

HRENC-4 for imc CRONOS-PL/-SL/compact

Datasheet Version 3.3

High-resolution capture of up to 4 counter input channel signals, rotational encoders with enhanced resolution for two-track sine signal encoders



The plug-in module **HRENC-4** for imc CRONOS-PL/*compact* (or configuration module for imc CRONOS-SL) serves to measure signals whose time- or frequency information is to be captured. In contrast to the case with analog channels, to actual measurement does not consist of repeated sampling at a fixed time interval. Instead, digital counters are used to determine either the count of pulses occurring or the time intervals between defined signal slope events. For the time measurement/ maximum frequency, a resolution of approx. 3.9 ns (256 MHz) is achieved.

When using two-track sine/cosine signal encoders, conversion to digital values for determining the rotation direction and the absolute count of increments (full periods) is performed. Additionally, detailed information about the position can be gained by analog evaluation of the sine/ cosine signal, which results in yet further increased resolution.

Order code:	Article number	Remarks
CRPL/HRENC-4	1080172	for installation in the imc CRONOS-PL housing
CRPL/HRENC-4-ET	1081118	version in extended temperature range
CRSL/HRENC-4-D	1180036	for installation in the imc CRONOS-SL housing with DSUB interconnections
CRSL/HRENC-4-L	1180037	for installation in the imc CRONOS-SL housing with LEMO interconnections
CRC/HRENC-4	1170030	for installation in the imc CRONOS <i>compact</i> housing
CRC/HRENC-4-ET	1171024	version in extended temperature range
CRC/HRENC-4-R	1170113	for installation in the imc CRONOS <i>compact</i> RACK
CRC/HRENC-4-R-ET	1171072	version in extended temperature range

Structure

- Plug-in module for imc CRONOS-PL/*compact* systems, occupying one slot.

Interconnections

- 2x **DSUB-15** terminals for each 2-channel pair
- 4x 7-pin LEMO terminals for 1 channel (only with CRSL/HRENC-4-L)

Included accessories for imc CRONOS-PL:**Connection terminals:**

- 2x **ACC/DSUB-ENC4**, 15-pin DSUB clamp terminal for each 2-channel pair

Included accessories for imc CRONOS-SL:

Power supply

- Supplied from imc CRONOS-PL/-SL/compact
- Additional power requirements due to installed module: 2.6 W

Operating conditions

- Depending on the module variety (with or without extended temperature range), the respective operating conditions pertain to the associated housing model.
- max. 16 counter inputs, 4x HRENC-4 modules in one system

Software configuration

- The module is completely supported by the operating software for imc CRONOS-PL/-SL/compact. The entire functionality or parameterization, data saving and online computations are available.

Data storage

- performed by imc CRONOS-PL/-SL/compact

Optional accessories:**Connection terminal:**

- **ACC/DSUB-ENC4-IU**, 15-pin DSUB connection terminal with current-to-voltage signal conversion
- **ACC/DSUB-ENC4-IP65**, 15-pin DSUB connection terminal adapted to imc CRONOS-SL for each channel pair for acquisition of incremental quantities such as RPM, frequency, displacement etc.

HRENC-4: angle, events, time, frequency, RPM

Technical Specs:

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Parameter	Value (typ. / max)	Remarks
Channels	4 + 1 (9 tracks)	4 channels with 2 tracks (X, Y) each 1 index-channel all fully conditioned (differential amplifier) (4 differential inputs)
Measurement mode	displacement, angle, events, time, frequency; velocity, RPMs	
Connection terminal	2x DSUB-15 / 2 channels or 5x LEMO 1B.307 / 1 channel	ACC/DSUB-ENC4(-IP65) ACC/DSUB-ENC-4-IU 2 channels per each terminal INDEX only occupied on second socket!

General		
Sampling rate	50 kHz / channel (max.)	
Measurement time resolution	3.9 ns	Counter frequency 256 MHz (primary sampling rate)
Data resolution	16 bit	

Differential-inputs		
Input configuration	differential	
Input voltage range (differential)	± 10 V ± 30 V	Linear range maximum range
Input impedance	50 k Ω	
Common mode input voltage	max. ± 30 V	
CMRR	70 dB (typ.), 50 dB (min.) 60 dB (typ.), 50 dB (min.)	DC, 50 Hz 10 kHz
Overvoltage protection	± 50 V	long-term
Gain uncertainty	<1 %	25°C
Offset uncertainty	<1 %	25°C
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

Digital Analysis (comparator)		
Switching threshold	-10 V to +10 V	adjustable individual for each channels
Hysteresis	0% to 40% off [threshold], min. 100 mV	adjustable individual for each channels
Switching delay	500 ns	modulation: 100 mV square wave

Analog analysis (ADC)		
SIN/COS encoder analysis	8x12 Bit A/D-converter	8 channels of simultaneous sampling
Input voltage range	± 1.5 V, ± 10 V	(differential)

Parameter	Value (typ. / max)	Remarks
Sensor supply	+5 V, 100 mA 300 mA (optional)	not isolated (reference: GND, CHASSIS)