

Overview



The safety functions of the safety-related automation systems are matched to the safety-related I/O modules (F-modules) of the ET 200M distributed I/O system. The F-signal modules (DI/DO/AI) in the ET 200M remote I/O stations comply with safety requirements up to SIL 3 (IEC 61508). They can diagnose both internal and external faults. To this end, they carry out self-tests, e.g. for short-circuit or open-circuit, and automatically monitor the discrepancy time defined in the parameter settings. They are able to guarantee plant safety even if there is a CPU failure in the automation system.

Depending on the version, the input modules support 1oo1 and 1oo2 evaluation on the module. 2oo3 evaluation of three sensors is possible using the corresponding voter block (component of the S7 F block library) within the safety program.

In the event of a faulty output, the digital output modules allow a safe shutdown via a second shutdown path.

Note:

The SM 326 F-DI NAMUR safety-related digital input module, article no. 6ES7326-1RF00-0AB0, is not PROFINET-enabled.

Design

SM 336 F-AI HART analog input module

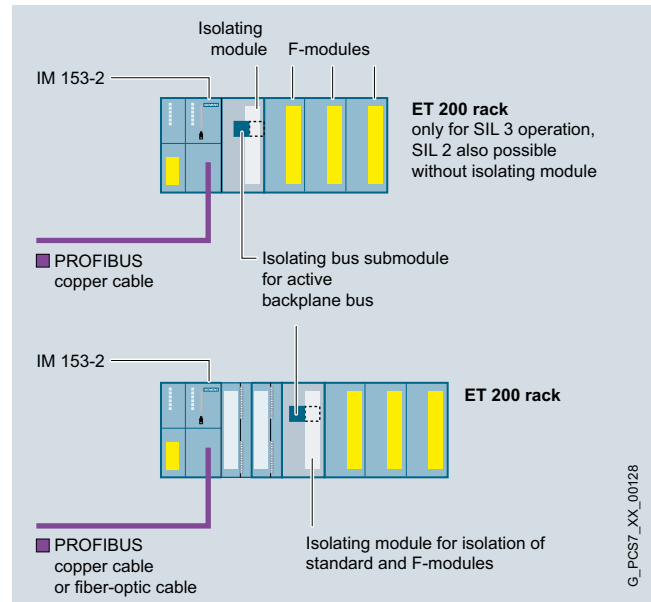
The safety-related SM 336 F-AI HART analog input module has 6 inputs for current measurements in the range from 0 to 20 mA or 4 to 20 mA, all of which are designed for SIL 3. The compact width of 40 mm means that a relatively high packing density can be achieved for F modules, allowing a design which saves space and costs.

The module can also handle HART communication with appropriate HART field devices. HART communication can be activated safety-related in online mode, or switched off.

Digital output module SM 326 F-DO

The 40-mm wide safety-related SM 326 F-DO digital output module with 10 outputs (24 V DC, 2 A) and parameterizable redundancy extends the range of compact F-modules commenced with the SM 336 F-AI HART. The module features short response times, and can be used in SIL 3 applications even without an isolating module. It supports the "Keep last valid value" function as well as channel-selective passivation.

Options



Isolating module

The following components are available as accessories for the F modules:

- Isolating module
 - Isolation of F and standard modules in an ET 200M remote I/O station
 - Signal isolation when using a copper bus connection (only F modules in an ET 200M remote I/O station with IM 153-2)
- Isolating bus submodule for isolating module, when using an active backplane bus

The isolating module is required in SIL 3 applications with F signal modules SM 326; AI 6 x 13 bit, SM 326; DI 8 x NAMUR and SM 326; DO 10 x DC 24 V/2 A (width 80 mm) in the following cases:

- Design of PROFIBUS DP with copper cables
- Design of PROFIBUS DP with fiber-optic cables and joint operation of the mentioned F signal modules with standard modules in an ET 200M station

Note:

The isolating module for F modules and the isolating bus submodule can only be used together. The 40-mm wide gap cannot be used for other modules.

Process I/O

SIMATIC ET 200M for SIMATIC PCS 7

F digital/analog modules

Ordering data	Article No.	Article No.
SM 326 F-DI safety-related digital input module, for floating contacts 24 inputs, 24 V DC 80 mm wide Isolated in groups of 12 Redundancy optional (channel-granular redundancy) <ul style="list-style-type: none"> • 4 short-circuit-proof sensor power supplies, each for 6 channels, isolated in groups of 3 • External sensor power supply possible • SIL 2: 1oo1 evaluation, 24 channels • SIL 3: 1oo2 evaluation on the module, 12 channels (adjustable discrepancy time) • SIL 3 achievable without isolating module • Short-circuit monitoring to L+ • Discrepancy monitoring • Supports 20 ms time stamping (SOE) • Module internal diagnostics • PROFIsafe telegram • Front connector required: 40-pin 	6ES7326-1BK02-0AB0	
8 inputs, NAMUR [EEEx ib]¹⁾ 80 mm wide Isolated by channel Redundancy optional (channel-granular redundancy) <ul style="list-style-type: none"> • 8 short-circuit-resistant sensor power supplies, each for 1 channel, mutually isolated • SIL 2: 1oo1 evaluation, 8 channels • SIL 3: 1oo2 evaluation on the module, 4 channels (adjustable discrepancy time) • Wire break and short-circuit monitoring (for contacts with external resistor circuit) • Discrepancy monitoring • Module internal diagnostics • PROFIsafe telegram • Front connector required: 40-pin 	6ES7326-1RF01-0AB0	
Safety-related digital output module SM 326 F-DO Suitable for solenoid valves, DC contactors and indicator lights		
10 outputs, 24 V DC, 2 A 40 mm wide Isolated in groups of 5 (outputs with internal diode) Redundancy optional (channel-granular redundancy) <ul style="list-style-type: none"> • 10 outputs, isolated in groups of 5 • SIL 3 achievable without isolating module • P/P-switching (for non-floating loads; ground and earth connected together) • Wire break and short-circuit monitoring • Configurable diagnostics • "Keep last valid value" parameter • Channel-selective passivation • PROFIsafe telegram • Front connector required: 40-pin 	6ES7326-2BF10-0AB0	
8 outputs, 24 V DC, 2 A 80 mm wide Electrically isolated in groups of 4 <ul style="list-style-type: none"> • SIL 2, SIL 3 configurable (8 channels) • SIL 3 achievable without isolating module • P/M-switching (for floating loads; ground and earth separate) • Wire break and short-circuit monitoring • Module internal diagnostics • PROFIsafe telegram • Front connector required: 40-pin 	6ES7326-2BF41-0AB0	
SM 336 F-AI HART safety-related analog input module 6 inputs, 0 ... 20 mA or 4 ... 20 mA 40 mm wide Electrically isolated in groups of 3 Redundancy optional (channel-granular redundancy) <ul style="list-style-type: none"> • Resolution: 15 bits + sign • 2-wire or 4-wire connection • 6 short-circuit-proof sensor supplies for 1 channel each • External sensor power supply possible • SIL 3: 1oo1 evaluation (6 channels) and 1oo2 evaluation (3 channels) on the module • SIL 3 achievable without isolating module • Discrepancy monitoring with 1oo2 evaluation (adjustable discrepancy time) • Wire break monitoring • Module and channel diagnostics • HART communication in measuring range 4 ... 20 mA (can be switched on/off online) • HART status display • PROFIsafe telegram • Front connector required: 20-pin 	6ES7336-4GE00-0AB0	
Options		
Isolating module For F modules, 40 mm wide <ul style="list-style-type: none"> • For isolation of F and standard modules in an ET 200M rack • For signal isolation when using a copper bus connection (only F modules in a rack with IM 153-2) 	6ES7195-7KF00-0XA0	
Isolating bus module 80 mm wide, for isolating module, when using an active backplane bus	6ES7195-7HG00-0XA0	

¹⁾ Module is not PROFINET-enabled