

WFT-2 for imc CRONOSflex (CRFX/WFT-2)

Interface module for two caemax WFT wheel force transducers

The WFT-2 is an imc CRONOSflex module for acquiring sensor data from two WFT-C^x or -C^{xs} wheel force transducers. The caemax WFTs are high-precision sensor systems which are used in vehicle development in order to record forces and torques acting on the wheels. The measurement results are usually used as the basis for simulations, design verification and load profiles for test rig systems.



CRFX/WFT-2

Highlights

- Power supply for the WFT sensor systems
- Robust digital data interface, highly immune to interference with exact synchronization of the WFT sensor system
- All resulting measurement channels (forces and torques in x, y, z) are available as standard measurement channels in the CRFX system
- Full support of configuration, calibration and zeroing by imc STUDIO software
- Up to six wheel force transducers (three WFT-2 modules) can be operated in one imc CRONOSflex system, so that all conceivable applications on vehicles with up to three axles can be covered
- Compact, integrated and comprehensive solution based on imc CRONOSflex - no additional equipment or software required

imc CRONOSflex - 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.

An imc CRONOSflex 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 CRONOSflex 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.



imc Click mechanism

In addition, when a module is added it is automatically recognized by the software displaying its dynamically assigned ID on the front of the module.



imc CRONOSflex distributed system

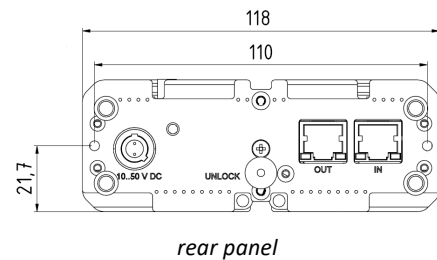
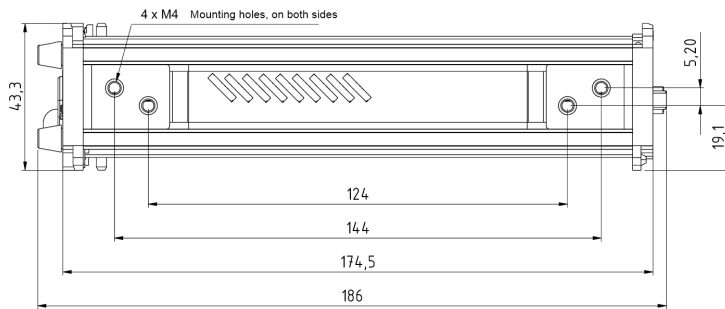
Alternatively, connection can be made by means of standard Ethernet cables (RJ45, CAT5), thus creating a spatially distributed system.

Overview of the available variants

Order Code		article no.	ET version*
CRFX/WFT-2	WFT-Interface for two sensor systems	11900241	11910144

* ET: Version in extended temperature range

Mechanical drawings of the module



Included accessories

Miscellaneous
Test certificate
Getting started with imc CRONOSflex (one copy per delivery)

Optional accessories

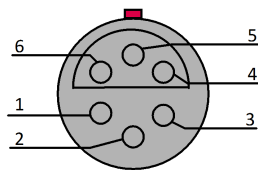
AC/DC power adaptor 110-230 VAC 50-60 Hz (with appropriate LEMO.1B.302 plug)		article no.
48 V DC / 150 W	ACC/AC-ADAP-48-150-1B	13500148
24 V DC / 60 W	CRPL/AC-ADAPTER-60W-1B	10800066
Power plugs		
ACC/POWER-PLUG-5	Power plug for DC supply LEMO.FGE.1B.302 plug (male, E-coded: 2 coding keys)	13500150
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-UPS-L	Handle with system power supply 50 V 100 W, UPS with lead-gel battery	11900043
CRFX/HANDLE-LI-IO-L	Handle with system power supply 50 V 100 W, UPS with Li-Ion battery	11900010
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 CRONOSflex Modules	11900066
CRFX/BRACKET-RACK	mounting element in the RACK	11900072

Miscellaneous	
Report set of function test for each device	

Connection cable		article no.
H-CAB-LEM-WFT-6m	Connection cable between Wheel Force Transducer and CRFX module, cable length 6 m	13700012
H-CAB-LEM-WFT-12m	Connection cable between Wheel Force Transducer and CRFX module, cable length 12 m	13700013

LEMO pin configuration (H-CAB-LEM-WFT-6m, H-CAB-LEM-WFT-12m):

Pin	Signal
1	Command OUT
2	12 V POWER
3	Data OUT (normal)
4	Data OUT (invers)
5, 6	GND



View on the plug

Technical Specs - CRFX/WFT-2

Parameter	Value	Remarks
Inputs	2	for two WFT measuring wheels
Terminal connection		
LEMO	2x LEMO.ERA.1E.306	measuring wheel connection
Input supply plug (female)	1x LEMO.EGE.1B.302	multicoded 2 notches, for optional individually power supply
EtherCAT connection	2x RJ45	system bus for expanded
Module connector	2x 20 pin	imc CRONOSflex components direct connection of modules (click) supply and system bus

Parameter	Value	Remarks
Channels	36 F _{x'} , F _{y'} , F _{z'} , M _{x'} , M _{y'} , M _{z'} Umdr, Drehz, Temp rot_f _{x'} , rot_f _{z'} , rot_m _{x'} , rot_m _{z'} Winkel, sin, cos Status, Aux	18 analog channels per measuring wheel: forces and moments revolutions, speed, temperature rotating coordinate system angle state, aux
Sampling rate	≤10 kHz	samplings rate and filter settings apply to all channels of a socket
Filter (digital)		
characteristic	low pass	individual selectable
frequency	Butterworth, Bessel 5 Hz to 500 Hz 5 Hz to 1 kHz	with Bessel with Butterworth
order	8th order	
Resolution	16 Bit	

Sensor supply for WFT-C^x or -C^{xs}

Parameter	Value (typ. / max.)	Remarks
Input supply voltage	10 V to 50 V DC	
Output voltage	12.2 V DC	no load, 25 °C
Output power	10 W (max.)	for each channel
Efficiency	typ. 83 %	full load, 25 °C
Capacitive load	>800 μF	per channel
Isolation	isolated	channel individual to housing and input nominal 60 V
Short-circuit protection	unlimited duration	automatic restart
Accuracy of output voltage	±1 %	at terminals, no load 25 °C
Temperature coefficient	typ. ±0.02 % / K	

Power supply	Value	Remarks
Input supply voltage	10 V to 50 V DC	
Power consumption	5 W plus 13 W per WFT	
Isolation	60 V	nominal isolation specification of the supply input

Pass through power limits	
Directly connected (clicked) imc CRONOSflex modules via module connector	3.1 A (maximum current) Equivalent power with chosen DC power input: <ul style="list-style-type: none"> • 149 W at 48 V DC (e.g. AC/DC line adaptor) • 37 W at 12 V DC (typical vehicle supplied DC input)

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 to 50%	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 60062-2-64 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	43.3 x 118 x 186 mm	W x H x D
Weight	ca. 750 g	