

SIMATIC S7-400, FM 453 FUNCTION MODULE FOR POSITIONING WITH SERVO AND STEPPER MOTORS (3 CHANNELS) INCL. CONFIG. PACKAGE ON CD



Figure similar

| Supply voltage                          |   |
|---|---|
| Auxiliary voltage 1L+, load voltage 2L+ |   |
| • Rated value (DC)                      | 24 V  |
| • permissible range, lower limit (DC)   | 20.4 V; Dynamic 18.5 V  |
| • permissible range, upper limit (DC)   | 28.8 V; dynamic 30.2 V  |
| Input current                           |   |
| from load voltage 1L+, max.             | 1 A; with 24 V position encoder; 1 A for 5 V position encoder |
| from load voltage 2L+ to 4L+, max.      | 2 A; Per channel  |
| from backplane bus 5 V DC, max.         | 1.6 A; Rated current  |
| Encoder supply                          |   |
| 5 V encoder supply                      |   |
| • 5 V                                   | Yes   |
| • Output current, max.                  | 300 mA  |
| • Cable length, max.                    | 35 m; at max. 210 mA; 25 m at max. 300 mA                     |
| 24 V encoder supply                     |   |
| • 24 V                                  | Yes   |

- Cable length, max. 100 m; at max. 300 mA

## Power loss

|                  |     |
|------------------|-----|
| Power loss, typ. | 8 W |
|------------------|-----|

## Digital inputs

|                          |                          |
|--------------------------|--------------------------|
| Number of digital inputs | 6; for each channel/axis |
|--------------------------|--------------------------|

|           |              |
|-----------|--------------|
| Functions | configurable |
|-----------|--------------|

### Input voltage

- Rated value (DC) 24 V
- for signal "0" -3 to +5 V (max. 3 mA)
- for signal "1" 11 to 30 V (max. 7 mA)

### Input delay (for rated value of input voltage)

#### for standard inputs

- at "0" to "1", max. 15 µs; via input voltage range, 8 µs at 24 V DC
- at "1" to "0", max. 45 µs; via input voltage range

## Digital outputs

|                           |                          |
|---------------------------|--------------------------|
| Number of digital outputs | 4; for each channel/axis |
|---------------------------|--------------------------|

|           |              |
|-----------|--------------|
| Functions | configurable |
|-----------|--------------|

|                          |     |
|--------------------------|-----|
| Short-circuit protection | Yes |
|--------------------------|-----|

### Output voltage

- Rated value (DC) 24 V
- for signal "1", min. UP - 0,3 V

### Output current

- for signal "1" rated value 0.5 A; at 40 °C; 0.1 A at 60 °C
- for signal "1" permissible range for 0 to 40 °C, min. 5 mA
- for signal "1" permissible range for 0 to 40 °C, max. 0.6 A
- for signal "1" permissible range for 40 to 60 °C, min. 5 mA
- for signal "1" permissible range for 40 to 60 °C, max. 0.12 A
- for signal "0" residual current, max. 2 mA

### Switching frequency

- with resistive load, max. 100 Hz
- with inductive load, max. 0.25 Hz

## Encoder

### Connectable encoders

- Incremental encoder (symmetrical) Yes
- Absolute encoder (SSI) Yes

### Encoder signals, incremental encoder (symmetrical)

- Input signal 5 V difference signal (phys. RS 422)

|  |   |
|--|---|
| • Input frequency, max.                        | 1 MHz; for 10 m cable length; 0.5 MHz for 35 m cable length |
| <b>Encoder signals, absolute encoder (SSI)</b> |   |
| • Input signal                                 | 5 V difference signal (phys. RS 422)                        |
| • Clock frequency, max.                        | 1.25 Mbit/s at 10 cable length (2.5 Mbit/s available soon)  |
| • Cable length, shielded, max.                 | 250 m; At max. 156 kbit/s                                   |

### Drive interface

|                     |  |
|---------------------|--|
| <b>Signal Input</b> |  |
| • Type              | Drive interface step, signal input "READY 1"                           |
| • Function          | "Power section ready" where $U_i < 1 \text{ V}$ , $I_i = 2 \text{ mA}$ |

### Analog drive

|                        |             |
|------------------------|-------------|
| <b>Setpoint signal</b> |             |
| — Rated voltage range  | -10 to +10V |
| — Output current       | -3 to +3 mA |
| — Cable length, max.   | 30 m        |

|                                 |        |
|---------------------------------|--------|
| <b>Output controller enable</b> |        |
| — Switching voltage, max.       | 50 V   |
| — Switching current, max.       | 1 A    |
| — Switching capacity, max.      | 30 V·A |

### Stepper drive

|  |   |
|--|---|
| • Differential output voltage, min.                | 2 V; $R_L = 100 \text{ Ohm}$                                      |
| • Differential output voltage for signal "0", max. | 1.1 V; $I_o = 30 \text{ mA}$                                      |
| • Differential output voltage for signal "1", min. | 3.7 V; $I_o = -30 \text{ mA}$                                     |
| • Load resistance, min.                            | 55 $\Omega$   |
| • Output current, max.                             | 60 mA   |
| • Pulse frequency                                  | 200 kHz; 500 kHz available soon                                   |
| • Cable length, shielded, max.                     | 35 m; 35 m with symm. transmission; 10 m with asymm. transmission |

### Potential separation

|   |                  |
|---|------------------|
| <b>Potential separation digital inputs</b>  |                  |
| • Potential separation digital inputs       | Yes; Optocoupler |
| <b>Potential separation digital outputs</b> |                  |
| • Potential separation digital outputs      | Yes; Optocoupler |

### Degree and class of protection

|  |     |
|--|-----|
| <b>Degree of protection acc. to EN 60529</b> |     |
| • IP20                                       | Yes |

### Ambient conditions

|  |       |
|--|-------|
| <b>Ambient temperature during operation</b>              |       |
| • min.   | 0 °C  |
| • max.   | 55 °C |
| <b>Ambient temperature during storage/transportation</b> |       |

- min. -40 °C
- max. 70 °C

#### Connection method

required front connector 1x 48-pin

#### Dimensions

Width 50 mm

Height 290 mm

Depth 210 mm

#### Weights

Weight, approx. 1 620 g

**last modified:** 03/30/2017