



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	
<ul style="list-style-type: none"> "0" to "1", max. 	15 µs

Analog inputs	
Number of analog inputs	5; Differential inputs
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> -10 V to +10 V 	Yes; -10 V: ± 4 LSB; to +10 V: ± 4 LSB (1 LSB = 4.88 mV)
<ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	470 k Ω
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	
<ul style="list-style-type: none"> -10 V to +10 V 	Yes
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	12 bit
<ul style="list-style-type: none"> Conversion time (per channel) 	45 μ s
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	4 AO: 16 bit, 4 AO: 12 bit
<ul style="list-style-type: none"> Conversion time (per channel) 	4 AO (16 bit): 2 μ s; 4 AO (12 bit): 4 μ s
Encoder	
Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders
Connectable encoders	
<ul style="list-style-type: none"> Incremental encoder (symmetrical) 	Yes
<ul style="list-style-type: none"> Incremental encoder (asymmetrical) 	Yes
<ul style="list-style-type: none"> Absolute encoder (SSI) 	Yes; Single or multturn encoder with SSI (synchronous serial) or EnDat interface
Encoder signals, incremental encoder (symmetrical)	
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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)	
<ul style="list-style-type: none"> Trace mark signals 	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
<ul style="list-style-type: none"> 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)	
<ul style="list-style-type: none"> Input signal 	5 V acc. to RS 422
<ul style="list-style-type: none"> Data signal 	Dual-, Gray-, Gray-Excess-Code
<ul style="list-style-type: none"> Clock frequency, max. 	2 MHz; 100 kHz to 2 MHz (depending on cable length)
Errors/accuracies	
Linearity error (relative to output range), (+/-)	(± 1 LSB)
Potential separation	
Potential separation digital inputs	
<ul style="list-style-type: none"> Potential separation digital inputs 	No
Potential separation digital outputs	
<ul style="list-style-type: none"> Potential separation digital outputs 	No
Potential separation analog inputs	
<ul style="list-style-type: none"> Potential separation analog inputs 	No
Potential separation analog outputs	
<ul style="list-style-type: none"> Potential separation analog outputs 	No
Dimensions	
Width	24 mm
Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	1 kg

last modified:

12/8/2024 