

S7-200

SIMATIC Text Display (TD) User Manual

System Manual

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Product Overview

1.1 Overview

Product Overview

The S7-200 TD devices provide a low-cost human-machine interface (HMI), allowing an operator or user to interact with your application.

The TD devices allow you to configure a set of hierarchical user menus to provide additional structure for the interaction with your application. You can also configure the TD device to display alarms or messages that are enabled by specific bits in the S7-200 CPU.

Tip

The TD devices provide additional functionality, such as the hierarchical user-defined menus. The TD 200C and the TD 200 are fully compatible with projects that were created with earlier versions of the TD 200 (prior to TD 200 V3.0, which supported only the bit-enabled messages from the S7-200 CPU).

You can use the TD 200C or the TD 200 device with an existing TD configuration without having to modify the control program in the S7-200 CPU.

The TD 100C and the TD400C devices are not compatible with the TD 200 devices.

1.2 Introducing the S7-200 Text Display (TD) Device

Introducing the S7-200 Text Display (TD) Devices

Your S7-200 TD device is a 2- or 4-line text display device that can be connected to the S7-200 CPU. The TD device allows you to view, monitor, and change the process variables pertaining to your application.

The S7-200 product family provides four TD devices:

- **TD 100C:** The TD 100C has a 4-line text display with 2 font choices. Your display can have 16 characters per line for a total of 64 characters, or you can use a bold font with 12 characters per line for a total of 48 characters. The faceplate of the TD 100C offers complete flexibility of the keypad layout and faceplate design.
You can create a custom keypad with up to 14 buttons (keys) of variable size, with varying shapes, colors, or fonts that can be layered onto any background image.
- **TD 200C:** The TD 200C has a 2-line text display with 20 characters per line for a total of 40 characters. The faceplate of the TD 200C offers complete flexibility of the keypad layout and faceplate design.
You can create a custom keypad with up to 20 buttons (keys) of variable size, with varying shapes, colors, or fonts that can be layered onto any background image.

1.2 Introducing the S7-200 Text Display (TD) Device

- **TD 200:** The faceplate of the TD 200 provides four keys with predefined, set-bit functions and allows up to eight set-bit functions by using the SHIFT key.
- **TD400C:** The TD400C can have a 2- or 4-line text display depending on your font and character choice. The TD400C buttons (keys) are tactile and have fixed positions.
 - Your display can have a 4-line display with 12 small Chinese characters per line for a total of 48 characters, or 24 small ASCII characters per line for a total of 96 characters.
 - Your display can have a 2-line display with 8 large Chinese characters per line for a total of 16 characters, or 16 large ASCII characters per line for a total of 32 characters.
 - You can create a custom keypad with up to 15 buttons (keys) of varying colors, functions, or fonts that can be layered onto any background image.

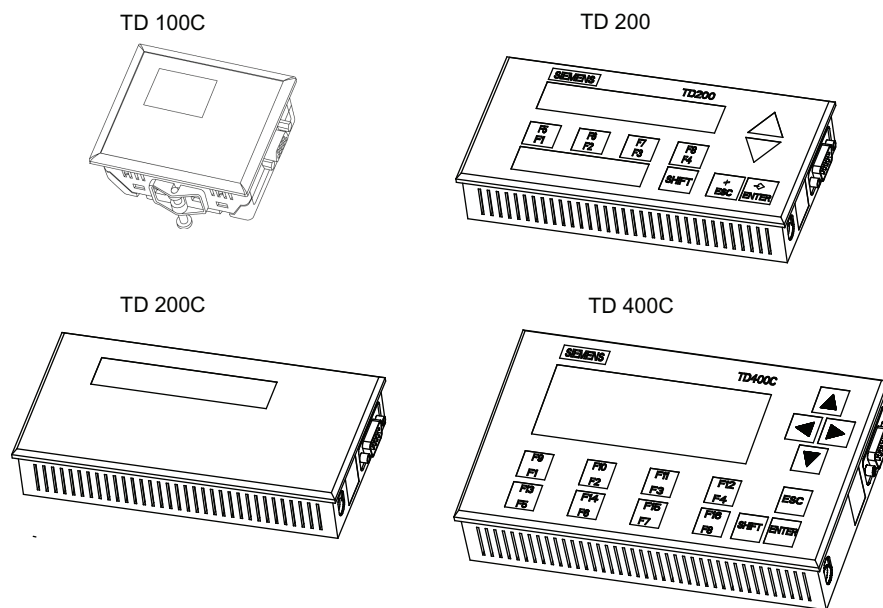


Figure 1-1 Text Display (TD) Devices

The TD devices receive power from the S7-200 CPU through the TD/CPU cable. The TD 200, TD 200C and TD400C devices can also receive power from a separate power supply.

The TD devices contain the following elements:

- Text display area: The TD 200C, TD 200 and TD400C have a backlit liquid crystal display (LCD).
 - The TD 200C and TD 200 displays have a resolution of 33 x 181 pixels
 - The TD400C display has a resolution of 192 x 64 pixels.
 - The TD 100C has a liquid crystal display (LCD) with a resolution of 132 x 65 pixels. There is no backlight on the TD 100C.
- Communication port: 9-pin D-connector
- Power connector
 - The TD 200C, TD 200, and TD400C have a connector for using an optional external power supply (power for the TD device is typically supplied by the S7-200 CPU through the TD/CPU cable).
 - The TD 100C does not have the option of using an external power supply.

STEP 7-Micro/WIN provides tools to help you configure the TD devices. Using the following tools, you can easily program your S7-200 to display text messages and other data:

- Text Display wizard helps you configure messages for the TD devices.
- Keypad Designer helps you to configure the custom keypad for the TD 100C, the TD 200C, and the TD400C. The Keypad Designer includes samples and templates in the following directories:
 - Sample bitmaps for buttons and backgrounds:
C:/Program Files/Siemens/TD Keypad Designer/Images
 - Sample projects:
C:/Program Files/Siemens/TD Keypad Designer/Samples
 - Sample template (for printing multiple copies of the faceplate):
C:/Program Files/Siemens/TD Keypad Designer/Templates

Each TD device functions as a network master when it is connected over a network that contains one or more S7-200 CPUs. The TD device is also designed to operate with other masters in a network. Multiple TD devices can be used with one or more S7-200 CPUs connected to the same network. More than one TD device can connect to the same S7-200 CPU.

1.3 Features of the Text Display (TD) Devices

Features of the Text Display (TD) Devices

You can use your TD device to perform the following tasks:

- Viewing a hierarchy of user menus and screens that allow an operator to interact with the application or process

You create these user menus and screens with the Text Display wizard of STEP 7-Micro/WIN

- Displaying alarms (bit-enabled messages) that are generated by the S7-200 CPU
You define these alarms with the Text Display wizard of STEP 7-Micro/WIN
- Modifying designated program variables

The TD device allows you to define a variable as either a text string or a numeric string:

- Text string: All characters in a variable are editable
- Numeric string: Only the numeric characters are editable (the cursor skips over all non-numeric characters)

The TD device allows you to define a variable as a word, double word, or real

- Forcing or unforcing I/O points: You can force individual I/O points in the S7-200 CPU to be on or off (TD 200C, TD 200, and TD400C only)
- Setting the time and date (if the S7-200 CPU supports a real-time clock)
- Viewing the CPU status (including version information)

The TD 200C and TD400C provide additional functionality for interacting with the S7-200 CPU:

- You can change the operating mode (RUN or STOP) of the S7-200 CPU
- You can load the user program in the S7-200 CPU to a memory cartridge
- You can access and edit the data stored in the memory of the S7-200 CPU

International Languages and Characters Support

The TD 200C and TD 200 devices provide a default TD character set which supports bar graph characters. The TD devices (as noted) support the following Windows character sets for displaying messages:

- Arabic
- Baltic
- Chinese (Simplified Chinese)¹
- Cyrillic
- Greek
- Hebrew
- Latin 1 (with Boldface)

- Latin 2 (with Boldface)
- Turkish (Latin 5)

The TD devices provide system menus and prompts in six languages: English, German, French, Spanish, Italian, and Simplified Chinese.

In the TD 100C, all fonts except Simplified Chinese are available in two sizes: 12 and 16 characters per row. All the 12 character fonts are bold.

The TD400C supports the character sets in two sizes.

Table 1- 1 Fonts Supported by the TD Devices

TD 100C	TD 200	TD 200C	TD400C V 2.0
Latin 1	Latin 1	Latin 1	Latin 1
-	Latin 1 Bold	Latin 1 Bold	Latin 1 Bold
Latin 2	Latin 2	Latin 2	Latin 2
-	Latin 2 Bold	Latin 2	Latin 2 Bold
Cyrillic	Cyrillic	Cyrillic	Cyrillic
Greek	Greek	Greek	Greek
Turkish	Turkish	Turkish	Turkish
Baltic Rim	Baltic Rim	Baltic Rim	Baltic Rim
-	Arabic	Arabic	Arabic
-	Hebrew	Hebrew	Hebrew
-	Original TD 200	Original TD 200	-
-	Bar Graph	Bar Graph	-
Simplified Chinese ¹	Simplified Chinese	Simplified Chinese	Simplified Chinese
1 The TD 100C includes approximately 1900 out of the possible 6763 Chinese characters.			

1.4 Comparing the TD Devices

Comparing the Text Display Devices

Table 1- 2 Comparing the TD Devices

Feature	TD 100C V 1.0	TD 200 V3.0	TD 200C V 1.0	TD400C V 2.0
Text display area	4 lines, up to 64 characters (up to 16 characters per line)	2 lines, up to 40 characters (up to 20 characters per line)	2 lines, up to 40 characters (up to 20 characters per line)	2 lines with large font, up to 16 Chinese or 32 ASCII characters per line (up to 8 Chinese or 16 ASCII characters per line) 4 lines with small font, up to 24 ASCII characters (up to 12 Chinese characters per line) Display backlight can be configured to extend the life of the TD400C device
Keypad options	User-designed custom keypad Standard keypad	Standard keypad	User-designed custom keypad Standard keypad	User designed custom keypad Standard keypad
Configurable buttons	Custom keypad: Up to 14 (user-configurable) Standard keypad: 2	Standard keypad: 4 (Up to 8 when using SHIFT)	Custom keypad: Up to 20 (user-configurable) Standard keypad: 4 (up to 8 when using SHIFT)	Custom keypad: Up to 15 (user configurable) Standard keypad: 8 (up to 16 when using SHIFT)
System buttons (pre-configured)	ENTER, ESC (Escape), UP, DOWN, LEFT and RIGHT arrows, F1, F2	ENTER, ESC (Escape), SHIFT, UP and DOWN arrows	ENTER, ESC (Escape), SHIFT, UP, DOWN, LEFT, and RIGHT arrows	ENTER, ESC (Escape), SHIFT, UP, DOWN, LEFT, and RIGHT arrows
User-defined menus and user screens	Maximum of 32 screens Up to 4 user menus, with up to 8 screens per user menu	Maximum of 64 screens Up to 8 user menus, with up to 8 screens per user menu	Maximum of 64 screens Up to 8 user menus with up to 8 screens per user menu	Maximum of 64 screens Up to 8 user menus with up to 8 screens per user menu
Alarms (from the S7-200 CPU)	Up to 40 alarm messages	Up to 80 alarm messages	Up to 80 alarm messages	Up to 80 alarm messages
Alarm indicator (icon)	Yes	Yes	Yes	Yes
Variable embedded in an alarm or screen	1 per line (1 for one-line alarms; 2 for two-line alarms, 4 for a screen)	Up to 6 variables per alarm or screen	Up to 6 variables per alarm or screen	Up to 6 variables per alarm or screen
Icons (graphics) embedded in a message	No	No	Yes	Yes

1.5 Using the TD Device to Access Screens and Alarms

Feature	TD 100C V 1.0	TD 200 V3.0	TD 200C V 1.0	TD400C V 2.0
System menu options	Release the password Set the time and date CPU status Clean keypad	Force I/O Release the password Set the time and date CPU status Switch languages (if configured) Clean keypad	Force I/O Release the password Set the time and date CPU status Switch languages (if configured) Change the CPU operating mode Clean keypad Edit the CPU memory Program a memory cartridge	Force I/O Release the password Set the time and date CPU status Switch language (if configured) Change the CPU operating mode Clean keypad Edit the CPU memory Program a memory cartridge
Password protection	Yes	Yes	Yes	Yes
Multiple language sets	No	Yes	Yes	Yes
Character sets supported (for displaying different languages)	7 character sets: Latin 1, Latin 2, Chinese (Simplified) ¹ , Cyrillic, Baltic, Greek, Turkish	10 character sets: Latin 1/Bold, Latin 2/Bold, Chinese (Simplified), Cyrillic, Arabic, Baltic, Greek, Hebrew, Turkish, and Standard TD (includes Bar Graph)	10 character sets: Latin 1/Bold, Latin 2/Bold, Chinese (Simplified), Cyrillic, Arabic, Baltic, Greek, Hebrew, Turkish, and Standard TD (includes Bar Graph)	9 characters sets: Latin 1/Bold, Latin 2/Bold, Chinese (Simplified), Cyrillic, Arabic, Baltic, Greek, Hebrew, Turkish
Languages for system menus and error messages	6 languages: English, French, German, Italian, Spanish, and Chinese	6 languages: English, French, German, Italian, Spanish, and Chinese	6 languages: English, French, German, Italian, Spanish, and Chinese	6 languages: English, French, German, Italian, Spanish, and Chinese
Feedback (when pressing a button)	Visual indicator in the text display area	Tactile dome over the buttons on the keypad and visual indicator	Visual indicator in the text display area	Tactile dome over the buttons on the keypad, visual indicator, and audio feedback
¹ The TD 100C includes approximately 1900 out of the possible 6763 Chinese characters..				

1.5 Using the TD Device to Access Screens and Alarms

Using the TD Device to Access Screens and Alarms

When you configure the TD device with the Text Display wizard of STEP 7-Micro/WIN, you create the screens and alarms for the TD device. You use the buttons on the keypad of the TD device to navigate through the screens and menus. The TD 200 device uses the standard TD keypad. The standard faceplates for the TD devices are shown in Figure 1-2.

The TD 100C and TD 200C allow you to create your own custom-designed buttons with specialized functions.

1.5 Using the TD Device to Access Screens and Alarms

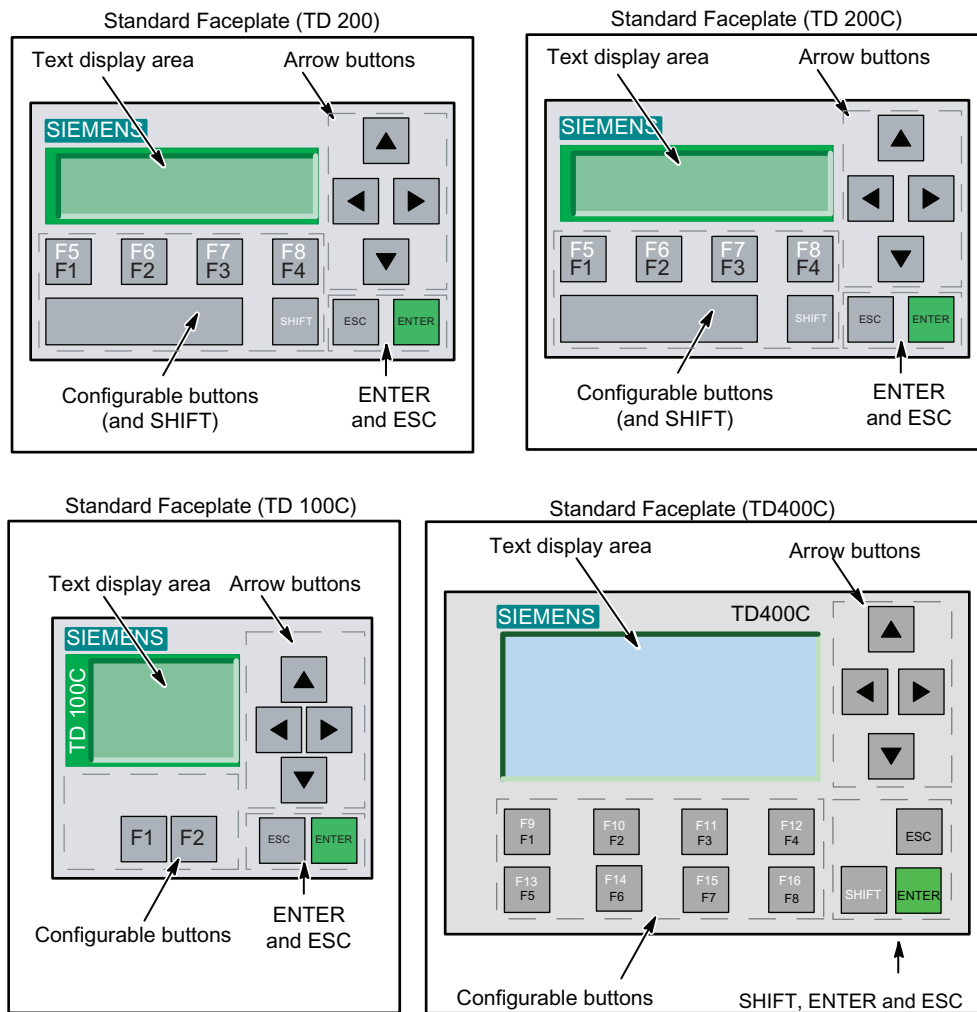


Figure 1-2 Standard Keypad Configuration for the TD Devices

Dividing Information into Screens and Bit-Enabled Alarms

As shown in Figure 1-3, you can configure the TD device to display screens (which are initiated by operator action) and bit-enabled alarms (which are initiated by the S7-200 CPU).

- **Screens:** You can create screens that allow the operator (using the TD device) to initiate the interaction with the S7-200 CPU. With the TD device, you can configure a user menu (up to 8 entries or groups for the TD 200C, TD 200, and TD400C, and up to 4 entries or groups for the TD 100C) that provides a hierarchy for the screens. You can create up to 8 screens for each menu item or group.
- **Alarms:** You can create alarm messages that allow the user program in the S7-200 CPU to initiate interaction with the operator by displaying a message on the TD device.

During the configuration of the TD device, you also designate which type of message (screens or alarms) will be the default display mode for the TD device. After power-up, the TD device goes to the default display mode. Also, the TD device returns to the default display mode after a period of inactivity (if no buttons have been pressed for one minute).

Storing the Screens and Alarms in the Parameter Block

The S7-200 CPU stores the text, embedded variables, and format information for the alarms and screens in a parameter block located in V memory. You use the Text Display wizard to configure the starting address for the parameter block in V memory, and the Text Display wizard allocates the memory required to store the information for the TD device.

If you configure more than one parameter block for the S7-200 CPU (with each parameter block having a different range of addresses in V memory), you can connect several TD devices to that one S7-200 CPU. You configure the V memory address for the specific parameter block for each of the TD devices. The Diagnostic Menu of the TD device provides a TD Setup command for specifying the starting address of the parameter block.

Tip

The parameter block for the TD 100C and the TD400C is not compatible with other TD devices. The TD 100C parameter block is only compatible with a TD 100C parameter block, and the TD400C parameter block is only compatible with a TD400C parameter block.

Displaying the Screens and Alarms on the TD Device

When the operator uses the buttons on the TD device to select a screen, the TD device reads the screen information from the parameter block (stored in V memory of the S7-200 CPU) and displays the appropriate screen.

When you configure an alarm, you also configure an alarm bit for enabling a specific alarm. The logic of your user program sets this alarm bit to display the alarm on the TD device. When you create the text for the alarm, you also designate the alarm bit. If you configured an alarm to require acknowledgement by an operator, that alarm also has an acknowledge bit. The TD device continuously polls the alarm bits to determine which alarms have been enabled.

To display an alarm on the TD device, your user program in the S7-200 CPU must first set the alarm bit for the specific alarm. When your user program sets one of the alarm bits, the TD device then reads the alarm bits in the parameter block in the S7-200 CPU and displays the corresponding alarm message.

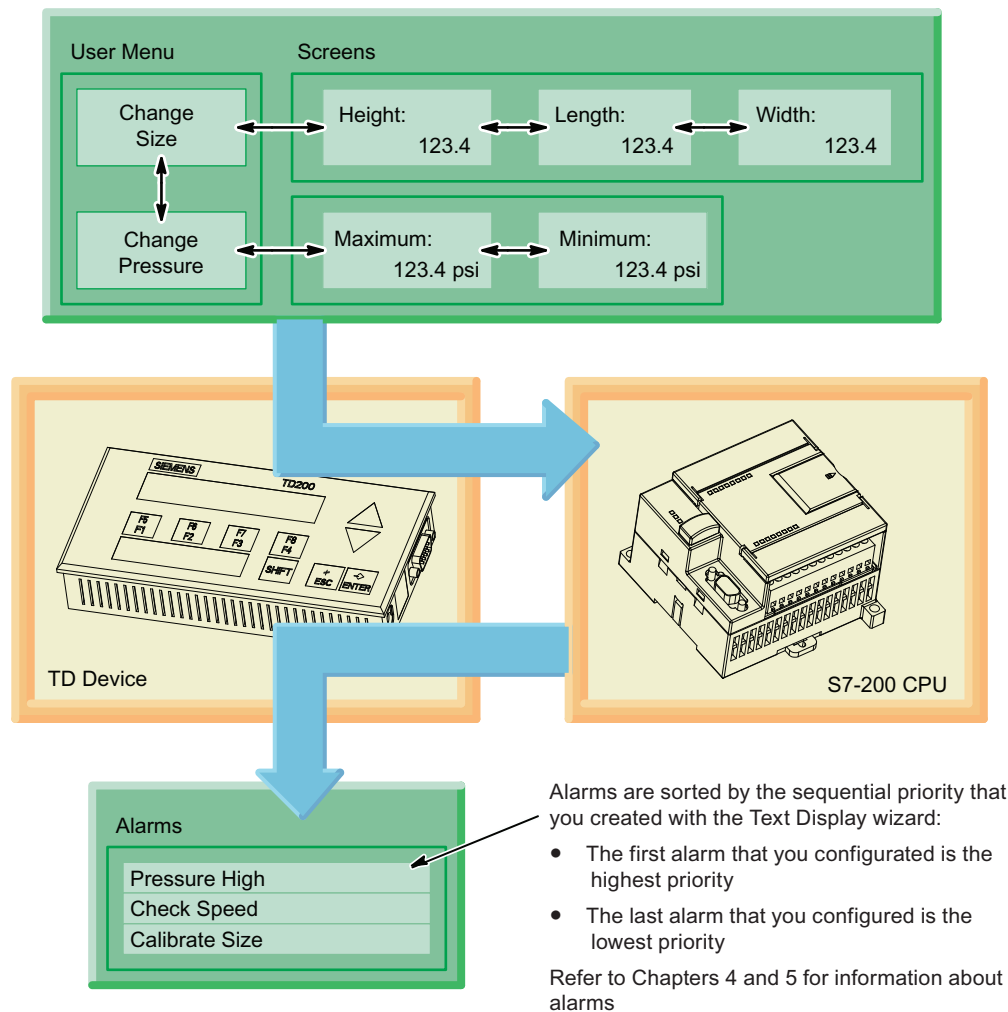


Figure 1-3 Screens and Alarms

1.6 Installation and Configuration Tasks

Installation and Configuration Tasks

As shown in Figure 1-4, you use the Text Display wizard of STEP 7-Micro/WIN to configure the TD device. You can create a custom faceplate for the TD 100C, TD 200C, and TD400C. The Keypad Designer creates a keypad configuration file for the Text Display wizard.

An overview of the tasks for installing your TD device is shown in the figures below. Refer to Chapter 2.

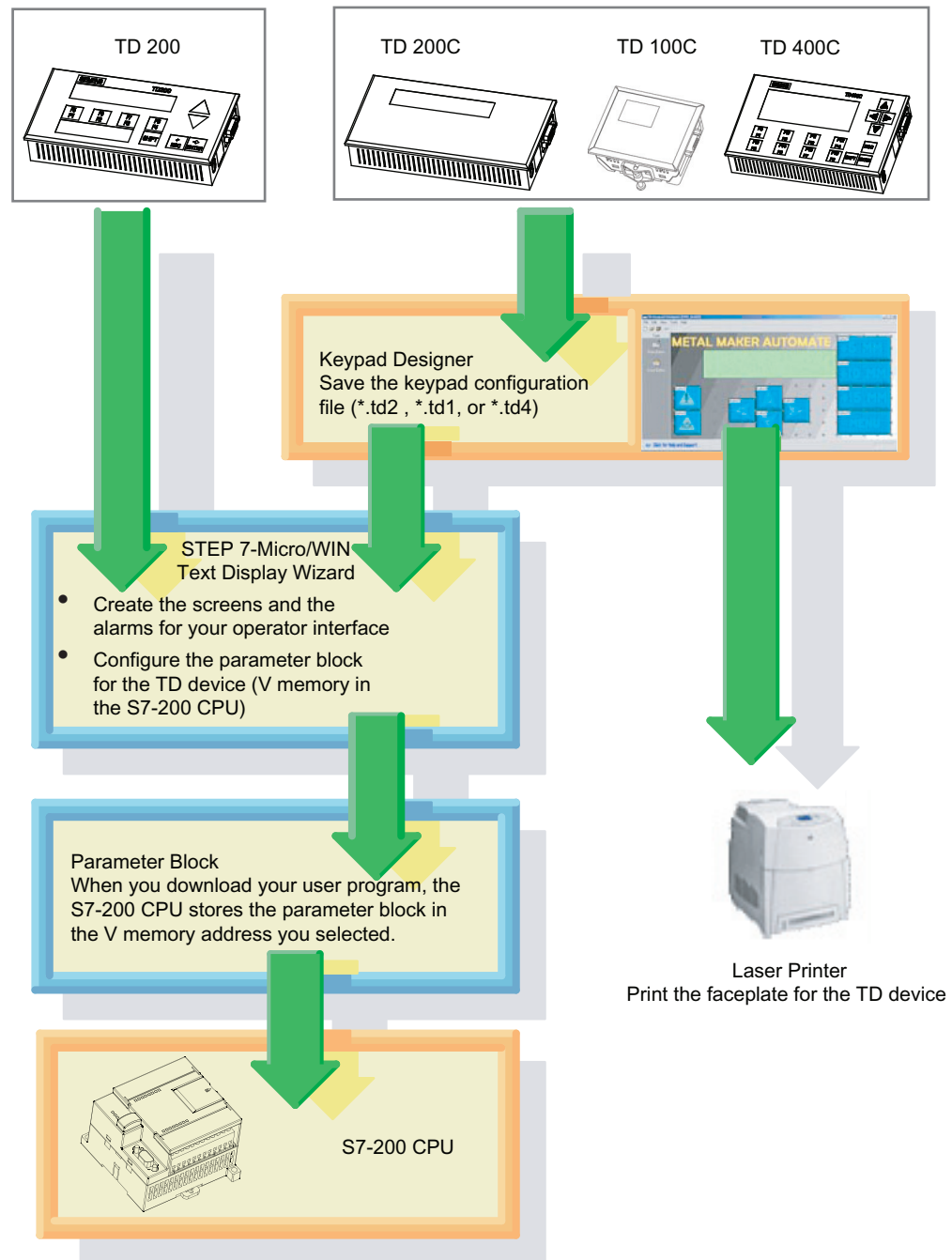


Figure 1-4 Configuration Tasks for the TD Devices

1.6 Installation and Configuration Tasks

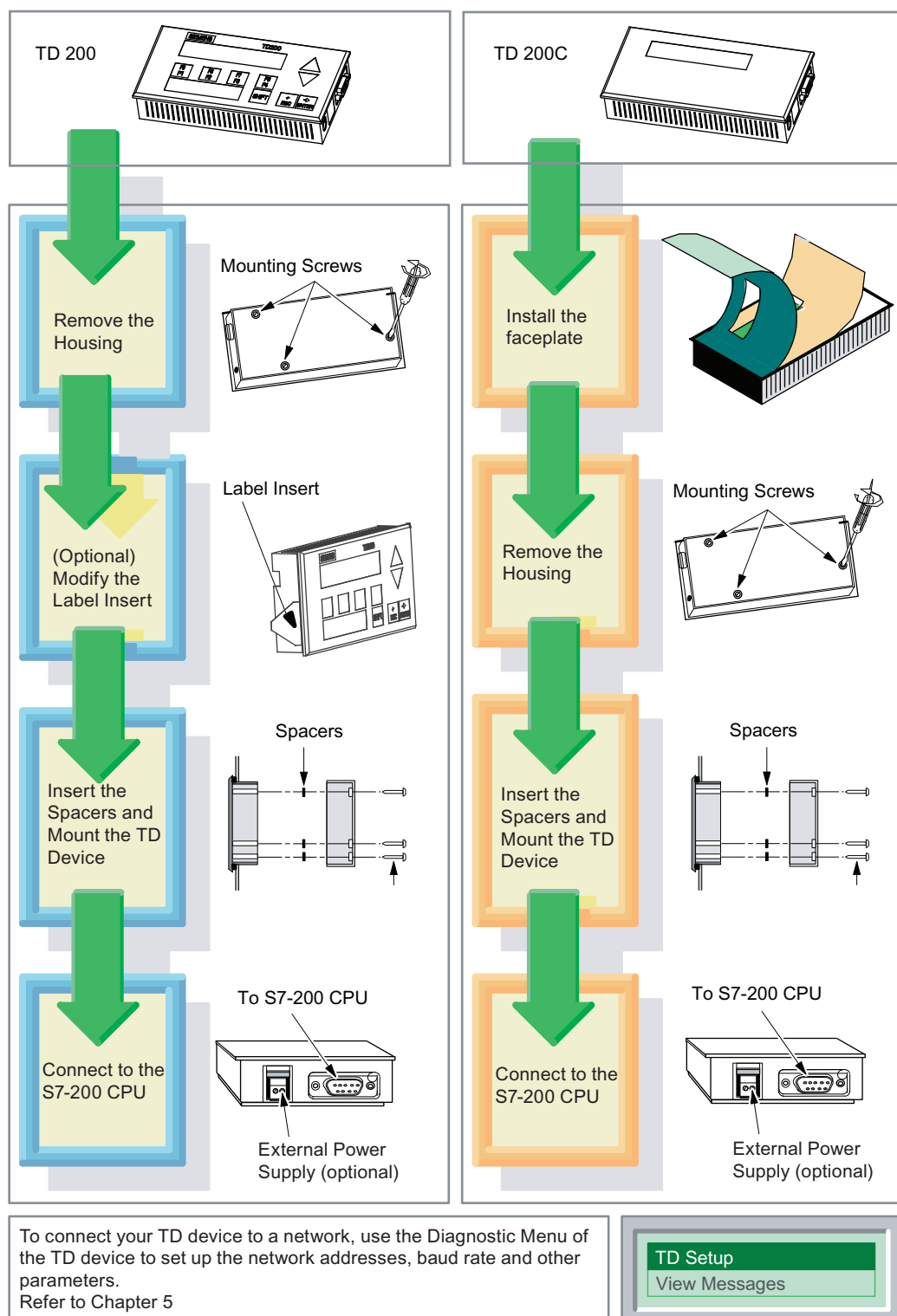
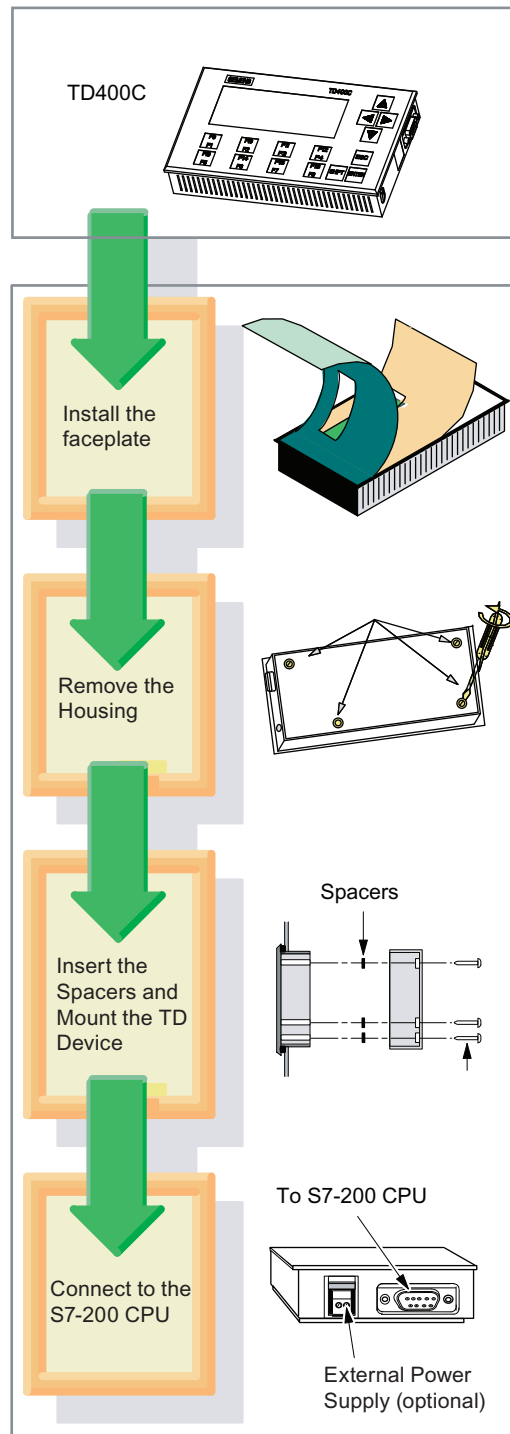


Figure 1-5 Installing Your TD 200 and TD 200C Device



To connect your TD device to a network, use the Diagnostic Menu of the TD device to set up the network addresses, baud rate and other parameters. Refer to Chapter 5.

TD Setup
View Messages

Figure 1-6 Installing Your TD400C Device

Installing your Text Display (TD) Device

2.1 Overview

Installing your TD Device

You can install your TD device for easy access, whether on a panel or on a door of an enclosure.

Installed properly, the TD devices meet the following standards (as noted) for protection.

- IP 65 (mounted on front of the panel)
- IP 20 (mounted on casing)
- UL 50 Type 4X

Refer to Appendix A for technical specification and for information about agency approvals and other certifications.

Tip

You can use the TD 200, version 3.0 and the TD 200C, version 1.0 with an existing TD 200 configuration without having to modify the control program in the S7-200 CPU. The TD 100C and the TD400C are not compatible with the TD 200 devices, nor with each other.

2.2 Components Shipped with the TD Devices

Components Shipped with the TD Devices

The TD devices ship with the following components:

- Gasket: Protective cushion with gasket for installing the TD device in inclement environments
- TD/CPU cable: 9-pin, straight-through cable that provides both communication and power to the TD device. The TD 200, TD 200C, and TD400C ship with a TD/CPU cable. The TD 100C does not include a TD/CPU cable; it must be ordered separately. The order number for the TD/CPU cable is 6ES7-901-3EB10-0XA0.
- Spacers: Self-adhesive spacers for mounting the TD device in a panel (TD 200, TD 200C, and TD400C only)
- Mounting brackets: Brackets for mounting the TD device in a panel (TD 100C only)
- Power connector: The TD 200, TD 200C, and the TD400C ship with a connector to power the TD device from an external supply.

The TD 200 ships with a pull-out user label that allows you to label the function keys for your application.

2.2 Components Shipped with the TD Devices

The TD 100C and TD 200C ship with a blank faceplate that you can customize. The TD 100C, TD 200C and TD400C ship with a pre-printed faceplate for the standard TD keypad. The faceplate is constructed from durable, polyester material which has been designed specifically for use for HMI faceplates.

Tip

To print your custom-designed image onto the blank faceplate material, you must use a laser printer that supports the printing of transparencies on both A4 and envelope formats and also supports color printing.

General TD Installation Information

Tip

To ensure compliance with IP 65 or UL 50 Type 4X:

- The minimum panel thickness must be at least 1.5 mm.
- For the TD 200, TD 200C, and TD400C, the mounting screws must be tightened to a torque of 0.7 N-m.
- For the TD 100C, the mounting screws must be tightened to a torque of 0.2 Nm (about 0.5 mm the height of the seal).
- The gasket must be replaced whenever the TD device is removed and reinstalled.

To procure new gaskets, contact your Siemens distributor or sales representative.

The TD 100C, TD 200, TD 200C, and TD400C devices are suitable for use in Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Group IIC; or non-hazardous locations.



WARNING

WARNING - EXPLOSION HAZARD!

DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS LOCATION IS KNOWN TO BE NON-HAZARDOUS



WARNING

WARNING - EXPLOSION HAZARD!

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

2.3 Mounting the TD 200, TD 200C, and TD400C in a Panel or on a Surface

Mounting the TD 200, TD 200C, and TD400C in a Panel or on a Surface

Tip

If you are using a customized label insert for your TD device, you must first install the new label insert before you mount the TD device.

Preparing the Mounting Surface for a TD 200, TD 200C, or TD400C

To prepare the surface where the TD device is to be mounted or installed, use the dimensions for your TD device as shown below:

- For a TD 200 and TD 200C, cut a 138 mm x 68 mm hole in the mounting surface (DIN 43700).
- For a TD400C, cut a 163.5 mm x 93.5 mm hole in the mounting surface
- Refer to Table A-1 for the outside dimensions of your TD device.

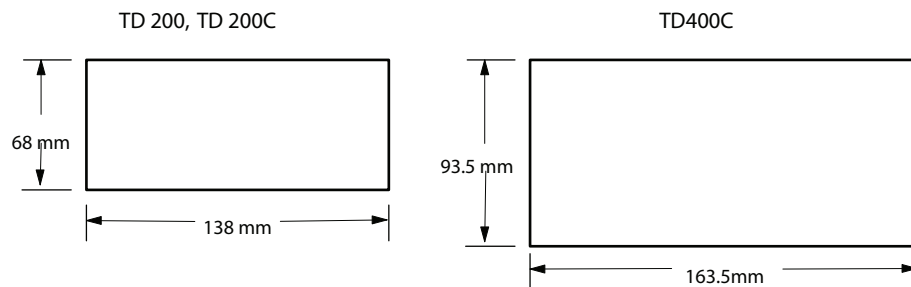


Figure 2-1 Dimensions for cutting a Hole in the Mounting Surface of the TD 200, TD 200C, and TD400C

Preparing the TD 200, TD 200C, and TD400C for Mounting

Refer to the figure below and use the following procedure to separate the front cover from the housing of your TD device:

1. For the TD 200 and TD 200C, use a flat-head screwdriver or a T8 Torx screwdriver to remove the three screws from the rear of the device. For the TD400C, use a cross screwdriver for M3 to remove the four screws from the rear of the device.
2. Remove the front cover of the TD device from the housing.

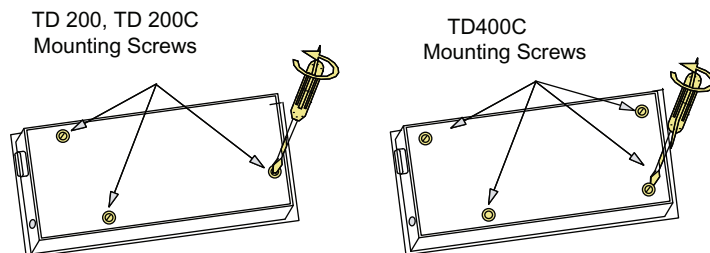


Figure 2-2 Removing the Mounting Screws of the TD device

Positioning the Spacers for the TD 200, TD 200C, and TD400C

The self-adhesive spacers included with the TD 200, TD 200C, and TD400C maintain the pressure on the TD device circuit board when the TD device is assembled. The number of spacers required is dependant upon the thickness of the mounting surface.

Refer to Figure 2-3 and use the following procedure to position the spacers:

1. Determine the number of spacers required, based on the thickness of the panel:
 - For up to 1.5 mm, use one spacer.
 - For 1.5 mm to 4.0 mm, use two spacers.
2. Place the spacers over the screw holes on the inside of the backplate.

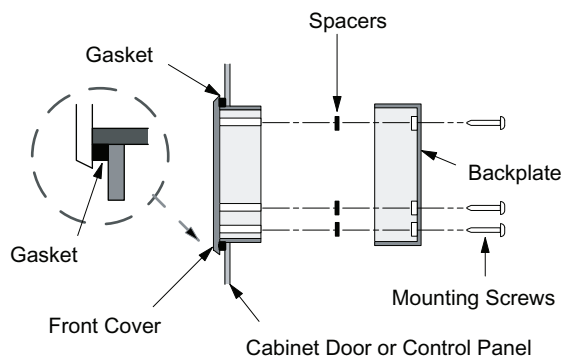


Figure 2-3 Positioning Spacers on the TD Device

Mounting the TD 200, TD 200C, and the TD400C

Refer to Figure 2-3 and use the following procedure to complete the mounting of your TD device:

1. Remove the gasket from the protective cushion.
2. Place the supplied gasket on the frontplate of the TD device.
3. Install the spacers (if required).
4. Fit the frontplate into the cutout you made in the mounting surface.
5. Secure the backplate onto the frontplate of the TD device using the screws you removed from the backplate. Carefully tighten the screws until snug.

2.4 Mounting the TD 100C in a Panel or on a Surface

Mounting the TD 100C in a Panel or on a Surface

Preparing the Mounting Surface for a TD 100C

To prepare the surface where the TD 100C is to be mounted or installed:

- Cut a 69 mm x 82 mm hole in the mounting surface (DIN 43700)
- Refer to Table A-1 for the outside dimensions of the TD 100C device.

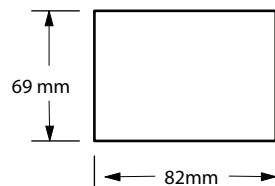


Figure 2-4 Dimensions for Cutting a Hole in the Mounting Surface of the TD 100C

Mounting the TD 100C

Use the following procedure to complete the mounting of your TD 100. See figure below.

1. Remove the gasket from the protective cushion.
2. Place the supplied gasket on the frontplate of the TD device.
3. Fit the TD 100C into the cutout you made in the mounting surface.
4. Attach the special mounting brackets (included) to the TD 100C.
5. Tighten the mounting screws on the mounting brackets to secure the TD 100C to the panel.

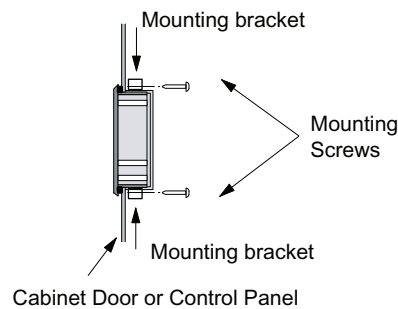


Figure 2-5 Mounting the TD 100C

2.5 Customizing the Labels for the Keys of the TD 200

Customizing the Labels for the Keys of the TD Device

The TD 200 allows you to define the functions for four of the nine keys (or buttons) on the standard faceplate. You can remove the label insert of the TD 200 and designate the functions assigned to those user-defined keys. You can also replace the standard TD 200 insert with your own custom insert for the user-defined keys.

You must remove (at least partially) the TD housing in order to access the label insert from underneath the front cover of the TD device.

Modifying the Label Insert of the TD 200

1. Remove the three screws on the back of the TD device and remove the front cover from the housing.
2. Remove the label insert by pulling the label insert tab out of the label slot with a pair of pointed tweezers.
3. Turn the label insert over and create your own label design. (The reverse side of the label insert is blank.)
4. Insert the label by placing the corner of the label into the label slot.

5. Reinstall the front cover into the back housing.
6. Replace and tighten the three screws on the back of the TD device to ensure that the cover and housing are secure.

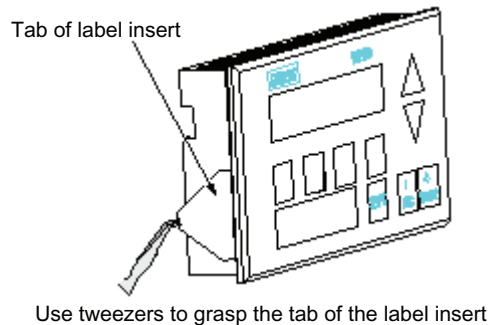


Figure 2-6 Removing the Label Insert

Creating a Custom Label Insert for the TD 200

The dimensions for creating your own custom label insert are shown in the figure below. These dimensions are valid for TD 200, hardware revision 3 and later.

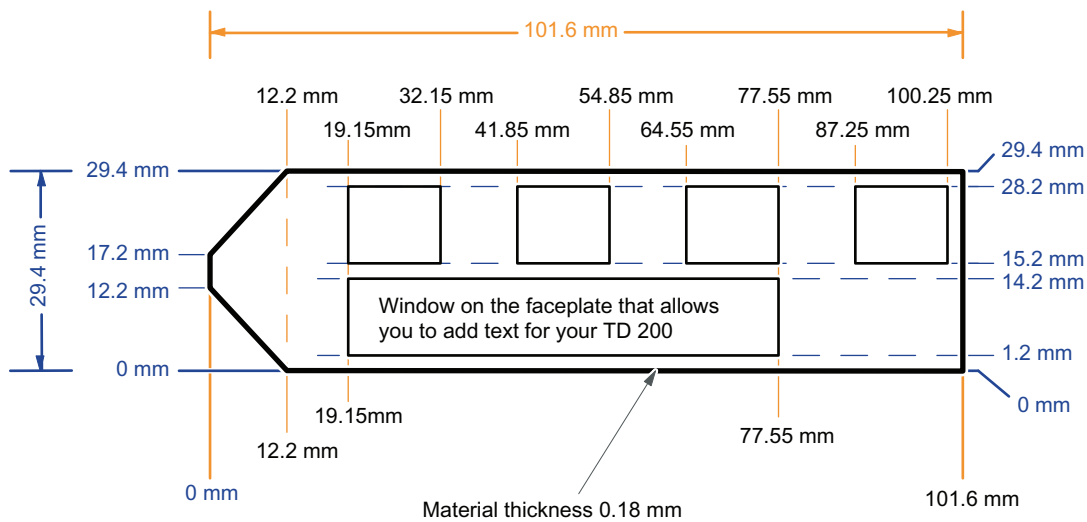


Figure 2-7 Dimensions for a Custom Label Insert

2.6 Installing a Faceplate for the TD 100C, TD 200C and TD400C

Installing a Faceplate for the TD 100C, TD 200C, and TD400C

The TD 100C and TD 200C ship with a blank faceplate (envelope size) for creating a custom-designed faceplate. The TD400C does not ship with a blank faceplate; you can order a package with blank faceplates (see appendix A for order information).

The TD devices do not ship with the faceplate attached. The front of the TD is an adhesive surface (shipped with a protective paper) that allows you to attach your custom faceplate.

Refer to Chapter 3 for information about designing and printing a custom faceplate.

The figure below shows the dimensions for the faceplate of the TD devices. Blank faceplate material for the TD 100C, TD 200C and TD400C is available in the sizes shown below.

- Envelope size for printing a single faceplate (TD 100C, TD 200C only)
- A4 size (210 mm x 297 mm) for printing multiple copies of the faceplate (TD 100C, TD 200C, and TD400C)

You must cut the faceplate from the envelope-sized material, but the A4 material is perforated to allow you to remove the faceplates without cutting.

Use the following procedure to install your custom faceplate on the TD device. The example shown here is for the TD 200C. Installing a faceplate on a TD 100C and TD400C is similar; the differences are noted below. To prepare for installation, remove the protective film covering the display window of the TD device and the back of the preprinted (standard) faceplate. The protective film is blue for the TD 100C and the TD 200C, and is transparent for the TD400C.

1. The dimensions for the custom faceplate are shown for the TD device.
2. If your TD device has a strip of protective paper, remove the strip to expose the strip of the adhesive. For the TD 200C and the TD400C, it is on the left side of the device. For the TD 100C, it is on the right side of the device.
3. Carefully align your custom faceplate on the entire TD device, and then seal the faceplate to the exposed adhesive by pressing down on the left (TD 200C and TD400C) or on the right (TD 100C) side of the faceplate.

4. Carefully lift back the unadhered faceplate and remove the rest of the protective paper from the TD device.
5. Carefully position the faceplate onto the TD device. Firmly press the faceplate onto the adhesive, taking care to remove any air bubbles that may have been trapped underneath.

NOTICE
Do not use excessive force when you install the faceplate onto the TD400C device. If you use excessive force in pressing the faceplate onto the TD400C device, it may cause damage to the springs under the faceplate. Ensure that excessive force is not used when you install the faceplate onto the device.

2.6 Installing a Faceplate for the TD 100C, TD 200C and TD400C

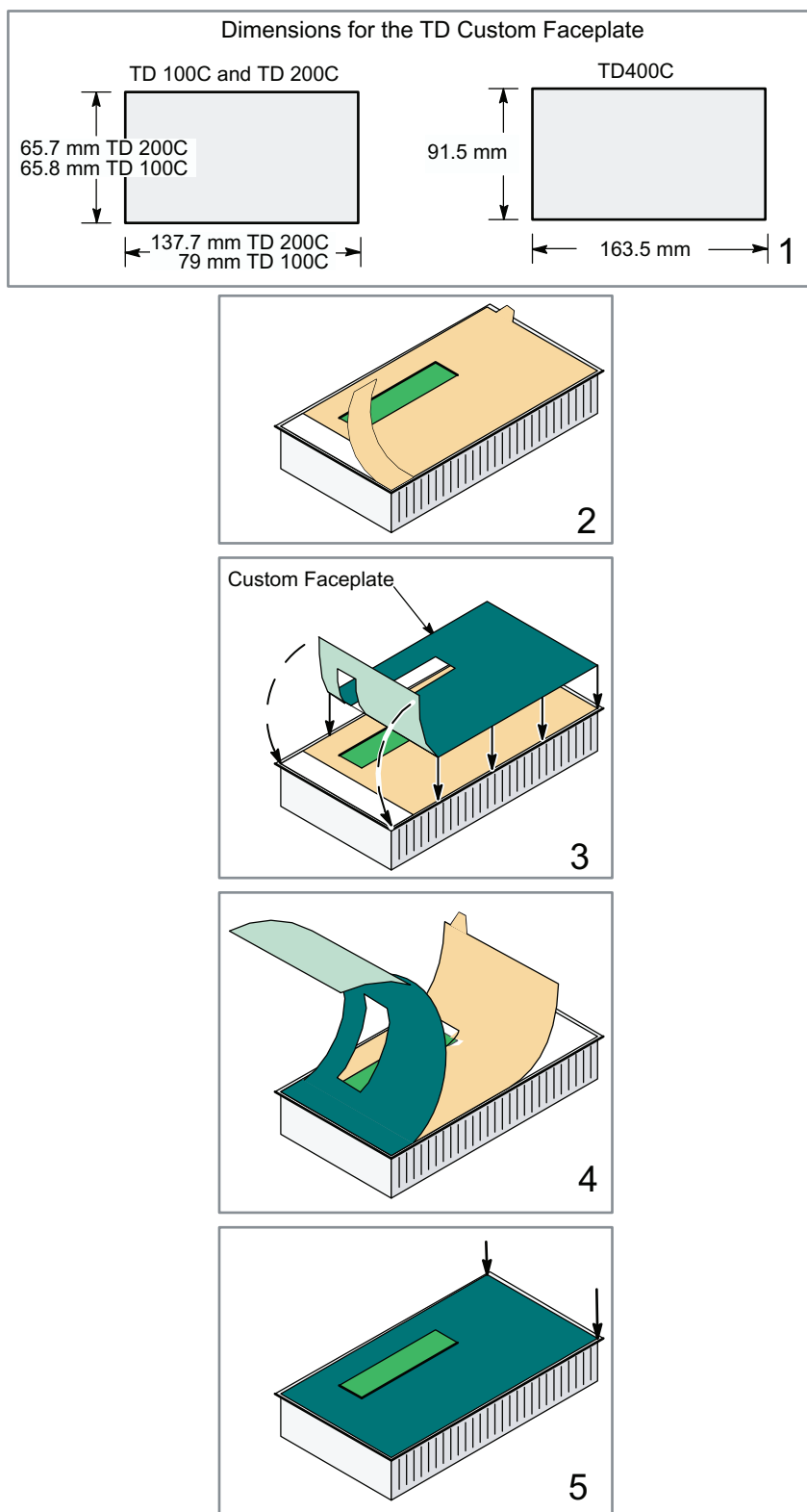


Figure 2-8 Installing a Custom Faceplate on a TD Device

The standard TD faceplates are shown in Figure 1-2. The TD 200C comes configured as a standard TD 200 (with LEFT and RIGHT arrows). The TD 100C comes configured with six standard keys (UP, DOWN, LEFT and RIGHT arrows, ESC, and ENTER). The TD400C comes configured with seven standard keys (UP, DOWN, LEFT, RIGHT, ESCAPE, ENTER, and SHIFT).

After creating and installing the custom faceplate on your TD device you must also download the TD configuration that you created with both the Keypad Designer and the Text Display wizard.

- Chapter 3 describes the Keypad Designer
- Chapter 4 describes the Text Display wizard

2.7 Connecting the TD/CPU Cable

Connecting the TD/CPU Cable

NOTICE
Operating the TD device with an ungrounded voltage source can damage the TD device. The TD device may only be connected to grounded voltage sources. Non-grounded operation can cause the TD device to become damaged. Always ensure that the voltage source for the TD device is properly grounded.

The TD devices can use the TD/CPU cable for communicating with the S7-200 CPU.

- You can connect the TD device directly to the S7-200 CPU, creating a one-to-one network configuration. In this configuration, one TD device connects to one S7-200 CPU through the TD/CPU cable.
- You can connect multiple TD devices to multiple S7-200 CPUs over a network. The TD device defaults to address 1 and attempts to communicate to a CPU at address 2.

For more information about connecting to multiple CPUs, see Appendix B. For information about changing the default addresses in the TD device, see Chapter 5.

If you require a longer cable (>2.5 m) to connect the TD device to the S7-200 CPU, use PROFIBUS components for the network connection. Refer to the SINEC IK10 Catalog.

2.8 Supplying Power for the TD Device

Supplying Power for the TD Device

The S7-200 CPU uses the TD/CPU cable to provide power to the TD device. Use this type of power supply when the distance between the TD device and the S7-200 CPU is less than 2.5 m (the length of the TD/CPU cable). The TD 200, TD 200C and the TD400C have the option of using an external power supply.

Tip

The TD 100C device must use the TD/CPU cable to provide power from the S7-200 CPU to the TD device. The TD 100C does not have the option of using an external power supply.

Tip

If the distance between the TD 200, TD 200C or TD400C and the S7-200 CPU is greater than 2.5 m, use an external 24 VDC power supply.

If you require a longer cable (greater than 2.5 m) to connect the TD device to the S7-200 CPU, use PROFIBUS components for the network connection. Refer to the SINEC IK10 Catalog.

Refer to Appendix B for information about using the TD device on a network.

As shown in the figure below, the TD device provides up to two options for providing power:

- The TD/CPU cable allows the S7-200 CPU to provide power to the TD device over the communications port. This is the only option available for the TD 100C.

For information about the TD/CPU cable and the communications port, refer to Appendix B.

- You can connect the TD 200, TD 200C or the TD400C to an external power supply.

The TD 200, TD 200C or TD400C requires 120 mA at 24 VDC to operate. An optional power connector is provided with the TD 200, TD 200C and the TD400C.

Connector for an external power supply

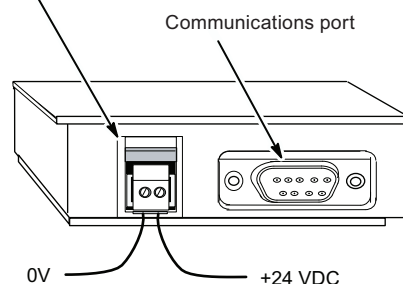


Figure 2-9 Connecting Power to the TD Device (TD 200, TD 200C, and TD400C)

2.9 Establishing a Connection for Your TD Device

Establishing a Connection for Your TD Device

As described in Chapter 4, you use the Text Display wizard of STEP 7-Micro/WIN to configure the screens, alarms, languages, and custom keypad layout for the TD 100C, TD 200C and the TD400C. The S7-200 CPU stores this information in a parameter block (V memory).

The TD devices ship with a default configuration and are set to communicate at a rate of 9600 baud. The TD devices must communicate with the S7-200 CPU to be able to read the parameter block.

You must configure your TD device to communicate at the same baud rate as your S7-200 CPU.

TD 100C, TD 200C, and TD400C

Until the TD device successfully connects to the S7-200 CPU and reads the parameter block, the TD device remains configured for the standard TD keypad shown in the figure below.

To change the baud rate of your TD device, you use the ESC and ENTER buttons to navigate to the Diagnostic/TD Setup Menu and change the TD Setup parameters. (See Chapter 5.) Because the TD devices ship with no faceplate attached, it may be difficult to consistently press ESC or ENTER.

The TD 100C, TD 200C, and TD400C devices ship with a faceplate for the standard TD keypad. In addition, the Keypad Designer provides a sample faceplate for the standard TD keypad in the following directory.

C:/Program Files/Siemens/ TD Keypad Designer/Templates

For temporary use, you can print this faceplate onto paper and lay the paper on top of the TD device (without removing the covering from the adhesive).

Refer to Chapter 3 for information about opening the Keypad Designer and printing a faceplate.

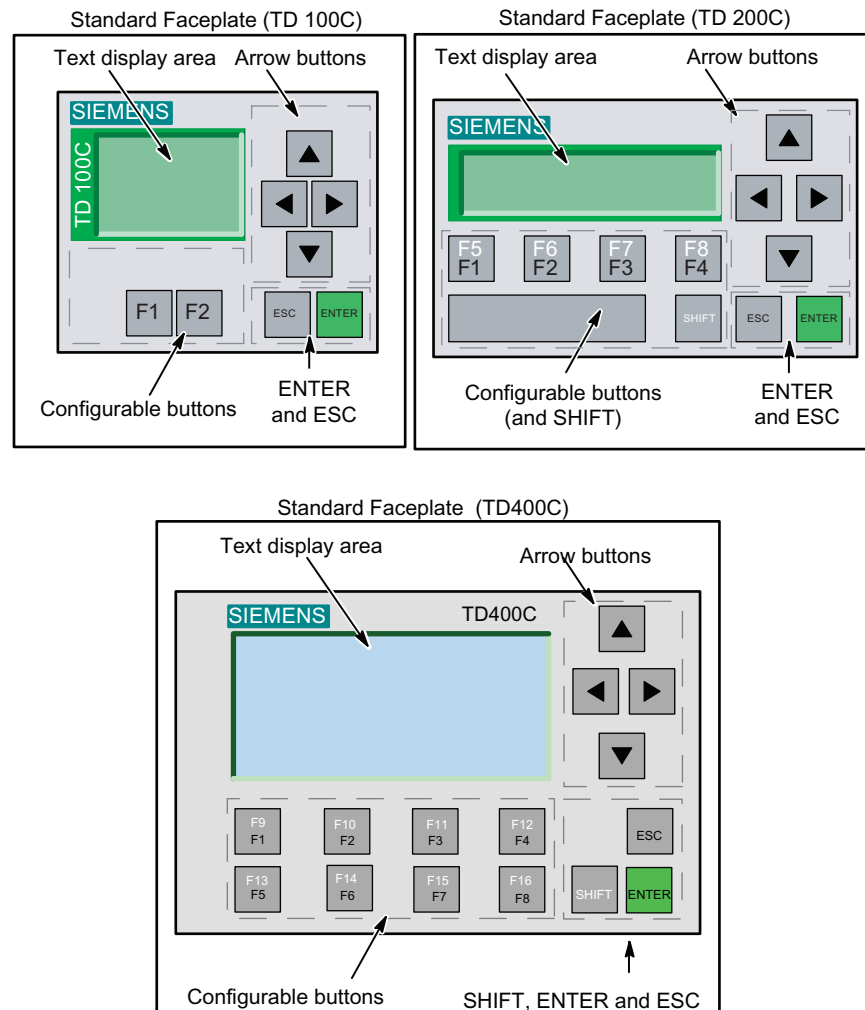


Figure 2-10 Standard TD Keypad for the TD 100C, TD 200C and TD400C

Tip

On an initial setup for the TD 100C, TD 200C, or TD400C, use the default keypad template shipped with the device to configure baud rates and addresses. Once the TD device has communicated to the CPU, the TD device will use the custom keypad configuration.

Tip

If you are using a custom keypad that does not support the ENTER and ESC buttons, you must use the standard keypad to set up the TD device.

To restore the standard TD keypad:

1. Power down the TD device
2. Press and hold the lower right corner (where ENTER key is located on the standard keypad)
3. Power up the TD device

The default keypad is restored until the TD device is power cycled again.

Using the Text Display Wizard to Configure the S7-200 CPU for Your Text Display (TD) Device

4

4.1 Overview

Overview of Chapter 4

You do not configure or program the TD device. The Text Display wizard creates a parameter block that stores the configuration, screens and alarms for the TD device. The S7-200 CPU stores the parameter block in V memory. At power-up, the TD device reads the parameter block from the S7-200 CPU.

You use the Text Display wizard of STEP 7-Micro/WIN to perform the following tasks:

- Configuring the parameters for the TD device
- Creating the screens and alarms to be displayed on the TD device
- Creating the language sets for the TD device (TD 200, TD 200C and TD400C only)
- Assigning the V memory address for the parameter block

Tip

To connect your TD device to a network, you use the Diagnostic or TD Setup Menu of the TD device to set up the network addresses, baud rate and other parameters. Refer to Chapter 5.

4.2 Overview of the Configuration Tasks

Overview of the Configuration Tasks

The S7-200 CPU stores the configuration data for the TD device, including the screens and alarms, into a parameter block (located in V memory). The Text Display wizard creates the parameter block. When you download your project (user program and data block) to the S7-200 CPU, you also download the parameter block as part of the data block.

You do not configure or program the TD device. At power-up, the TD device reads the parameter block from the S7-200 CPU.

As shown in the figure below, you use the Text Display wizard of STEP 7-Micro/WIN to create the parameter block for the TD devices. The next figure shows the sequence of the tasks required for configuring the parameters of the TD device.

TD 200

Select the functions you want to be available on the TD 200 menus. The TD 200 supports the following functions:

- Setting the Time-of-Day clock: Allows you to set the time and date for the S7-200 CPU
- Forcing I/O: Allows you to force I/O points in the S7-200 CPU to be on or off

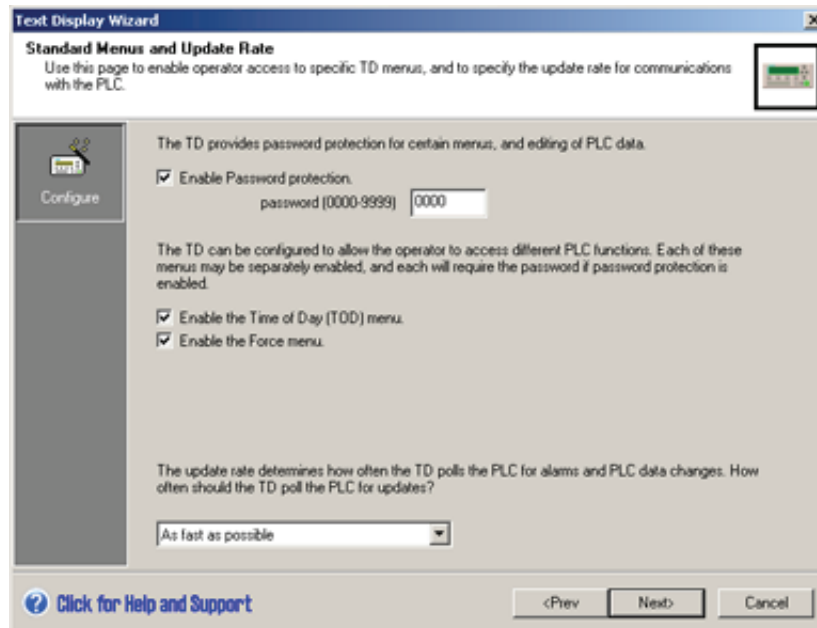


Figure 4-6 Enabling the CPU Functions for the TD 200

TD 200C and TD400C

Select the functions you want to be available on the TD 200C or TD400C menus. The TD 200C and TD400C support the following functions:

- Setting the Time-of-Day clock: Allows you to set the time and date for the S7-200 CPU
- Forcing I/O: Allows you to force I/O points in the S7-200 CPU to be on or off
- Creating a memory cartridge: Allows you to create a memory cartridge which is a complete copy of the CPU

4.3 Configuring the Text Display Device

- Changing the operating mode: Allows you to set the S7-200 CPU to STOP or RUN
- Editing the CPU memory: Allows you to view and change the values of the data stored in the S7-200 CPU

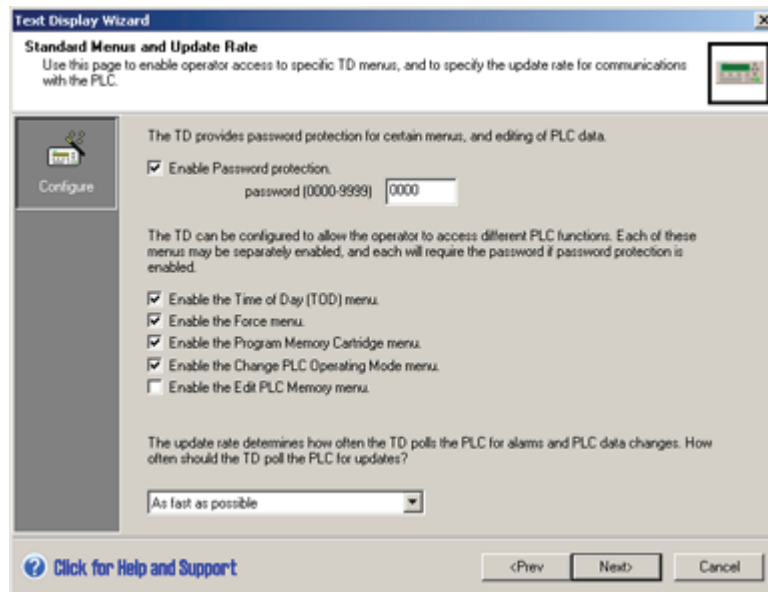


Figure 4-7 Enabling the CPU Functions for the TD400C and TD 200C

TD 100C

Select the function you want to be available on the TD 100C menus.

The TD 100C supports the Setting the Time-of-Day clock function. This function allows you to set the time and date for the S7-200 CPU function.

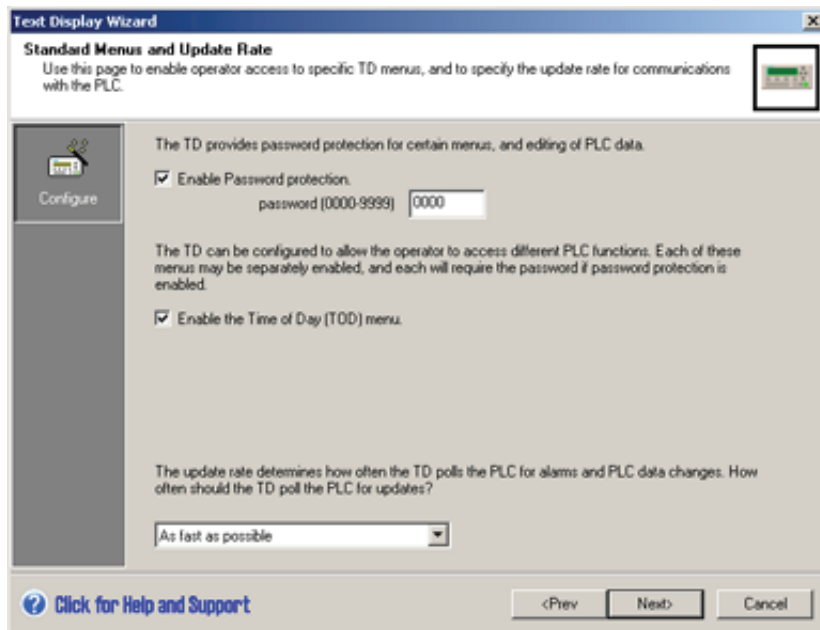


Figure 4-8 Enabling the CPU Functions for the TD 100C

Selecting the Update Rate for the TD Device

You can select how often the TD device performs a read operation to update the information from the S7-200 CPU. You can select from "As fast as possible" to "Every 15 seconds" (in one-second increments).

Selecting the Language and the Character Set

The Text Display wizard allows you to select the language for the system menus and prompts of the TD device. This selection does not affect the language setting for the screens or alarms that you enter. You select a character set that supports the language of the text that you enter for the screens and alarms. (If the character set does not match the Windows character set, the Text Display wizard may not display the characters correctly. The TD device displays these characters correctly.)

- Select the language for the system menus and prompts displayed by the TD device.

The TD devices support English, French, German, Italian, Simplified Chinese, and Spanish.

- Select the character set for the text in your alarms and screens.

Refer to Appendix A for descriptions of the character sets supported by your TD device.

The Simplified Chinese Character Set is an electronic file that resides on the STEP 7-Micro/WIN documentation CD

These settings define a language set for the TD device. The Text Display wizard also provides a series of dialogs for copying the alarms and screens to create additional language sets (TD 200, TD 200C, and TD400C). For each language set, you select the language and the character set.

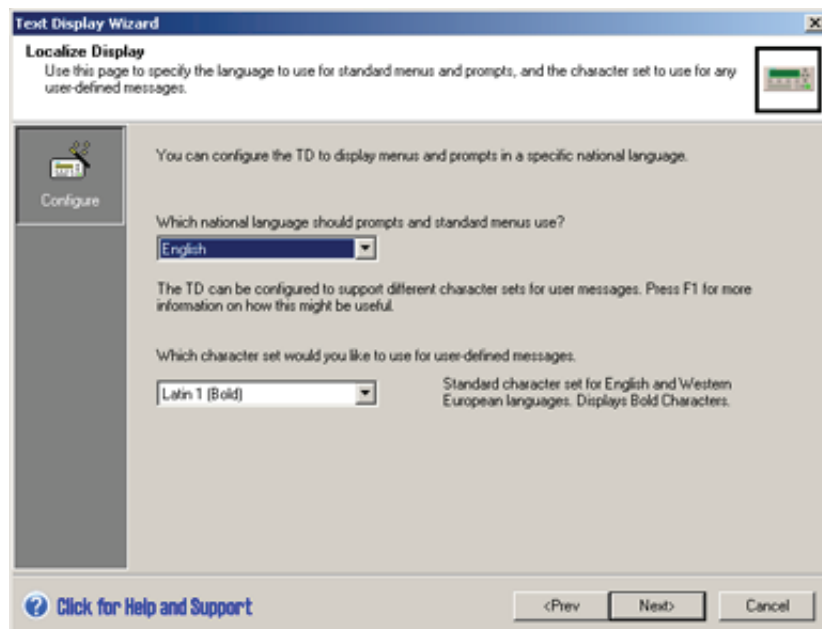


Figure 4-9 Localizing the TD Device

4.3 Configuring the Text Display Device

Tip

When you create multiple language sets (TD 200, TD 200C, and TD400C), the Text Display wizard copies the alarms and screens from the primary language set to the other language set. You then edit the screens and alarms to translate the text displayed for the new language set.

If you need to modify the screens or messages (such as to add a new variable or to add a new alarm), you must edit the primary language. The Text Display wizard copies these changes to the other language sets.

The Text Display wizard only allows you to change the text in the other language sets.

Selecting the Font Size (TD 100C, TD400C)

The TD 100C and TD400C support two font sizes for displaying user and alarm messages. Larger fonts are easier to read, but will result in fewer characters per user message. You select the font size for the TD100C as shown in the figure below. You select the font size for the TD400C when you configure the alarm or user message (refer to the section on configuring screens and alarms in this chapter).

The following font sizes are available:

- TD 100C:
 - Small font (16 ASCII or 8 Chinese characters per line)
 - Large font (12 ASCII characters per line)
 - Font selection applies to all messages and screens
- TD400C:
 - Small font (24 ASCII or 12 Chinese characters per line)
 - Large font (16 ASCII or 8 Chinese characters per line)

Each alarm or screen can have a different font

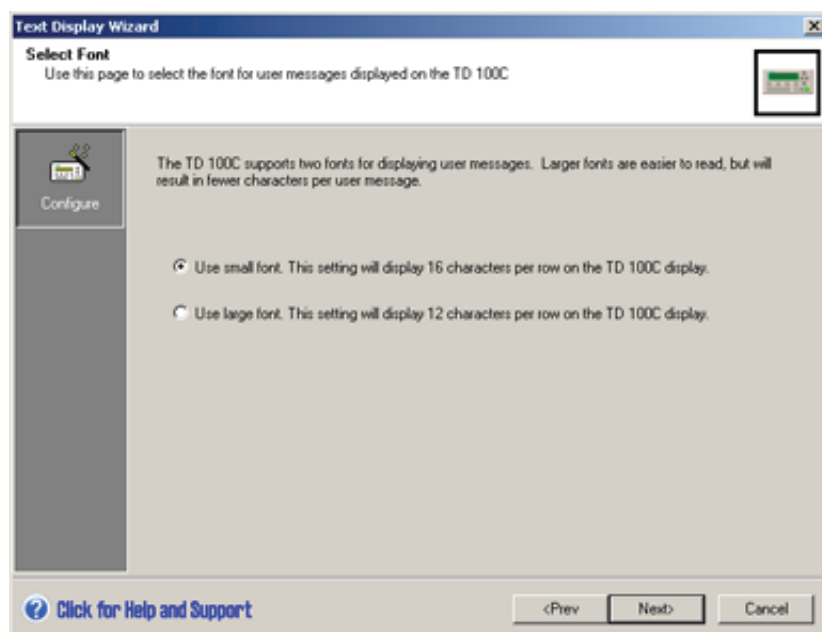


Figure 4-10 Selecting the Font Size (TD 100C)

Loading a Custom Keypad (TD 100C, TD 200C, and TD400C Only)

The TD 100C, TD 200C, and TD400C allow you to create a custom keypad. As described in Chapter 3, you can insert buttons onto the keypad. The Keypad Designer saves this configuration to a file (*.td1 for the TD 100C, *.td2 for the TD 200C, and *.td4 for the TD400C).

To load the keypad configuration file into the Text Display wizard:

- Select the option, Use a custom keypad created with the Keypad Designer. (Find this check box in the Options area of the Configure Keypad Buttons dialog. See Figure below.)
- Browse to the keypad configuration file (*.tdx) that you created with the Keypad Designer.

The Text Display wizard loads the keypad configuration file and updates the table of buttons and the button symbols.

The Text Display wizard lists only those buttons that you had defined with the Set Bit functionality when you created the buttons with the Keypad Designer.

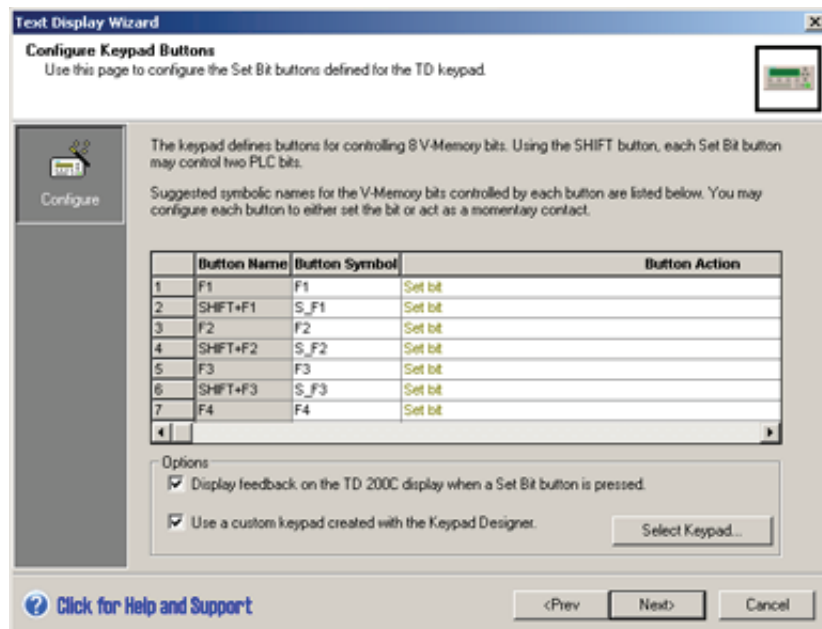


Figure 4-11 Configuring the Functions for the Buttons (TD 200C)

4.3 Configuring the Text Display Device

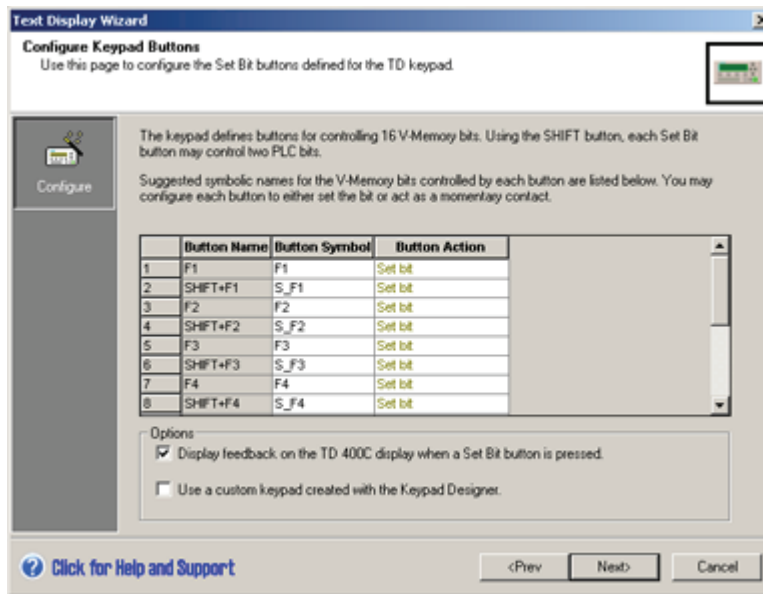


Figure 4-12 Configuring the Functions for the Buttons (TD400C)

Configuring the Buttons on the Keypad

As shown in previous figure, the Configure Keypad Buttons dialog allows you to select a symbol name and an action for each of the configurable buttons on the TD device.

- The TD 200 keypad provides 4 configurable buttons and a SHIFT button that can be configured for up to 8 bits in the S7-200 CPU
- The TD 200C can be configured for up to 20 configurable buttons
- The TD 100C can be configured for up to 14 configurable buttons
- The TD400C can be configured for up to 15 configurable buttons

Tip

The Configure Keypad Buttons dialog of the Text Display wizard displays only those buttons that set bits in the S7-200 CPU. The Text Display wizard does not list the buttons with other functionality, such as ESC or SHIFT.

The symbols that you assign to the buttons on the keypad allow the logic of your user program in the S7-200 CPU to interact with the TD device. (The Text Display wizard suggests a symbol for these buttons. You can accept the recommendation or enter a new symbol for the button.)

For each button, you configure the type of action:

- Set bit: When you press the button on the TD device, the TD device sets the bit on in the S7-200 CPU. The bit stays on until the logic of your user program in the S7-200 CPU resets the bit.
- Momentary contact: When you press the button on the TD device, the TD device sets the bit on in the S7-200 CPU. When the TD device button is released, the TD device turns the bit off in the S7-200 CPU.

Operating Your Text Display (TD) Device

5.1 Overview

Operating Your TD Device

Included in this chapter is information about routine operator tasks, such as entering and releasing the password, editing variables embedded in a message or screen, and checking the status information of the S7-200 CPU. This chapter also describes the less-routine diagnostic functions provided by the TD device for troubleshooting problems in the S7-200 CPU, such as forcing I/O or changing the operating mode

5.2 Using the Text Display Device to Access Screens and Alarms

Using the TD Device to Access Screens and Alarms

The TD devices allow you to structure information as either screens or bit-enabled alarm messages. You use the buttons of the keypad of the TD device to navigate through the screens and menus:

- TD 200: Uses the standard TD keypad.
- TD 100C, TD 200C, and TD400C: Allow you to change the configuration and use your own custom-designed keypad. (If there is no custom configuration, the TD 100C, TD 200C and TD400C defaults to the standard TD keypad configuration.)

Tip

For more information about configuring the functionality of the buttons on the keypad:

- Chapter 4 provides information about configuring the buttons for the TD devices. The TD configuration is downloaded to the S7-200 CPU with your user program.
- Chapter 3 provides information about creating a custom keypad layout for the TD device, and assigning specific functionality for each button. (You then integrate the custom keypad with the screens and alarm messages as described in Chapter 4.)

As shown in Figure 5-1 and Figure 5-2, the standard TD keypad provides the following buttons:

- ENTER and Escape (ESC) buttons:
 - ENTER selects a menu item or confirms a value.
 - ESC exits from a menu or cancels a selection.
- Configurable buttons:
 - Function keys perform the task that you configured with the Text Display wizard. The TD 200, TD 200C, and TD400C uses F1 to F4, and the TD 100C uses F1 and F2.
 - SHIFT on the TD 200, TD 200C and TD400C allows the function keys (F5 to F8) to perform the task that you configured with the Text Display wizard.

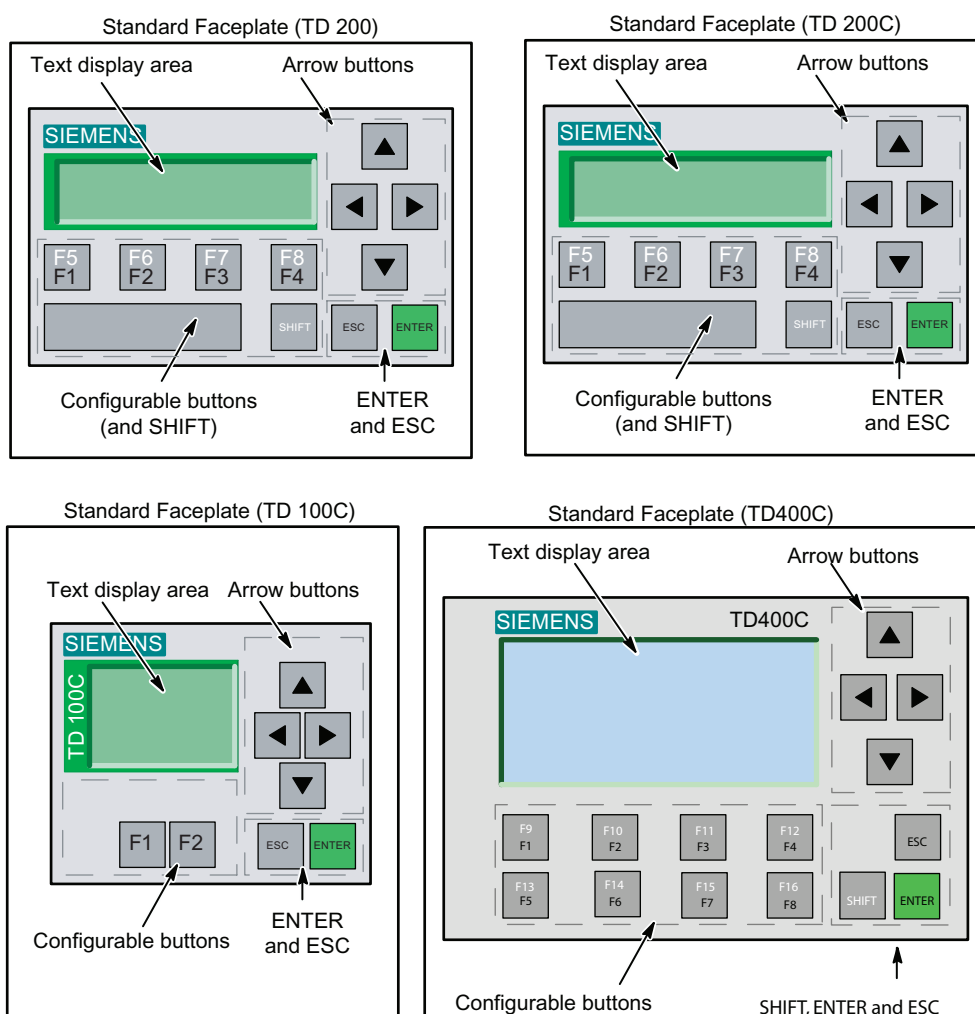


Figure 5-1 Standard TD Keyboards

- Arrow buttons:
 - UP arrow scrolls (upwards) through menu items or increments a value that can be edited.
 - DOWN arrow scrolls (downwards) through menu items or decrements a value that can be edited.
 - LEFT and RIGHT arrows move the cursor left or right within the message (TD 100C, TD 200C, and TD400C only). For a TD 200, use SHIFT+DOWN to move right and SHIFT+UP to move left. You can also use ENTER to move to the next variable message.

To select a menu item, use the UP and DOWN arrows to scroll through the list of available items. The TD device highlights the menu item.

- Pressing ENTER selects the highlighted item.
- Pressing ESC returns to the previous menu or screen.

Display Backlight on the TD400C

The TD400C allows you to set the amount of time that the display backlight is on. This allows you to extend the life of the TD400C by turning off the backlight when the display is not needed.

You can configure the TD400C display backlight on time:

- From 1 to 59 minutes in 1 minute increments
- Always on
- 1, 2, 4, or 8 hours
- Default on time (10 minutes)

The backlight will turn on when:

- The TD400C is powered on
- The S7-200 CPU forces a reset of the TD400C with the TD_Reset bit in the TD parameter block.
- You press a key. The time is extended each time a key is pressed.
- A new alarm is read from the S7-200 CPU

When the display backlight is turned on, the backlight is on for the time that you configured in the TD Setup menu.

If the backlight is currently off and you press a key, the first keypress will turn on the backlight, but will not execute the key function. You must press the key a second time to execute the key function. There will be no audio or visual feedback for the first keypress that turns on the backlight. This lets you know that the key did not execute the key function and you must press the key again.

If your TD400C has an alarm that requires acknowledgement (an alarm that flashes or blinks), and that alarm is enabled, the display backlight will be on until you acknowledge the alarm.

Displaying Information on the TD Device

The TD device provides both screens (user-defined menus with associated screens of information) and bit-enabled alarm messages:

- **Menu:** A menu is a list of items that select a grouping of related screens. The TD 200, TD 200C and the TD400C have 8 menus available; the TD 100C has 4 menus available
- **Screen or alarm:**
 - A screen or alarm for the TD 200 and TD 200C displays up to two lines of text that provide information for the operator. Each line can be up to 20 characters of text and data. A screen contains up to 40 characters of text and data. An alarm can be either 1 or 2 lines.
 - A screen or alarm for the TD400C displays up to four lines of text that provide information for the operator. Each line can be up to 24 characters of text and data. A screen contains up to 96 characters of text and data. An alarm can be either 1, 2, or 4 lines.
 - A screen or alarm for the TD 100C displays up to four lines of text that provide information for the operator. (Each line can contain either 12 or 16 characters of text and data. A screen contains 48 or 64 characters of text and data. An alarm can be either 1 or 2 lines.)

The textual message of the screen or alarm can convey information for the operator and can also allow the operator to interact with the S7-200 CPU by changing the embedded value of a variable (such as a set point or limit).

You can configure the TD device to display screens (which are initiated by operator action) and bit-enabled alarms (which are generated by the S7-200 CPU). You can also configure the TD 200 and TD 200C, and TD400C device to display an icon to alert the operator of some event or action required. (Refer to Chapter 4 for information about configuring the TD device.)

Tip

Pressing ESC returns you to the previous menu. If there is no activity for 20 seconds (no button pressed), the TD device returns to the default display mode.

The operator uses the buttons on the keypad to navigate through the menu or a list of text. Figure 5-2 shows the buttons that an operator could use to navigate from a user menu to the screens associated with that item in the menu. Figure 5-3 shows how to navigate through the alarms. The TD 200, TD 200C, and the TD400C have eight menus available, and the TD 100C has four menus available.

- Setting the time in the S7-200 CPU (Set Time and Date)
- Selecting a language set for the TD device (Set Language) (TD 200, TD 200C, and TD400C)

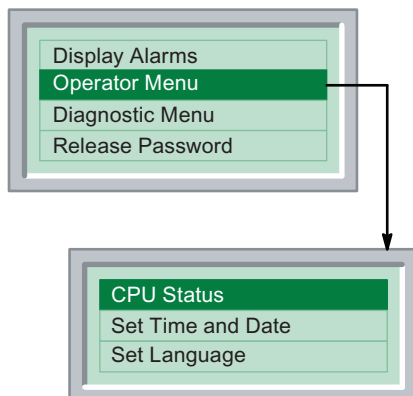


Figure 5-10 Operator Menu for TD 200, TD 200C, and TD400C

Viewing the Status of an S7-200 CPU

The CPU Status command allows you to display the following information:

- Model and version of the S7-200 CPU
- Error messages generated by the S7-200 CPU

After you select the CPU Status command, the TD device displays the CPU model and version.

Press the UP or DOWN arrows to display the error messages that were generated by the S7-200 CPU.

The TD device displays an error message only if an error exists in the S7-200 CPU. The CPU classifies errors as either fatal errors or non-fatal errors.

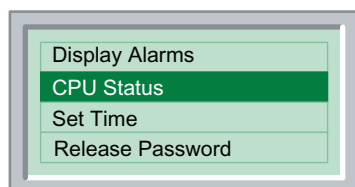


Figure 5-11 CPU Status Menu for TD 100C

Table 5-2 lists the error messages that can be displayed by the TD devices. Refer to the SIMATIC S7-200 Programmable Controller System Manual for information about specific errors.

Table 5- 2 Error Messages Relating to the Status of the S7-200 CPU

Type	Message	Description
Fatal	Program Checksum Error	Hardware failure (S7-200 CPU)
	Compare Contact	User program error: Illegal Compare contact
	EEPROM/Permanent Memory Failure	Hardware failure (S7-200 CPU)
	Memory Cartridge Failure	Memory cartridge failure
	Scan Watchdog Timeout	Hardware failure (S7-200 CPU)
	Unknown Error XXXX (where XXXX = the error number) ¹	CPU failure (S7-200 CPU)
Non-Fatal	I/O Error Mod X (where X = the number of the I/O module)	An expansion module encountered an I/O error. If there are multiple failures, the TD device displays this message multiple times one time for each failed module.
	Runtime Error XXXX (where XXXX = the error number) ¹	The S7-200 CPU encountered an error while executing the user program, such as: • Indirect addressing • HSC setup and execution errors • Attempting to execute an illegal instruction (ENI, DISI, or HDEF) inside an interrupt routine • Subroutine nesting errors • TODW data errors • Simultaneous Transmit (XMT) and Receive (RCV) errors
¹ Refer to the SIMATIC S7-200 Programmable Logic Controller System Manual for information about specific errors.		

Setting Time and Date in the S7-200 CPU

You can use the TD device to change the time-of-day settings in the S7-200 CPU. This allows an operator to easily adjust for time changes.

The TD device does not maintain time and date settings. In order to display the time and date values, the TD device reads the current time and date from the S7-200 CPU and displays these values. The operator can then use this screen to edit these values and then write the new time and date settings back to the S7-200 CPU.

Tip

The TD device does not validate the time, date or day of the week values that you enter. You can inadvertently write an incorrect date or day of the week to the S7-200 CPU.

To allow an operator to change the time and date settings in the S7-200 CPU:

- You must have enabled (selected) the time-of-day (TOD) option when you configured the TD device with the Text Display wizard. Refer to Chapter 4.
- The S7-200 CPU must support the TOD clock

Tip

If you configured a password for the TD device, the operator must enter the password before being allowed to set the time and date.

If the TD device was not configured to allow changes to the time or if the S7-200 CPU does not support the TOD clock, the Set Time and Date command does not appear on the Operator Menu.

After you select the Set Time command, the TD device reads the current date and time from the S7-200 CPU.

The Time and Date screen displays the following information:

- Date: day-month-year (for Chinese, the date is displayed as year-month-day)
- Time
- Day of the week

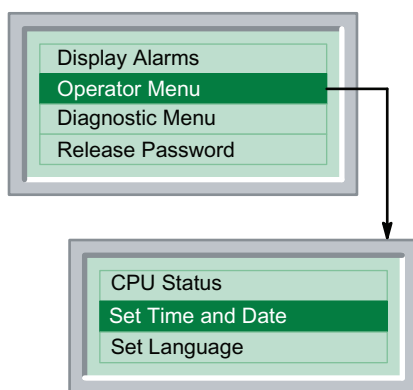


Figure 5-12 Setting the Time and Date on the TD 200, TD200C, and TD400C

Use the UP or DOWN arrow buttons to change the values in the fields.

Use the ENTER to move to the next field. (For a TD 100C, TD 200C, and TD400C, you can also use the RIGHT arrow. For a TD 200, you can use the SHIFT+DOWN arrow.)

Use the ESC to move back to the first field. (For a TD 100C, TD 200C, and TD400C, you can also use the LEFT arrow. For a TD 200, you can use the SHIFT+UP arrow.)

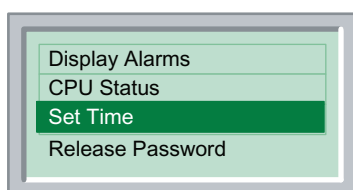


Figure 5-13 Setting the Time and Date on the TD 100C

Pressing ENTER when the cursor is located on the last field of the Time and Date screen writes the new time and date values to the S7-200 CPU and returns to the Operator Menu.

Pressing ESC when the cursor is located on the first field of the Time and Date screen returns to the Operator Menu.

Changing the Language Set (TD 200C, TD 200, and TD400C only)

You can use the TD device to change the language set in order to localize the TD device for another country. You must have created different language sets for your alarms and screens when you configured the TD device with the Text Display wizard. Each language set that you configure selects the language for the system menus and prompts of the TD device, as well as the screens and alarms. Refer to Chapter 4 for information about configuring language sets for the TD device.

Selecting the Set Language command displays a menu of the languages that you configured with the Text Display wizard as shown in the figure below. Use the UP or DOWN arrows to select the language to be displayed by the TD device.

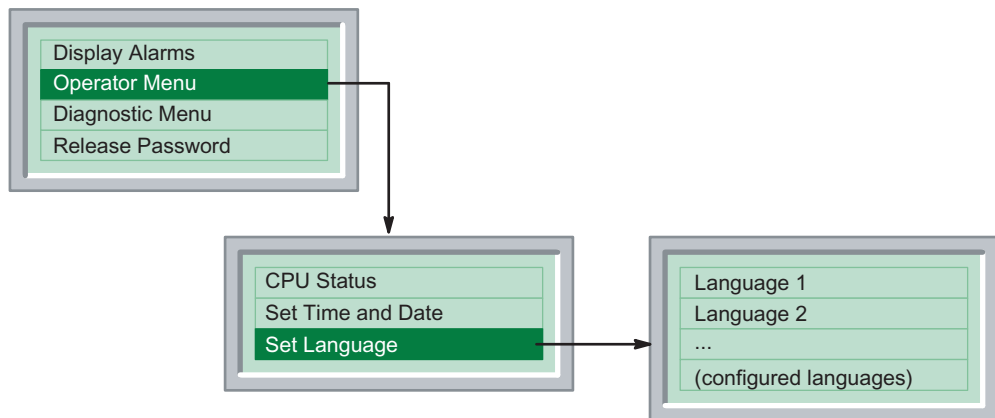


Figure 5-14 Selecting One of the Language Sets Configured for the TD Device

Cleaning the Keypad

The Clean Keypad function disables the keypad for 30 seconds to allow you to clean the keypad without affecting TD operation. The TD device displays a count down timer that shows the remaining seconds.

5.7 Performing Specialized Operator Tasks (Diagnostic/Setup Menu)

Performing Specialized Operator Tasks (Diagnostic/Setup Menu)

Some of the pre-configured tasks provided by the TD device provide assistance with setting up the TD device or troubleshooting problems with the S7-200 CPU. These functions are typically accessed infrequently. See the figures below.

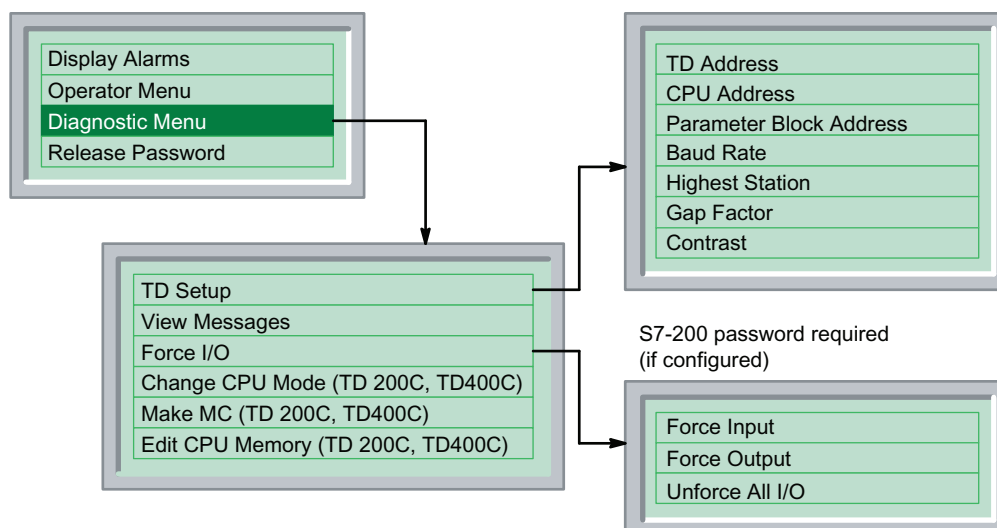


Figure 5-15 TD 200, TD 200C, and TD400C Diagnostic Menu Hierarchy

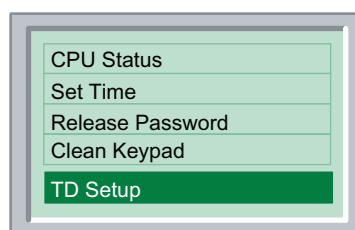


Figure 5-16 TD 100C Diagnostic Menu Hierarchy

Tip

If you are using a custom keypad that does not support the ENTER and ESC buttons, you must use the standard keypad to set up the TD device.

To restore the standard TD keypad:

1. Power down the TD device
2. Press and hold the lower right corner (where ENTER key is located on the standard keypad)
3. Power up the TD device

The default keypad is restored until the TD device is power cycled again.

Setting up the TD Device

As shown in the figure below, you use the TD Setup menu to configure various parameters for the TD device, such as network addresses, address of the parameter block (stored in V memory of the S7-200 CPU), baud rate, and other communication parameters.

- Setting the network address for the TD device: Use the UP or DOWN arrow to set the network address (default address = 1).
- Setting the CPU address: Use the UP or DOWN arrow to select the network address for the S7-200 CPU (default = 2).
- Setting the address for the parameter block: Designates a V memory location where the parameter block (or an offset to the location of the parameter block) is stored in the S7-200 CPU. Setting the address of the parameter block allows you to connect multiple TD devices to a single S7-200 CPU.

Use the UP or DOWN arrow to select the starting V memory address of the parameter block that stores the configuration of the TD device.

The address of the parameter block must match the address that you configured in the S7-200 CPU (address range: VB0 to VB32000, default = VB0).

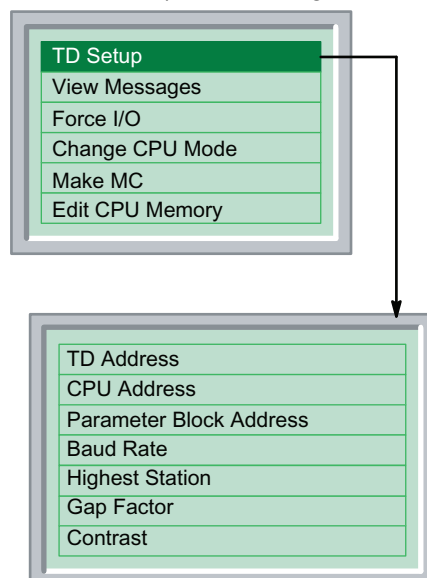


Figure 5-17 TD Setup Menu for the TD 200 and TD 200C

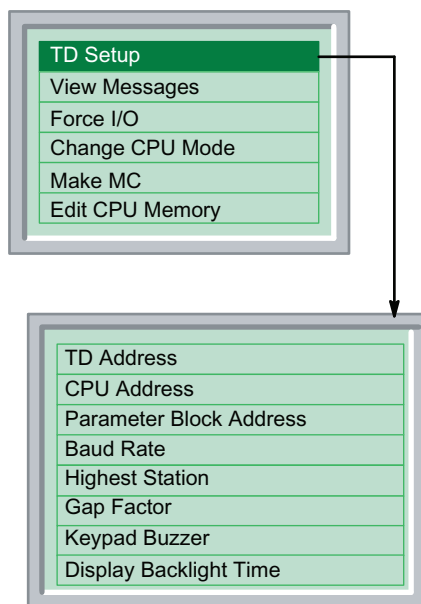


Figure 5-18 TD setup menu for the TD400C

- Setting the baud rate for the TD device: choose the baud rate for the TD device. You can choose either 9.6 kbaud (9600 baud), 19.2 kbaud, or 187.5 kbaud.

Use the UP or DOWN arrow to select the baud rate. The baud rate must match the baud rate of the S7-200 CPU and any other device on the same network.

- Setting the Highest Station: Changes the highest station address for the TD device. This setting tells the TD device which network addresses to check when looking for other network master devices. The default highest station address is 31. This means that the TD device checks addresses 0 through 31 when looking for other network masters. This setting should only be changed when there are more than 32 master devices on the network.

Use the UP and DOWN arrows to select the highest address on the network (default = 31).

- Setting the Gap Factor: Changes the Gap Factor for the TD device. This setting tells the TD device how often to check for other network master devices. The default setting of 10 causes the TD device to check once every 10 messages. A setting of 1 would cause the TD device to check for other masters after every message.

Use the UP and DOWN arrows to select the gap factor between stations (default = 10).

- Setting the contrast:

- TD 100C, TD 200, and TD 200C: You can optimize the display for different viewing angles and lighting conditions by adjusting the contrast of the screen on the TD device. The default contrast value is 40, with values ranging from 25 (lighter) to 55 (darker).

Use the UP and DOWN arrows to select the contrast setting for the display area of the TD device (default setting = 40).

- Selecting the keypad buzzer: The TD400C has a keypad buzzer setting (On or Off) to provide audio feedback when a key is pressed. The default is set to On.
- Setting the display backlight time: The TD400C allows you to set the time that the display backlight is on allowing you to extend the life of the TD400C display.
 - The backlight on time is configurable from 1 to 60 minutes in one minute increments
 - You can configure the backlight to be on all the time
 - The default backlight on time is 10 minutes

Tip

At 9600 baud or 19.2 kbaud, the highest station address may need to be increased, even though the network does not contain more than 32 masters. Increasing the highest station address allows more time for the masters to transmit messages.

Viewing the TD Messages Stored in the S7-200 CPU (TD 200, TD 200C, and TD400C only)

You can review all of the TD messages (screens and alarms) that you configured for the TD device within the language set currently selected for the TD device.

The View Messages command allows you to verify that all of the alarms and screens were correctly stored in the S7-200 CPU.

The View Messages command does not allow you to edit any values that are displayed in the messages.

Selecting the View Messages command displays all of the messages and process values stored in the S7-200 CPU. Use the UP and DOWN arrows to scroll through messages stored in the S7-200 CPU.

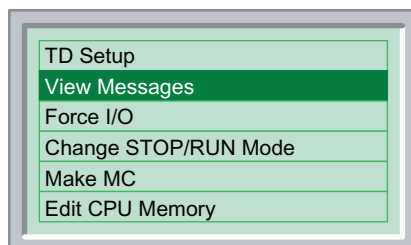


Figure 5-19 View Messages Command

Forcing the Inputs and Outputs in the S7-200 CPU (TD 200, TD 200C, and TD400C only)

The Force I/O menu allows you to force inputs, force outputs, or unforce all inputs and outputs. The Force I/O command is available only if you enabled the force-menu when you configured the TD device with the Text Display wizard.

Caution

Turning off the power to the S7-200 CPU before the force information is written to the permanent memory in the CPU can cause the S7-200 CPU to experience a failure the next time you turn the S7-200 CPU on.

To clear the error condition, use the TD device to either unforce all of the I/O points or else rewrite the force information to the S7-200 CPU. Cycling the power to the S7-200 CPU should clear the error.

If the S7-200 CPU requires a password before allowing the I/O to be forced, the TD device prompts the operator to enter the 8-character CPU password.

The Force I/O command provides the following options:

- Force Inputs: Allows you to force individual inputs on or off, or to turn off the Force function
- Force Outputs: Allows you to force individual outputs on or off, or to turn off the Force function
- Unforce All I/O: Allows you to turn off the Force function for all of the forced I/O points

Use the UP or DOWN arrow to select the specific I/O point. Pressing ENTER moves the cursor to the Force options. (For a TD 200C and TD400C, you can also use the RIGHT arrow. For a TD 200, you can use the SHIFT+DOWN arrow.)

Use the UP or DOWN arrow to select the type of force condition for the selected I/O point.

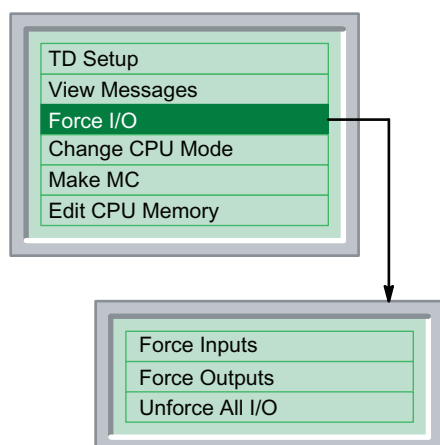


Figure 5-20 Force I/O Command

Tip

Unforcing the I/O points does not place them in the OFF state. Unforcing only removes the Force option. The points remain in their last state until you manually change them or they are changed by the user program in the S7-200 CPU.

Changing the Operating Mode of the S7-200 CPU (TD 200C and TD400C)

The Change STOP/RUN Mode command is only available for the TD 200C and TD400C and is only available if you selected this function when you configured the TD device with the Text Display wizard. See Chapter 4.

You can use the TD device to change the operating mode of the S7-200 CPU from STOP to RUN or from RUN to STOP. The operator may need to enter the TD password, if the TD device is configured for password-protection.

In order to allow the TD device to change the operating mode, the mode selector switch on the S7-200 must be set to either RUN or TERM.

The TD device cannot change the operating mode if the mode selector switch is set to STOP.

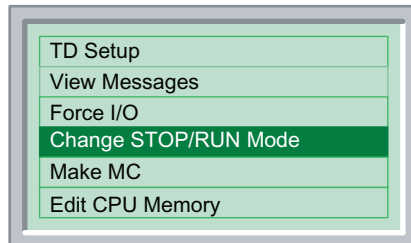


Figure 5-21 Changing the Operator Mode

Copying the User Program to a Memory Cartridge (TD 200C and TD400C)

The Make MC (memory cartridge) command is only available for the TD 200C and TD400C and only if you selected this function when you configured the TD device with the Text Display wizard. See Chapter 4.

You can use the TD 200C and TD400C to copy the user program in the S7-200 CPU to a memory cartridge (MC). The operator may need to enter both the TD password and the CPU password, if both the TD device and the S7-200 CPU are configured for password-protection.

Before attempting to write the user program to the memory cartridge, ensure that you have installed a memory cartridge in the S7-200 CPU.

After you select the Make MC command, the TD device alerts you that this operation will erase any existing data on the memory cartridge. Press the DOWN arrow to continue.

After reading the message, press ENTER to continue or press ESC to abort the operation

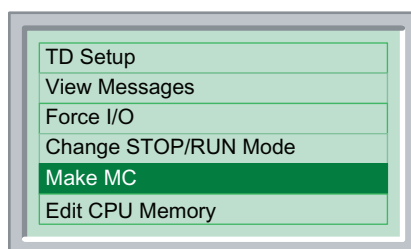


Figure 5-22 Making a Memory Cartridge

Editing the CPU Memory (TD 200C and TD400C)

The Edit CPU Memory command is only available for the TD 200C and TD400C and only if you selected this function when you configured the TD device with the Text Display wizard. See Chapter 4

You can use the TD 200C and TD400C to edit the values stored in the memory of the S7-200 CPU. The operator may need to enter the TD password, if the TD device is configured for password-protection.

After you select the Edit CPU Memory command (see the figure below), the TD device displays the Edit CPU Memory screen.

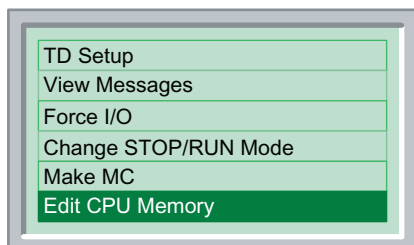


Figure 5-23 Edit CPU Memory Command

As shown in the figure below, you press ESC to edit the data in the memory address. The TD device places a cursor on the memory area.

- To edit the memory address: Use the UP or DOWN arrows to change the memory address. (Use the RIGHT or LEFT arrow keys to move between the fields of the memory address.) Press ENTER to display the value of that memory address and to move the cursor to the data type field.
- To edit the data type: Use the UP or DOWN arrows to change the data type. Press ENTER to display the value and to move the cursor to the value field.
- To edit the value stored in the memory address: Use the UP or DOWN arrows to change the value.

Press ENTER to write the new values to the memory address in the S7-200 CPU. Pressing ESC aborts the function.

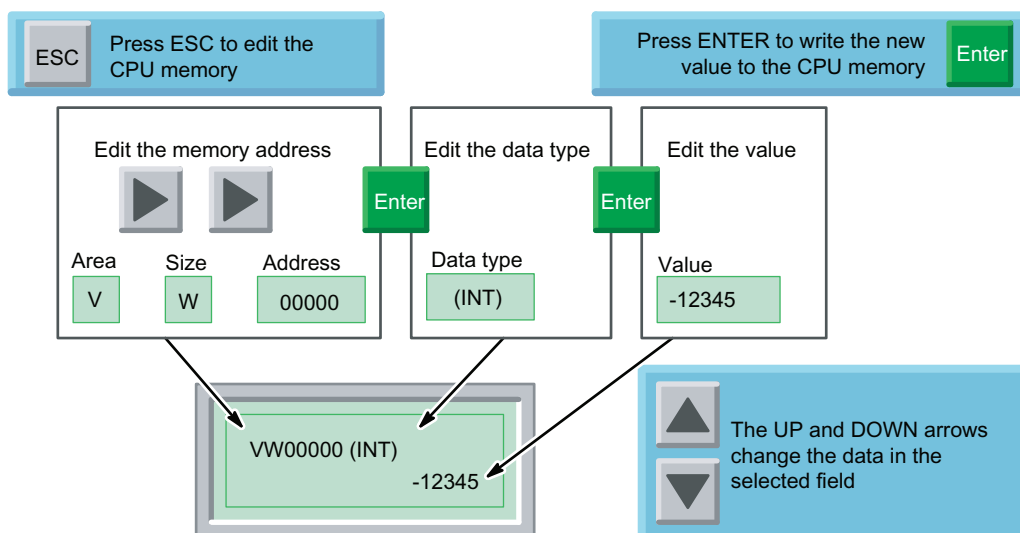


Figure 5-24 Editing the Memory in the S7-200 CPU

Technical Specifications and Reference Information

A.1 General Specifications for the Text Display Devices

General Technical Specifications for the Text Display Devices

Order Number	Description	Dimensions (mm) (H x H x D)	Weight
6ES7 272-1BA10-0YA1	TD 100C Operator Interface	89.6 x 76 x 35.7	0.11 kg
6ES7 272-0AA30-0YA1	TD 200 Operator Interface	148 x 76 x 28	0.19 kg
6ES7 272-1AA10-0YA1	TD 200C Operator Interface	148 x 76 x 28	0.20 kg
6AV6640-0AA00-0AX1	TD400C Operator Interface	174 x 102 x 31	0.31 kg
6ES7 272-1AF00-7AA0	TD 200C Blank faceplate material, A4 size (10 sheets/package)		
6ES7 272-1BF00-7AA0	TD 100C Blank faceplate material, A4 size (10 sheets/package)		
6AV6671-0AP00-0AX0	TD400C Blank faceplate material, A4 size (10 sheets/package)		
6ES7 901-3EB10-0XA0	TD/CPU cable	2.5 meters	0.15 kg

A.2 Technical Specifications for the TD 100C, TD 200 and TD 200C

Technical Specifications for the TD 100C, TD 200 and TD 200C

Table A- 1 Technical Specifications for the TD 100C, TD 200 and TD 200C

General	TD 100C 6ES7 272-1BA10-0YA1	TD 200 6ES7 272-0AA30-0YA1	TD 200C 6ES7 272-1AA10-0YA1
Keyboard	Customizable faceplate Supports up to 14 keys	Membrane keypad with 9 keys; Tab inserts for customer-specific labeling	Customizable faceplate Supports up to 20 keys
Display	FSTN-Graphic Display with 132 x 65 (columns x rows), no backlight	STN-Graphic Display with 181 x 33 (Columns x Rows), LED backlight	
PLC interface	RS 485 (PPI): 9.6 / 19.2 / 187.5 Kbits/s		

A.3 Technical Specifications for the TD400C

Technical Specifications for the TD400C

Table A- 2 Technical Specifications for the TD400C

General	TD400C 6AV6640-0AA00-0AX1
Keyboard	Customizable faceplate Supports up to 15 keys
Display	STN-Graphic Display with 192 x 64 (Columns x Rows), backlight
PLC interface	RS 485 (PPI); 9.6 / 19.2 / 187.5 Kbits/s
Supply voltage (U _N)	24 VDC, 15 VDC ... 30 VDC, safety extra low voltage, NEC Class 2 or limited power source (supplied by the S7-200 CPU, mains adapter or a 24 VDC external supply). The TD device has no integrated means of protection against strong interference pulses in the microsecond range (surge impulse). If the power being supplied has no appropriate means of protection, then a surge voltage protector should be pre-connected.
Current consumption (I _N)	Typical 41 mA
Inrush current	Maximum 570 mA
Degree of protection	IP 65 ¹ (mounted on front of the panel) IP 20 (mounted on casing)
Noise emission	<45dB(A) to DIN 45635 (no fan)
¹ To ensure compliance of the TD400C with IP 65 and UL 50 Type 4X, you must follow these guidelines. The minimum panel thickness must be at least 1.5 mm. The mounting screws on the TD device must be tightened to a torque of 0.7 N-m. The gasket must be replaced whenever the TD device is removed and reinstalled. To procure new gaskets, contact your Siemens distributor or sales representative.	

Table A- 3 Technical Specifications for the TD400C (continued)

General	TD400C 6AV6640-0AA00-0AX1
Electromagnetic Compatibility (EMC) (tested with TD/CPU cable)	
Emitted interference Limit class	A to EN 55011 = CISPR 11
Noise immunity on signal lines	±2kV, Testing according to IEC 61000-4-4; Burst
Noise immunity to discharge of static electricity	±8kV Air discharge (according to IEC 61000-4-2; ESD) ±6kV Contact discharge (according to IEC 61000-4-2; ESD)
Conducted interference on DC power supply line	±2kV, Testing according to IEC 61000-4-4; Burst ±1kV according to IEC 61000-4-5; ms-impulse (Surge); (line against line) ±2kV according to IEC 61000-4-5; ms-impulse (Surge); (line against earth) Power supplies with the same voltage can only be used with additional means of protection, for example, a surge voltage protector available from the Dehn company, type BVT AD 24, order No. 918 402.

General	TD400C 6AV6640-0AA00-0AX1
Noise immunity to high frequency emission	10 V with 80% amplitude modulation at 1 kHz, 10 kHz to 80 MHz 10 V/m with 80% amplitude modulation at 1 kHz, 80 MHz to 1 GHz 3 V/m with 80% amplitude modulation at 1.4 GHz to 2 GHz 1 V/m with 80% amplitude modulation at 2.0 GHz to 2.7 GHz
Climatic Conditions	
Temperature Operation Storage/Transport	0 to +50 °C -20 to +60°C
Relative humidity Operation Storage/Transport	85% (30°C), no condensation 95% (25°C to 55°C), no condensation
Mechanical Environmental Conditions	
Vibration	Tested according to IEC 60068-2-6
Operation	5 Hz to 9 Hz, amplitude, 3,5 mm 9 Hz to 150 Hz, acceleration 9.8 m/s ²
Transport (packaged)	5 Hz to 9 Hz, amplitude 3.5 mm, 9 Hz to 500 Hz, acceleration 9.8 m/s ²
Shock Operation Transport (packaged)	Tested according to IEC 60068-2-27/29 Semisinusoidal: 150 m/s ² (15g), 11 ms Semisinusoidal: 250 m/s ² (25g), 6 ms
Special Features	
Quality assurance	In accordance with ISO 9001
Servicing	Maintenance-free (no battery)
Panel mounting	Accessories for panel mounting are enclosed

A.4 Certificates, Directives and Declarations for the TD Device

Certificates, Directives and Declarations for the TD Device

IEC 61131-2

The TD 100C and TD400C devices satisfy the requirements and criteria of the IEC directive 2004/108/EC standard (programmable controllers, part 2 on equipment requirements and tests).

Notes on the CE Symbol

The following applies to the SIMATIC product described in this operating instruction



EMC Directive

This product fulfils the requirements for the EC directive 2004/108/EC on "electromagnetic compatibility" and the following fields of application apply according to this CE symbol. See Table A-4.

Table A- 4 EMC Directive

Field of Application	Requirement for Emittet Interference	Requirement for Noise Immunity
Residential, commercial areas and light industrial environments	EN 6100-6-3	EN 61000-6-1
Industry	EN 61000-6-4	EN 61000-6-2

Declaration of Conformity (TD 200C, TD 200, and TD400C)

The EC declarations of conformity and the documentation relating to this are available to the authorities concerned, according to the above EC directive, from:

Siemens AG
Bereich Automatisierungs- und Antriebstechnik
I IA AS RD ST
Postfach 1963
D-92209 Amberg

Tel.: 09621 80 3283
Fax: 09621 80 3278

Observing the Setup Guidelines

The setup guidelines and notes on safety given in the manual must be observed on startup and during operation.

A.5 Approvals for USA, Canada and Australia

Approvals for US,



Australia

Markings stamped on a device are indicative of the requirements which that device must meet. Markings include: HAZ. LOC. Laboratories: cULus Approval, Hazardous Location

cULus Listed 21BP I.T.E. for Hazardous Location
Underwriters Laboratories Inc., according to:

- TD 200 and TD 200C:
UL 60950 (Information Technology)
CSA C22.2 No. 60950 (Information Technology)

cULus Listed 7RA9 IND. Cont. EQ. for Hazardous Location
Underwriters Laboratories Inc., according to:

- TD 100C and TD400C
UL 508 (Industrial Control Equipment)
CSA C22.2 No. 142 (Industrial Control Equipment)
UL 1604 (Hazardous Location)
CSA-213 (Hazardous Location)

APPROVED for use in:

- Cl. I, Div.2, GP. A, B, C, D, T5
- Cl. I, Zone 2, GP.IIC, T5

Please see the note below:

Note

This plant has to be mounted according to the NEC (National Electric Code) stipulations.
When used in environments according to class I, division 2 (see above), the SIMATIC TD device must be mounted in a housing that corresponds to at least IP54 according to EN 60529.

FM approval to Factory Mutual Approval Standard Class Number 3611, Class I, Division 2, Group A, B, C, D, and Class I, Zone 2, Group IIC.
Temperature Class T5 is adhered to when the ambient temperature during operation does not exceed 50 degrees C



Note for Australia: The TD 100C, TD 200, and TD 200C devices fulfil the requirements for Norm AS/NZS CISPR 22. The TD400C device fulfils the requirements for Norm AS/NZS CISPR 11.

