

ICPU2-8 for imc CRONOScompact (CRC/ICPU2-8)

8-channel IEPE/ICP-Measurement Module

The ICPU2-8 is a broadband measurement amplifier for the measurement of:

- IEPE/ICP sensors (current-fed 4 mA)
- Voltage (AC and DC coupling)

Direct connection of ICP-compatible sensors (ICP™, DELTATRON®, PIEZOTRON® sensors) takes place via BNC.

Highlights

- High signal bandwidth of up to 48 kHz
- Finely adjustable input voltage range (from ±5 mV to ±50 V)
- Input coupling switchable via software: DC, AC, AC with current supply
- Each channel with its own adjustable filter (e.g., anti-aliasing filter) and simultaneous A/D converter
- Supports imc Plug & Measure (TEDS) ¹



CRC/ICPU2-8

Typical applications

- Ideal for noise and vibration analysis and acceleration measurements

imc CRONOScompact - modular measurement system

imc CRONOScompact is a modular and reconfigurable hardware a "rack"-based series of devices available in a variety of housing sizes and device frames. imc CRONOScompact (CRC) plug-in-modules can be inserted into the system (CRC-400GP).

Once the modules are plugged into a portable or rack-based housing, they are electrically connected to the CRC-system and are supplied by the system with power. The data storage will be managed by the CRC-system.

Rack-based modules ("-R") differ from the standard modules only in terms of the front panel's attachment mechanism.



imc CRONOScompact plug-in-modules



imc CRONOScompact portable housing

Overview of available variants

Standard version		ET Version ²	
Order Code:	article no.	article no.	Remarks
CRC/ICPU2-8	11700057	11710032	for imc CRONOScompact
CRC/ICPU2-8-R	11700121	11710080	for imc CRONOScompact RACK

- 1 The measurement module has only limited TEDS capability: The TEDS type DS2413 which is used in most current IEPE sensors is not supported!
- 2 ET: Version in extended temperature range

Included accessories

Documents
Getting started with imc CRONOScompact (one copy per delivery / system)
Device certificate

Optional accessories

Mounting brackets for fixed installations of imc CRONOScompact devices (CRC)

- | | | |
|--------------------|-------------------------------|----------|
| • CRC/BRACKET-CON | mounting bracket 90° | 11700153 |
| • CRC/BRACKET-90 | mounting bracket for DIN-Rail | 11700152 |
| • CRC/BRACKET-BACK | mounting bracket for DIN-Rail | 11700154 |

Technical Specs - ICPU2-8

Inputs, measurement modes, terminal connection		
Parameter	Value	Remarks
Inputs	8	
Measurement modes	voltage measurement IEPE-sensor with current-fed	

Sampling rate, Bandwidth, Filter, TEDS			
Parameter	Value typ.	min. / max.	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 $f_{\text{cutoff}} = 0.4 f_s$
Filter cut-off frequency (high pass, 3 rd order,-3 dB)	0.43 Hz 1.06 Hz		ICPU2-8 standard version ICP, ranges ≤±10 V ICP, ranges >±10 V
Resolution		16 Bit	internal processing 24 Bit
TEDS		conforming to IEEE 1451.4 Class I Mixed Mode Interface only limited! The currently mainly used TEDS type DS2431 is not supported!	supports TEDS type DS2433 not supported DS2431 (typ. IEPE sensor)

General			
Parameter	Value typ.	min. / max.	Remarks
Overvoltage protection		±50 V	continuous channel to chassis
Maximum input voltage		-11 V to +15 V	between ±IN and CHASSIS; input range ≤±10 V
Input coupling	AC, DC, AC with current feed (ICP)		
Input configuration	differential Single-ended		software-configurable
Input impedance range >±10 V	333 kΩ 0.67 MΩ 1 MΩ		at DC-voltage resp. 50 Hz ICP (Single-ended) AC (differential) DC (differential)
range ≤±10 V	908 kΩ 1.82 MΩ 20 MΩ		ICP (Single-ended) AC (differential) DC (differential)

Voltage measurement			
Parameter	Value typ.	min. / max.	Remarks
Input ranges	$\pm 50\text{ V}$, $\pm 25\text{ V}$, $\pm 10\text{ V}$, $\pm 5\text{ V}$, $\pm 2.5\text{ V}$, $\pm 1\text{ V}$, ..., $\pm 5\text{ mV}$		
Gain error	0.02%	$\leq 0.05\%$	of the reading, at 25°C
Gain drift	$(+20\text{ ppm/K}) \cdot \Delta T_a$	$(+80\text{ ppm/K}) \cdot \Delta T_a$	$\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Offset error	0.02%	$\leq 0.05\%$ $\leq 0.06\%$ $\leq 0.15\%$	of the input range, at 25°C $> \pm 50\text{ mV}$ $\leq \pm 50\text{ mV}$ $\leq \pm 10\text{ mV}$
Offset drift	$(\pm 40\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 0.7\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 0.1\text{ }\mu\text{V/K}) \cdot \Delta T_a$	$(\pm 200\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 6\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 1.1\text{ }\mu\text{V/K}) \cdot \Delta T_a$	ranges $> \pm 10\text{ V}$ range $\pm 10\text{ V}$ bis $\pm 0.25\text{ V}$ ranges $\leq \pm 0.1\text{ V}$
CMRR (common mode rejection ratio)			common mode voltage (DC..60 Hz):
Input ranges: $\pm 50\text{ V}$ to $\pm 10\text{ V}$	62 dB	$> 46\text{ dB}$	$\pm 50\text{ V}$
Input ranges: $\pm 5\text{ V}$ to $\pm 50\text{ mV}$	92 dB	$> 84\text{ dB}$	$\pm 10\text{ V}$
Input ranges: $\pm 25\text{ mV}$ to $\pm 5\text{ mV}$	120 dB	$> 100\text{ dB}$	$\pm 10\text{ V}$
Noise	$14\text{ nV}/\sqrt{\text{Hz}}$ $0.4\text{ }\mu\text{V}_{\text{rms}}$		DC coupling 1 kHz bandwidth 0.1 Hz to 1 kHz
Constant current supply			
Parameter	Value typ.	min. / max.	Remarks
ICP current sources	4.2 mA/channel	$\pm 10\%$	
Compliance voltage	25 V	$> 24\text{ V}$	
Source impedance	280 k Ω	$> 100\text{ k}\Omega$	