MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7650-8EK70-0AA0

DO16 DIGITAL OUTPUT MODULE

Used with the applicable SIMATIC ET 200PA SMART configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens ET 200PA SMART Operating Instructions, section 10.3

ET 200PA SMART I/O modules

10

10.1 Module overview

The following I/O modules are available in the ET 200PA SMART system:

Module	Article no.	Article no. (with conformal coating)
Digital input module DI16xDC24V	6ES7650-8DK70-0AA0	6ES7650-8DK70-1AA0
Digital input module DI32xDC24V	6ES7650-8DK80-0AA0	6ES7650-8DK80-1AA0
Digital output module DO16xDC24V/0.5A	6ES7650-8EK70-0AA0	6ES7650-8EK70-1AA0
Digital output module DO32xDC24V/0.5A	6ES7650-8EK80-0AA0	6ES7650-8EK80-1AA0
Analog input module AI8x13Bit	6ES7650-8AE60-0AA0	6ES7650-8AE60-1AA0
Analog input module AI8x16Bit	6ES7650-8AK60-0AA0	6ES7650-8AK60-1AA0
Analog input module AI16x16Bit	6ES7650-8AK70-0AA0	6ES7650-8AK70-1AA0
Analog input module AI8xTC/4xRTD	6ES7650-8AR60-0AA0	6ES7650-8AR60-1AA0
Analog input module AI 8 x 16-bit HART[1]	6ES7650-8AT60-0AA0	6ES7650-8AT60-1AA0
Analog output module AO8x12Bit	6ES7650-8BK60-0AA0	6ES7650-8BK60-1AA0
Analog output module AO 8 x 16-bit HART[1]	6ES7650-8BT60-0AA0	6ES7650-8BT60-1AA0

[1] Available as of PCS 7 V9.0 SP2 and the corresponding update collection

In addition to the ET 200PA SMART I/O modules specified in this table, the following modules can also be used in an ET 200PA SMART system.

- Numerous S7-300 standard I/O modules and HART analog modules that are also approved for use in an ET 200PA SMART in the list of released modules PCS 7 (as of V8.1).
- Numerous counter modules and point-to-point couplings which are also approved for use in an ET 200PA SMART in the list of released modules PCS 7 (as of V8.1).

If you are using modules from the S7-300 series of modules, you can find information for them in the following manuals:

- Automation System S7-300, Module Data (http://support.automation.siemens.com/WW/view/en/8859629)
- ET 200M, Signal Modules for Process Automation (http://support.automation.siemens.com/WW/view/en/7215812)
- ET 200M Distributed I/O Device HART Analog Modules (http://support.automation.siemens.com/WW/view/en/22063748)

Non-assignable diagnostic messages are always provided by the module regardless of whether the diagnostics is enabled.

Pending diagnostic information is displayed via the group error display (SF LED).

Diagnostic interrupts are only signaled by the I/O modules if "Diagnostic interrupt" is enabled via the respective parameter assignment dialog.

Group error display (SF LED)

The group error display (SF LED) of the ET 200PA SMART modules indicates the following:

- Operation of the ET 200PA SMART module centrally in an S7-300 system or an ET 200M station. In this case, the SF LED flashes at 2 Hz. The ET200PA SMART module is not ready for operation.
  All the remaining modules can be operated without restriction.
- Error state of the respective module in the case of modules with diagnostic capability The SF LED lights up as soon as diagnostic information of a module is detected. It goes out when all causes of the diagnostic information (errors) are eliminated.

Internal module defects are indicated for modules with and without diagnostic capability. The SF-LED lights up when a module defect has been detected.

10.2 Digital input modules

Overview of properties

The table below presents the ET 200PA SMART digital input modules based on their most important properties.

Table 10-1 ET 200PA SMART digital input modules

	Module	
	DI 16 x DC24V	**DI 32 x DC24V**
Properties	**6ES7650-8DK70-xAA0**	**6ES7650-8DK80-xAA0**
Number of inputs	16 Isolated in groups of 16	32 Isolated in groups of 16
Rated input voltage	24 V DC	24 V DC
Suitable for...	2-/3-/4-wire proximity switches (BEROs)	
Configurable diagnostics	Yes	No
Diagnostic interrupt	Yes	No
Adjustable input delays	Yes, for entire module	No

Technical specifications	
• With inductive load according to IEC 947-5-1, DC 13	Max. 0.5 Hz
• With lamp load	Max. 10 Hz
Internal limiting of the inductive trip voltage to	Typ. L+ (-53 V)
Short-circuit protection of the output	Yes, electronic
• Response threshold	Typ. 1 A
Connection of the actuators	Using a 40-pin front connector

10.3.2 Digital output module DO 16 x DC 24 V/0.5 A

Article numbers

Standard module: 6ES7 650-8EK70-0AA0

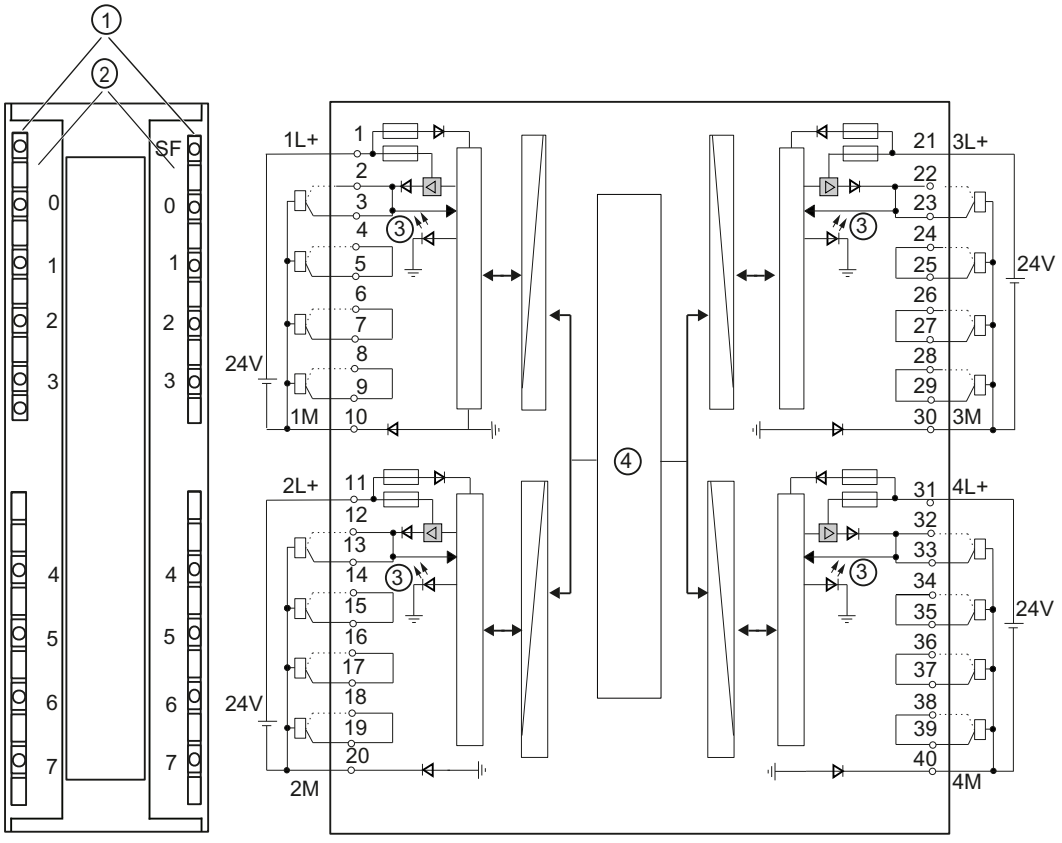
Module with conformal coating: 6ES7 650-8EK70-1AA0

Properties

The DO 16 x DC 24 V/0.5 A is characterized by the following properties:

- 16 outputs, isolated in groups of 4 channels
- Output current 0.5 A
- Rated load voltage 24 V DC
- Suitable for solenoid valves, DC contactors and signal lamps
- Wire break detection at "0" and "1" signal
- Group error display (SF LED)
- Configurable diagnostics
- Configurable diagnostic interrupt
- Configuration in Run (CiR) supported

Wiring and block diagram



① Status displays - green
Group error display - red (SF_LED)

② Channel numbers
Numbers 0 to 7 on the right side correspond to channel numbers 8 to 15

③ Channel status

④ Backplane bus interface

Load resistances and actuators

The load resistances of the actuators must be in the range from 48 Ω to 4 kΩ. For larger values, a suitable resistor must be connected in parallel directly to the connecting terminals of the actuator (in so doing, observe the maximum power loss when signal "1" is present).

The lower response threshold of the actuator must be known in the operating temperature range or be determined experimentally. The output voltage of the module when signal "0" is present can be influenced through parallel connection of a resistor directly to the actuator connecting terminals. The maximum power loss when signal "1" is present must be observed when selecting the resistor.

- Load resistances between 10 kΩ and 1 MΩ can be signaled as a short-circuit to L+.
- Outputs or loads without protection circuit greater than 1 MΩ are signaled as a "wire break".