

## Light Curtain Compatible Input Extension for F200 Safety Systems

### Characteristics

- 2 input circuits compatible with devices with 24 VDC semiconductor outputs:
  - light curtains (light beam arrays) with semiconductor outputs
  - other protective devices with semiconductor outputs
- 17.5 mm housing (DIN rail compatible)
- Diagnostic LED indicators
- Plug-in terminal blocks

### Description

The **F221** Input Expansion Module allows a light curtain or other protective device with 24 Vdc solid-state outputs to be integrated with F200 Safety Systems. Additionally, an emergency-stop command switching device can also be connected to an **F221** Module.

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. The **F221** can be integrated with an F200 System to implement safety systems based on F210 / F211 Basic Modules, with combinations of solidstate switch, limit-switch, and relay contact inputs to precisely match users' application requirements. Up to 10 Extension Modules can be cascaded in this way so that a maximum of 22 inputs are available.

Each input can be controlled through 1 or 2 channels depending on the safety requirements of specific applications. With single channel control, the inputs are connected to the terminals of both channels. For light-curtains with relay outputs, F220 Input Expansion Modules are used instead.

The LED's on the front of the Module provide information on whether the input signal levels are high (green) or low (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

All four inputs of the **F221** must be at 24 Vdc levels to confirm its operational status to the Basic Module over the system bus. The safety contacts can be closed (relay energised) only if all inputs of the complete system are activated (green LED on). If an emergency stop input device deactivates one input, the safety contacts open (relay de-energised) immediately.

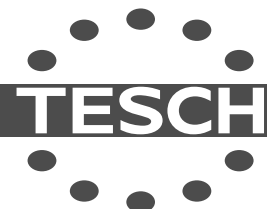
With positive input signals and dual channel connection of emergency stop switching devices, cross-fault monitoring is not done by the **F221**, since this function is usually integrated into 2-channel light curtains and scanners with semiconductor outputs.

Since all inputs of the system are interrogated continuously, unused inputs of the **F221** must be connected directly to the +24 VDC supply circuit.

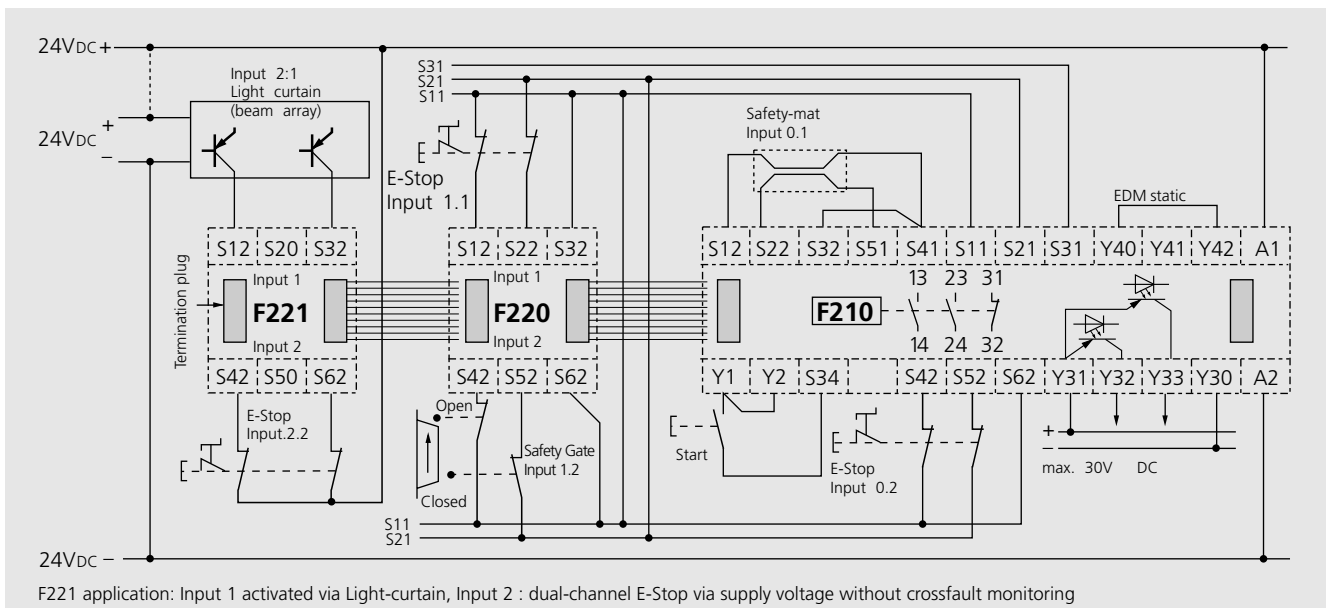
Through the inter-module bus, the Basic Module ascertains the configuration as well as the switching condition of the inputs of the Expansion Modules. The open bus interface connector of the last Module must therefore have a terminating plug.

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

As soon as an emergency stop command or a fault closes an input, the Basic Module opens the safety contact, 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), and the cause and time of the tripping recorded. 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



## F221 Input Connections

Inputs for both channels must be 24 V<sub>DC</sub> signals.

Input 1: OSSD1 output of light curtain to S12 terminal  
 OSSD2 output of light curtain to S32 terminal  
 S20 terminal: unconnected

Input 2: OSSD1 output of light curtain to S42 terminal  
 OSSD2 output of light curtain to S62 terminal  
 S50 terminal: unconnected

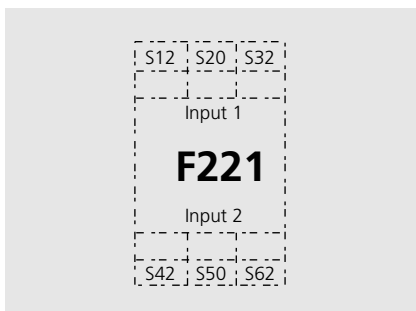
For the system to function, inputs at terminals S12, S32, S42, and S62 must be 24 V<sub>DC</sub> levels. If only one Light curtain is connected, the inputs to the other channel must be either emergency stop switches (as shown in the circuit example), or these inputs must be connected directly to the +24 V<sub>DC</sub> line.

The signal inputs and 24 V<sub>DC</sub> power supply must have a common return path.

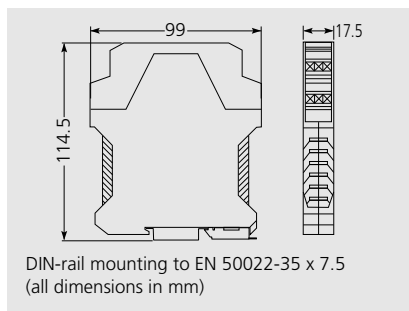
## Technical Data

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	IP20, casing IP40
Installation	In an 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 Diagram



## Dimensional Diagram



## Models and Ordering Data

Inputs	2 Safety inputs for Light-curtain or equivalent activation.
Type F 221 24 V <sub>DC</sub>	<b>Order No.</b> 074 00182

\* = Approval expected