

HISO-8 for imc CRONOS-PL/compact

Datasheet Version 3.3

Isolated HV-differential measurement amplifier for 8 channels



CRC/HISO-8

The **HISO-8** is a differential measurement amplifier for 8 channels. It comes as a plug-in module for imc CRONOS-PL/compact.

The amplifier's strengths are:

- isolated measurement of low voltages, current and temperature (thermocouples and Pt100) on a high common mode level
- differential: max. 60 V measurement range / 600 V overvoltage protection at 800 V common mode isolation
- high signal bandwidth

Typical applications: hybrid car, battery and fuel cell etc.

Order code	Article #	
CRPL/HISO-8	1080212	for installation in an imc CRONOS-PL housing
CRPL/HISO-8-ET		version in extended temperature range
CRC/HISO-8	1170022	for installation in an imc CRONOScompact housing
CRC/HISO-8-ET	1171021	version in extended temperature range
CRC/HISO-8-R	1170112	for installation in an imc CRONOScompact RACK
CRC/HISO-8-R-ET	1171071	version in extended temperature range

Structure

- Plug-in module for imc CRONOS-PL/*compact* systems, occupying two slots (width: 40.64 mm)
- For reasons of the equipment safety this module is only configurable ex-factory.

Terminals

- PHOENIX (FFKDS 3.81) spring-clasp terminals, 5 contacts/channel

Operating conditions

- Depending on the **module variety**, the respective operating conditions are stated for the particular housing type.

Software configuration

- The module is fully supported by the operating software for imc CRONOS-PL/*compact*. The entire functionality in regard to parameterization, data storage, and online data processing is available.

Data storage

- handled by imc CRONOS-PL/*compact*

Plug & Measure

- **Upon request**, only when equipped with custom connectors

HISO-8 Voltage, current, temperature

Technical Specs: Datasheet Version 3.3

Parameter	Value typ.	max.	Remarks
Inputs	8		differential
Measurement modes	voltage measurement current measurement thermocouples, RTD (Pt100)		all measurement modes isolated individually
Sampling rate / channel	≤100 kHz		
Bandwidth	0 Hz to 11 kHz 0 Hz to 8 kHz		-3 dB ±0.2 dB
Filter (digital) cut-off frequency, characteristic, order	2 Hz to 5 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 $f_{\text{cutoff}} = 0.4 f_s$
Connection terminal	5 contacts / channel (+IN, -IN +I, +PT, -PT)		PHOENIX FFKDS 3.81 spring-clasp terminals

Module width	40.64 mm 8 TE / 8 channels		
Power consumption	2.0 W	2.4 W	for 8 channels
Voltage and current measurement			
Voltage input ranges	±50 mV / ±100 mV / ±250 mV / ±500 mV / ±1 V / ±2 V / ±5 V / ±10 V / ±25 V / ±50 V / ±60 V		
Current input ranges	±10 mA / ±20 mA / ±40 mA		internal shunt 50 Ω
Gain uncertainty	<0.025 % <0.07 %	<0.05 % <0.15 %	voltage, 23 °C current
Offset uncertainty	0.02%	≤0.05% ≤0.08%	of range range > ± 50 mV range ≤ ± 50 mV
Linearity uncertainty	<120 ppm		± 10 V input range
Gain drift		15 ppm/K 50 ppm/K	ranges ≤± 2 V ranges ≥± 5 V over entire temperature range
Offset drift		1 μV/K	over entire temperature range
Noise voltage (RTI)	2.5 μVrms 12 μVpp		Bandwidth: 0.1 kHz to 1 kHz
Channel isolation	>1 GΩ, <40 pF >1 GΩ, <10 pF		to system ground channel-to-channel
Crosstalk	>165 dB (50 Hz) >92 dB (50 Hz)		ranges ≤± 2 V ranges ≥± 5 V $R_{\text{source}} \leq 100 \Omega$

Temperature measurement - Thermocouples			
Input ranges	R, S, B, J, T, E, K, L, N		per IEC 584
Resolution	0.063 K (1/16 K)		
Measurement uncertainty		<±0.6 K <±1.0 K	Type K, range: -150 °C to 1200 °C otherwise
Temperature drift	±0.02 K/K·ΔT _a		ΔT _a = T _a - 25 °C

Temperature measurement - Thermocouples			
			ambient temperature T_a
Uncertainty of the cold junction temperature Drift of cold junction temp.	$\pm 0.001 \text{ K/K} \cdot \Delta T_j$	$< \pm 0.5 \text{ K}$	$\Delta T_j = T_j - 25 \text{ }^\circ\text{C} $ contact point temperature T_j

Temperature measurement – Pt100		
Input ranges	-200 °C to +850 °C -200 °C to +250 °C	separate current sources, isolated
Resolution	0.063 K (1/16 K)	
Measurement uncertainty	$< \pm 0.25 \text{ K}$ $< \pm 0.05 \%$	-200 °C to +850 °C, four-wire measure. plus measured value
Temperature drift	$\pm 0.01 \text{ K/K} \cdot \Delta T_a$	$\Delta T_a = T_a - 25 \text{ }^\circ\text{C} $; ambient temperature T_a
Excitation current (Pt100)	250 μA	

General			
Parameter	Value typ.	max.	Remarks
Isolation strength (common mode) Automotive measurement categories operating voltage transient, diff. over voltage Main power supply measurement categories assessment voltage General pollution degree test voltage against system ground	CAT I 800 V 500 V CAT II 300 V 2 2300 V		according IEC (EN) 61010-1 impulse according ISO 7637-2 1 min
Overvoltage strength (differential)	$\pm 600 \text{ V}$ ESD 2 kV transient protection: automotive load dump ISO 7637, test impulse 6		diff. input voltage, 1 min. human body model test impulse 6 $R_i = 30 \text{ } \Omega$, $t_d = 300 \text{ } \mu\text{s}$, $t_r < 60 \text{ } \mu\text{s}$
IMR (isolation mode rejection)	$> 105 \text{ dB}$ (50 Hz) $> 65 \text{ dB}$ (5 kHz) 40 dB ($\geq 1 \text{ MHz}$) $> 70 \text{ dB}$ (50 Hz) $> 30 \text{ dB}$ (5 kHz) 18 dB ($\geq 1 \text{ MHz}$)		ranges $\leq \pm 2 \text{ V}$ ranges $\geq \pm 5 \text{ V}$ $R_{\text{source}} = 0 \text{ } \Omega$
Input coupling configuration	DC differential, isolated		isolated to the system ground (housing, CHASSIS, function ground)
Input impedance	6.7 M Ω 1 M Ω 50 Ω		ranges $\leq \pm 2 \text{ V}$ ranges $\geq \pm 5 \text{ V}$ and with device deactivated current input
Input current normal operation in case of overvoltage		1 nA 1 mA	for operating conditions $ V_{in} > 5 \text{ V}$ for ranges $< \pm 5 \text{ V}$ or deactivated
TEDS - Transducer Electronic DataSheets	conforms to IEEE 1451.4 Class II MMI		upon request when equipped with custom connectors

