

HRENC-4 for imc CRONOS-SL (CRSL/HRENC-4)

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



imc CRONOS-SL-2 (back panel)



imc CRONOS-SL-2 (front panel)

The plug-in module **HRENC-4** for imc CRONOScompact (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.

Overview of available variants

Order code	article no.	remarks
CRSL/HRENC-4-D	11800036	with DSUB-15 sockets
CRSL/HRENC-4-L	11800037	with LEMO sockets

Included accessory

Documents
Getting started with imc CRONOScompact & imc CRONOS-SL (one copy per delivery / system)
Device certificate

Optional accessories

DSUB-15 plug		
ACC/DSUBM-ENC4	15-pin DSUB clamp terminal for each 2-channel pair for acquisition of incremental quantities such as RPM, frequency, displacement etc.	13500171
ACC/DSUBM-ENC4-IP65	sealed version of the ACC/DSUBM-ENC4	13500219

DSUB-15 plug		
ACC/DSUBM-ENC4-IU	15-pin DSUB clamp terminal for each 2-channel pair for acquisition of incremental quantities such as RPM, frequency, displacement etc. Requires modifications of the incremental interfaces to a higher voltage 5 V / 300 mA	13500053

Technical Specs - CRSL/HRENC-4

Inputs, measurement modes, terminal connection		
Parameter	Value	Remarks
Inputs	4 + 1 (9 tracks)	4 channels with 2 tracks (X, Y) each 1 index-channel, all fully conditioned
Measurement modes	Displacement (abs), Displacement (diff), Angle (abs), Angle (diff), Event, Frequency, Speed, Velocity, Time and Puls Time Measurement	only if the sampling rate is ≤ 1 ms
Terminal connection	2x DSUB-15 or 4x LEMO 1B.307	2 channels per DSUB (ACC/DSUBM-ENC4) 1 channel per LEMO

General		
Parameter	Value	Remarks
Sampling rate	≤ 50 kHz	per channel
Measurement time resolution	3.9 ns	Counter frequency 256 MHz (primary sampling rate)
Data resolution	16 bit	
Sensor supply	+5 V, 300 mA / module	

Differential-inputs		
Parameter	Value	Remarks
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 error	<1 %	25°C
Offset error	<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)		
Parameter	Value	Remarks
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)		
Parameter	Value	Remarks
SIN/COS encoder analysis	8x12 Bit A/D-converter	8 channels of simultaneous sampling
Input voltage range	± 1.5 V, ± 10 V	(differential)