ISO2-8(-16)-2T for imc CRONOSflex (CRFX)

8- or 16-channel, isolated measurement amplifier for thermocouples

This imc CRONOS*flex* Measurement Module is equipped with 8 (CRFX/ISO2-8-2T) or with 16 (CRFX/ISO2-16-2T) isolated channels for the measurement of thermocouples of type K.

CRFX/ISO2-8-2T

CRFX/ISO2-16-2T

Highlights

- complete channel individual isolation and conditioning (filter, ADC)
- high bandwidth for acquisition of dynamic processes
- direct connection of thermocouples type K via miniature thermocouple terminal connector

imc CRONOS*flex* - Frameless expansion, flexible modularity

The imc Click Mechanism and extruded aluminum case provide a firm mechanical and electrical connection. As a result, no mainframe or rack is needed.

imc Click Mechanism

An imc CRONOS*flex* system uses EtherCAT as an "internal" system bus for connecting various modules to the main base unit (CRFX-400 / CRFX-2000G). With the system bus, all imc CRONOS*flex* modules are guaranteed to be synchronized with each other. This allows various modules to be either connected in one central block or connected via standard network cable in a spatially distributed system.

Alternatively, connection can be made by means of standard Ethernet cables (RJ45, CAT5), thus creating a spatially distributed system.

CRFX distributed system

Overview of available variants

Standard version		ET-version *	
Order Code:	article no.	article no.	remarks
CRFX/ISO2-8-2T	11900073	11910100	with miniature thermocouple sockets
CRFX/ISO2-16-2T	11900104	11910095	with 16 miniature thermocouple sockets

* ET: Version for an extended temperature range

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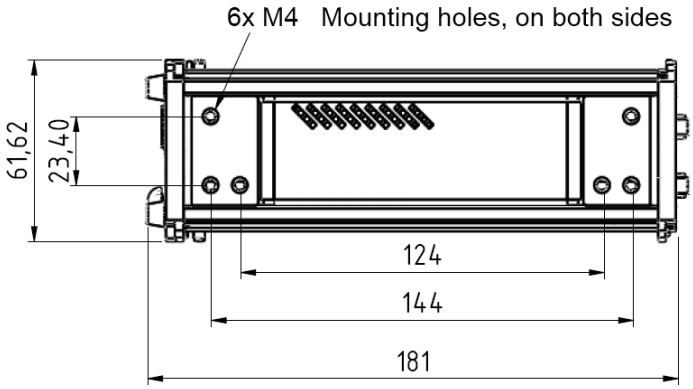
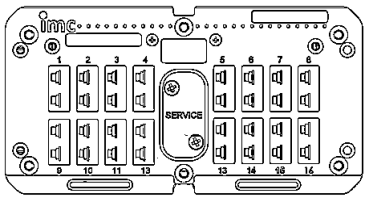
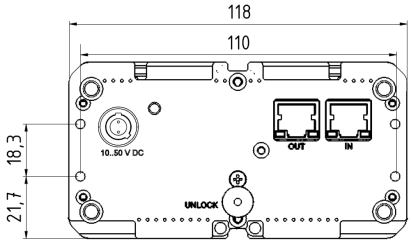
Mechanical drawings with dimensions

apply to both CRFX/ISO2-8-2T and CRFX/ISO2-16-2T





front view: CRFX/ISO2-16-2T



rear view

Module power supply options

- Direct connection (LEMO.EGE.1B.302 power socket)
- Adjacent module (module connector / imc Click Mechanism)
- EtherCAT network cable: Power over EtherCAT (PoEC)

For further details refer to the power options documentation.

Included accessories

Documents
Getting started with imc CRONOS*flex* (one copy per delivery)
Device certificate

Optional accessories

AC/DC power adaptor 110-230 VAC 50-60 Hz (with appropriate LEMO.1B.302 plug)		article no.
48 V DC / 150 W	ACC/AC-ADAP-48-150-1B	13500148
24 V DC / 60 W	CRPL/AC-ADAPTER-60W-1B	10800066

Power plugs		
ACC/POWER-PLUG-5	Power plug for DC supply LEMO.FGE.1B.302 plug (male, E-coded: 2 coding keys)	13500150
CRFX/MODUL-PP-90	Power plug for DC supply 90° angular LEMO.FHE.1B.302 plug (male, E-coded: 2 coding keys)	11900074

Supply module (Power Handle)		article no.
CRFX/HANDLE-POWER-L	Handle with system power supply 50 V 100 W, without UPS	11900058
CRFX/HANDLE-NIMH-L	Handle with system power supply 50 V 100 W, UPS with NiMH battery	11900273
CRFX/HANDLE-LI-IO-L	Handle with system power supply 50 V 100 W, UPS with Li-Ion battery	11900010

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Passive-Handle		
CRFX/HANDLE-L	standard unpowered left handle	11900008
CRFX/HANDLE-R	standard unpowered right handle	11900007

Mounting bracket for increased stability (recommended for lifetime and robustness)		
CRFX/BRACKET-CON	assembly element for 2 modules	11900071

Mounting brackets for fixed installations		
CRFX/BRACKET-90	mounting bracket 90°	11900068
CRFX/BRACKET-180	mounting bracket 180°	11900069
CRFX/BRACKET-BACK	rear panel mounting element	11900070
CRFX/RACK	19" RACK for imc CRONOS*flex* Modules	11900066
CRFX/BRACKET-RACK	mounting element in the RACK	11900072

Documents		
SERV/CAL-PROT	Calibration protocol per amplifier imc manufacturer calibration certificate with measurement values and list of calibration equipment used (pdf).	150000566
SERV/CAL-PROT-PAPER	Calibration protocol per amplifier (paper print) imc manufacturer calibration certificate with measurement values and list of calibration equipment used with signature and seal.	150000578
Device certificates and calibration protocols: Detailed information on certificates supplied, the specific contents, underlying standards (e.g. ISO 9001 / ISO 17025) and available media (pdf etc.) can be found on our website, or you can contact us directly.		

Technical Specs - CRFX/ISO2-8-2T and ISO2-16-2T

Channels, measurement modes, terminal connection		
Parameter	Value	Remarks
Channels	8 16	ISO2-8-2T ISO2-16-2T
Measurement mode	temperature measurement thermocouples type K	
Terminal connection Measurement input EtherCAT connection Input supply plug (female) Module connector	 miniature thermocouple terminal connector 2x RJ45 LEMO.EGE.1B.302 2x 20-pin	 2-pin, female system bus for distributed imc CRONOS*flex* components multicoded 2 notches for optional individually power supply direct connection of modules (click) supply and system bus

Sampling rate, Bandwidth, Filter		
Parameter	Value	Remarks
Sampling rate	≤10 kHz	per channel, max system throughput of all module channels: 800 kHz including monitor channels
Bandwidth	0 Hz to 1 kHz 0 Hz to 2 kHz	-0.1 dB ISO2-8-2T -0.1 dB ISO2-16-2T
Resolution	 16 Bit 24 Bit	output format is selectable for each channel individually: a) 16 Bit Integer b) 32 Bit Float (24 Bit Mantissa)
Filter (digital) cut-off frequency	 2 Hz to 500 Hz CRFX/ISO2-16-2T 2 Hz to 5 kHz CRC/CRFX/ISO2-8-2T	 Butterworth, Bessel low pass filter: 8th order high pass filter: 4th order band pass: LP 8th and HP 4th order Anti-aliasing filter: Cauer 8.order with $f_{cutoff} = 0.4\ f_a$

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Temperature measurement - thermocouples			
Parameter	Value typ.	min. / max.	Remarks
Measurement range	temperature range: -200°C to +1200°C type K		
Resolution	0.063 K (1/16 K) 32 bit float (24 Bit mantissa)		With selected data type / output format: a) 16-Bit integer b) Float (24-Bit mode)
Measurement error		<±0.6 K <±1.0 K	type K, range -150°C to 1200°C type K, range -200°C to -150°C
Temperature drift	±0.02 K//K·ΔT_a		$\Delta T_a = \lvert T_a - 25°C \rvert$; with T_a = ambient temperature
Error of cold junction compensation[1]		<±0.15 K	
Temperature drift	±0.001 K//K·ΔT_j		$\Delta T_j = \lvert T_j - 25°C \rvert$; with T_j = cold junction temperature

General		
Parameter	Value	Remarks
Isolation nominal rating test voltage	galvanically isolated ±60 V ±300 V (10 sec.)	channel-to-channel and against system ground (housing, CHASSIS, PE) channel to case
Overvoltage protection	±60 V ESD 2 kV transient protection: automotive load dump ISO 7637	differential input voltage (continuous) human body model R_i=30 Ω, t_d=300 µs, t_r<60 µs
Input coupling	DC	
Input configuration	differential, isolated	galvanically isolated to System-GND (housing, CHASSIS)
Input impedance	6.7 MΩ	

Power supply of the module		
Parameter	Value	Remarks
Input supply voltage	10 V to 50 V DC	
Power consumption	10 W	10 V to 50 V DC
Isolation	60 V	nominal isolation specification of the supply input
Power-over EtherCAT (PoEC)	42 V to 50 V DC	supply via EtherCAT network cable

1 If the operating temperature exceeds 65 °C (typical), an additional deviation of the cold junction compensation of ±1 °C may occur.

Pass through power limits	
Directly connected (clicked) imc CRONOS*flex* Modules	3.1 A (maximum current) Equivalant power with chosen DC power input: • 149 W @ 48 V DC (e.g. AC/DC line adaptor) • 37 W @ 12 V DC (typical vehicle supplied DC input)
Power-over EtherCAT (PoEC) for remote imc CRONOS*flex* Modules	350 mA (maximum current corresponding to IEEE 802.3) Equivalant power with chosen DC power input: • 17.5 W @ 50 V DC (e.g. Power-Handle) • 16.8 W @ 48 V DC (e.g. AC/DC line adaptor) • 14.7 W @ 42 V DC (minimum voltage for PoEC) Note: minimum system power of 42 V DC required for PoEC

Operating conditions		
Parameter	Value	Remarks
Operating environment	dry, non corrosive environment within specified operating temperature range	
Rel. humidity	80% up to 31°C, above 31°C: linear declining to50%	according IEC 61010-1
Ingress protection rating	IP20	
Pollution degree	2	
Operating temperature (standard)	-10°C to +55°C	without condensation
Operating temperature (extended: "-ET" version)	-40°C to +85°C	condensation temporarily allowed
Shock- and vibration resistance	IEC 61373, IEC 60068-2-27 IEC 60068-2-64 category 1, class A and B MIL-STD-810 Rail Cargo Vibration Exposure U.S. Highway Truck Vibration Exposure	
Extended shock- and vibration resistance	upon request	specific tests or certifications upon request
Dimensions	62 x 118 x 186 mm	W x H x D
Weight	approx. 1.1 kg	

Contact imc

An Axiometrix Solutions Brand

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imc ACADEMY - Training center

The safe handling of measurement devices requires a good knowledge of the system. At our training center, experienced specialists are here to share their knowledge.

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