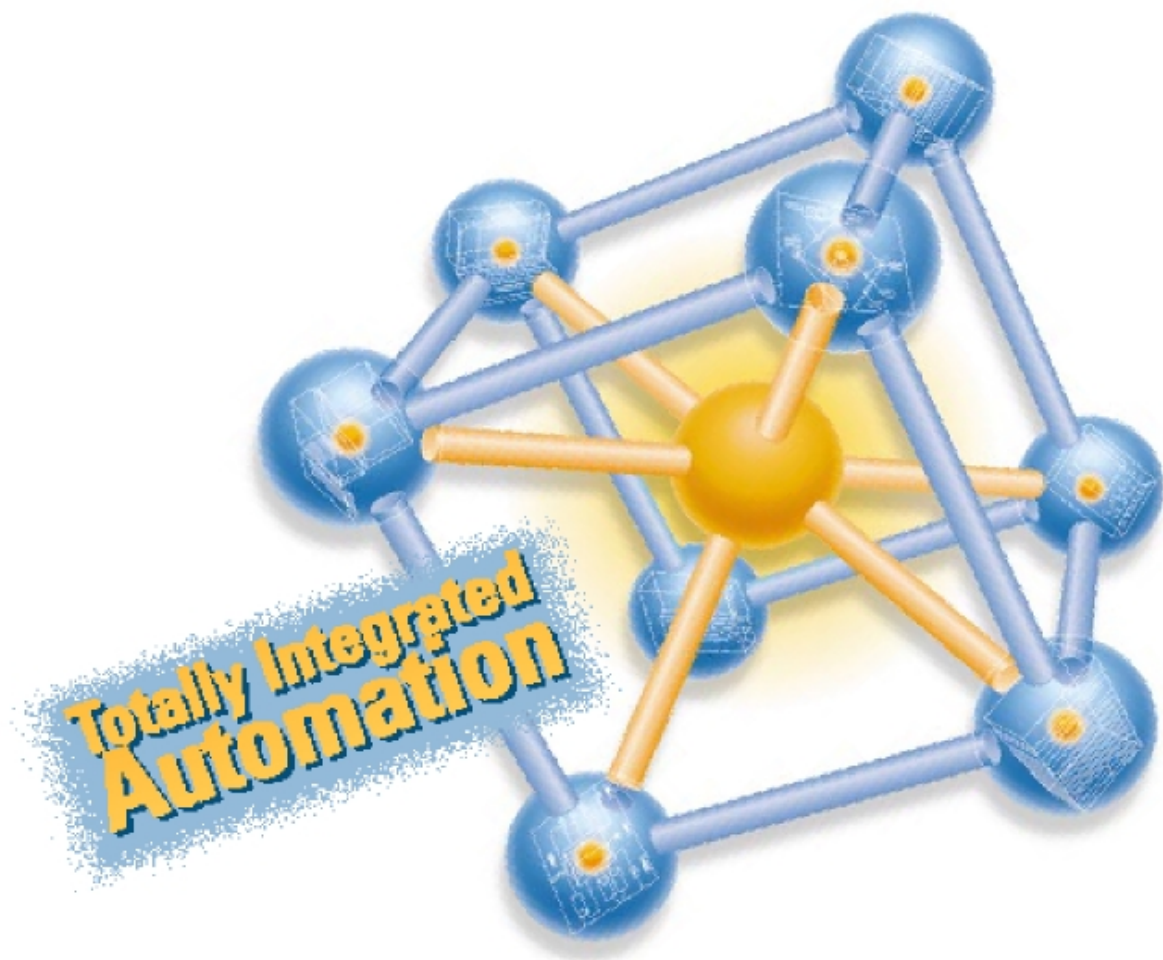


SIMATIC FM 450-1

Getting Started

Edition 09/2000

First Steps in Commissioning



This guide uses a specific example to introduce you to starting up your FM 450-1 module. It uses four steps to lead to a functioning application in which you count the switching operations of a contact and become familiar with and test the basic functions of the hardware and software of your FM 450-1. The references to the manual are intended to give you an initial overview of the information in the manual. The references refer to the “FM 450-1 Function Module” manual with the number C79000-G7076-C450-01.

The time required to work through the example will be approximately 1 to 2 hours, depending on how experienced you are.

Requirements

The following requirements must be fulfilled:

- You must have an S7-400 station comprising a power supply module and a CPU.
- You have an external 24 V DC power supply.
- STEP 7 (≥V4.02) is correctly installed on your programming device (the example given in this Getting Started was carried out with STEP 7 V5.0).
- You have set up a project for the S7-400 station.
- The programming device must be connected to the CPU.
- You must have an FM 450-1 module, the configuration package for the FM 450-1, and the necessary accessories such as a front connector, sensors or switches, and wiring material.

Installing the Configuration Package on the Programming Device

The configuration package contains a configuration tool for the FM 450-1, the functions (FC) and the data structure (UDT) required, and a sample program.

Insert the CD in the CD drive.

Under Windows start the dialog for installing software by double-clicking the “Add/Remove Programs” symbol in “Control Panel”.

Click [Install...](#) , start the Setup.exe file on the CD in the Setup folder and follow the instructions of the installation program.

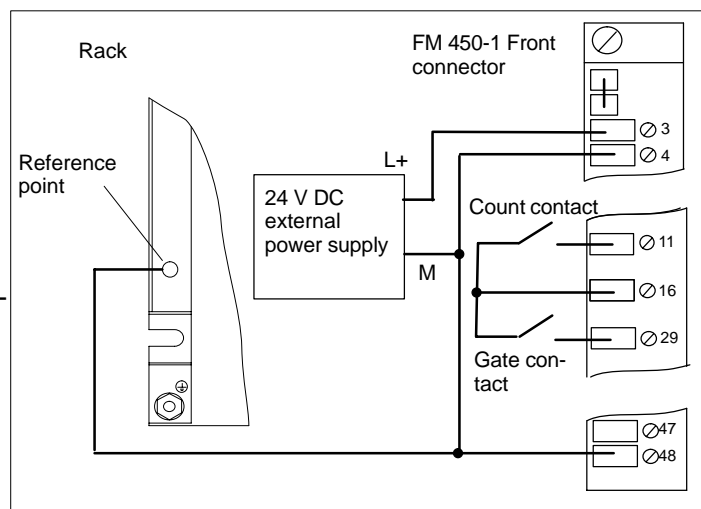
Installing and Wiring the FM 450-1 (Manual Chapter 3 and 4)

Turn off the power supply and change the mode selector on the CPU to STOP.

Hook the top of the FM 450-1 onto the rail in the selected slot, swing it down and secure it with screws (for more detailed information, refer to Chapter 3 of the manual).

Wire up the channel 1 to the front connector as shown in the picture on the right (the full pinout of the front connector is described in Chapter 4 of the manual).

Plug in the front connector on the FM 450-1 and secure it with screws.



Test: Turn on the power supply module and the external 24 V DC power supply. The red EXTF LED on the FM 452 is lights up briefly and goes off again. The INTF LED remains lit since you have not yet entered the FM 452 in the hardware configuration.

Assigning Parameters to the FM 450-1

Open your project in the SIMATIC Manager.

Open the configuration table (HW Config) in your project.

From the hardware catalog select the FM 450-1 with the correct order number and drag it to the required slot (in the example: slot 5).

Call the parameter assignment screen forms by double-clicking on this FM 450-1. To do this, you may have to close the dialog asking you to save the configuration with **OK**.

Select the following settings for the channels 1 and 2 by clicking on the buttons in the parameter assignment screen forms (please leave all other settings unchanged, as they are not yet required for commissioning):

- Operating Modes: 0 to +32 Bit, Continuous Counting, Hardware Gate
- Encoders: 24V Initiator, P Switch
- Inputs: Level-Controlled Hardware Gate
- Process interrupt enable: not possible as deselected in basic parameters
- Outputs: DQ0 Inactive, DQ1 Inactive
- Reaction to CPU stop: STOP

Enter the FM 450-1 parameter assignments in your configuration using the menu command **File > Save** and close the parameter assignment window.

Save the configuration created by you in your project using the menu command **Station > Save and Compile**.

Download the configuration with the CPU in STOP mode using the menu command **PLC > Download To Module**.

The data are now downloaded directly to the CPU and into the FM 450-1. The red LED INTF extinguishes. From now on, as long as the configuration remains buffered in the CPU, the data will be transferred from the CPU to the FM 450-1 every time the CPU switches from STOP to RUN.

Test: *You can now run simple tests for channel 1 without a program:*

Close the gate contact: the green LED 110 lights up.

Close and open the count contact several times: you can monitor the state of the least significant bit of the FM 450-1 counter via the green LED CR.

Note that a mechanical count contact can bounce.

When you open the gate contact, the gate LED 110 extinguishes and no more switching operations are counted (the timing diagram for this function can be found in Section 2.2 of the manual).

Integrating into the User Program

Open the library FMx50LIB in the SIMATIC Manager using the menu command **File > Open...Libraries**.

Copy the functions FC0 and FC1 and the user-defined data type UDT1 from the “**Blocks**” container of the FMx50LIB library to the “Blocks” container of your project.

Insert DB1 in the “Blocks” container using the menu command **Insert > S7 Block > Data Block**.

Open DB1 and create the DB1 as a data block referencing the user-defined data type UDT1.

Save the DB 1 using the menu command **File > Save** and then close with **File>Close**.

Open the popup menu in HW Config by clicking with the right mouse button on the FM450-1 entry. Using the **Object Properties** menu command start the **Properties – FM450-1 COUNTER** screen form.

Using the **Mod Addr...** button you can now automatically enter the module address (MOD_ADR) (in the example: 512 corresponds to 200 Hex), the channel address (CH-ADR) and the channel length set under **Addresses** in the channel data block.

You can achieve this by clicking the [Select DB](#) button in the [Module Address for DB](#) screen form. Click and select the [DB 1](#) in the [Open](#) dialog which was started. By clicking [OK](#) the values are stored in [DB 1](#) and the [Open](#) and [Module address for DB](#) screen forms are automatically closed. Exit the [Properties – FM450-1 COUNTER](#) screen form with [OK](#).

Alternatively you can also supply these parameters to DB1 in OB100 (see manual, Section 6.1).

Open OB 1 in your project.

Call FC0 in OB1 and supply parameters to FC0 (see manual, Section 6.1):

```
CALL FC 0
      DB_NO := 1
      :
      :
```

Assign all remaining parameters of FC0 with free memory bits.

Save OB1 using [File → Save](#).

Select all the blocks in your project (apart from VAT and UDT).

Download your program to the CPU using the menu command [PLC > Download](#).

Test: Using the “Monitoring and Modifying Variables” application you can now monitor the count value and the gate, for example:

In your project select the “Blocks” container. Insert the variable table VAT1 using the menu command [Insert > S7 Block > Variable Table](#) and confirm with [OK](#).

Open the variable table VAT1 and enter the following variables in the “Address” column:

[db1.dbd34](#) (actual count value)

[db1.dbx43.6](#) (status of internal gate)

Save the variable table VAT1 using the menu command [Table > Save](#).

Switch online using the menu command [PLC > Connect To > Configured CPU](#).

Switch to monitoring using the menu command [Variable > Monitor](#).

Switch the CPU to RUN-P.

Generate pulses with the count contact and monitor the count value with relation to the state of your gate contact.

Diagnosics

Errors can occur as a result of incorrect operation, incorrect wiring, or contradictory parameter assignments which the FM 450-1 displays with the error LEDs INTF or ESTF.

Refer to Section 6.2 and Chapter 13 of the manual for information on how you can diagnose errors and messages.

Example

In the zEn23-1 project you will find another example which you can use to guide you and which you can adapt to your application.