

## Input Extension for F200 Safety Systems

### Characteristics

- 2 input circuits for the following connections:
  - 1- or 2- channel emergency stop switches
  - Safety gates with up to 3 limit contacts
  - Light barriers with relay outputs
  - Safety-mats and Safety-Edges
- 17.5 mm housing (DIN rail compatible)
- Diagnostic LED indicators
- Plug-in terminal blocks

### Description

The **F220** Input Expansion Module allows 2 additional emergency stop switches/contacts to be connected to an F210 Basic Module of the F200 Series.

The Basic Module and Extension Modules are inter-linked through a data bus, for which connections are made simply by means of plug-in connectors on the front of the Modules. Data transfer and power supply are routed through the same bus cable and connectors.

Up to 10 Expansion Modules can be cascaded in this way so that a maximum of 22 inputs are available.

Emergency stop switches, limit switches for safety gates, safety-mats and safety-edges, light-beam arrays, etc., can be used as command initiating devices. For light-curtains with solid-state switch (24VDC nominal) outputs the F221 Expansion Module should be used. Devices with NO and NC contacts wired in the mode "with start-up test" must be actuated once after energising the F200 system.

Each input can be controlled through 1, 2, or 3 channels depending on the safety requirements of specific applications.

The LED's on the front of the Module provide information on whether the



connected emergency stop circuits are closed (green) or open, short circuited, or have errors (red).

The narrow width of the module housing ensures compact system configurations, making it easier to extend the system at a later date. Modules can be inserted at any position in the input chain: the system is automatically reconfigured when it is switched on.

### Mode of Operation

The Basic Module has several signal outputs. These are routed via the contacts of the E-Stop triggering devices to the Module's input terminals. The number of channels is determined for each input depending on the switching circuits and the links between of the terminals. Even the required switching logic is determined this way: for example, emergency stop switches opening and foot-mat switches closing. Each input must be switch-circuited: for every unused input a one-channel controlling circuit must be completed.

Through the inter-module bus, the Basic Module ascertains the configuration as well as the switching condition of the inputs of the Expansion Modules.

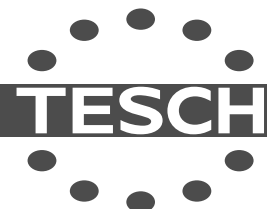
The open bus interface connector of the last Module must therefore have a terminating plug.

The safety contacts of the Basic Module can be activated only when all wired emergency stop circuits of the entire system are closed.

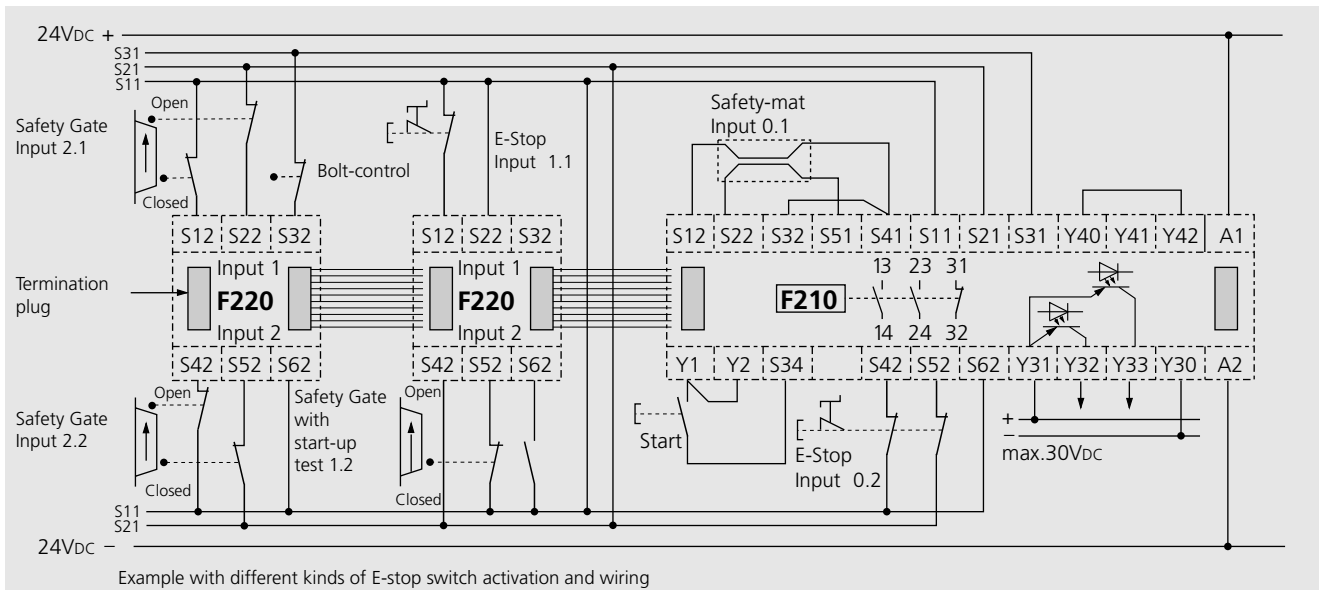
The status of each input is indicated by a corresponding green LED.

As soon as an emergency stop command or a fault deactivates an input, the Basic Module opens the safety contacts and instead of the green, the red input LED lights up.

The status of this input can be transmitted to a supervisory system (PLC or computer) to record the cause of the tripping. A quick diagnosis of the cause of the emergency stop occurrence is therefore possible and increases system safety, while avoiding unnecessary down time.



## External Circuit Example



## F220 Input Connections

Each input can be used for single- dual- or triple channel activation. Open inputs have to be linked e.g. as if single channel activated.  
The terminals have to be linked and connected to the safety switches according the following scheme:

Singel- Input 1: S11 — S12 & S11 — S22  
channel: Input 2: S11 — S42 & S11 — S52

Dual- Input 1: S11 — S12 & S21 — S22 & S11 — S32  
channel: Input 2: S11 — S42 & S21 — S52 & S11 — S62

Triple- Input 1: S11 — S12 & S21 — S22 & S31 — S32  
channel: Input 2: S11 — S42 & S21 — S52 & S31 — S62

Safety-mat One surface side connected between S41 and connection: S12, the other between S51 and S22, with S41 - S32 linked

Termination plugs must be installed in unused expansion interface connectors.

## Technical Data

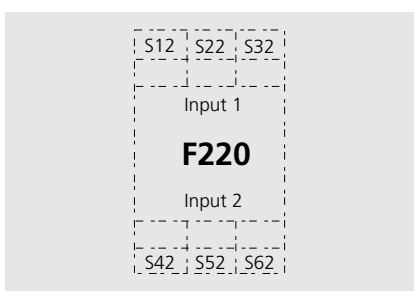
Rated voltage	24 V <sub>DC</sub> via Base Module
Power consumption	Approx. 2 W
Ambient temperature	-5 °C to + 55 °C
Storage temperature	-25 °C to + 70 °C
Protection class	Terminals IP20, casing IP 40
Installation	In a cabinet: IP54
Terminals	Terminal box with wire protection
Wire cross section	2.5 mm <sup>2</sup>
Control circuit	24 V <sub>DC</sub> nominal
Weight	Approx. 95g

Connection of limit-switches with NO and NC contacts

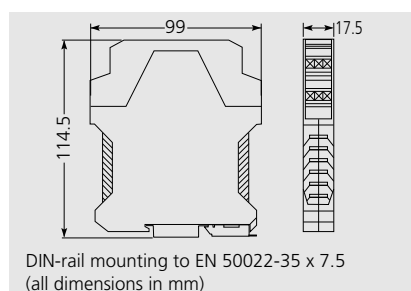
**with** start-up test: Input 1: S11 — S22 & S11 — S32 & **S21** — S12  
Input 2: S11 — S52 & S11 — S62 & **S21** — S42

**without** start-up test: Input 1: S11 — S22 & S11 — S32 & **S31** — S12  
Input 2: S11 — S52 & S11 — S62 & **S31** — S42

## Connection Diagram



## Dimensional Diagram



## Models and Ordering Data

Inputs	2 Safety Inputs, each for max. triple-channel activation
Type F 220 24 V <sub>DC</sub>	<b>Order No.</b> 074 00181

	* = Approval expected