

SIMATIC

ET 200PA SMART+ AI 16xI 2-wire PA

Equipment Manual

Cybersecurity information	1
Preface	2
Product overview	3
Terminal	4
Parameters	5
Displays and interrupts	6
Technical specifications	7
Drivers, parameters, diagnostics messages and address space	A
Analog value display	B

6DL1164-6GH00-0PH1

Preface

Validity of the documentation

This Equipment Manual describes the AI 16xI 2-wire PA I/O module with article number 6DL1164-6GH00-0PH1.

It supplements the System Manual for the ET 200PA SMART+ Distributed I/O System.

Functions that generally relate to the system are described in this manual.

The information in this Equipment Manual and in the System/Function Manuals enables you to commission the ET 200PA SMART+.

Conventions

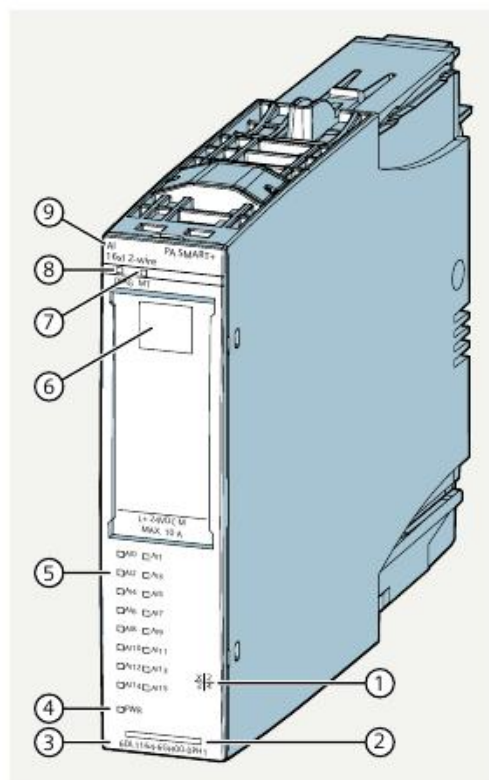
Please also observe notes marked as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product and on the section of the documentation to which particular attention should be paid.

Description

The I/O module consists of the following components:



- | | |
|---------------------------|-------------------------------|
| ① Function version | ⑧ LED for diagnostics |
| ② Serial number | ⑨ Module type and designation |
| ③ Article number | |
| ④ LED for supply voltage | |
| ⑤ LEDs for channel status | |
| ⑥ 2D matrix code | |
| ⑦ LED for maintenance | |

3.2 Accessories

Definition

Accessories for the I/O module must be ordered separately.

Displays and interrupts

6.1 Status and error displays

Definition

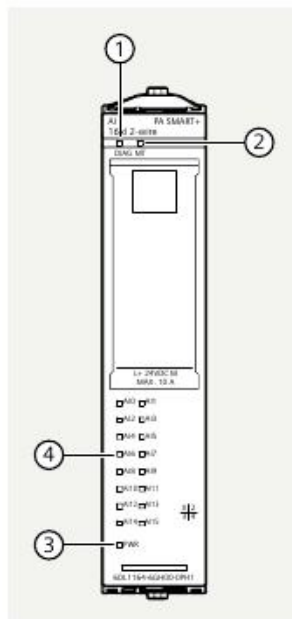
The LED displays are status and error indicators.

Diagnostic messages and maintenance events, as well as their possible causes and solutions, are described in the diagnostic messages and maintenance events.

Diagnostics alarms (Page 43)

Description

The following figure explains the LED displays of the I/O module.



- ① DIAG LED (Page 28) (green / red)
- ② MT LED (Page 28) (yellow)
- ③ PWR LED (Page 29) (green)
- ④ Channel status LEDs (Page 29) (green)

Article number	6DL1164-6GH00-0PH1
General information	
Product type designation	AI 16xI 2-wire PA
Firmware version	
• FW update possible	Yes
Usable terminal block	see the system manual
Product function	
• I&M data	Yes; I&M 0
Operating mode	
• Oversampling	No
• MSI	No
Redundancy	
• Redundancy capability	No
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	No
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	350 mA
Encoder supply	
Number of outputs	16
Output voltage (DC)	24 V
Output voltage, min.	19.2 V
Short-circuit protection	Yes
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes; Per output, thermal
• Output current per channel, max.	46 mA
• Output current per module, max.	0.8 mA
Power loss	
Power loss, typ.	0.6 W
Address area	
Address space per module	
• Address space per module, max.	34 byte; 32-byte inputs and 2 bytes for QI information
• Inputs	34 byte
Analog inputs	
Number of analog inputs	16
• For current measurement	16

Article number	6DL1164-6GH00-0PH1
permissible input current for current input (destruction limit), max.	30 mA
Cycle time (all channels), min.	400 ms
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 16 bit incl. sign
– Input resistance (0 to 20 mA)	250 Ω
• 4 mA to 20 mA	Yes; 16 bit incl. sign
– Input resistance (4 mA to 20 mA)	250 Ω
Cable length	
• shielded, max.	800 m
• unshielded, max.	200 m
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; 15 bit at 0 ... 10 mA and 60 Hz interference suppression
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	16.6 / 20 / 100 ms
Smoothing of measured values	
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.5 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.3 %
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel-by-channel, at 4 to 20 mA only

Article number	6DL1164-6GH00-0PH1
- Short-circuit - Overflow/underflow	No Yes; channel by channel
Diagnostics indication LED	
- MAINT LED - Monitoring of the supply voltage (PWR-LED) - Channel status display - for channel diagnostics - for module diagnostics	Yes; Yellow LED Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED
Potential separation	
Potential separation analog inputs	
- between the channels - between the channels and backplane bus - Between the channels and load voltage L+ - between the channels and the power supply of the electronics	No Yes No No
Potential separation channels	
- between the channels - between the channels and backplane bus - Between the channels and load voltage L+ - between the channels and the power supply of the electronics	No Yes No No
Isolation	
Isolation tested with	1 500 V DC/1 min, type test
Ambient conditions	
Ambient temperature during operation	
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C 70 °C; Observe derating -40 °C 60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	148 g

Cycle time

The cycle time describes the time slice in which signals from the inputs are acquired and processed.