

ICPU-6 for imc ARGUS (ARGFT/ICPU-6)

6-channel measuring amplifier for voltage and IEPE sensors



The ICPU-6 from the imc ARGUSfit series is a 6-channel measurement amplifier that can be used in conjunction with an imc ARGUS system (or base unit) to which it is directly docked with its housing.

Individually isolated, conditioned and configurable differential channels capture:

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

Direct connection of IEPE compatible sensors (ICP™, DELTATRON®, PIEZOTRON® sensors) is made via BNC connectors.

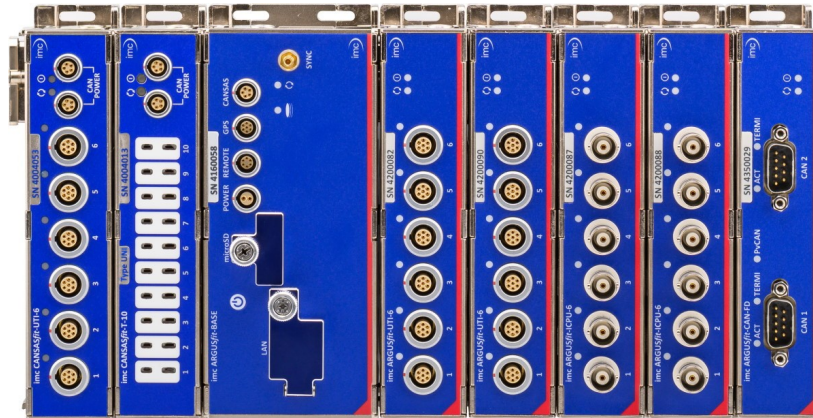
Highlights

- Channel individually galvanically isolated
- 220 kHz bandwidth at max. 500 kSps/channel sampling rate
- 24 bit digitisation, internal processing and data resolution
- Status LEDs to indicate connection errors (cable break or short circuit)
- 6 channels in extremely compact design, clickable to imc ARGUSfit systems

Typical applications

- Typical applications
- Acoustics and NVH
- esp. also in connection with imc WAVE software
- IEPE acceleration sensors and microphones
- Explosion testing with ICP-based blast pressure sensors
- Power measurement on 48V systems (e.g. small electric vehicles) in connection with current measurement via shunt or current transformer

imc ARGUSfit: Flexible modular system for fast measurement systems

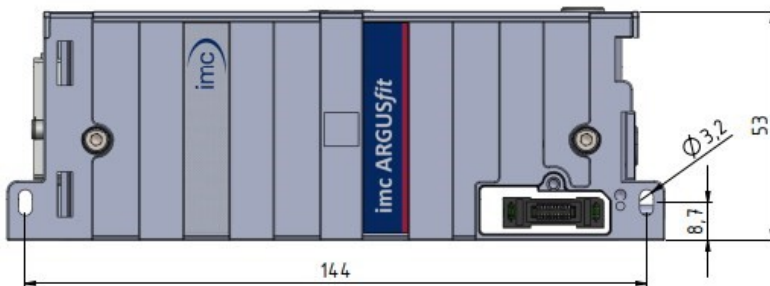


Based on an imc ARGUSfit base unit, imc ARGUSfit measurement amplifier and interface modules can be combined to form complete systems by means of a robust click mechanism, which can even integrate imc CANASfit modules. The click connectors provide the electrical connection to the power supply and system bus.

For expansion to decentralized distributed topologies, the fast "internal" system bus can be converted to fiber optic cables by means of a clickable fiber converter module.

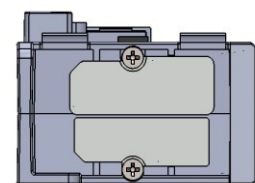
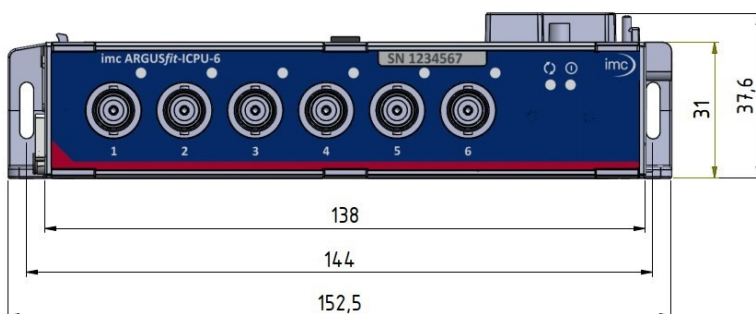
The entire system can be controlled via a common Ethernet connection (LAN/WLAN) with a PC (imc STUDIO software) and can also be networked and operated synchronously and uniformly with all other imc measuring instrument series.

Dimensions



imc ARGUSfit ICPU-6

Module shown in standard operating position (terminal connections upwards)



left module panel with holding mechanism for the covers of the module connectors

Order Code	properties	article no.
ARGFT/ICPU-6	voltage IEPE and voltage (voltage amplifier)	11400209

Included accessories

Documents
Certificates and calibration protocols: Detailed information on certificates supplied, the specific contents, underlying standards (e.g. ISO 9001 / ISO 17025) and available media (pdf etc.) can be found on our website, or you can contact us directly.
Getting started with imc ARGUS <i>fit</i> (one copy per delivery)

Optional accessories

Mounting accessories		
CANFT/BRACKET-DIN	Mounting on DIN-Rail (top hat rail) for imc ARGUS <i>fit</i> and imc CANSAS <i>fit</i>	12100029
CANFT/BRACKET-MAG	Mounting with magnet system for imc ARGUS <i>fit</i> and imc CANSAS <i>fit</i>	12100030

Technical Specs - ARGFT/ICPU-6



General

Inputs, measurement modes		
Parameter	Value	Remarks
Inputs	6	differential, analog
Measurement modes	voltage measurement IEPE (Integrated Electronics Piezo Electric)	
Supported sensors	IEPE	
TEDS (Transducer Electronic Data Sheet)	supported on the hardware side Software support (imc STUDIO: in preparation	
Connector / socket Measuring input Module connector	BNC Click-connection (covering caps)	for the supply and system bus of directly connected modules without further cables, see data sheet of the ARGFT base unit

Sampling rate, bandwidth, filter			
Parameter	Value typ.	min. / max.	Remarks
Sampling rate		≤500 kHz	individually adjustable per channel
Bandwidth	0 Hz to 220 kHz 0 Hz to 200 kHz		-3 dB 0.1 dB
Filter Type Characteristic Cut-off frequency Order Anti-aliasing filter	low pass Mean, Butterworth, Bessel 10 Hz to 50 kHz 8 th Cauer 8 th order with $f_{\text{cut-off}} = 0.4 f_s$		digital filter in addition to hardware filter low pass filter f_s : output rate
Resolution	24 bit		data output: 32 bit Float (24 bit mantissa)

Isolation		
Parameter	Value	Remarks
Isolation analog input channel-to-channel	±60 V ±60 V	to case (CHASSIS) and between functional units

Coupling		
Parameter	Value	Remarks
Input coupling	AC, IEPE and DC	
Input configuration	isolated	

Status-LED			
Parameter		Value	Remarks
Power-LED green		power active	
Status-LED green blue yellow red		multicolor operating, run init, firmware update etc. no sensor short circuit	overall status of module open (no sensor connected or cable breakage) Error (in case of overload or short-circuit of IEPE sensors)
Channel-Status-LED off green red red		bicolor channel passive channel active over-range error error	status for each channel >5 % over nominal range see manual for detailed information

Measurement modes

Voltage measurement			
Parameter	Value typ.	min. / max.	Remarks
Input ranges	$\pm 60\text{ V}$, $\pm 50\text{ V}$, $\pm 25\text{ V}$, $\pm 10\text{ V}$, $\pm 5\text{ V}$ to $\pm 25\text{ mV}$		for measuring range $\pm 60\text{ V}$ applies: nominal working voltage 60 V (acc. to Low Voltage Directive); adjustable for valid measured values: up to 100 V
Max. overvoltage		$\pm 200\text{ V}$	
Input coupling	DC		
Input configuration	isolated		
Input impedance	$1\text{ M}\Omega$ $10\text{ M}\Omega$	$\pm 1\%$ $\pm 2\%$	input range $\geq \pm 10\text{ V}$ input range $< \pm 10\text{ V}$
Gain error		0.02% $+ 0.003\%/K \cdot \Delta T_a$	of the reading $\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Offset error		0.02% $+ 0.001\%/K \cdot \Delta T_a$	of the input range $\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Noise	$3\ \mu\text{V}_{\text{rms}}$ $0.4\ \mu\text{V}_{\text{rms}}$ $0.3\ \mu\text{V}_{\text{rms}}$		range: 25 mV , bandwidth 0.1 Hz to 90 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz

AC voltage measurement and IEPE measurement			
Parameter	Value typ.	min. / max.	Remarks
Input ranges AC voltage measurement	$\pm 60\text{ V}, \pm 50\text{ V}, \pm 25\text{ V}, \pm 10\text{ V}, \pm 5\text{ V}$ to $\pm 25\text{ mV}$		
IEPE measurement	$\pm 5\text{ V}, \pm 2,5\text{ V}, \pm 1\text{ V}$, to $\pm 25\text{ mV}$		
Max. overvoltage		$\pm 200\text{ V}$	
Input coupling	AC, IEPE		
cut-off frequency	1 Hz	$\pm 8\%$	-3 dB; 0.1% settling time approx. 3 s
Max. DC component		-12 V + Signal up to +12 V - Signal	
Input coupling	isolated		
Input impedance	1 M Ω 10 M Ω	$\pm 1\%$ $\pm 2\%$	input range $> \pm 10\text{ V}$ input range $\leq \pm 10\text{ V}$
Offset error		0.05% $+ 0.003\%/K \cdot \Delta T_a$	of the reading $\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Isolationsunterdrückung (IMRR)	TBD dB		50 V, 50 Hz
Noise range = 5 V	TBD μV_{rms} TBD μV_{rms} TBD μV_{rms} TBD μV_{rms}		bandwidth: 0.1 Hz to 220 kHz 0.1 Hz to 20 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz
range = 25 mV	TBD μV_{rms} TBD μV_{rms} 0.5 μV_{rms} 0.5 μV_{rms}		0.1 Hz to 220 kHz 0.1 Hz to 20 kHz 0.1 Hz to 1 kHz 0.1 Hz to 10 Hz
SNR range = 5 V	TBD dB		0.1 Hz to 20 kHz
range = 500 mV	TBD dB		0.1 Hz to 20 kHz

Sensor supply			
Parameter	Value typ.	min. / max.	Remarks
IEPE constant current source	4.2 mA	$\pm 5\%$	
Output voltage	+20 V to 0 V		
'Short circuit' detection	3 V	<4 V	sensor voltage
'No sensor' detection	20.4 V	>22 V or <2 mA	current of the sensor
Max. Overvoltage		$\pm 200\text{ V}$	
Output resistance	3.1 M Ω	>1 M Ω	output voltage = +5 V to +17 V

Operating conditions

Operating conditions		
Parameter	Value	Remarks
Operating environment	dry, non corrosive environment within specified operating temperature range	
Ingress protection class	IP50	with correctly fixed mounted covers ² over both module connectors
Pollution degree	2	
Operating temperature range	-15 °C to +55 °C	without condensation
Shock- and vibration resistance	IEC 60068-2, IEC 61373 IEC 60062-2-64 category 1, class A and B MIL-STD-810 Rail Cargo Vibration Exposure U.S. Highway Truck Vibration Exposure	
Extended shock- and vibration resistance	upon request	specific tests or certification upon request
Dimensions (L x W x H)	153 x 40 x 53 mm	including mounting flanges and click mechanism, see mechanical drawings ²
Weight	0.33 kg	

Power supply of the module			
Parameter	Value typ.	min. / max.	Remarks
Input supply voltage		10 V to 35 V DC	via base unit, fiber converter or UPS module; in dry environment up to 50 V allowed
Power consumption		4 W / 5 W (min.)/(max.)	plus up to 1 W for sensor supply, plus 2 %/10 K
Power supply options	via adjacent module		module connector (click mechanism)

Pass through power limits for directly connected modules (click-mechanism)		
Parameter	Value	Remarks
Max. current	5 A	at 55 °C current rating of click connector to ARGFT modules (right side, viewed from the base unit ²)
	60 W at 12 V DC 120 W at 24 V DC	typ. DC vehicle voltage AC/DC power adaptor and installations