

## DI16-DO8-ENC4 for imc CRONOS-SL (CRSL)

16 Digital Inputs, 8 Digital Outputs and 4 Counter Inputs

The combi-card comes with 16 digital inputs, 8 digital 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 (back panel)*



*imc CRONOS-SL-2 (front panel)*

### Overview of available variants

Order code	article no.	remarks
CRSL/DI16-DO8-ENC4-D	11800038	with DSUB-15 sockets

### 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

## ENC-4 (DI16-DO8-ENC4) 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 (4 incremental counter inputs)
Measurement mode:	displacement, angle, events time, frequency; velocity, RPMs		
Connection terminals	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		
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 %		of voltage range (25°C)
Zero point uncertainty	<1 %		of voltage range (25°C)
Overvoltage protection	±50 V		long-term
Sensor supply	+5 V (max. 300 mA)		not isolated (reference: GND, CHASSIS)

## DI-16 (DI16-DO8-ENC4) Digital inputs

Parameter	Value (typ. / min.max.)	Remarks
Channels	16	Common grounding point for each 4-channel group, electrically isolated from the other input group (16 digital inputs)
Configuration options	TTL or 24 V 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
Isolation strength	$\pm 150$ V	to system ground (tested 200 V)
Sampling rate	10 kHz	per channel
Input current	max. 500 $\mu$ A	
Switching threshold	1.5 V ( $\pm 200$ mV) 7 V ( $\pm 300$ mV)	5 V mode 24 V mode
Switching time	<20 $\mu$ s	
Sensor supply	5 V max. 100 mA	Reference at Level otherwise electrically isolated from system

## DO-8 (DI16-DO8-ENC4) Digital outputs

Parameter	Value (typ. / min. max.)		Remarks
Channels	8		8-bit group, isolated, common reference potential ("LCOM") for a group (8 digital outputs)
Connection plug	DSUB-15 / 8 bits		ACC/DSUB-DO8(-IP65)
Isolations strength	$\pm 50$ 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. $U_{\text{ext}} - 0.8$ V		internal isolated supply voltage  by means of connecting an external supply voltage $U_{\text{ext}}$ with "HCOM", $U_{\text{ext}} = 5$ V to 30 V
Max. output current (typ.)	<i>HIGH</i>	<i>LOW</i>	external inverse diode needed with inductive load
TTL	15 mA	0.7 A	
24 V-logic	22 mA	0.7 A	
open-drain	---	0.7 A	
open-drain with intern. 5 V supply		200 mA	
Output voltage	<i>HIGH</i>	<i>LOW</i>	with 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
TTL	$>3.5$ V	$\leq 0.4$ V	
24 V-logic ( $U_{\text{ext}} = 24$ V)	$>23$ V	$\leq 0.4$ V	
Internal supply voltage available at contacts	5 V, 200 mA isolated		
Switching time	$<100$ $\mu$ s		