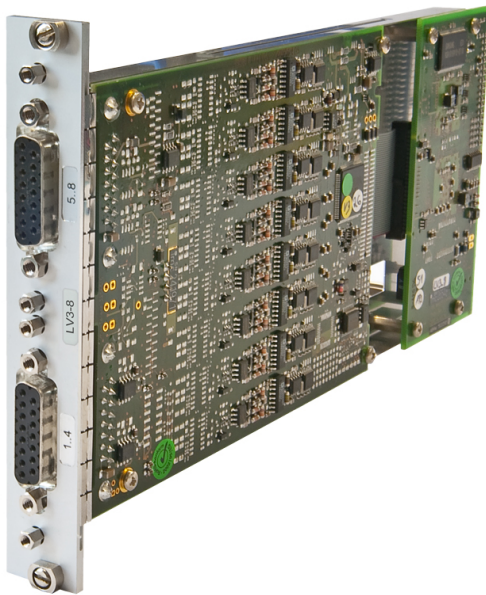


LV3-8 for imc CRONOS-PL/-SL/compact

datasheet version 3.4

8-channel Differential Amplifier



CRPL/LV3-8



CRC/LV3-8

The **LV3-8**, available as a plug-in module for imc CRONOS-PL/*compact* or as configuration module for CRONOS-SL, is an 8-channel differential amplifier for measuring voltage, current and ICP-sensors¹.

This amplifier's strengths are:

- Supports *imc Plug & Measure* (Transducer Electronic Data Sheets (IEEE 1451))
- Cost-effective measurement of current and voltage

Order code:	Article #	Remarks
CRPL/LV3-8	1080219	for installation in an imc CRONOS-PL housing
CRPL/LV3-8-ET	1081139	version in extended temperature range
CRSL/LV3-8-D	1180086	for installation in an imc CRONOS-SL housing with DSUB interconnections
CRSL/LV3-8-L	1180087	for installation in an imc CRONOS-SL housing with LEMO interconnections
CRC/LV3-8	1170015	for installation in an imc CRONOS <i>compact</i> housing
CRC/LV3-8-ET	1171014	version in extended temperature range
CRC/LV3-8-R	1170105	for installation in an imc CRONOS <i>compact</i> RACK
CRC/LV3-8-R-ET	1171064	version in extended temperature range

Physical structure:

- Plug-in module for imc CRONOS-PL/*compact* systems, occupying one slot.

Interconnections:

- 2x DSUB-15 terminal for each 4-channel group
- 8x 7-pin LEMO terminal for 1 channel (only with CRSL/LV3-8-L)
see table for other measurement modes

Included accessories for CRONOS-PL/compact:

Connection terminals:

- 2x **ACC/DSUB-U4**, 15-pin DSUB terminal connector for each 4-channel voltage measurement group

Included accessories for CRONOS-SL:

Power supply:

- provided by imc CRONOS-PL/-SL/compact unit
- Additional power consumption due to installed module: 1.9 W (+1.4 W when ICP sensors used)

Operating conditions:

- The module varieties' respective operating conditions (with or without an extended temperature range) depend on the corresponding housing type.

Installed software:

- The module is fully supported by the imc CRONOS-PL/-SL/compact operating software. The entire functionality, particularly the parameterization, storage and online computations is provided.

Data storage: handled via imc CRONOS-PL/-SL/compact

Optional accessories:**Connection terminals:**

- **ACC/DSUB-ICP4**, 15-pin DSUB connection terminal with conditioning for 4 ICP inputs
- **ACC/DSUB-I4**, 15-pin DSUB connection terminal for each 4-channel group (50 Ω shunt). For measurement of currents up to 50 mA (scaling factor: 0.02 A/V)
- **ACC/DSUB-TEDS-U4**, 15-pin DSUB terminal connector for each 4-channel voltage measurement group, according to IEEE 1451.4 for use with *imc Plug & Measure*
- **ACC/DSUB-TEDS-I4**, 15-pin DSUB connection terminal for each 4-channel group (50 Ω shunt). For measurement of currents up to 50 mA (scaling factor: 0.02 A/V), according to IEEE 1451.4 for use with *imc Plug & Measure*
- **ACC/DSUB-U4-IP65**, 15-pin DSUB terminal connector adapted to CRONOS-SL, for each group of 4 voltage measurement channels (up to ± 50 V)
- **ACC/DSUB-ICP4-IP65**, 15-pin DSUB terminal connector adapted to CRONOS-SL with conditioning for 4 ICP inputs
- **ACC/DSUB-I4-IP65**, 15-pin DSUB terminal connector adapted to CRONOS-SL for each 4-channel group (50 Ω shunt). For measurement of currents of up to 50mA (scaling factor: 0.02 A/V)
- **ACC/DSUB-TEDS-U4-IP65**, 15-pin DSUB terminal connector adapted to CRONOS-SL, for each group of 4 voltage measurement channels, conformant to IEEE1451.4 for use with *imc Plug & Measure*
- **ACC/DSUB-TEDS-I4-IP65**, 15-pin DSUB terminal connector adapted to CRONOS-SL for each 4-channel group (50 Ω shunt). For measurements of currents of up to 50 mA (scaling factor: 0.02 A/V), conformant to IEEE1451.4 for use with *imc Plug & Measure*

Sensor supply:

- Integrated sensor supply module (requires no extra slot) with adjustable supply voltages, output on DSUB terminals.

¹ ICP is a registered trade mark of PCB Piezotronic inc.

LV3-8 voltage / current

Technical Specs: datasheet version 3.4

Parameter	typ.	min. / max.	Remarks
Channels		8	differential, analog
Measurement modes (DSUB)		voltage current current feed sensors	with shunt plug (ACC/DSUB-I4) with ICP4 extension plug ACC/DSUB-ICP4, ACC/DSUB-ICP-BNC
Measurement modes (LEMO)		voltage current	with external shunt

Connector plug Standard		2 plug DSUB-15. 4 channels per plug	ACC/DSUB-U4(-IP65) ACC/DSUB-I4(-IP65) ACC/DSUB-ICP4(-IP65)
LEMO		or 8x LEMO.1B.307 / 1 channel	

Bandwidth, Filter, TEDS			
Parameter	typ.	min. / max.	Remarks
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 $f_{\text{cutoff}} = 0.4 f_s$
Bandwidth		0 Hz to 48 kHz 0 Hz to 30 kHz	-3 dB -0.1 dB
Sampling frequency/ channel		≤ 100 kHz	per channel
TEDS		conform IEEE 1451.4 Class II MMI	ACC/DSUB-TEDS-U4(-IP65) ACC/DSUB-TEDS-I4(-IP65) ACC/DSUB-ICP-Microdot

Voltage measurement			
Parameter	typ.	min./ max.	Remarks
Input ranges		± 50 V, ± 25 V, ± 10 V, ± 5 V, ± 2.5 V, ± 1 V... ± 5 mV	
Surge protection		± 80 V ± 50 V	permanent channel to chassis range $\leq \pm 10$ V and device switched off range $\leq \pm 10$ V
Input coupling		DC	
Input configuration		differential	
Input impedance		1 M Ω 20 M Ω	differential range: $> \pm 10$ V $\leq \pm 10$ V
Gain uncertainty		0.02 %	≤ 0.05 %
drift		10 ppm/K $\cdot\Delta T_a$	30 ppm/K $\cdot\Delta T_a$ $\Delta T_a = T_a - 25^\circ\text{C} $; ambient temp: T_a
Offset uncertainty		0.02 %	≤ 0.05 % ≤ 0.06 %
drift		± 40 $\mu\text{V}/\text{K}\cdot\Delta T_a$ ± 0.7 $\mu\text{V}/\text{K}\cdot\Delta T_a$ ± 0.1 $\mu\text{V}/\text{K}\cdot\Delta T_a$	± 200 $\mu\text{V}/\text{K}\cdot\Delta T_a$ ± 6 $\mu\text{V}/\text{K}\cdot\Delta T_a$ ± 1.1 $\mu\text{V}/\text{K}\cdot\Delta T_a$ range $> \pm 10$ V range ± 10 V to ± 0.25 V range $\leq \pm 0.1$ V $\Delta T_a = T_a - 25^\circ\text{C} $

Voltage measurement			
Parameter	typ.	min./ max.	Remarks
			ambient temp T_a
Non-linearity	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	$3.6 \mu V_{\text{eff}}$ $0.6 \mu V_{\text{eff}}$ $0.14 \mu V_{\text{eff}}$	$5.5 \mu V_{\text{eff}}$ $1.0 \mu V_{\text{eff}}$ $0.26 \mu V_{\text{eff}}$	bandwidth 0.1 Hz to 50 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz

Parameter	typ.	min. / max	Remarks
Add. Sensor supply voltage current internal resistance	+5 V > 0.26 A 1.0Ω	$\pm 5\%$ > 0.2 A $< 1.2 \Omega$	with ICP-extension plug independant of optional sensor supply, short circuit proof power per DSUB-plug

Current measurement			
Parameter	typ.	min. / max.	Remarks
Input ranges	± 50 mA, ± 20 mA, ± 10 mA, ± 5 mA, ± 2 mA, ± 1 mA		50 Ω shunt in terminal plug
Over load protection		± 60 mA	permanent
Input configuration	differential		50 Ω shunt in terminal plug (ACC/DSUB-I4)
Gain: uncertainty	0.02 %	≤ 0.06 %	of reading
drift	$+15$ ppm/K $\cdot\Delta T_a$	≤ 0.1 % $+55$ ppm/K $\cdot\Delta T_a$	plus uncertainty of 50 Ω shunt $\Delta T_a = T_a - 25 \text{ }^\circ\text{C} $; ambient temp: T_a
Offset: uncertainty	0.02 %	≤ 0.05 %	of range
Current noise	40 nA _{eff} 0.7 nA _{eff} 0.17 nA _{eff}	70 nA _{eff} 12 nA _{eff} 0.3 nA _{eff}	Bandwidth: 0.1 Hz to 50 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz

CRPL/SEN-SUPPLY sensor SUPPLY module

Optional sensor supply for SC2-32, LV-16, LV2-8, LV3-8, C-8, ISO2-8, OSC-16

Technical datasheet version 3.1

Parameter	Value (typ./ max.)			Remarks
Configuration options	5 adjustable ranges			The sensor supply module always got 5 selectable voltage ranges. Default ranges: +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	upon request, +12 V can be replaced by +2,5 V set globally for all channels of an amplifier. upon request, +15 V can be replaced by ±15 V
Isolation Standard: option, upon request:	non isolated isolated			output to case (CHASSIS) nominal rating: 50 V, Test voltage (10 sec.): 300 V, not available with option ±15 V.
Short-circuit protection	unlimited duration			to output voltage reference ground
Accuracy of output voltage	<0,25% (typ.) <0,5% (max.) <0,9% (max).			at terminals, no load 25°C 25°C over entire temperature range
Efficiency	typ. 72% typ. 66% typ. 55% typ. 50%			10 V to 24 V none isolated 5 V 10 V to 24 V isolated 5 V
Max. capacitive load	>4000 µF >1000 µF >300 µF			2,5 V to 10 V 12 V, 15 V 24 V