imc

imc CRONOS-SL
rugged • autonomous • mobile

Sealed data acquisition system for harsh environments

imc – productive testing

Instrumentation Devices

Partner Italiano di imc dal 1993

imc CRONOS-SL at a glance

- Extremely rugged test and measurement system: IP65 sealed, extended operating temperature and shock resistant (MIL STD-810F)
- High precision signal conditioning for all common sensors in electromechanical testing
- Autonomous PC-independent operation
- Data storage both onboard the system and/ or PC and network drive
- High sampling rates for dynamic measurements including sonic range
- Integrated real-time data analysis and reduction
- Modern wireless transmission options available
- Configuration and operating software - imc STUDIO

imc CRONOS-SL

The ideal solution for electromechanical testing in extreme environments

Measurements performed under harsh environmental conditions, such as extreme hot and cold temperatures, water spray, and intense vibration, require appropriately protected test equipment. The imc CRONOS-SL is designed to maintain its full precision, dynamics and flexibility even when operating in the toughest environments.

Measurement amplifiers are individually configured at build time. imc CRONOS-SL is a system tailored to your needs for direct connection of virtually any signals and sensors. The two available housing sizes can be equipped with 2 or 4 modules from a broad selection of versatile and universally applicable I/O options.

They not only comprise full analog input conditioning and filtering – additionally any measurement channels can be subjected to freely defined real-time calculations and analysis directly within the system.

In conjunction with extra digital I/O and analog outputs, these real-time processing capabilities even allow for open and closed loop control tasks or responsive limit monitoring. Field and vehicle bus logging (CAN, LIN, FlexRay, etc.) can also be integrated: decoded according to a variety of protocols and fully synchronous to analog channels. Hence, you benefit from a complete solution that is perfectly suited for vehicle testing, where CAN control networks, ECU communication or additional CAN-based sensors, as well as GPS logging, are covered by the test setup.

I/O connectors can be chosen as waterproof DSUB-15. LEMO and BNC are also available, as well as any desired solution with suitable sealed custom connectors. While capable of autonomous PC-less operation, including onboard storage, imc CRONOS-SL connects to a PC via an Ethernet TCP/IP interface (or optional WLAN) to allow for setup and interactive operation.

Voltage & high voltage	Current	Temperature	Strain Gauge	Frequency speed / angle	Digital Input/output	IEPE/ICP acceleration	Audio	Analog output

imc CRONOS-SL-2

imc CRONOS-SL-4

imc CRONOS-SL: prepared to meet tough challenges

Extreme conditions
- Operating temperatures -40°C to +85°C
- Ingress protection rating IP65
- Condensation allowed
- Shock resistance: MIL STD810F
- Power supply: 10 to 32 V DC

Immediate results
- Real-time calculations already performed onboard the system (imc Online FAMOS)
- Local data reduction
- Directly control the progress of the test and immediately react
- Limit monitoring with real-time response
- Open and closed loop control (incl. PID)
- Easily configurable with productive operating software: imc STUDIO

Maximum security
- Redundant or autarkic data storage onboard the system
- Integrated UPS prevents any loss of measurement data during power failure
- Automatic self-start after power failure
- Reliable industrial grade system, real-time capable without PC
- Intuitive operating software imc STUDIO keeps full control and minimizes handling errors

Autonomous and mobile
- PC independent
- Robust wide range power supply with battery backed UPS
- Unmanned automatic self-start upon power-up
- Decentralized network capability
- WLAN, GPRS, EDGE, 3G, 4G, LTE capable
- Compact design

In Practice

The ideal system for demanding environments

imc CRONOS-SL is an extremely rugged, mobile measurement system for test challenges in harsh environments. Complying with the standard MIL STD-810F, it is ideally suited for use on demanding test tracks or on machinery. The system works reliably where commercial electronics would fail; it can be operated autonomously and works independently of a PC. Captured data are stored within the system on an internal hard drive or removable CF-cards, ensuring seamless and safe data storage. If direct live display of measured data is desired, the PC is not the only option: the TFT graphical terminal is an excellent alternative.
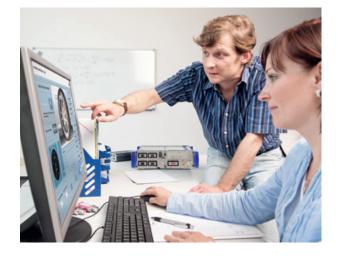
As close as remote can be

Imagine your test vehicles are in Alaska and your office is in Munich. With the combination of imc CRONOS-SL and the software solution imc LINK, there's no reason to catch a cold. Thanks to this imc solution, you'll always have an accurate overview from your office how measurements are proceeding and you can take appropriate actions from your location if necessary. imc LINK is designed specifically for remote access to measurement systems and ensures a secure, automated data transfer from measuring devices, regardless if connected to a PC or not. With the black-box functionality of the robust imc CRONOS-SL, your data are always backed up.

Intuitive operating software: imc STUDIO

The imc CRONOS-SL is operated by imc STUDIO — the same intuitive software users know from all other imc data acquisition systems. imc STUDIO offers a complete test and measurement workflow environment with an emphasis on productivity in measurement configuration and test development. From quick and simple data capture tasks, to fully automated durability tests, imc STUDIO is based on over 20 years of experience, with one single goal in mind: improve your testing productivity.

imc CRONOS-SL Details

imc CRONOS-SL general specs and housing types

	SL-2	SL-4
General		
Aggregate sampling rate	400 kSps	
Max. channel sampling rate	100 kSps / Kanal	
Size (W x H x D, mm)	256 x 73 x 257	256 x 116 x 257
Weight	6,5 kg	8,0 kg
Amplifier options		
Typ. number of channels	16	32
Configurable modules (analog and digital)	2	4
Applicable I/O connectors (back) DSUB-15 / LEMO.1B	8 / 16	16 / 32
Additional multi-functional module (MULTI-IO)	○	○
Extension via external imc CANSAS modules	○	○
Operating conditions		
Ext. temp. range (-40 .. +85°C, incl. condensation)	●	●
Ingress protection rating	IP65	
Shock vibration rating	MIL 810F (40g)	
Connectivity		
Ethernet	100 MBit	
WLAN (WiFi)	○	○
Wireless UMTS, 3G, 4G	○	○
WLAN / wireless router	○	○
GPS connection port	○	○
Display connection port	●	●
Remote controlled main switch	●	●
Data storage		
CF card slot (Compact Flash)	●	●
Storage on PC	●	●
Storage on network drive	○	○
Internal hard drive	○	○
Stand-alone capabilities		
PC independent trigger functionality	●	●
Onboard real-time data analysis (imc Online FAMOS)	●	●
Autarkic PC-less operation, self start (timer)	●	●
Synchronization & clock		
Master-slave between different imc systems	●	●
NTP network based synchronization	○	○
Via external GPS signal	●	●
Via external DCF-77 signal	●	●
Via external IRIG-B & DCF-77 signal	○	○
Field bus extensions		
CAN	○	○
LIN, FlexRay, ARINC, J1587, MVB, XCPoE	○	○
EtherCAT slave	○	○
Kistler RoaDyn®	○	○
Power supply		
DC input 10V to 32V	●	●
Isolated power supply input	●	●
AC/DC adaptor (110 to 230VAC)	●	●
Data integrity upon power fail	●	●
UPS (lead gel battery)	●	●
UPS (extended range Li-Ion)		(○)
Software		
imc STUDIO Standard	○	○
imc REMOTE WebServer	○	○

imc CRONOS-SL-2 (front)

imc CRONOS-SL-2 (back)

imc CRONOS-SL-4 (front)

imc CRONOS-SL-4 (back)

Waterproof DSUB connector

imc CRONOS-SL analog amplifier modules

module name CRSL/xxx	channels	# of standard DSUB-15	LEMO version (●)	BNC version (●)	TEDS	max. sampling rate (per channel)	signal bandwidth (-3dB)	isolated voltage mode	min. voltage range (mV)	voltage up to 10V	voltage up to 50/60V	20mA internal shunt	20mA shunt plug	Thermocouple (TC)	RTD (PT100)	ICP mode integrated	ICP plug (DSUB-15)	sensor supply	(per channel)	full bridge	half bridge	quarter bridge	DC excitation	AC excitation (CF)	single SENSE	double SENSE
Voltage measurement																										
LV-16	16	4	○	○	●	20 kHz	6.6 kHz		250	●			●					○	○							
LV3-8	8	2	○	○	●	100 kHz	48 kHz		5	●	●		●					○	○							
SC2-32	32	8	○	○	●	100 kHz	28 kHz		250	●			●					○	○							
Voltage & temperature measurement																										
OSC-16	16	4	○		●	5 Hz	1 Hz	●	50	●	●	●		●	●				○							
C-8	8	2	○	○	●	20 kHz	20 Hz		2.5	●	●	●		●	●				○							
ISO2-8	8	2	○	○	●	100 kHz	11 kHz	●	50	●	●	●		●	●			○	○							
ISOF-8	8	2	○	○	●	100 kHz	48 kHz	●	50	●	●	●		●	●			○	○							
Audio & vibration measurement																										
ICPU2-8	8			●	●	100 kHz	48 kHz		5	●	●					●										
ICPU-16	16			●	●	20 kHz	6.6 kHz		250	●						●										
AUDIO-4	4			●	●	100 kHz	48 kHz		25	●	●					●										
AUDIO-4-MIC	4		●	●	●	100 kHz	48 kHz		25	●	●					●										
Bridge & strain gauge measurement																										
BR2-4	4	2	○		●	20 kHz	8.6 kHz		5	●	●		●				○	(●)		●	●	●	●	●	●	●
B-8	8	4	○		●	100 kHz	48 kHz		5	●		●					○	●		●	●	●	●	●	●	
DCB2-8	8	4	○		●	100 kHz	5 kHz		5	●							○	●		●	●	●	●		●	
For universal use																										
UNI2-8	8	4	○		●	100 kHz	48 kHz		5	●	●	●		●	●		○	●		●	●	●	●		●	
UNI-4	4	2	○		●	100 kHz	48 kHz	●	2.5	●	●	●	●	●	●		○	●		●	●	●	●	●	●	●

imc CRONOS-SL DIO, pulse counter, DAC modules

module name CRSL/xxx	# of standard DSUB-15	LEMO version	BNC version	digital input bits	digital output bits	analog outputs	counter inputs	quadrature mode chan	counter frequency	analog sin/cos mode
Multi functional modules (MULTI-IO)										
DI16-DO8-ENC4	4			16	8		4	2	32 MHz	
Pulse counter modules										
ENC4	2	○					4	2	32 MHz	
HRENC-4	2	○					4	4	256 MHz	●
Digital I/O modules										
DI-16	2			16						
DO-16	2				16					
Analog out modules (DAC)										
DAC-8	2	○				8	∓10V			
SYNTH-8	2					8	synthesizer + PID controller			

TEDS support
(Transducer Electronic Data Sheet)
imc CRONOS-SL supports direct read/
write of TEDS sensors, including imc's
TEDS Clip.
Connectors: TEDS interfaces require
either the ACC/DSUBTEDS-x
variants of our connectors or
per-channel connectors such as Lemo.
"IEPE" type TEDS is supported in
audio modules with direct BNC input
connectors.

Digital I/O
galvanically isolated,
configurable to 24V/5V (TTL/CMOS)
Level, output: 0.7A sink, high current:
sink and source 0.7A

Pulse counter
full analog input conditioning:
500 kHz analog bandwidth, differential
input, analog filter, software
adjustable threshold levels
Modes: event counter, time, frequency,
speed, RPM differential and absolute
angle and displacement

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