



*** spare part *** SIMATIC S7-400, EXM 438-1 I/O extension for FM 458 4x analog outputs 16-bit EXM 438-1 not spare part-compatible for EXM438

Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> • 5 V DC • 24 V DC 	Yes 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	
<ul style="list-style-type: none"> • Rated value 	100 mA
Power loss	
Power loss, typ.	7.5 W
Digital inputs	
Number of digital inputs	16
Input voltage	
<ul style="list-style-type: none"> • Rated value (DC) • for signal "0" • for signal "1" 	24 V -1 to +6 V or input open +13 to +33V
Input current	
<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Response threshold, typ. 	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V
Output voltage	
<ul style="list-style-type: none"> • for signal "0", max. • for signal "1", max. 	3 V Supply voltage -2.5 V
Output current	
<ul style="list-style-type: none"> • 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	Yes; -10 V: ±4 LSB; to +10 V: ±4 LSB (1 LSB = 4.88 mV)	
— Input resistance (-10 V to +10 V)	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 bit: 27 mA; 12 bit: 100 mA	
Output ranges, voltage		
• -10 V to +10 V	Yes	
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	12 bit	
• Conversion time (per channel)	45 µs	
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	4 AO: 16 bit, 4 AO: 12 bit	
• Conversion time (per channel)	4 AO (16 bit): 2 µs; 4 AO (12 bit): 4 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 voltage	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)	
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	
Dimensions		
Width	24 mm	
Height	290 mm	
Depth	210 mm	
Weights		
Weight, approx.	1 kg	
Classifications		
	Version	Classification
eClass	14	27-24-22-05

eClass	12	27-24-22-05
eClass	9.1	27-24-22-05
eClass	9	27-24-22-05
eClass	8	27-24-22-05
eClass	7.1	27-24-22-05
eClass	6	27-24-22-05
ETIM	10	EC001422
ETIM	9	EC001422
ETIM	8	EC001422
ETIM	7	EC001422
IDEA	4	3567
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval



[Miscellaneous](#)



General Product Approval

EMV

For use in hazardous locations

[China RoHS](#)



For use in hazardous locations

Maritime application

[Miscellaneous](#)



[CCC-Ex](#)



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