HRENC-4 for imc CRONOS-SL/compact

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 *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.

imc CRONOS *compact* - modular measurement system

imc CRONOS *compact* is a modular and reconfigurable hardware a "rack"-based series of devices available in a variety of housing sizes and device frames. imc CRONOS *compact* (CRC) plug-in-modules can be inserted into the system (CRC-400 / CRC-2000G).

Once the modules are plugged into a portable or rack-based housing, they are electrically connected to the CRC-system and are supplied by the system with power. The data storage will be managed by the CRC-system.

Rack-based modules ("-R") differ from the standard modules only in terms of the front panel's attachment mechanism.
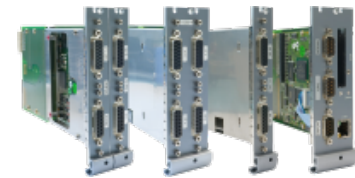
imc CRONOScompact plug-in-modules

imc CRONOScompact portable housing

Overview of available variants

Order code:	article number	remarks
CRSL/HRENC-4-D	11800036	for installation in the imc CRONOS-SL housing with DSUB sockets
CRSL/HRENC-4-L	11800037	for installation in the imc CRONOS-SL housing with LEMO sockets
CRC/HRENC-4	11700030	for installation in the imc CRONOS *compact* housing occupying one slot
CRC/HRENC-4-ET	11710024	version in extended temperature range
CRC/HRENC-4-R	11700113	for installation in the imc CRONOS *compact* RACK
CRC/HRENC-4-R-ET	11710072	version in extended temperature range

Terminal connections

- 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

- Test certificate
- Included accessories for imc CRONOS*compact*:

  Terminal connection:

2x 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

- Included accessories for imc CRONOS-SL:

Optional accessories:

DSUB-15 plugs

ACC/DSUBM-ENC4-IP65	sealed version of the ACC/DSUBM-ENC4	13500219
ACC/DSUBM-ENC4-IU	15-pin DSUB clamp for each 2 incremental channels higher supply necessary 5 V / 300 mA	13500053

Mounting brackets for fixed installations

CRC/BRACKET-CON	Mounting bracket 180°; mounting of two devices	11700153
CRC/BRACKET-90	Mounting bracket 90°; mounting on a flat surface	11700152
CRC/BRACKET-BACK	Back panel mounting bracket, mounting on a flat surface	11700154

Technical Specs - 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 (differential amplifier) (4 differential inputs)
Measurement modes	displacement, angle, events, time, frequency, velocity, RPMs	
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	

Differential-inputs		
Input configuration	differential	
Input voltage range (differential)	±10 V ±30 V	linear range maximum range
Input impedance	50 k	
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)		
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	Remarks
Sensor supply	+5 V, 300 mA / module	