detecting, locating the cause of and eliminating process errors, • customizing standard diagnostic screens supplied with the software.

Glossary



Acknowledgement

Acknowledgement of an **alarm message** on the operating unit confirms that it has been noted. After acknowledgement, the message disappears from the operating unit. Alarm messages can be acknowledged either on the operating unit or PLC. Alarm messages can be compiled into groups so that several messages can be acknowledged simultaneously.

Acknowledgement groups

During configuration, several alarm messages can be compiled to form an acknowledgement group. After acknowledging the first message, all the other messages belonging to the same group are simultaneously acknowledged. This enables, for example, acknowledgement of alarm messages for the cause of a fault and all resulting faults (**group acknowledgement**).

Alarm message

Provides information on the operating unit concerning operating errors on the machine or system connected to the **PLC**. The message text may also contain current measured values.

Since alarm messages indicate abnormal operating status, they must be acknowledged.

ALARM_S

Active message procedure by which the CPU issued messages to all the registered network participants. ALARM_S messages are configured in STEP 7.

Analog display

A screen object which displays numeric values by means of a pointer instrument.

Archive

A memory area on a data storage medium in which messages or tags can be stored. The size of the archive is defined in ProTool/Pro CS.

Area pointer

Defines a memory area in the **PLC** for data exchange between the PLC and operating unit.



Bar graphs

Represent values from the **PLC** as rectangular areas. This is a way of displaying filling levels or workpiece numbers, for example, on the operating unit.

Baud rate

Rate of speed at which data is downloaded. Baud rate is specified in Bit/s.

Blanking circuit

Switch off or dim the screen back-lighting.

Boot

A loading process which downloads the operating system in the working memory of the operating unit

Buttons

A virtual button on the operating unit screen. Buttons on operating units with touch screens are contact sensitive.

**Clicking**

Configurable **event** which can trigger a function assigned to a button, for example, when the button is pressed and released (clicked) within the contour of the button.

If the button is pressed using the mouse button or finger (when using touch panels) but moved outside the contour before releasing, the operating unit does not interpret the action as a *click* event.

Clock

Screen object which displays the system time either as digits (digitally) or in the form of a clock (analog).

Combo box

Contains a list of entries from which one can be selected on the operating unit.

Configuration

Definition of basic, system-specific settings, messages and screens using the **ProTool CS** configuration software.

**Data record**

A **recipe** containing data. A recipe can be comprised of several data records. When a data record is downloaded, all the assigned data is transferred to the PLC together and synchronously.

Display message

A screen object with configurable filter criteria which is used to display the volatile **message buffer** or message archive.

Display period

Defines whether and how long a system message is displayed on the operating unit.

Download

The transfer of run-capable project data to the operating unit. Connect the operating unit to the configuration computer with a standard cable beforehand.

Download mode

Operating unit operating mode in which data can be downloaded from the configuration computer to the operating unit (also refer to **Download**).



Event

Functions are triggered by the arrival of defined events. Events can be configured according to the object. Events which can be configured for a button include:

- **Click**
- **Press**
- **Release**

Event message

Provides information on the operating unit concerning the operating statuses of the machine or system connected to the **PLC**. The message text may also contain current measured values.



Fixed window

Window which always appears at the top of the operating unit screen. The content of the fixed window is independent of the screen currently open.

Flash memory

Programmable memory which can be electrically deleted and written to again segment-by-segment.

Function key

Key on the operating unit to which a configurable function can be assigned. A function key with a global function assignment always initiates the same function regardless of the screen currently open. A function key with a local function assignment (**softkey**) can have a different function for each screen.

**Global tag**

This is a process tag linked to the PLC. Global tags have a fixed address in the PLC. The operating unit accesses this address for reading and writing purposes.

Graphics list

A list in which each value relates to a tag assigned to a graphic. This enables, for example, the assigned graphic to be displayed on the operating unit output field instead of the value.

Group acknowledgement

During the configuration, each **alarm message** can be assigned to an **acknowledgement group**. When the alarm message is acknowledged, all the other alarm messages in the same group are simultaneously acknowledged.

**Half Brightness Life**

Time period after which the brightness of the lighting tube only achieves 50% of its original value.

Hardcopy

Represents a printout of the current screen content. Windows called in on top are not printed.

Help text

Configurable, additional information on messages, screens and fields. The help text concerning an alarm message can, for example, contain information on the cause of the fault and methods of elimination.

History trend

After setting a trigger bit that reads all the trend values simultaneously from the PLC, they are displayed as a history trend on the operating unit. History trends are well suited for displaying distinct changes in a trend when the progress of a trend curve is of more interest with regard to its full course (history) than to the individual values.



Icon

Pixel graphic of a fixed size, e.g. assigned to a **softkey**, to identify its function.

Input field

Enables the user to enter values which are subsequently downloaded to the **PLC**.

Invisible buttons

Buttons which are only visible during configuration, not on the operating unit. If invisible buttons are superimposed on components in the process screen, the respective components can be operated by clicking the button with the mouse or pressing them on the touch screen.



Limit value

Configurable values of a tag defining a value range. Attempts to define values outside these limits, may cause the following effects on the operating unit:

- Input field
input is rejected
- Output field
values are displayed in the configured color
- Trend/Bar
values are displayed in the configured color

Local tag

A tag without a link to the PLC. Local tags are only available on the operating unit.

Logout time

Configurable interval of time after which the password level is reset to zero when the operating unit is not used.

**Message arrival**

Time at which a message was triggered by the **PLC** or operating unit.

Message buffer

Memory area in the operating unit in which **message events** can be stored in chronological order as they arrive. Event messages and alarm messages are stored in separate message buffers.

Message departure

Time at which a message was withdrawn by the **PLC**.

Message events

These are stored in chronological order in the operating unit message archive. Message events consist of:

- Message arrival
- Message acknowledgement
- Message departure

Message indicator

A configurable graphical symbol displayed on the operating unit when at least one alarm message is present.

Message logging

Printout of messages parallel to their display on the operating unit display.

Message view

Screen object to display the volatile message buffer and/or message archive.

Multi Panel

Multi-purpose, configurable operating unit with graphic display and Windows CE operating system for operating and monitoring machines and systems.



Normal operation

Operating unit operating mode in which messages are displayed and screens can be operated.



Object

Is a component part of a screen or message. Depending on the object type, objects serve to display or enter texts and values on the operating unit.

Operator Panel

Configurable operating unit for operating and monitoring machines and systems.

Output field

Displays current values from the **PLC** on the operating unit.



Password

A character string which must be entered on the operating unit before a protected function can be activated. Each password is assigned to a defined **password level**.

Password level

The rights to use operating units can be specifically restricted to certain users and user groups. To do this, the individual functions and operating elements are assigned to hierarchically defined password levels. The password level linked to the **password** allocates the rights to execute functions on the operating unit belonging to that level or lower.

Password list

A screen object for entering passwords related to different authorization levels.

PCL

Hewlett Packard printer language (**P**rinter **C**ontrol **L**anguage).

PLC

General term for units and systems with which the operating unit communicates (e.g. SIMATIC S7 or PC).

PLC job

PLC jobs can be used by the **PLC** to trigger functions on the operating unit, e.g. display a screen.

Power-up test

Checks the status of the CPU and memory each time the power is switched on.

Press

Configurable **event** which may trigger a function assigned to a button, for example, as the button is pressed.

Print screen

Printout of a copy of the screen contents.

Process screen

The display of process values and process progress on the operating unit in the form of screens, which may contain graphics, texts and values.

Programmable controller

PLC from the SIMATIC S5 series (e.g. AG S5-115U/135U).

Programmable system

PLC from the SIMATIC S7 series (SIMATIC S7-200/300/400).

ProTool

Full-graphic configuration software for configuring text displays, text-based and graphics operator panels as well as units from the Windows CE range, such as TP170/OP170/MP270/MP370.

ProTool CS

General name for the three configuration software variants **ProTool/Pro CS**, **ProTool** and **ProTool/Lite**.

ProTool/Lite

Full-graphic configuration software for configuring text displays and text-based operator panels, as well as WindowsCE-based units in the 170er product range, such as TP170 A.

ProTool/Pro CS

Full-graphic configuration software for configuring the entire SIMATIC HMI product range and Windows-based systems.



Queued messages

Messages which have been detected as having been received by the operating unit (message event **Arrived**) but for which the message event **Departed** has still not occurred.



Recipe

A combination of tags to a fixed data structure. The data structure configured can be assigned data on the operating unit and is then referred to as a data record. The use of recipes ensures that when a data record is downloaded, all the assigned data is transferred to the PLC together and synchronously.

Recipe view

Screen object to create, edit, store and download **data records**.

Release

Configurable **event** which may trigger a function assigned to a button, for example, as the button is released.

Remaining buffer

Configurable size of the message buffer. In the case of a buffer overflow, the operating unit deletes message events until the configured remaining buffer capacity is reached.

RS232

Standard interface for serial data transmission with defined voltage levels. Sender and receiver are electrically connected.

RS485

Standard interface for serial data transmission with very high transmission rates.

Runtime software

The program visualization software SIMATIC ProTool/Pro RT with which the project created using ProTool CS can be run on your Windows-based system.

**Screen**

A screen displays all the logically related process data on the operating unit, whereby the individual values can be modified. Screens are composed of static and dynamic parts. Static parts refer to text and graphics, dynamic parts to input and output fields.

Selection field

Contains a list of entries from which one can be selected on the operating unit.

Slider controls

Screen object for entering and displaying numeric values in analog form.

Softkey

Function key on the operating unit with a local function assignment. The function triggered by a softkey varies according to the screen currently open.

Start screen

The first screen which automatically appears after the operating unit has started up.

Status button

A status button is a display and operating element with two possible states: **ON** and **OFF**, i.e. **touched** and **untouched**. Both states can be configured for display with text or graphics, which then label the status button.

Status/Force tag

Screen object which enables direct read and write access from the operating unit to individual address areas in the connected SIMATIC S5 or SIMATIC S7.

STEP 7

Programming software for SIMATIC S7, SIMATIC C7 and SIMATIC WinAC.

Superuser

A user with permissions to trigger functions of the highest **password level**. The superuser has access to all the operating unit functions.

Switch

A screen object for entering and displaying a binary status. A switch can only be in the status on or off .

System message

Provides information on the operating unit concerning internal statuses of the operating unit and **PLC**.

**Trend curve**

Curve type by which just one curve value is read from the PLC per cycle or trigger resulting in a curve display. If the configured number of measured values is not achieved, each new value overwrites the oldest value. Trend curves are especially suited to displaying continual progress.

Trend view

Screen object providing a clear, continuous display of process data. Several different curves can be displayed simultaneously in the trend view, e.g. in the form of **trend curves** or **history trends**.

TTY

Standard interface for serial data transmission with defined current levels. Sender and receiver are electrically isolated.

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