

I/O systems

ET 200 systems for the control cabinet

ET 200S - Fail-safe I/O modules

F electronic modules

Overview



F electronic modules are digital inputs/outputs for the fail-safe SIMATIC S7 systems.

Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508) and PL e (ISO 13849)

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)

Fail-safe digital hybrid module

- 4 fail-safe inputs/3 fail-safe outputs
- Certified up to SIL 2 (IEC 61508) and PL d (ISO 13849)

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations.

They can be used with all fail-safe SIMATIC S7 CPUs.

Technical specifications

Article number	6ES7138-4FA05-0AB0
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
Product type designation	
Supply voltage	
Rated value (DC)	Yes
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Encoder supply	
Number of outputs	2
Type of output voltage	min. L+ (-1.5 V)
short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
Output current	
• nominal	300 mA
• permissible range	0 to 300 mA
Address area	
Occupied address area	
• Inputs	6 byte
• Outputs	4 byte
Digital inputs	
Number of digital inputs	8; 8 (one-channel); 4 (two-channel)
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
• Number of simultaneously controllable inputs	8
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
Input current	
• for signal "1", typ.	3.7 mA

Article number	6ES7138-4FA05-0AB0
	ET200S, EL-MOD., 4/8 F-DI, DC 24V
Input delay (for rated value of input voltage)	
for standard inputs	
- Parameterizable	Yes
- at "0" to "1", min.	0.3 ms
- at "0" to "1", max.	17 ms
- at "1" to "0", min.	0.3 ms
- at "1" to "0", max.	17 ms
Cable length	
• shielded, max.	500 m
• Unshielded, max.	500 m
Encoder	
Connectable encoders	
• 2-wire sensor	No
- Permissible quiescent current (2-wire sensor), max.	0.6 mA; max.
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Diagnostic information readable	Yes
• Short circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
• between the channels	No
• between the channels and the backplane bus	Yes
• between the channels and the load voltage L+	No

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Ordering data	Article No.		Article No.
4/8 F-DI PROFIsafe 24 V DC electronic module 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FA05-0AB0	S7 Distributed Safety programming tool V5.4 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 and higher Floating license Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	
4 F-DO PROFIsafe 24 V DC/2A electronic module 30 mm wide, up to PL e according to ISO 13849.1	6ES7138-4FB04-0AB0		6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5
4 F-DI / 3 F-DO PROFIsafe 24 V DC/2A electronic module 30 mm wide, up to PL e according to ISO 13849.1 / SIL 2 (IEC 62061)	6ES7138-4FC01-0AB0		
Accessories		S7 Distributed Safety Upgrade From V5.x to V5.4; floating license for 1 user	6ES7833-1FC02-0YE5
Terminal modules for electronic modules	See F terminal modules	STEP 7 Safety Advanced V13 SP1 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 SP1 Floating license for 1 user Floating license for 1 user, license key download without software or documentation ¹⁾ ; e-mail address required for delivery	
IM 151-1 High Feature interface module For ET 200S; transmission rate up to 12 Mbit/s; max. 63 modules can be connected, with isochronous mode, bus connection via 9-pin Sub-D connector incl. terminating module	6ES7151-1BA02-0AB0		
IM 151-3 PN HF interface module For ET 200S; transfer rate up to 100 Mbit/s; max. 63 I/O modules up to 2 m wide can be connected; 2 x bus connection via RJ45 connector, incl. terminating module	6ES7151-3BA23-0AB0		6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5
IM 151-3 PN FO interface module For ET 200S; 2 PROFINET FO interfaces, integrated 2-port switch, max. 63 I/O modules up to 2 m wide can be connected, incl. terminating module	6ES7151-3BB23-0AB0	SIMATIC Manual Collection Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	6ES7998-8XC01-8YE0
		SIMATIC Manual Collection – Update service for 1 year Scope of delivery: Current DVD "S7 Manual Collection" and the three subsequent updates	6ES7998-8XC01-8YE2

¹⁾ For up-to-date information and download availability, see:
<http://www.siemens.com/tia-online-software-delivery>

Overview



Digital inputs/outputs for the fail-safe SIMATIC S7 systems

Fail-safe digital input module

- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 2 internal sensor supplies (incl. test function) onboard

Fail-safe digital output module

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be controlled up to 2 A

All modules are certified up to Cat. 4 (EN 954-1) and up to SIL 3 (IEC 61508).

The modules support PROFIsafe, in both PROFIBUS and PROFINET configurations.

They can be used with all fail-safe SIMATIC S7-CPU's.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Technical specifications

Article number	6AG1138-4FA05-2AB0
Based on	6ES7138-4FA05-0AB0 SIPLUS ET200S EM F-DI 24V PROFISAFE
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	60 °C
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	6AG1138-4FB04-2AB0
Based on	6ES7138-4FB04-0AB0 SIPLUS ET200S EM F-DO 24V PROFISAFE
Ambient conditions	
Ambient temperature in operation	
• Min.	-25 °C
• max.	60 °C
Extended ambient conditions	
• Relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m)
• At cold restart, min.	-25 °C
Relative humidity	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!