

SIMATIC S7-400, control module FM 455 S, 16 channels, step and pulse, 8/16 AI + 16 DI+ 32 DO



Supply voltage

Load voltage L+

- | | |
|---------------------------------------|--------|
| • Rated value (DC) | 24 V |
| • permissible range, lower limit (DC) | 20.4 V |
| • permissible range, upper limit (DC) | 28.8 V |

Input current

from load voltage L+ (without load), max.	400 mA; typ. 330 mA
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Power loss

Power loss, typ.	10.7 W
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Digital inputs

Number of digital inputs	16
Input characteristic curve in accordance with IEC 61131, type 2	Yes

Input voltage

- | | |
|--------------------|-----------|
| • Rated value (DC) | 24 V |
| • for signal "0" | -3 to +5V |
| • for signal "1" | 13 to 30V |

Input current

• for signal "1", typ.	7 mA
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Number of digital outputs	32
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	L+ (-1.5 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Load resistance range	
• lower limit	240 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-2.5 V)
Output current	
• for signal "1" rated value	0.1 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	150 mA
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for logic links	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	100 Hz
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	16; With thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection
permissible input voltage for voltage input (destruction limit), max.	20 V
permissible input current for current input (destruction limit), max.	40 mA
Input ranges	
• Voltage	Yes
• Current	Yes

• Thermocouple	Yes
• Resistance thermometer	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 k Ω
• -1.75 V to +11.75 V	Yes
— Input resistance (-1.75 V to +11.75 V)	100 k Ω
• -80 mV to +80 mV	Yes
— Input resistance (-80 mV to +80 mV)	10 M Ω
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	50 Ω
• 0 to 23.5 mA	Yes
— Input resistance (0 to 23.5 mA)	50 Ω
• -3.5 mA to +23.5 mA	Yes
— Input resistance (-3.5 mA to +23.5 mA)	50 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	50 Ω
Input ranges (rated values), thermocouples	
• Type B	Yes
— Input resistance (Type B)	10 M Ω
• Type J	Yes
— Input resistance (type J)	10 M Ω
• Type K	Yes
— Input resistance (Type K)	10 M Ω
• Type R	Yes
— Input resistance (Type R)	10 M Ω
• Type S	Yes
— Input resistance (Type S)	10 M Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
— Input resistance (Pt 100)	10 M Ω
Thermocouple (TC)	
Temperature compensation	
— internal temperature compensation	Yes; Parameterizable
— external temperature compensation with Pt100	Yes; Parameterizable
Characteristic linearization	
• parameterizable	Yes
— for thermocouples	Type B, J, K, R, S
— for resistance thermometer	Pt100 (standard)
Cable length	

- shielded, max.

200 m; 50 m at 80 mV and thermocouples

Analog value generation for the inputs

Integration and conversion time/resolution per channel

- Resolution with overrange (bit including sign), max. 14 bit; 12 bit or 14 bit, parameterizable

Encoder

Connection of signal encoders

- for voltage measurement Yes
- for current measurement as 4-wire transducer Yes

Connectable encoders

- 2-wire sensor Yes
- permissible quiescent current (2-wire sensor), max. 1.5 mA

Errors/accuracies

Operational error limit in overall temperature range

- Voltage, relative to input range, (+/-) ± 0.6 to $\pm 1\%$
- Current, relative to input range, (+/-) ± 0.6 to $\pm 1\%$
- Resistance thermometer, relative to input range, (+/-) ± 0.6 to $\pm 1\%$

Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-) ± 0.4 to $\pm 0.6\%$
- Current, relative to input range, (+/-) ± 0.4 to $\pm 0.6\%$
- Resistance thermometer, relative to input range, (+/-) ± 0.4 to $\pm 0.6\%$

Interrupts/diagnostics/status information

- Substitute values connectable Yes; Parameterizable

Integrated Functions

Control technology

- Number of closed-loop controllers 16; With thermocouples or 2-wire connection; 8 with Pt 100 or 4-wire connection

Potential separation

Potential separation controller

- between the channels No
- between the channels and backplane bus Yes; Optocoupler

Isolation

- Isolation tested with 500 V DC

Connection method

- required front connector 2x 48-pin

Dimensions

Width	50 mm
Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	1 400 g
last modified:	10/16/2020