

Safety integrated automation

SIMATIC ET 200SP fail-safe distributed IO

Digital fail-safe input modules

Overview



Digital fail-safe input module
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important properties:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (Article and serial number)
 - Connection diagram
 - Color coding of the module type DI: White
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article number
- Optional labeling accessories
 - Labeling strips
 - Reference identification label
- Optional module-specific color identification of the terminals according to the color code CC
- The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

Application

The fail-safe modules of ET 200SP can be used to implement the safety-related application requirements as an integral part of the overall automation. The safety functions required for fail-safe operation are integrated in the modules. Communication to fail-safe SIMATIC S7 CPUs is performed by means of PROFIsafe.

The modules can be operated both in centralized and distributed configurations.

Design

Usable BaseUnits

For a single- or multi-conductor connection, BaseUnits with an appropriate number of terminals are available.

A light BaseUnit opens a new load group. The power supply to the sensors must be fed via this BU. The first BU next to the interface module must always be a light BU.

A dark BaseUnit forwards the power supply of the adjacent light BaseUnit on the left via self-assembling voltage buses. A new in-feed is therefore only required on the next light BaseUnit to the right.

All variants that correspond to the BU type of the I/O module can be used as BaseUnits.

Color identification of the terminals

The potentials at the terminals of the BaseUnit are defined by the I/O module. Optionally, the potentials of the terminals can be identified by module-specific color-coding labels to prevent wiring errors. The color-coded label that matches the respective I/O module is defined by the color code CCxx of the I/O module. This color code is also printed on the front of the module.

In BaseUnits with the 10 internally jumpered AUX terminals, these can also be identified with color coding labels. For the 10 AUX terminals, color-coding labels are available in red, blue, and yellow/green.

System-integrated shielded connection

For the connection of cable shields that is both space-saving as well as optimized in terms of EMC, a shield connection is available that is quick and easy to mount. This consists of one shield connection element that can be plugged onto the BaseUnit and one shield terminal for each module. The low-impedance connection to the functional ground (DIN rail) is achieved without any additional wiring by the user.

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Technical specifications

6ES7136-6BA00-0CA0	
Designation	F-DI 8x24VDC HF
General information	
Product function	
• I&M data	Yes
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Output current	
• up to 60 °C, max.	0.3 A
• Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	800 mA
Digital inputs	
Number of digital inputs	8
m/p-reading	Yes; p-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value, DC	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 V to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
• for standard inputs - Parameterizable	Yes
• for counter/technological functions - Parameterizable	No
Cable length	
• Cable length, shielded, max.	1 000 m
• Cable length unshielded, max.	500 m

6ES7136-6BA00-0CA0	
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring the supply voltage	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
Galvanic isolation	
Electrical isolation channels	
• between the channels and the backplane bus	Yes
Isolation	
Isolation checked with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance Level in accordance with EN ISO 13849-1:2008	PLe
• SIL according to IEC 61508:2010	SIL 3
Ambient conditions	
Operating temperature	
• min.	0 °C
• max.	60 °C
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	15 mm
Weights	
Weight, approx.	49 g

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Selection and ordering data

	Article No.
Digital F input modules	
F-DI 8x24 V DC High Feature, BU type A0, color code CC01	6ES7136-6BA00-0CA0
Usable BaseUnits	
BU15-P16+A0+2D	6ES7193-6BP00-0DA0
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	6ES7193-6BP00-0BA0
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
BU15-P16+A10+2D	6ES7193-6BP20-0DA0
BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	6ES7193-6BP20-0BA0
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	

	Article No.
Accessories	
Reference identification label	6ES7193-6LF30-0AW0
10 sheets of 16 labels	
Labeling strips	
• 500 labeling strips on roll, light gray	6ES7193-6LR10-0AA0
• 500 labeling strips on roll, yellow	6ES7193-6LR10-0AG0
• 1000 labeling strips DIN A4, light gray	6ES7193-6LA10-0AA0
• 1000 labeling strips DIN A4, yellow	6ES7193-6LA10-0AG0
BU cover	
for covering empty slots (gaps); 5 units	
• 15 mm wide	6ES7133-6CV15-1AM0
• 20 mm wide	6ES7133-6CV20-1AM0
Shield connection	6ES7193-6SC00-1AM0
5 shield supports and 5 shield terminals	
Color-coding plates	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	6ES7193-6CP01-2MA0
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	6ES7193-6CP71-2AA0
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	6ES7193-6CP72-2AA0
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP73-2AA0