

C-8 for imc CRONOS-SL (CRSL/C-8)

8-channel differential amplifier

The **C-8** is a high-precision measurement amplifier for eight channels available as a modular plug-in for imc CRONOS*compact* and as a configuration module for CRONOS-SL. The amplifier provides the measurement of voltages, currents and **temperatures** by means of 8 differential analog channels.

Highlights

- Backplane for type K thermo-socket available (extra charge)
- Supports *imc Plug & Measure* (Transducer Electronic Data Sheets)



imc CRONOS-SL-2 (rear)



imc CRONOS-SL-2 (front)

Overview of available variants

Order code	article no.	remarks
CRSL/C-8-D	11800019	variant with DSUB-15
CRSL/C-8-L	11800020	variant with LEMO sockets

Included accessory

Documents
Getting started with imc CRONOS <i>compact</i> & imc CRONOS-SL (one copy per delivery / system)
Device certificate

Technical Specs - CRSL/C-8

Inputs, measurement nodes, terminal connection		
Parameter	Value	Remarks
Inputs	8	
Measurement modes DSUB-15	voltage measurement current measurement thermocouple measurement PT100 temperature measurement	ACC/DSUBM-I4
Measurement modes LEMO	voltage measurement current measurement PT100 temperature measurement	with external shunt
Measurement mode Thermocouple terminal socket (-2T)	thermocouple type-K	miniature thermocouple terminal
Terminal connection DSUB-15	2x DSUB-15	4 channels per plug
LEMO	or 8x LEMO.1B.307	1 channel per plug
-2T	or 8x miniature thermocouple terminal	1 channel per plug

Sampling rate, bandwidth, filter, TEDS		
Parameter	Value	Remarks
Sampling rate per channel	≤20 kHz	update rate max. 100 Hz
Bandwidth	0 Hz to 20 Hz	-3 dB
Filter (digital) cut-off frequency characteristic order	1 Hz to 50 Hz	Butterworth low pass: 6th order Anti-aliasing filter: Butterworth 6th order $f_{\text{cutoff}} = 0.5 f_s$
TEDS - Transducer Electronic Data Sheets	conforming to IEEE 1451.4 Class II MMI	esp. with ACC/DSUBM-TEDS-xx (DS2433) not supported DS2431 (typ. IEPE/ICP sensor)

General			
Parameter	Value typ.	min. / max.	Remarks
Overvoltage protection	±250 V	±80 V	long term to chassis <1 ms
Input coupling	DC		
Input configuration	differential		
Input impedance	1 MΩ 492 kΩ 79 kΩ	±1% >135 kΩ >75 kΩ	range ±50 V to ±2.5 V range ±1 V to ±50 mV range ±25 mV to ±2.5 mV

Voltage measurement			
Parameter	Value typ.	min. / max.	Remarks
Input range	$\pm 50\text{ V}$, $\pm 25\text{ V}$, $\pm 10\text{ V}$, $\pm 5\text{ V}$, $\pm 2.5\text{ V}$, $\pm 1\text{ V}$, $\pm 500\text{ mV}$, $\pm 250\text{ mV}$,..., $\pm 2.5\text{ mV}$		
Gain error	0.01%	$\leq 0.05\%$ $\leq 0.02\%$ $\leq 0.05\%$	of reading $\pm 50\text{ V}$ to $\pm 250\text{ mV}$ $\pm 100\text{ mV}$ to $\pm 25\text{ mV}$ $\pm 10\text{ mV}$ to $\pm 2.5\text{ mV}$
Gain drift	$5\text{ ppm/K}\cdot\Delta T_a$	$20\text{ ppm/K}\cdot\Delta T_a$	$\Delta T_a = T_a - 25^\circ\text{C} $ $T_a = \text{ambient temperature}$
Offset error	0.01% 0.005% 0.01% 0.02%	$\leq 0.05\%$ $\leq 0.01\%$ $\leq 0.05\%$ $\leq 0.1\%$	of measurement range $\pm 50\text{ V}$ to $\pm 250\text{ mV}$ $\pm 100\text{ mV}$ to $\pm 25\text{ mV}$ $\pm 10\text{ mV}$ to $\pm 5\text{ mV}$ $\pm 2.5\text{ mV}$
Offset drift	$\pm 4\text{ }\mu\text{V/K}$ $\pm 0.07\text{ }\mu\text{V/K}$	$< \pm 12\text{ }\mu\text{V/K}$ $< \pm 0.16\text{ }\mu\text{V/K}$	$\pm 50\text{ V}$ to $\pm 2.5\text{ V}$ $\pm 1\text{ V}$ to $\pm 2.5\text{ mV}$
Signal-to noise ratio	95 dB 90 dB 86 dB	$> 90\text{ dB}$ $> 86\text{ dB}$ $> 82\text{ dB}$	bandwidth 0.1 Hz to 10 Hz $\pm 50\text{ V}$ to $\pm 10\text{ mV}$ $\pm 5\text{ mV}$ $\pm 2.5\text{ mV}$
Common mode voltage $\pm 50\text{ V}$ to $\pm 2.5\text{ V}$ $\pm 1\text{ V}$ to $\pm 2.5\text{ mV}$	50 V 2 V	$< 30\text{ V}$ $< 1\text{ V}$	with differential input voltage: $\pm 50\text{ V}$ $\pm 1\text{ V}$
Common mode rejection ratio (CMRR) $\pm 50\text{ V}$ to $\pm 2.5\text{ V}$ $\pm 1\text{ V}$ to $\pm 2.5\text{ mV}$	70 dB 120 dB	$> 54\text{ dB}$ $> 100\text{ dB}$	common mode test voltage: $\pm 50\text{ V}$ $\pm 1\text{ V}$

Temperature measurement - Thermocouples			
Parameter	Value typ.	min. / max.	Remarks
Measurement mode	J, T, K, E, N, S, R, B		
Measurement range	-270°C bis 1370°C -270°C bis 1100°C -270°C bis 500°C		type K
Resolution	0.063 K		J, T, K, E, N, S, R, B
Measurement error	0.2 K	$< 0.6\text{ K}$ $< \pm 1\text{ K}$	type J, T, K, E, L (for all other types see specifications of voltage measurement) range -150°C to 1100°C otherwise
Drift	$0.02\text{ K/K}\cdot\Delta T_a$		$\Delta T_a = T_a - 25^\circ\text{C} $ $T_a = \text{ambient temperature}$
Cold junction compensation error		$\pm 0.15\text{ K}$	DSUB (standard)
drift of cold junction comp.	$\pm 0.001\text{ K/K}\cdot\Delta T_a$		$\Delta T_a = T_a - 25^\circ\text{C} $ with $T_a = \text{ambient temperature}$
Input impedance	100 k Ω		differential

Temperature measurement - PT100			
Parameter	Value typ.	min. / max.	Remarks
Input range	-200°C to 850°C, -50°C to 150°C		
Resolution	0.063 K		
Error		<±0.1 K <±0.05%	-200°C to 850°C, four-wire connection plus of reading
Drift		±0.01 K/K·ΔT _a	ΔT _a = T _a -25°C with T _a = ambient temperature
Sensor supply	625 μA		
Input impedance	20 MΩ	±1%	differential
Signal-noise ratio		>85 dB	bandwidth 0.1 Hz to 10 Hz
Bandwidth	0 Hz to 10 Hz		-3 dB