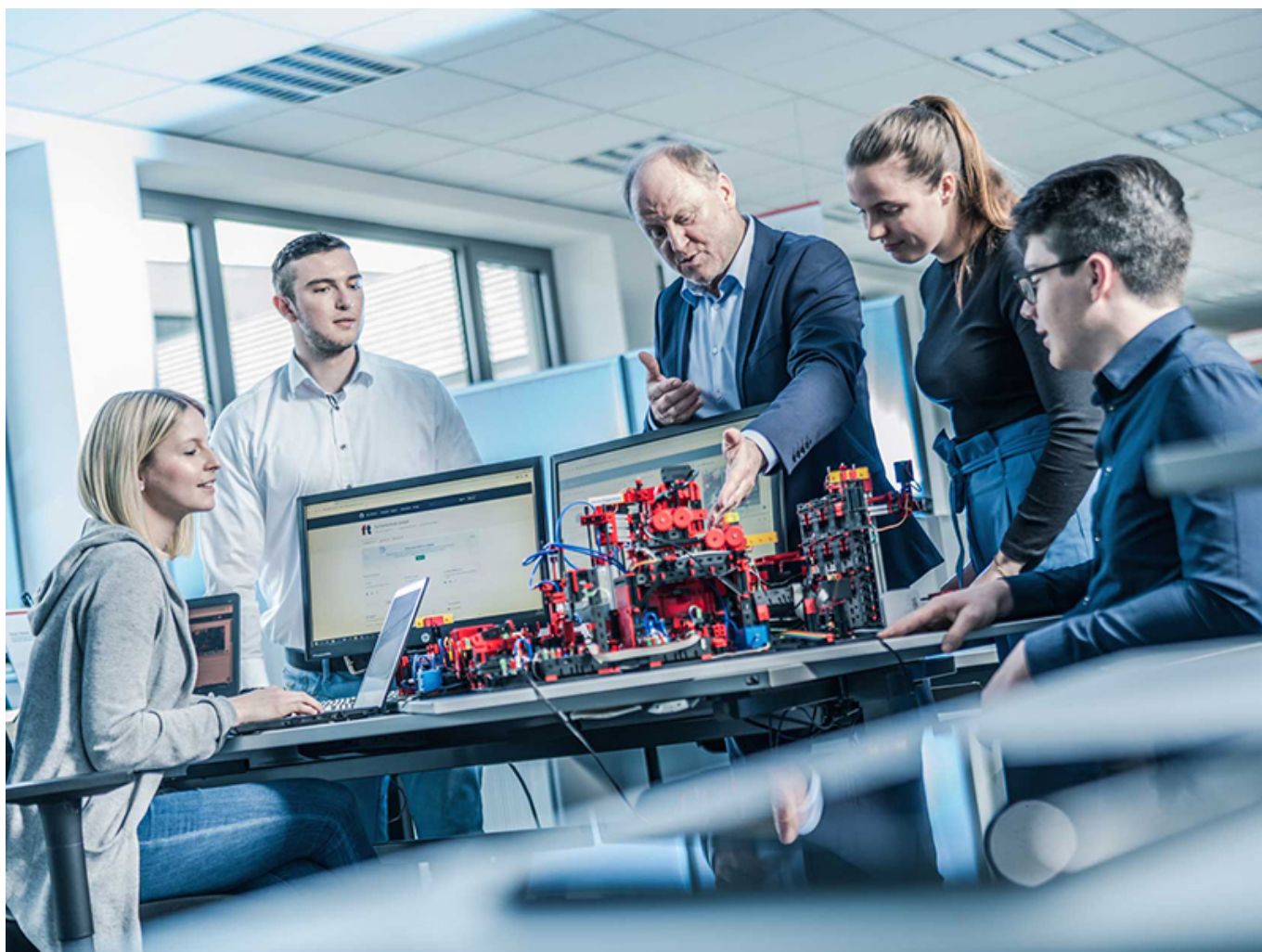


560841 - Training Factory Industry 4.0 24V with PLC connection board

Order code: **5503.560841**



Information about product price on demand

Parameters

By age and focus

Models 24V for PLC

Quantitative unit

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The fischertechnik learning environment is used for learning and understanding industry 4.0 applications in vocational school and training and for use in research, teaching and development at universities, in companies and IT departments. The simulation depicts the ordering process, the production process and the delivery process in digitized and networked process steps.

Advantages:

- Including PLC connection board and ready wiring on model and PLC side
- Enables in-depth learning through haptic grasping on a realistic production image

- Digital traceability through NFC/RFID, remote monitoring via camera, sensory applications
- Integrated cloud connection with dashboard, control via smart devices, own cloud and dashboard can be integrated, Raspberry Pi 4 with Node-RED interface
- Communication via OPC-UA and MQTT

Factory photo

The Training Factory consists of the factory modules storage and retrieval station, vacuum gripper robot, high-bay warehouse, multi-processing station with oven, a sorting line with colour detection, an environmental sensor and a swivelling camera. After delivery of raw materials, they are stored in the high-bay warehouse and after ordering in the dashboard, the workpieces pass through the respective factory modules and the current status is immediately visible in the dashboard.

The integrated environmental sensor reports values for temperature, humidity, air pressure and air quality. Due to the vertical and horizontal swivel range, the camera can see the entire plant and can therefore be used for web-based remote monitoring.

The individual workpieces are tracked by NFC (Near Field Communication): each workpiece is given a unique identification number (ID). This enables the current status of the workpieces in the machining process to be tracked and made visible..

Control

There are three different versions of the fischertechnik Training Factory Industry 4.0 24V, which differ in the scope of delivery of the controller. This variant is already wired and prepared for connection to the PLC.

The Training Factory Industry 4.0 24V with PLC connection board is controlled by a PLC, independent of brand. The PLC is not included in the scope of delivery. The Training Factory Industry 4.0 24V with PLC connection board is fully wired and prepared for the connection of a PLC. All inputs and outputs of the individual adapter boards are brought together on a central collective board. The Training Factory Industry 4.0 can be conveniently connected to the PLC via two connecting cables. A ready-written sample programme (as structured text, ST) is included in the scope of delivery. The programme was created on the basis of a Siemens S7-1500 (for details, see "Downloads" on this page) and was written in Siemens TIA Portal V.16.

A fischertechnik TXT controller is also installed. This is supplied with power via the adapter board and provides the connection to the fischertechnik cloud. The TXT controller also communicates in MQTT to the IOT gateway (Raspberry Pi), which in turn translates in OPC-UA to the PLC controller. In this way, the 9V-based components such as the environmental sensor, the USB camera, the brightness sensor and the NFC reader can be addressed via the MQTT interface and read out by the PLC. Even more interesting, however, is another function of the IOT Gateway, namely the possibility of an optional connection to a separate cloud. Thus, Training Factory 4.0 offers maximum flexibility for the respective user.

Software

The PLC program for controlling fischertechnik Training Factory 4.0 was created as structured text (ST) based on a Siemens S7-1500 and can be called up in the eLearning portal. It can also be viewed, used and downloaded free of charge at [Github.com/fischertechnik](https://github.com/fischertechnik). Of course, the Learning Factory can also be controlled with other PLC models and brands and individual solutions can be programmed and implemented by the user. It may be necessary to make small adjustments to the example program, which can then be implemented independently.

Fischertechnik Cloud

The connection to the fischertechnik cloud is established via the WLAN router which is integrated in the learning factory. The use of the Chrome or Firefox web browsers is recommended. www.fischertechnik-cloud.com. The servers of the cloud are located in Germany and ensure that the strict European requirements apply for the storage of data. Personal data is protected in an account with password access, which uses the very secure "OAuth2" industry standard. All data sent to the cloud is encrypted with certificates (https standard).

2 Dashboards, Raspberry Pi and Node-RED

The fischertechnik dashboard in the cloud can be called up and operated via mobile devices such as tablet and smartphone as well as on laptop and PC. In addition, a local dashboard, created with Node-RED, is implemented on the Raspberry Pi (IOT gateway), and own dashboards can also be created via Node-RED.

The dashboards included in Lernfabrik 4.0 enable the presentation of platforms from three different perspectives:

- Customer view
- Supplier view
- Production view

The **customer view** shows a webshop interface with a shopping cart, where you can order a workpiece and track the current status of the order in the shopping cart. This process is displayed on the interface for the customer so that he/she is informed about the status of his/her order.

The process of ordering the raw material is displayed and visualised in the **supplier view**.

The factory status, the production process, the stock, the NFC/RFID reader and the sensor values can be queried in the **production view**. In addition, the camera that monitors the production line can also be controlled here. All these functions are controlled within a window and actuated via the menu.

In **Factory status**, the status of the respective module is visualised via a traffic light display. If a fault occurs in production, it is acknowledged via a button after the cause has been rectified and production is continued. The individual manufacturing steps are visually simplified using connected nodes and represented in the **Production process** view. The currently active node (= production module) lights up green or red when the respective process step is being processed live or there is an error and is waiting to be corrected.

The Inventory production view visualises the current inventory of workpieces including minimum and maximum stock. A reorder point procedure is stored. This production view is used exclusively for visualisation. The production view of the **NFC/RFID reader** displays the workpiece data and can be used to read or delete workpieces manually. The raw data of the NFC tags can be read using a standard NFC app from mobile devices with NFC readers. Each workpiece has its own unique ID and displays the following data: Status, colour and timestamp from delivery to dispatch. The **camera** is also controlled via the production view and the read values of the **environment sensor** can also be viewed here.

AV/VR, Digital Twin

All fischertechnik training and simulation models can also be ideally used for digital applications and demonstrators. We will be happy to provide you with the necessary CAD data.

In the training model included:

- PLC connection board
- Finished wiring on the model side and preparation of the PLC side
- Basic programme in ST (Structured Text)
- Raspberry Pi (IOT Gateway)
- NFC/RFID Reader and NFC-Tag
- environment sensor
- USB-camera
- WLAN router
- storage and retrieval station
- Boards of the latest generation