HRENC-4 for imc CRONOS-XT (CRXT/HRENC-4)

4 counter input channel signals with enhanced resolution

CRXT/HRENC-4
(Fig. similar)

The HRENC-4 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.

Highlights

- The HRENC-4 is both a digital comparator and serves the purpose of analog evaluation (sine / cosine signals).
- Fully conditioned (differential input and filter)
- 256 MHz measurement time resolution
- Feedback of revolution speed etc. to precise time measurement

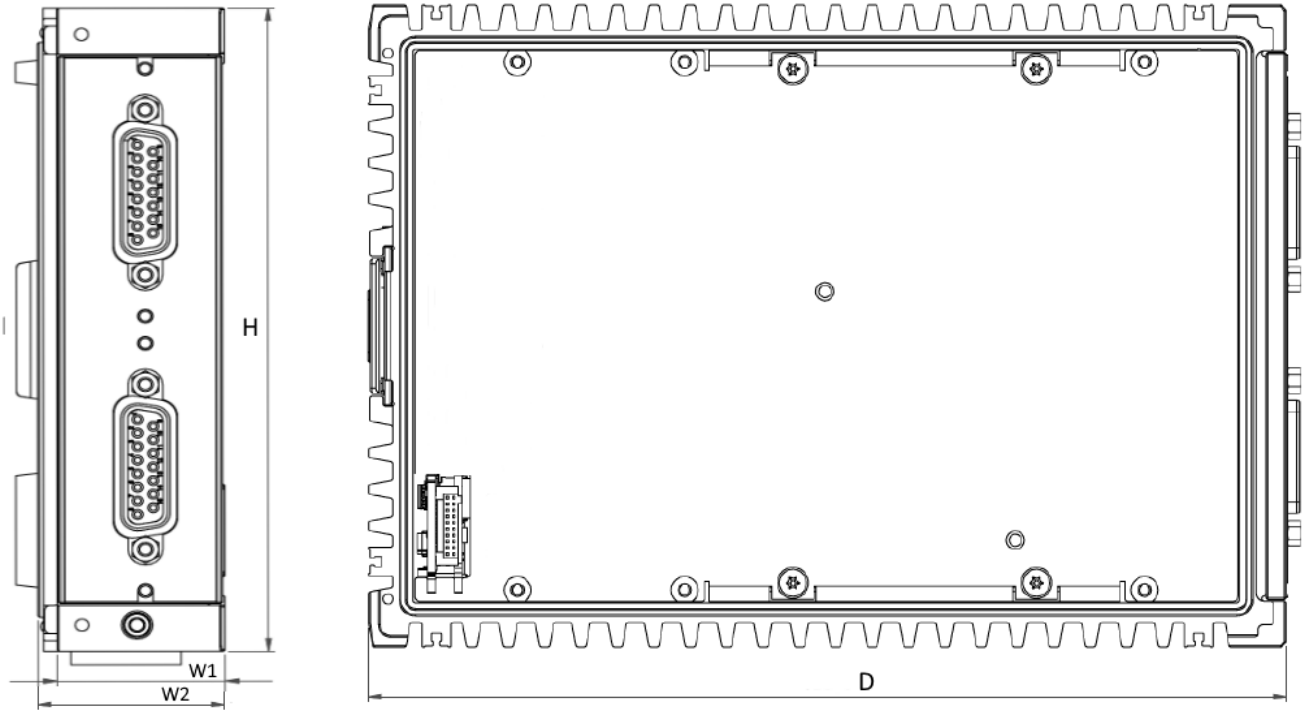
imc CRONOS-XT - Maximizes flexible modularity

An imc CRONOS-XT system is composed of a base unit and one or more imc CRONOS-XT modules. The imc click mechanism offers a mechanically strong connection between several imc CRONOS-XT modules. At the same time, the "click" establishes an electrical connection to the system bus and the power supply.

Overview of available variants

Order Code	Signal connections	power consumption	weight	housing	article no.
CRXT/HRENC-4	DSUB-15	7.4 W	0.7 kg	XT1	11100013

Dimensions



Shown in standard operating orientation: housing type XT1

Housing type:	XT1	XT2	XT3	XT4	Remarks
W: Width in mm	30.5 34	61 64.5	91.5 95	116.9 120.4	W1: modular spacing (effective stacking width) W2: complete width
H: Height in mm	130				
D: Depth in mm	186.5				

Sealing, IP rating and environmental specs

A single CRXT slice cannot achieve an IP protection level at first because it is functionally open at the side. The specified specifications are always only valid for a complete in a controlled environment clicked (closed) CRXT system. Only after it has been combined with a CRXT base unit (plus power module), CRXT slices if applicable, and the final handles to form a CRXT system can an evaluation be made. The specification for shock, vibration and IP degree of protection applicable to the entire device is then derived from the weakest specification of the CRXT slices used in this combination. They assume that the individual CRXT slices are each mounted in conjunction with the additional stabilizing interconnect brackets (included in the standard accessories supplied).

According to IEC 60529 the Ingress Protection (IP) rating refer to protection classes provided by a housing, the protection of the electrical parts within the housing shell. If all functionally accessible contacts of the sockets are also to be protected, the corresponding plugs must be connected to all sockets. In many cases, a protective cover can also be used alternatively on unused sockets.

Accessories and Plugs

Included accessories

Sealing Caps and mounting accessories		
2x ACC/CAP-DSUB-15-IP67	Sealing Cap IP67 for DSUB-15 sockets	13500342
2x CRXT/BRACKET-CON	interconnect brackets, intended for increased stability	11100040

Miscellaneous
Test certificate
Getting started with imc CRONOS-XT (one copy per delivery)

Optional accessories

DSUB-15 plug (solder) IP67		
CRXT/DSUB15M-IP67	IP67 DSUB-15 plug male	11100073

DSUB-15 plug (IP65)		
ACC/DSUBM-ENC4-IP65	IP65 DSUB-15 plug with screw terminals for each 2-channel pair for acquisition of incremental quantities such as RPM, frequency, displacement etc.	13500219

Dust protection		
ACC/CAP-DSUB-15	dust protection cap for DSUB-15	13500339

Miscellaneous		
ACC/DSUBM-LOCKING-BOLT-L	extended length locking bolts (2 pcs); adapting standard terminal plugs (ACC/DSUBM-xx) for interlocking installation on CRXT (*mechanical adaption/retrofit, only*)	13500327
Report set of function test for each device		

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	2 channels per DSUB

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 kΩ	
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	