

DI8-DO8-ENC4-DAC4 for imc CRONOS-SL (CRSL)

8 Digital Inputs, 8 Digital Outputs, 4 Analog Outputs and 4 Counter Inputs

The module for digital IO and counter inputs comes with 8 digital inputs, 8 digital outputs, 4 analog outputs and 4 inputs for capture of incremental encoder signals, RPM measurements, angle, frequencies etc., available as plug-in module for the imc CRONOS *compact* or as configuration module for imc CRONOS-SL.

Each 8-bit group of digital inputs can be configured by means of a wire jumper in the connector for the acquisition of either TTL-signals or 24 V signals. The 4 inputs for the capture of counter signals can be paired up to capture dual-track encoder signals.



imc CRONOS-SL-2 (rear)



imc CRONOS-SL-2 (front)

Overview of available variants

Order code	article no.	remarks
CRSL/DI8-DO8-ENC4-DAC4	11800067	variant with DSUB-15

Optional accessories:

IP65 DSUB-15 plugs		
ACC/DSUBM-DI4-8-IP65	15-pin DSUB plug for each 8 bits	13500221
ACC/DSUBM-DO8-IP65	15-pin DSUB plug for digital outputs	13500220
ACC/DSUBM-ENC4-IP65	15-pin DSUB plug for 4 counter inputs	13500219
ACC/DSUBM-DAC4-IP65	15-pin DSUB plug for 4 analog outputs	13500223

DI: Digital Inputs

Parameter	Value (typ. / min. max.)	Remarks
Channels	8 16	Common grounding point for each 4-channel group, electrically isolated from the other input group If the multiboard is charged with analog inputs (DAC-4) 8 digital inputs will be dispensed (DI-8)
Configuration group	TTL or 24V input voltage range (configurable globally for each 8-channel groups)	Configurable at DSUB connector Bridge from LCOM to LEVEL activates TTL mode LEVEL open activates 24 V-mode
Connection terminals	DSUB-15	ACC/DSUBM-DI4-8(-IP65)
Input configuration	differential	isolated mutually and from supply
Sampling rate	10 kHz	per channel
Isolation strength	± 150 V	to system ground (tested 200 V)
Input current	max. 500 μ A	
Switching threshold	1.5 V (± 200 mV) 7 V (± 300 mV)	5 V mode 24 V mode
Switching time	<20 μ s	
Sensor supply	5 V max. 100 mA	Reference at Level otherwise electrically isolated from system

DO: Digital Outputs

Parameter	Value (typ. / min. max.)		Remarks
Channels	8		8-bit group, isolated, common reference potential ("LCOM") for a group
Isolations strength	±50 V		to system ground (protection ground)
Output configuration	totem pole <i>or</i> open-drain		configurable with wire jumper ("ODRN" - "LCOM") in the connector pod
Output level	TTL <i>or</i> max. $U_{\text{ext}} - 0.8 \text{ V}$		internal isolated supply voltage by means of connecting an external supply voltage U_{ext} with "HCOM", $U_{\text{ext}} = 5 \text{ V to } 30 \text{ V}$
Max. output current (typ.)	<i>HIGH</i>	<i>LOW</i>	external inverse diode needed with inductive load for all outputs
TTL	15 mA	0.7 A	
24 V-logic open-drain	22 mA ---	0.7 A 0.7 A	
open-drain with intern. 5 V supply		200 mA	
Output voltage	<i>HIGH</i>	<i>LOW</i>	with load current:
TTL	>3.5 V	≤0.4 V	$I_{\text{high}} = 15 \text{ mA}, I_{\text{low}} \leq 0.7 \text{ A}$
24 V-logic ($U_{\text{ext}} = 24 \text{ V}$)	>23 V	≤0.4 V	$I_{\text{high}} = 22 \text{ mA}, I_{\text{low}} \leq 0.7 \text{ A}$
Internal supply voltage available at contacts	5 V, 200 mA isolated		
Switching time	<100 μs		
Terminal connection	1x DSUB-15 / 8 bits		ACC/DSUBM-DO8(-IP65)

ENC: Incremental Counter Channels

Parameter	Value (typ. / min. max.)		Remarks
Channels	4 + 1 (5 tracks)		4 single tracks or joining of two tracks to make a two-track channel 1 index-channel
Measurement mode:	displacement, angle, events time, frequency; velocity, RPMs		
Connection terminals	1x DSUB-15		ACC/DSUBM-ENC4(-IP65)
Sampling rate	50 kHz / channel		
Time resolution of the measurement	31.25 ns		Counter frequency: 32 MHz
Resolution of data	16 bits		
Input configuration	differential		
Input impedance	100 k Ω		
Input voltage range (differential)	± 10 V		
Common mode input voltage	max. +25 V, min. -11 V		
Switching threshold	-10 V to +10 V		individual for each channel
Hysteresis	min. 100 mV		individual for each channel
Analog bandwidth	500 kHz		-3 dB (full power)
Analog filter	bypass (without filter), 20 kHz, 2 kHz, 200 Hz		adjustable (per channel) Butterworth, 2nd order
Switching delay	500 ns		Modulation: 100 mV square wave
CMRR	70 dB 60 dB	50 dB 50 dB	DC, 50 Hz 10 kHz
Gain uncertainty	<1%		25°C
Zero point uncertainty	<1%		25°C
Overvoltage protection	± 50 V		long-term
Sensor supply	+5 V (max. 300 mA)		not isolated (reference: GND, CHASSIS)

DAC: Analog Outputs

Parameter	Value (typ. / min. max.)		Remarks
Channels	4		
Connector plug	1x DSUB-15 / 4 channels		ACC/DSUB-DAC4
Output level	± 10 V		
Load current	± 10 mA /channel max.		
Resolution	16 bit		16-bit; no missing codes
Nonlinearity	± 2 LSB		load current: $I_{\text{high}} = 15$ mA, $I_{\text{low}} \leq 0.7$ A $I_{\text{high}} = 22$ mA, $I_{\text{low}} \leq 0.7$ A
Max. output frequency	50 kHz		
Analog bandwidth	50 kHz		-3 dB, low-pass 2nd order
Gain uncertainty	$< \pm 5$ mV	$< \pm 10$ mV	-40°C to 85°C
Offset uncertainty	$< \pm 2$ mV	$< \pm 4$ mV	-40°C to 85°C