

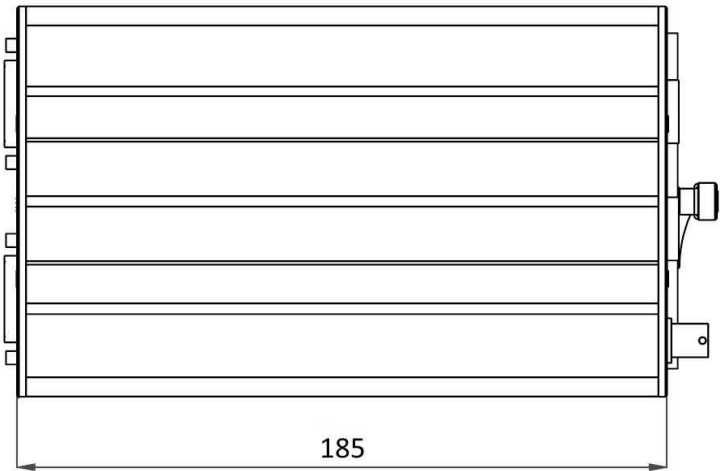
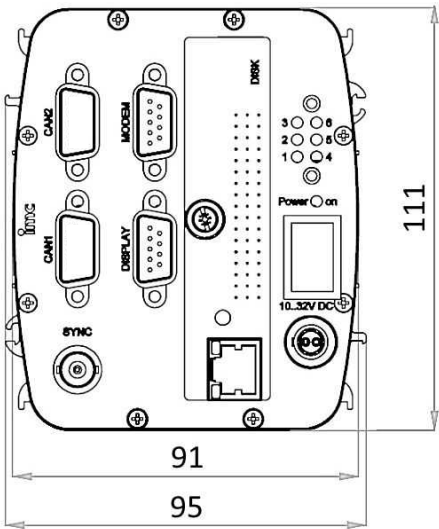
imc C-SERIES: STG-8

Compact and intelligent measurement system for strain gauge and bridge measurements



device type: STG-8 ,8 analog measurement inputs

Mechanical drawings with dimensions



CS device shown in standard operating orientation.

General Technical Specs

Data acquisition, trigger		
Parameter	Value	Remarks
Max. aggregate sampling rate	400 kS/s	
Channel individual sampling rates	selectable in 1–2–5 steps	
Number of sampling rates: analog channels, DI and counter	2	usable simultaneously in one configuration
Number of sampling rates: fieldbus channels	arbitrary	
Number of sampling rates: virtual channels	arbitrary	data rates generated via imc Online FAMOS (e.g. via reduction)
Monitor channels	✓ of the types: analog, DI and counter (incremental counter) and CAN	doubled channels with independent sampling and trigger settings
Intelligent trigger functions	✓	e.g. logical combination of multiple channel events (threshold, transition) to create triggers that start and stop acquisition of assigned channels
Multi.triggered data acquisition	✓	multiple trigger-machines and multi-shot
Independent trigger-machines	48	start/stop, arbitrary channel assignment
Direct onboard data reduction: arithmetic mean, min, max.	✓	
Extensive real-time calculation and control functions	✓	included in standard delivery (via imc Online FAMOS)
External GPS signal receiver	0	
Internal WiFi (WLAN) adaptor	0 IEEE 802.11g (1 antenna) max. 54 Mbit/s	

Storage, signal processing		
Parameter	Value	Remarks
Internal flash storage	CF-card	removable cover for the CF slot
Removable flash storage media	CF	recommended media available at imc; the specified operating temperature range of the media is relevant
Storage on NAS (network storage)	✓	alternatively to onboard Flash storage
Arbitrary memory depth with pre- and post trigger	✓	maximum pretrigger limited by size of Circular Buffer RAM; posttrigger only limited by available mass storage (Flash)
Circular buffer mode	✓	cyclic overwrite of circular buffer memory on mass storage media
Synchronization	DCF 77 GPS IRIG-B NTP	Master / Slave via external GPS-receiver TTL via network

Power supply	Value	Remarks
Power supply	10 V to 32 V DC	
Isolation of supply input	not-isolated	
AC/DC adaptor	110 V to 230 V AC	external adaptor included in delivery
Auto start upon power up	configurable	automatic start of measurement

UPS and Data integrity	Value	Remarks
Autarkic operation without PC	✓	
Self start (automatic data acquisition operation)	configurable	timer, absolute time, automatic start when power supply is available
Auto data-saving upon power outage	✓	buffering (UPS) with "auto-stop": auto-stop of measurement, data storage and automatic shutdown
UPS	integrated	Super-Caps
Charging time of the Super-Caps	360 s	minimum required active operation for full UPS functionality
UPS coverage	complete system	
UPS delay per power outage	1 s	"buffer time constant": required duration of a continuous outage that will trigger auto shutdown procedure fix parameter: not changeable in device configuration!
Effective buffer capacity	100 mWh	sufficient for auto-stop (max. 12 s); with fully charged Super-Caps (after minimum operating duration)

Operating conditions		
Parameter	Value	Remarks
Operating environment	dry, non corrosive environment within specified operating temperature range	
Rel. humidity	80% up to 31°C, above 31°C: linear declining to 50%	according IEC 61010-1
Ingress protection rating	IP20	
Pollution degree	2	
Operating temperature (Standard)	-10°C to +55°C	without condensation
Operating temperature (extended: "-ET" version)	-40°C to +85°C	condensation temporarily allowed
Shock- and vibration resistance	IEC 61373, IEC 60068-2-27 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 certifications upon request

STG-8 analog inputs

Channels, measurement modes, terminal connection		
Parameter	Value	Remarks
Inputs	8	
Measurement modes	voltage measurement current measurement bridge sensor strain gauges current-fed sensors (IEPE/ICP)	ACC/DSUBM-I2 shunt-plug or Single-ended (internal shunt) ACC/DSUBM-B2 full, half, quarter bridge with DSUB-15 extension plug: ACC/DSUBM-ICP2I-BNC-S/-F, isolated

Sampling rate, Bandwidth, Filter, TEDS		
Parameter	Value	Remarks
Sampling rate	≤100 kHz	per channel
Bandwidth	0 Hz to 5 kHz	-3 dB
Filter (digital) cut-off frequency characteristic order	1 Hz to 2 kHz	Butterworth, Bessel (digital) low pass or high pass filter 8th order band pass, LP 4th and HP 4th order Anti-aliasing filter: Cauer 8.order with $f_{\text{cutoff}} = 0.4 f_s$
TEDS	conforming IEEE 1451.4 Class II MMI	esp. with ACC/DSUBM-TEDS-xx (DS2433) not supported: DS2431 (typ. IEPE/ICP sensor)
Characteristic curve linearization	user defined (max. 1023 supporting points)	

General			
Parameter	Value typ.	min. / max.	Remarks
Overvoltage protection		±40 V	permanent
Input coupling	DC		
Input configuration	differential		
Input impedance	20 MΩ	±1%	
Auxiliary supply			only with DSUB-15 variant for IEPE/ICP expansion plug
voltage	+5 V	±5%	independent of integrated
available current	0.26 A	0.2 A	sensor supply, short-circuit protected
internal resistance	1.0 Ω	<1.2 Ω	power per DSUB-plug

Voltage measurement			
Parameter	Value typ.	min. / max.	Remarks
Input range	$\pm 10\text{ V}, \pm 5\text{ V}, \pm 2.5\text{ V}, \pm 1\text{ V} \dots \pm 5\text{ mV}$		
Gain error	0.02%	0.05%	of the measured value, at 25°C
Gain drift	$(10\text{ ppm/K}) \cdot \Delta T_a$	$(30\text{ ppm/K}) \cdot \Delta T_a$	$\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 range $> \pm 50\text{ mV}$ range $\leq \pm 50\text{ mV}$ range $\leq \pm 10\text{ mV}$
Offset drift	$(\pm 0.7\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 0.1\text{ }\mu\text{V/K}) \cdot \Delta T_a$	$(\pm 6\text{ }\mu\text{V/K}) \cdot \Delta T_a$ $(\pm 1.1\text{ }\mu\text{V/K}) \cdot \Delta T_a$	range $\pm 10\text{ V}$ to $\pm 0.25\text{ V}$ range $\leq \pm 0.1\text{ V}$ $\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Nonlinearity	10 ppm	50 ppm	
CMRR (common mode rejection ratio)	110 dB 138 dB	>90 dB >132 dB	DC and $f \leq 60\text{ Hz}$ range $\pm 10\text{ V}$ to $\pm 50\text{ mV}$ range $\pm 25\text{ mV}$ to $\pm 5\text{ mV}$
Noise (RTI)	$0.6\text{ }\mu\text{V}_{\text{RMS}}$ $0.14\text{ }\mu\text{V}_{\text{RMS}}$	$1.0\text{ }\mu\text{V}_{\text{RMS}}$ $0.26\text{ }\mu\text{V}_{\text{RMS}}$	bandwidth 0.1 Hz to 1 kHz bandwidth 0.1 Hz to 10 Hz

Current measurement with shunt plug			
Parameter	Value typ.	min. / max	Remarks
Input range	$\pm 50\text{ mA}, \pm 20\text{ mA}, \pm 10\text{ mA}, \pm 5\text{ mA}, \pm 2\text{ mA}, \pm 1\text{ mA}$		
Shunt impedance	50 Ω		external plug ACC/DSUBM-I2
Over load protection		$\pm 60\text{ mA}$	permanent
Input configuration	differential		
Gain error	0.02%	0.06% 0.1%	of reading, at 25°C plus error of 50 Ω shunt
Gain drift	$(15\text{ ppm/K}) \cdot \Delta T_a$	$(55\text{ ppm/K}) \cdot \Delta T_a$	$\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Offset error	0.02%	0.05%	of range, at 25°C
Noise (current)	$0.6\text{ nA}_{\text{RMS}}$ $0.15\text{ nA}_{\text{RMS}}$	$10\text{ nA}_{\text{RMS}}$ $0.25\text{ nA}_{\text{RMS}}$	bandwidth 0.1 Hz to 1 kHz bandwidth 0.1 Hz to 10 Hz

Current measurement with internal shunt			
Parameter	Value typ.	min. / max	Remarks
Input range	$\pm 50 \text{ mA}$, $\pm 20 \text{ mA}$, $\pm 10 \text{ mA}$, $\pm 5 \text{ mA}$, $\pm 2 \text{ mA}$, $\pm 1 \text{ mA}$		
Shunt impedance	120 Ω		internal
Over load protection		$\pm 60 \text{ mA}$	permanent
Input configuration	Single-ended		internal current backflow to -VB
Gain error	0.02%	0.06%	of reading, at 25°C
Gain drift	$(15 \text{ ppm/K}) \cdot \Delta T_a$	$(55 \text{ ppm/K}) \cdot \Delta T_a$	$\Delta T_a = T_a - 25^\circ\text{C} $; with T_a = ambient temperature
Offset error	0.02%	0.05%	of range, at 25°C
Noise (current)	0.6 nA _{RMS} 0.15 nA _{RMS}	10 nA _{RMS} 0.25 nA _{RMS}	bandwidth 0.1 Hz to 1 kHz bandwidth 0.1 Hz to 10 Hz

Bridge measurement			
Parameter	Value typ.	min. / max.	Remarks
Mode	DC		
Measurement modes	full-, half-, quarter bridge		bridge supply $\leq 5 \text{ V}$ with quarter bridge
Input ranges bridge supply: 10 V bridge supply: 5 V bridge supply: 2.5 V bridge supply: 1 V	$\pm 1000 \text{ mV/V}$, $\pm 500 \text{ mV/V}$, $\pm 200 \text{ mV/V}$, $\pm 100 \text{ mV/V}$ $\pm 0.5 \text{ mV/V}$... $\pm 1 \text{ mV/V}$... $\pm 2 \text{ mV/V}$... $\pm 5 \text{ mV/V}$		(as an option) (as an option)
Bridge excitation voltage (as an option)	10 V 5 V (2.5 V and 1 V)	$\pm 0.5\%$ $\pm 0.5\%$	The actual value will be dynamically captured and compensated for in bridge mode.
Min. bridge impedance	120 Ω , 10 mH full bridge 60 Ω , 10 mH half bridge		
Max. bridge impedance	5 k Ω		
Internal quarter bridge completion	120 Ω , 350 Ω		internal, switchable per software
Input impedance	20 M Ω	$\pm 1\%$	differential, full bridge
Gain error	0.02%	0.05%	of reading
Offset error	0.01%	0.02%	of input range after automatic bridge balancing
automatic shunt calibration	0.5 mV/V	$\pm 0.2\%$	for 120 Ω and 350 Ω
Cable resistance for bridges (without return line)	<6 Ω <12 Ω		10 V excitation 120 Ω 5 V excitation 120 Ω

Sensor supply			
Parameter	Value typ.		max.
Configuration options	5 selectable settings		
			The sensor supply module always has 5 selectable voltage settings. default selection: +5 V to +24 V
Output voltage	Voltage (+1 V) (+2.5 V) +5.0 V +10 V +12 V +15 V +24 V (±15 V)	Current 580 mA 580 mA 580 mA 300 mA 250 mA 200 mA 120 mA 190 mA	Power 0.6 W 1.5 W 2.9 W 3.0 W 3.0 W 3.0 W 2.9 W 3.0 W
			set jointly for all eight channels upon request, also 2.5 V and 1 V settings are available, for example by replacing the +12 V or +15 V setting. An arbitrary set of 5 setting can be chosen preferred selections: +24 V, +12 V, +10 V, +5.0 V, +2.5 V +15 V, +10 V, +5.0 V, +2.5 V, +1 V upon request, special order: +15 V can be replaced by ±15 V. This eliminates the internal current- and quarter bridge measurement.
Short-circuit protection	unlimited duration		to output voltage reference ground: "-VB"
Accuracy of output voltage	<0.25 %		0.5 % 0.9 % 1.5 %
			at terminals, no load at 25 °C over entire temperature range plus with optional bipolar output voltage
Compensation of cable resistances	3-line control: SENSE line as refeed (-VB: supply ground)		calculated compensation with bridges
Max. capacitive load	>4000 µF >1000 µF >300 µF		2.5 V to 10 V 12 V, 15 V 24 V