

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected original pages for procurement and maintenance review

PRODUCT BRAND

Siemens

PRODUCT MODEL

6ES7138-4FA02-0AB0

PROFIsafe Digital Input Module

SOURCE EDITIONS AND SCOPE

08/16/2017; technical last-modified 08/12/2017 (PDF 1,2); 07/2005, A5E00103686-04 (PDF 2,3,107)

Selected Siemens product-reference pages for FA02; not a complete commissioning manual. An unresolved probability-value discrepancy in the 2005 manual is excluded from this package and from authored claims. Obtain applicable manufacturer clarification before safety calculations.

Open identified Siemens source (complete document)

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Amikon prepared this independent reference package. Siemens remains the author of the appended original pages; original page numbers and manufacturer notices are retained.

SIMATIC DP, ELECTRON. MODULE F. ET200S, 4/8 F-DI
PROFISAFE, 24V DC, 30 MM WIDTH UP TO CATEGORY 4
(EN954-1) ALSO USEABLE IN PROFINET- NETWORK WITH
IM151-3 HF

Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	No
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	
• Rated value	300 mA
• permissible range, lower limit	0 mA
• permissible range, upper limit	300 mA
Power loss	
Power loss, typ.	4 W
Address area	
Occupied address area	
• Inputs	6 byte
• Outputs	4 byte
Digital inputs	
Number of digital inputs	8; 8 single 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	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
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.	200 m
• unshielded, max.	200 m
Encoder	
Connectable encoders	
• 2-wire sensor	No
Interrupts/diagnostics/status information	
Diagnostic functions	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	No
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• acc. to EN 954	Cat. 3 (single-channel), Cat. 4 (two-channel)
• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
Dimensions	
Width	30 mm
Height	81 mm
Depth	52 mm
Weights	
Weight, approx.	78 g
last modified:	08/12/2017 

Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.



Danger

indicates that death or severe personal injury **will** result if proper precautions are not taken.



Warning

indicates that death or severe personal injury **may** result if proper precautions are not taken.



Caution

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:



Warning

This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Purpose of this Manual

The information in this manual is a reference source for operations, function descriptions, and technical specifications of the fail-safe modules of the ET 200S distributed I/O system.

Basic Knowledge Requirements

This manual is a supplement to the ET 200S Distributed I/O System manual. Working with this manual requires general knowledge of automation engineering. You also require experience of using the *STEP 7* basic software and the ET 200S distributed I/O system.

Scope of this Manual

Module	Order Number	Release Number and Higher
PM-E F pm DC24V PROFIsafe Power Module	6ES7 138-4CF02-0AB0	01
PM-E F pp DC24V PROFIsafe power module	6ES7 138-4CF41-0AB0	01
PM-D F DC24V PROFIsafe power module	3RK1 903-3BA01	01
4/8 F-DI DC24 V PROFIsafe Digital Electronic Module	6ES7 138-4FA02-0AB0	01
4 F-DO DC24V/2A PROFIsafe digital electronic module	6ES7 138-4FB02-0AB0	01

What's New

Compared with the previous version, this manual includes the following major changes/additions:

- Ability to connect ET 200S to PROFINET I/O (with modules as of order numbers above)
- New parameter "Behavior after channel faults"

7.5 4/8 F-DI VDC24V PROFIsafe Digital Electronic Module

7.5.1 Properties of the 4/8 F-DI 24 VDC PROFIsafe Digital Electronic Module

Order Number

6ES7 138-4FA02-0AB0

properties

The 4/8 F-DI 24 VDC PROFIsafe digital electronic module has the following properties:

- Eight inputs (AK4/SIL2/Category 3) or four inputs (AK6/SIL3/Category 3 or 4)
- 24 VDC rated input voltage
- Suitable for switches and 3 or 4-wire proximity switches (BEROs)
- Two short-circuit-proof sensor supplies for each of the four inputs
- External sensor supply possible
- Group fault display (SF; red LED)
- Status display for each input (green LED)
- One fault display for each sensor supply (1VsF and 2VsF; red LED)
- Assignable diagnostics

Power Modules for SIL2 or SIL3

Table 7-18 EM 4/8 F-DI DC24V PROFIsafe: Power Modules for AK/SIL/Category

Power module	Achievable AK/SIL/Category
Supply using PM-E 24 VDC	With 1oo1 evaluation of the sensors (8 F-DI) AK4/SIL2/Category 3
Power supply from PM-E DC24..48V/AC24..230V	With 1oo1 evaluation of the sensors (8 F-DI) AK4/SIL2/Cat.3 with 1oo2 evaluation of sensors (4 F-DI) AK6/SIL3/Cat.4
Power supply by PM-E DC24..48V	With 1oo1 evaluation of the sensors (8 F-DI) AK4/SIL2/Cat.3 with 1oo2 evaluation of sensors (4 F-DI) AK6/SIL3/Cat.4

Capacitive Crosstalk of Digital Input/Output Signals

See *Properties of the PM-E F pm DC24V PROFIsafe Power Module*