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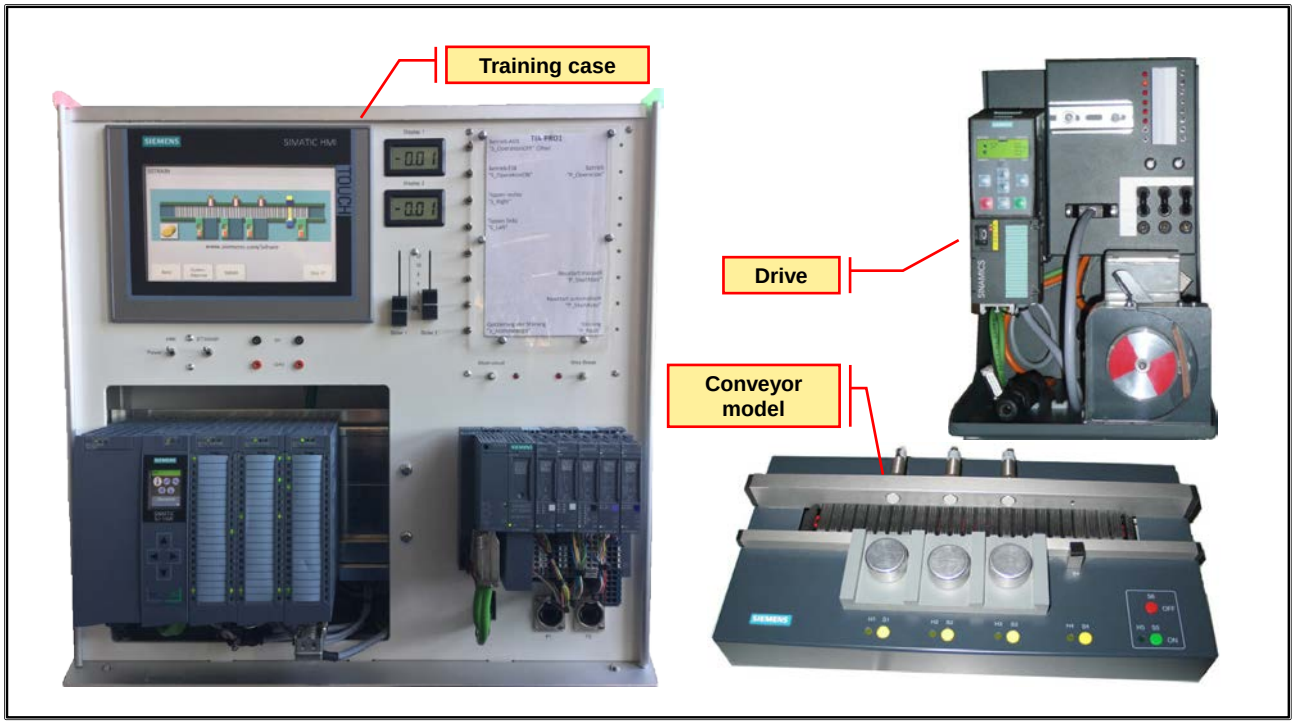
1. Training Devices and Addressing

At the end of the chapter the participant will ...

... be familiar with the configuration of the training area

... be familiar with the wiring of the training area components

1.1. Training Area Setup



Components of the Training Area

The training area for this course contains the following components:

- Training case
- Sinamics G120 drive
- Conveyor model
- And additionally, a SIMATIC Field PG or PC for configuring and programming

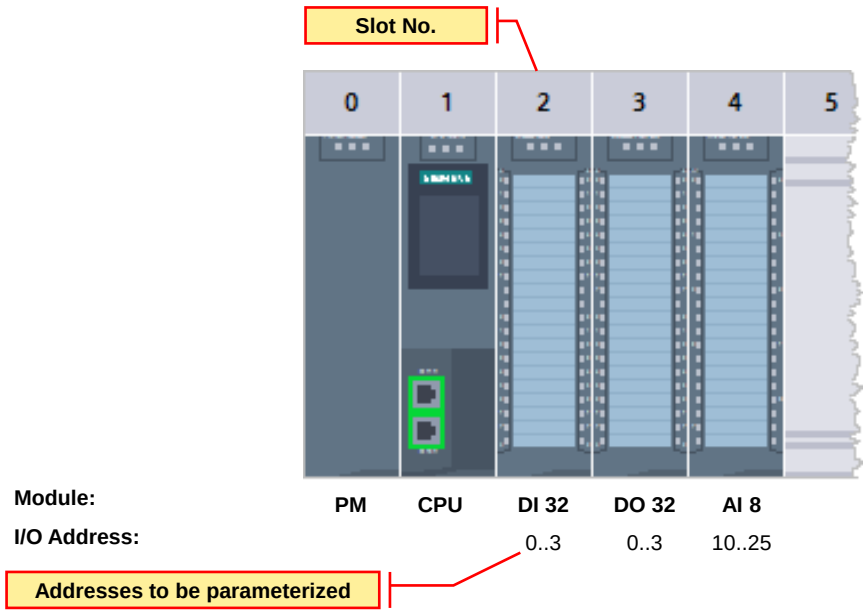
1.2. Training Case

Components of the Training Case

The training case consists of the following components:

- S7-1500 controller with central I/O,
- I/O-Device (ET 200SP) with distributed I/O,
- Touchpanel as operator control and monitoring device (HMI),
- An operating tableau for digital signals with input elements (switches) and display elements (lights [LEDs])
- An analog display and operating area with slide controls and voltage displays

1.2.1. Configuration of the Controller (S7-1500)

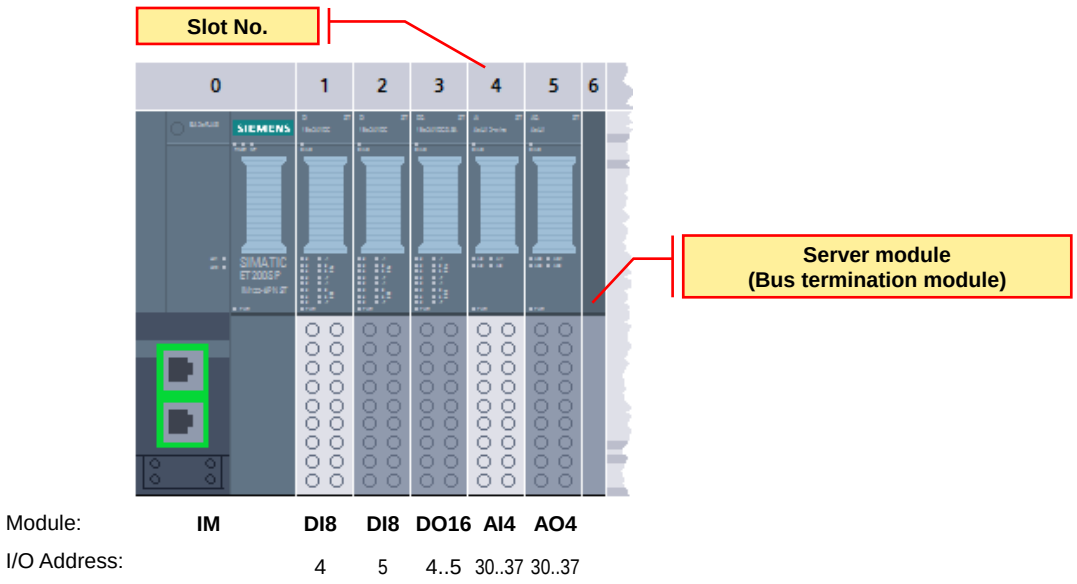


Addresses of the Central S7-1500 I/O Modules

Two digital 32-channel modules are available as central I/O. These are to begin as of Address =0.

Since digital channels are also available on the distributed I/O, the analog module of the central I/O is to begin as of Address =10.

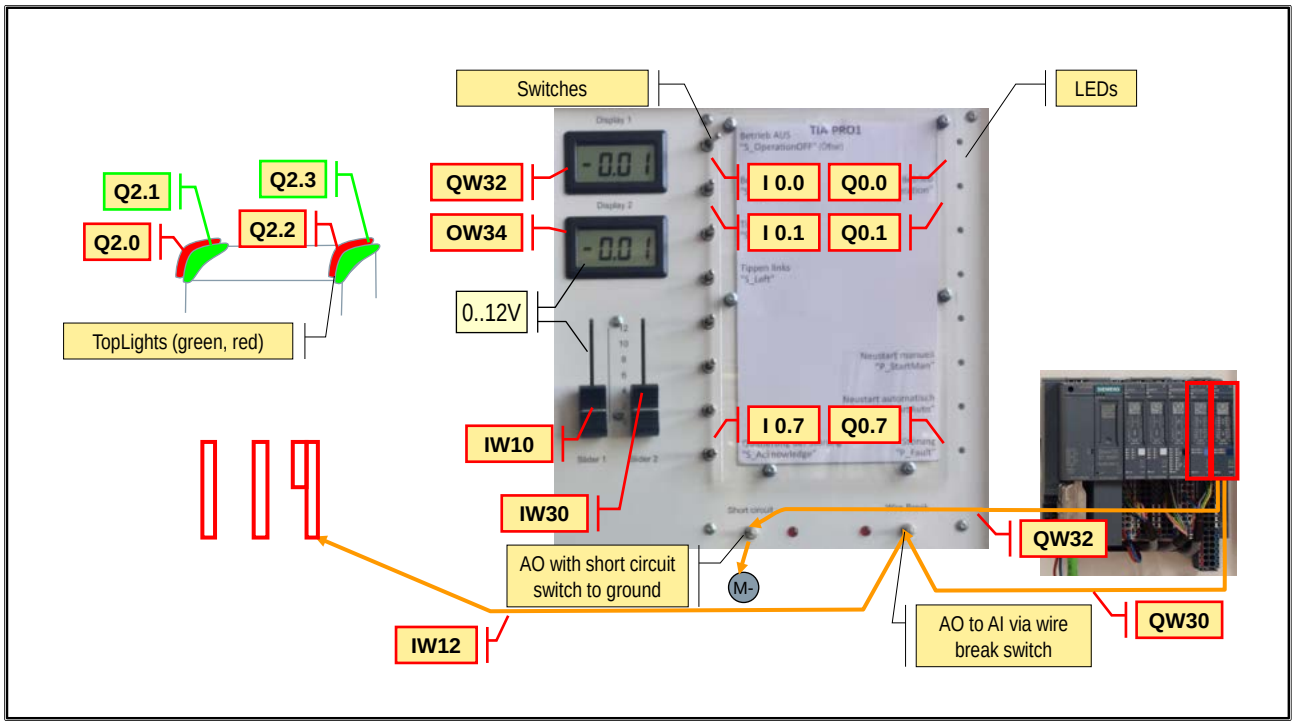
1.2.2. Configuration of the I/O-Device (ET 200SP)



Three digital modules are available as distributed I/O. These are to follow the central digital I/O in the address space as of Address =4.

The analog distributed I/O is to begin as of Address =30.

1.2.3. Operating and Display Elements of the Training Device



Operating Elements

In addition to the touchpanel, separate operating elements are also available for operating the system:

- 8 switches
- 2 potentiometers for setting or simulating analog input signals
- Wire break switch that interrupts the connection AO1 distributed I/O to AI2 central I/O
- Short circuit switch that short-circuits the AO2 of the distributed I/O to ground

Display Elements

In addition to the touchpanel, separate display elements are also available for the visualization of process information:

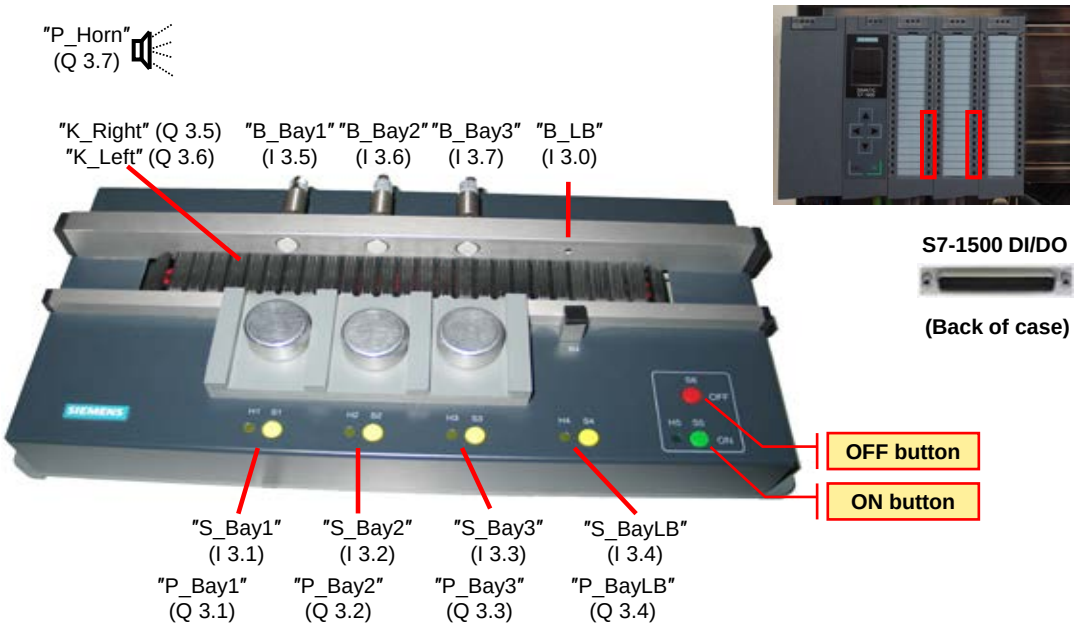
- 8 LEDs
- 2 digital voltage displays for displaying analog output signals
- On top of the training device there are, to the right and left, 2 LED bars "TopLights" (2x green, 2x red). These can be controlled by means of 4 DOs.

Addressing

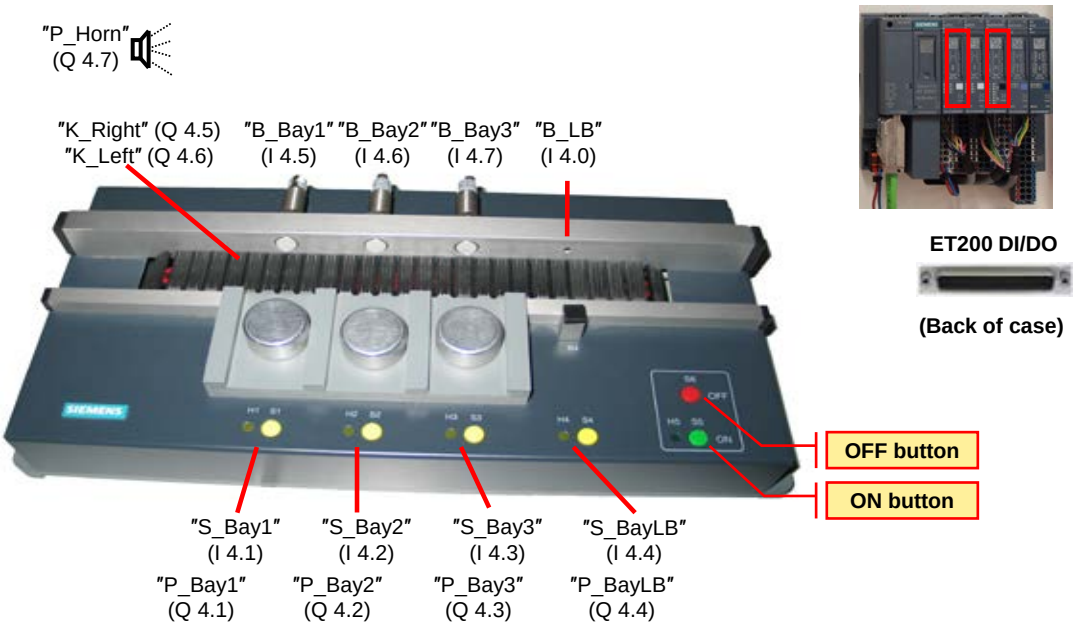
For the addressing shown in the picture, the relevant module address settings must be made in the device configuration.

1.3. Setup and Connection of the Conveyor Model

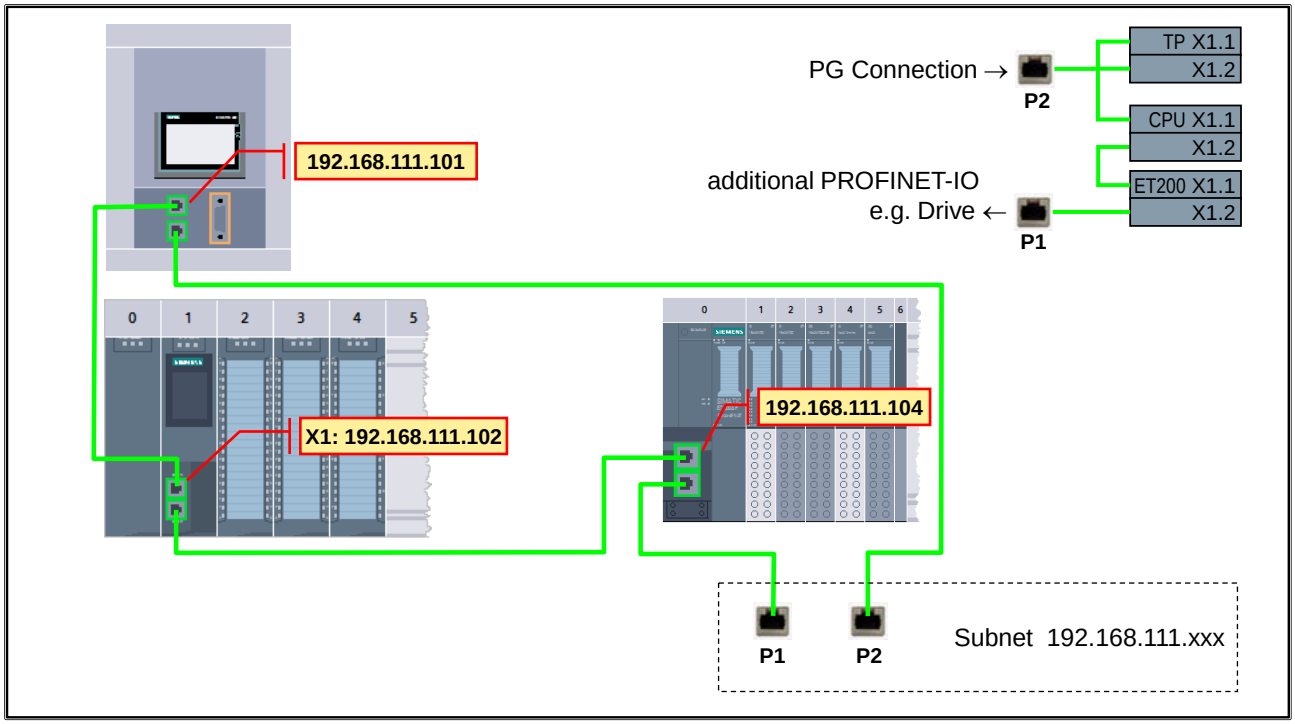
1.3.1. Connection to Central I/O of the S7-1500



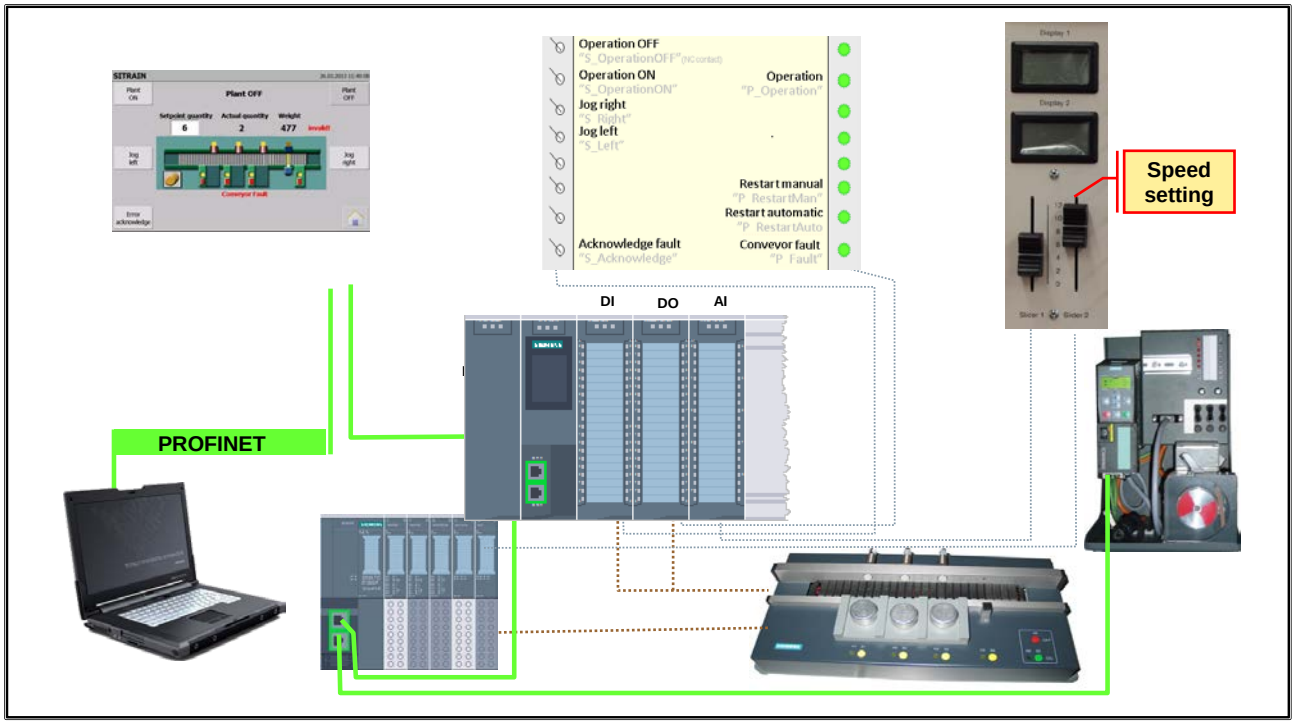
1.3.2. Connection to Distributed I/O of the ET 200SP



1.4. Networking and IP Addresses of the Modules



1.5. Training Area as Plant with Distribution Conveyor and Touchpanel



Function Description:

The distribution conveyor is used to transport parts and can be operated in two different operating modes.

For now, the simulator switches are used to select the operating mode and later, the associated buttons on the touchpanel.

Operation Switched Off "P_Operation" (Q0.1) = Off

In Manual mode ("P_Operation" = FALSE), the conveyor motor can be jogged to the right and left. For now, the simulator switches are to be used for this, later, the associated buttons on the touchpanel.

Later, the G120 drive will also be controlled as if it would drive the conveyor. The speed of the motor is preset through a parameter in the converter.

Continued on the next page

Operation Switched On "P_Operation" (Q0.1) = On

When Automatic mode ("P_Operation" = TRUE) is switched on, parts are transported on the conveyor model from Bay 1 or 2 to the right until they are through the light barrier.

If a transport sequence takes longer than 6 seconds, the conveyor motor is automatically switched off and the fault is displayed on the simulator as well as on the touchpanel. Only after the fault is acknowledged with the simulator switch or on the touchpanel, can a new transport sequence be started.

All parts that pass the light barrier when in Automatic mode ("P_Operation" = On) are counted.

If the setpoint quantity (can be preset on the touchpanel) of parts is reached, it is indicated on the conveyor model LED ("P_BayLB") of the light barrier bay with a 1Hz flashing light. Only after the message is acknowledged with the pushbutton ("S_BayLB") of the light barrier bay or renewed Automatic mode ON-OFF, can a new transport sequence be started.

The indicator lights at the Bays 1 and 2 show...

- Continuous light when a new part can be placed on the conveyor.
- 1Hz flashing light at the Bay at which a part is detected by the associated proximity switch, however, only as long as the conveyor has not yet been started.
- 2Hz flashing light as long as the conveyor motor is running.

The indicator light at the Light Barrier Bay shows...

- 2Hz flashing light as long as the conveyor motor is running.
- Continuous light when the SETPOINT quantity has been reached.

Later, the drive will also be controlled as if it would drive the conveyor. The speed of the motor can be set through the right slider "S_Slider2".