

# ICPU2-8 for imc CRONOS-PL/-SL/compact

Datasheet Version 3.3

## 8-channel ICP-Amplifier



CRPL/ICPU2-8



CRC/ICPU2-8

The **ICPU2-8** is a broad-band measurement amplifier for use in the field of sound and vibration measurement engineering. The plug-in module **ICPU2-8** for imc CRONOS-PL/*compact* or configuration module for CRONOS-SL is an 8-channel differential amplifier for measurement of voltages as well as for direct connection of ICP-sensors (ICP™-, DELTATRON®-, PIEZOTRON®-sensors).

### Order code:

	Article #	Remarks
<b>CRPL/ICPU2-8</b>	1080209	for installation in an imc CRONOS-PL housing
<b>CRPL/ICPU2-8-ET</b>	-	version in extended temperature range
<b>CRSL/ICPU2-8</b>		for installation in an imc CRONOS-SL housing
<b>CRC/ICPU2-8</b>	1170057	for installation in an imc CRONOS <i>compact</i> housing
<b>CRC/ICPU2-8-ET</b>	1171032	version in extended temperature range
<b>CRC/ICPU2-8-R</b>	1170121	for installation in an imc CRONOS <i>compact</i> <b>RACK</b>
<b>CRC/ICPU2-8-R-ET</b>	1171080	version in extended temperature range

### Structure:

- Plug-in module for imc CRONOS-PL/*compact* systems, occupying two slots

### Terminals:

- 8x BNC terminals

**Power supply:**

- Supplied by imc CRONOS-PL/-SL/compact
- Additional power requirements due to plug-in module: 1.9 W (+1.4 W with the use of ICP-sensors)

**Operating conditions:**

- Depending on the module model (with or without extended temperature range), the respective operating conditions are stated for the corresponding housing model.

**Included software:**

- The module is completely supported by the operating software for imc CRONOS-PL/-SL/compact. The entire functionality concerning parameterization, saving, online calculation is available.

**Data storage:**

- provided via imc CRONOS-PL/-SL/compact

**Plug & Measure (TEDS)**

- The amplifier is TEDS-capable and supports collaboration with *imc Sensors*

## ICPU2-8 Voltage, ICP

### Technical Specs: Datasheet Version 3.3

Parameter	typ.	min. / max.	Remarks
Inputs		8	differential, analog
Measurement modes		voltage transducer with constant current supply	e.g. ICP™-, DELTATRON®-Sensors <sup>1</sup>
Input coupling		DC AC, ICP	<b>AC-coupling</b> (or ICP) means a high pass filter at the input. To avoid drifting of the module, a high pass filter is always calculated, even if the user selects "without filter".
Terminal connection		BNC	

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 $f_{\text{cutoff}} = 0.4 f_s$ for AC-coupling without filter a HP 2 <sup>nd</sup> order Bessel with $f_{\text{cutoff}} = 1 \text{ Hz}$ (0.5 Hz with WAVE) is calculated
Filter cut-off frequency (high pass, 3th order, -3dB)	0.37 Hz 1.11 Hz	$\pm 5 \%$ $\pm 5 \%$	AC, ICP, range $\leq \pm 10 \text{ V}$ AC, ICP, range $> \pm 10 \text{ V}$
Bandwidth		0 Hz to 48 kHz 0 Hz to 30 kHz	-3 dB -0.1 dB
Sampling frequency		$\leq 100 \text{ kHz}$	per channel
TEDS		conforms to IEEE 1451.4 Class I Mixed Mode Interface	TEDS-data and analog signal shared wire <sup>2</sup>

<b>Voltage</b>			
<b>Parameter</b>	<b>typ.</b>	<b>min. / max.</b>	<b>Remarks</b>
Input configuration	differential single-end		software-configurable
Voltage input ranges (IR)	$\pm 50\text{ V}$ , $\pm 25\text{ V}$ , $\pm 10\text{ V}$ , $\pm 5\text{ V}$ , $\pm 2.5\text{ V}$ , $\pm 1\text{ V}$ , ..., $\pm 5\text{ mV}$		
Surge protection		$\pm 50\text{ V}$	permanent channel to chassis
Input impedance Range $> \pm 10\text{ V}$  $\leq \pm 10\text{ V}$	333 k $\Omega$ 0.67 M $\Omega$ 1 M $\Omega$  908 k $\Omega$ 1.82 M $\Omega$ 20 M $\Omega$		at DC-voltage resp. 50 Hz ICP (single-end) AC (differential) DC (differential)  ICP (single-end) AC (differential) DC (differential)
Gain uncertainty	0.02 % $+20\text{ ppm/K}\cdot\Delta T_a$	$\leq 0.05\%$ $+80\text{ ppm/K}\cdot\Delta T_a$	of display range (25°C) $\Delta T_a =  T_a - 25^\circ\text{C} $ ambient temperature $T_a$
Offset uncertainty  drift	0.02 %  $\pm 60\text{ }\mu\text{V/K}\cdot\Delta T_a$ $\pm 0.06\text{ }\mu\text{V/K}\cdot\Delta T_a$	$\leq 0.05\%$ $\leq 0.06\%$ $\pm 100\text{ }\mu\text{V/K}\cdot\Delta T_a$ $\pm 0.3\text{ }\mu\text{V/K}\cdot\Delta T_a$	of input range (25°C) $> \pm 50\text{ mV}$ $\leq \pm 50\text{ mV}$ $> \pm 10\text{ V}$ $\leq \pm 10\text{ V}$ $\Delta T_a =  T_a - 25^\circ\text{C} $ ambient temperature $T_a$
Common mode suppression Input ranges $\pm 50\text{ V to } \pm 10\text{ V}$ $\pm 5\text{ V to } \pm 50\text{ mV}$ $\pm 25\text{ mV to } \pm 5\text{ mV}$	62 dB 92 dB 120 dB	$> 46\text{ dB}$ $> 84\text{ dB}$ $> 100\text{ dB}$	Common mode voltage (DC..60 Hz): $\pm 50\text{ V}$ $\pm 10\text{ V}$ $\pm 10\text{ V}$
Noise	0.4 $\mu\text{Vrms}$ 14 nV/ $\sqrt{\text{Hz}}$		Bandwidth 0.1 kHz to 1 kHz

<b>Constant current supply</b>			
<b>Parameter</b>	<b>typ.</b>	<b>min. / max.</b>	<b>Remarks</b>
ICP current sources	4.2 mA/channel	$\pm 10\%$	
Compliance voltage	25 V	$> 24\text{ V}$	
Source impedance	280 k $\Omega$	$> 100\text{ k}\Omega$	

<sup>1</sup> ICP is a registered trade mark of PCB Piezotronics Inc., Delta Tron is a registered trade mark of Bruel & Kjaer Sound and Vibration; PIEZOTRON, PIEZOBEAM is a registered trade mark of Kistler

<sup>2</sup> Only galvanically insulated sensors. For more detailed information, please refer to chapter "MMI-TEDS" in imc CRONOS manual.