

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
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Digital outputs</b>	
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
<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	240 Ω
• upper limit	4 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-2.5 V)
<b>Output current</b>	
• 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
<b>Parallel switching of two outputs</b>	
• for logic links	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	100 Hz
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Analog inputs</b>	
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
<b>Input ranges</b>	
• Voltage	Yes
• Current	Yes

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

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

### Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-)  $\pm 0.4$  to  $\pm 0.6\%$
- Current, relative to input range, (+/-)  $\pm 0.4$  to  $\pm 0.6\%$
- Resistance thermometer, relative to input range, (+/-)  $\pm 0.4$  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
<b>last modified:</b>	09/03/2020