LV3-8 for imc CRONOS-XT

8-channel differential measurement amplifier

The LV3-8 is a differential measurement amplifier with 8 channels for the measurement of:
- Voltage and current (20 mA)
- IEPE/ICP sensors (with optional DSUB-15 plug)

Highlights

- High-resolution measuring of current and voltage
- Finely adjustable input voltage range (±5 mV to ±50 V)
- High signal bandwidth up to 48 kHz
- Each channel with its own adjustable filter (e.g., anti-aliasing filter) and simultaneous A/D converter
- Supports imc Plug & Measure (Transducer Electronic Data Sheets)

CRXT/LV3-8
(Fig. similar)

Typical applications

- Ideally suited for measurements of signals, voltage-based sensors as well as 20 mA process variables with higher bandwidths.

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.
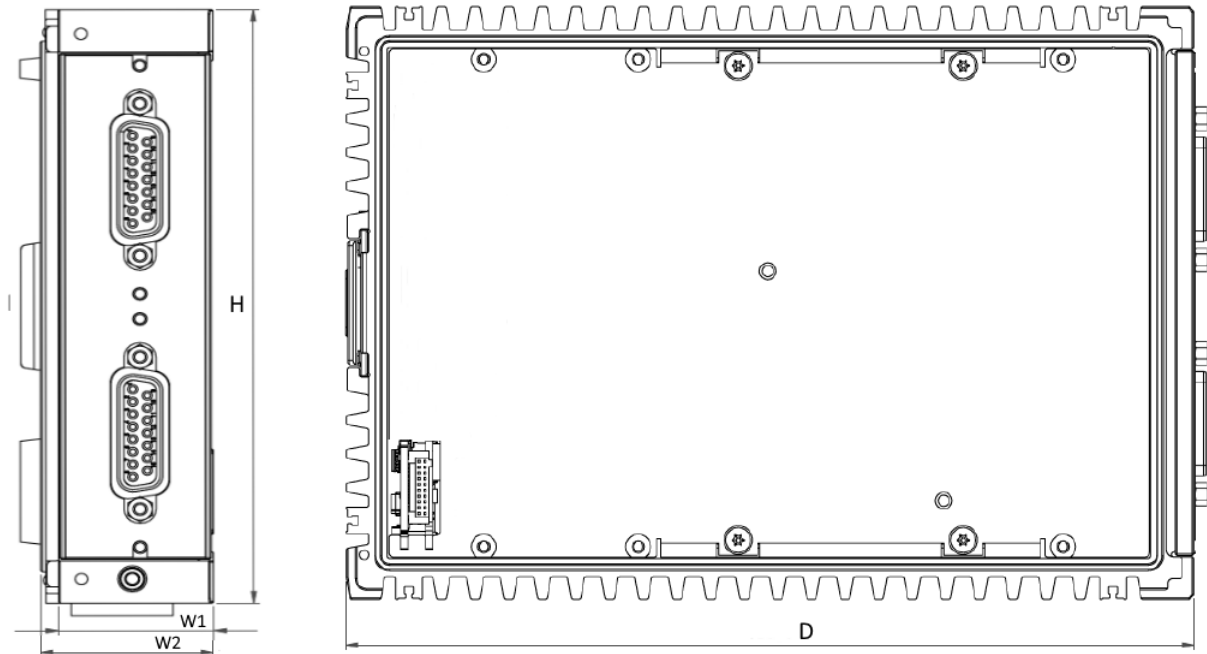
Overview of available variants

Order Code	Signal connections	power consumption	weight	housing	article no.
CRXT/LV3-8	DSUB-15	6.4 W	0.7 kg	XT1	11100018
CRXT/LV3-8-SUPPLY	DSUB-15	12.4 W	0.8 kg	XT1	11100056

Integrated sensor supply

The CRXT/LV3-8-**SUPPLY** variant with an integrated sensor supply, requires no extra module expansion. This variant is equipped with adjustable supply voltages (globally selectable for 8 channels), output on reserved pins.

Dimensions

Shown in standard operating orientation: housing type XT1

Housing type:	XT1	XT2	XT3	XT4	Remarks
W: Width in mm	30.5	61	91.5	116.9	W1: modular spacing (effective stacking width)
	34	64.5	95	120.4	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.

Included accessories

Sealing Caps and mounting accessories		article no.
2x ACC/CAP-DSUB-15-IP67	sealing Cap IP67 for DSUB-15 sockets	13500342
CRXT/BRACKET-CON	interconnect brackets, intended for increased stability; set of 2 units for top and bottom side	11100040

Documents
device certificate
Getting started with imc CRONOS-XT (one copy per delivery)

Optional accessories

DSUB-15 plug (solder) IP67		article no.
CRXT/DSUB15M-IP67	IP67 DSUB-15 plug male	11100073

DSUB-15 plugs (IP65)		
ACC/DSUBM-I4-IP65	IP65 DSUB-15 plug with screw terminals for 4-channel current measurement of up to 50 mA (50 Ω shunt, scaling factor: 0.02 A/V)	13500328
ACC/DSUBM-TEDS-I4-IP65	sealed IP65 TEDS version	13500333
ACC/DSUBM-U4-IP65	IP65 DSUB-15 plug with screw terminals for 4-channel voltage measurement	13500216
ACC/DSUBM-TEDS-U4-IP65	sealed IP65 TEDS version	13500330

DSUB-15 extension plug for two IEPE transducers (IP65)		
CRXT/DSUB-ICP2-IP65	IP65 DSUB-15 plug with 2 PG for cable with diameter 2.5 to 3 mm^2	11100064

DSUB-15 extension plugs for two IEPE transducers (no IP65 rating)		
ACC/DSUBM-ICP2I-BNC-S	ICP2I (isolated, 2x BNC), slow	13500293
ACC/DSUBM-ICP2I-BNC-F	ICP2I (isolated, 2x BNC), fast	13500294

Sealing caps		
ACC/CAP-DSUB-15	dust protection cap for DSUB-15	13500339

Miscellaneous		
CRXT/BRACKET-CON-BOT	interconnect bracket with mounting option (180°) for the bottom side of the CRXT module	11100084
ACC/DSUBM-LOCKING-BOLT-L	extended length locking bolts (2 pcs)	13500327
For the slices with DSUB-15 sockets, the sealed terminal plugs ACC/DSUBM-xxx-IP65 must be used - regardless of the sealing properties: The simple standard plug (ACC/DSUBM-xxx without suffix [-IP65]) have shorter locking screws and therefore cannot be fixed to CRXT slices. However, they can be retrofitted with the long bolts. With long bolts: only for CRXT, with short standard bolts: only for CRFX, CRC, C-SERIES etc.		

Documents		
SERV/CAL-PROT	Calibration protocol per amplifier	150000566
	imc manufacturer calibration certificate with measurement values and list of calibration equipment used (pdf).	
SERV/CAL-PROT-PAPER	Calibration protocol per amplifier (paper print)	150000578
	imc manufacturer calibration certificate with measurement values and list of calibration equipment used with signature and seal.	
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 - LV3-8

Inputs, measurement modes, terminal connection		
Parameter	**Value**	**Remarks**
Inputs	8	
Measurement modes DSUB	voltage measurement current measurement current feed sensors	shunt plug (ACC/DSUBM-I4) with DSUB-15 expansion plug: ACC/DSUB-ICP4, not isolated ACC/DSUBM-ICP2I-BNC-S/-F [1], isolated
Terminal connection Standard	2x DSUB-15	4 channels per plug

Sampling rate, Bandwidth, Filter, TEDS		
Parameter	**Value**	**Remarks**
Sampling rate	≤100 kHz	per channel
Bandwidth	0 Hz to 48 kHz 0 Hz to 30 kHz	-3 dB -0.1 dB
Filter (digital) cut-off frequency characteristic order	10 Hz to 20 kHz	Butterworth, Bessel low pass or high pass filter: 8th order band pass: LP 4th and HP 4th order Anti-aliasing filter: Cauer 8.order with $f_{cutoff} = 0.4\ f_s$
Resolution	16 Bit	internal processing 24 Bit
Resolution	16 Bit 24 Bit	output format is selectable for each channel individually: a) 16 Bit Integer b) 32 Bit Float (24 Bit Mantissa)
TEDS	conforming to IEEE 1451.4 Class II MMI	esp. with ACC/DSUBM-TEDS-xx (DS2433) supports also: DS2431 (typ. IEPE/ICP sensor)
Characteristic curve linearization	user defined (max. 1023 supporting points)	

1   When using the two-channel IEPE plug in combination with the analog inputs, which provide four channels per socket, only channels 1 and 3 can be used.

General			
Parameter	**Value typ.**	**min. / max.**	**Remarks**
Overvoltage protection		±80 V ±50 V	permanent, differential input range >±10 V or device switched off input range ≤±10 V
Input coupling	DC		
Input configuration	differential		
Input impedance	1 MΩ 20 MΩ		range >±10 V range ≤±10 V
Auxiliary supply			for IEPE/ICP expansion plug
voltage	+5 V	±5%	independent of optional
available current	>0.26 A	>0.2 A	sensor supply, short circuit proof
internal resistance	1.0 Ω	<1.2 Ω	power per DSUB-plug

Voltage measurement			
Parameter	**Value typ.**	**min. / max.**	**Remarks**
Input ranges	±50 V, ±25 V, ±10 V, ±5V, ±2.5 V, ±1 V... ±5 mV		
Maximum input voltage		-11 V to +15 V	between ±IN and CHASSIS; input range ≤±10 V
Gain error	0.02 %	0.05 %	of the reading
Gain drift	10 ppm/K·ΔT_a	30 ppm/K·ΔT_a	$\Delta T_a = |T_a - 25\ °C|$; T_a = ambient temperature
Offset error	0.02 %	≤0.05 % ≤0.06 % ≤0.15 %	of the range, at 25 °C >±50 mV ≤±50 mV ≤±10 mV
Offset drift	±40 µV/K·ΔT_a ±0.7 µV/K·ΔT_a ±0.1 µV/K·ΔT_a	±200 µV/K·ΔT_a ±6 µV/K·ΔT_a ±1.1 µV/K·ΔT_a	range >±10 V range ±10 V to ±0.25 V range ≤±0.1 V $\Delta T_a = |T_a - 25\ °C|$; T_a = ambient temperature
Nonlinearity	30 ppm	≤90 ppm	
Common mode rejection ranges ±50 V to ±25 V ±10 V to ±50 mV ±20 mV to ±5 mV	80 dB 110 dB 138 dB	>70 dB >90 dB >132 dB	Common mode voltage (DC..60 Hz): ±50 V ±10 V ±10 V
Noise	3.6 µV$_{rms}$ 0.6 µV$_{rms}$ 0.14 µV$_{rms}$	5.5 µV$_{rms}$ 1.0 µV$_{rms}$ 0.26 µV$_{rms}$	bandwidth 0.1 Hz to 50 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz

Current measurement with shunt plug

Parameter	Value typ.	min. / max.	Remarks
Input ranges	±50 mA, ±20 mA, ±10 mA, ±5 mA, ±2 mA, ±100 µA1 mA		50 Ω shunt in terminal plug
Shunt impedance	50 Ω		external plug ACC/DSUBM-I4
Over load protection		±60 mA	permanent
Maximum input voltage		-11 V to +15 V	between ±IN and CHASSIS
Input configuration	differential		50 Ω shunt in terminal plug
Gain error	0.02 %	≤0.06 % ≤0.1 %	of reading plus error of 50 Ω shunt
Gain drift	+15 ppm/K·ΔT_a	+55 ppm/K·ΔT_a	$\Delta T_a = \lvert T_a\text{-}25\,°C\rvert$; T_a = ambient temperature
Offset error	0.02 %	≤0.05 %	of the range
Current noise	40 nA$_{rms}$ 0.7 nA$_{rms}$ 0.17 nA$_{rms}$	70 nA$_{rms}$ 12 nA$_{rms}$ 0.3 nA$_{rms}$	Bandwidth: 0.1 Hz to 50 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz

Sensor supply module (LV3-8-SUPPLY, LV3-8-L-SUPPLY)

Parameter	Value typ.			max.	Remarks
Configuration options	5 selectable settings				The sensor supply module always has 5 selectable voltage settings. default selection: +5 V to +24 V
Output voltage	Voltage (+2.5 V) +5.0 V +10 V +12 V +15 V +24 V (±15 V)	Current 580 mA 580 mA 300 mA 250 mA 200 mA 120 mA 190 mA	Netpower 1.5 W 2.9 W 3.0 W 3.0 W 3.0 W 2.9 W 3.0 W		set jointly for all eight channels optional, special order, +12 V or 15 V can be replaced by +2.5 V preferred selection with 2.5 V: +2.5 V, +5.0 V, +10 V, +12 V, +24 V optional, special order: +15 V can be replaced by ±15 V
Short-circuit protection	unlimited duration				to output voltage reference ground
Accuracy of output voltage	<0.25 %			0.5 % 0.9 % 1.5 %	at terminals, no load at 25°C over entire temperature range plus with optional bipolar output voltage
Max. capacitive load	>4000 µF >1000 µF >300 µF				2.5 V to 10 V 12 V, 15 V 24 V

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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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