

SIMATIC S7-400, EXM 438-1 I/O EXPANSION MODULE FOR FM
458 4 X ANALOG OUTPUTS 16 BIT EXM 438-1 NOT SPAREPART
COMPATIBLE TO EXM438



Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
Input current	
Current consumption, typ.	1.5 A
Encoder supply	
Type of output voltage	about 14 V (non-isolated)
Short-circuit protection	Yes; Electronic
Output current	
• Rated value	100 mA
Hardware configuration	
Slots	
• required slots	1
Digital inputs	
Number of digital inputs	16
Input voltage	

• Rated value (DC) • for signal "0" • for signal "1"	24 V -1 to +6 V or input open +13 to +33V
Input current	
• for signal "0", max. (permissible quiescent current) • for signal "1", typ.	0 mA 3 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— at "0" to "1", max.	200 µs
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V
Output voltage	
• for signal "0", max. • for signal "1", max.	3 V Supply voltage -2.5 V
Output current	
• for signal "1" rated value • for signal "1" permissible range for 0 to 40 °C, min. • for signal "0" residual current, max. • Total switching current	50 mA 100 mA 20 µA 80% at 50 °C all outputs 50 mA
Output delay with resistive load	
• "0" to "1", max.	15 µs
Analog inputs	
Number of analog inputs	5; Differential inputs
Input ranges (rated values), voltages	
• -10 V to +10 V • Input resistance (-10 V to +10 V)	Yes; -10 V: +/-4 LSB; to +10 V: +/-4 LSB (1 LSB = 4.88 mV) 470 kΩ
Analog outputs	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs 12 bit
Voltage output, short-circuit protection	Yes; relative to frame
Voltage output, short-circuit current, max.	16 bits: 27 mA; 12 bits: 100 mA
Output ranges, voltage	
• -10 V to +10 V	Yes
Analog value generation	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	4 AO: 16 bits, 4 AO: 12 bits, 5 AI: 12 bits

- Conversion time (per channel)

4 AO (16 bits): 2 µs; 4 AO (12 bits): 4 µs; 5 AI: 45 µs

Encoder

Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes; Single or multiturn encoder with SSI (synchronous serial) or EnDat interface
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	1) for tracks A and B (90° out of phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input signal	With 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
• Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V acc. to RS 422
• Data signal	Dual-, Gray-, Gray-Excess-Code
• Clock frequency, max.	2 MHz; 100 kHz to 2 MHz (depending on cable length)

Errors/accuracies

Linearity error (relative to output range), (+/-)	(+/- 1 LSB)
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Potential separation

Potential separation digital inputs	
• Potential separation digital inputs	No
Potential separation digital outputs	
• Potential separation digital outputs	No
Potential separation analog inputs	
• Potential separation analog inputs	No
Potential separation analog outputs	
• Potential separation analog outputs	No

Weights

Weight, approx.	1 kg
last modified:	10/28/2016