DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS Mobile and Lab Eight-channel Input Module for Voltage, ICP® and Charge

Simcenter/VC8/2406/20240625

Product Information Sheet

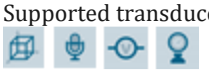
Summary

VC8 input module

The VC8 supports eight channel signal conditioning and signal processing for voltage sources and ICP or piezoelectric sensors in a single Simcenter SCADAS Mobile or Simcenter SCADAS Lab slot.

The VC8 offers the unique combination of ultra-low power consumption, 204.8 kHz 24-bits analogue to digital conversion, and a spurious free dynamic range of 150 dB.

Supported transducers



Typical applications

BENEFITS

- 8 input channels via microdot connectors
- Channel selectable Voltage, ICP and Charge modes

FEATURES

- Smart sensor support
- Analog anti-alias filter
- Analog and digital overload detection with LED indication on front-panel
- ICP cable check with LED indication
- 150 dB dynamic range eliminates the need for range setting
- Built-in calibration for improved specifications over a longer period

Signal conditioning
Each input channel has a voltage amplifier input with ICP supply and a charge amplifier input for direct interfacing to ICP and piezoelectric sensors.

The overload LED indicates both analogue overloads, detected at the input amplifier, and digital overloads, detected by the digital signal processor.

The VC8 has an ICP cable check circuit to detect an open loop or short circuit in the sensor cable; errors are indicated through a front-panel LED for optimum user feedback and simultaneously transferred to the host as well.

VC8 supports smart sensors according to IEEE 1451.4 to read the Transducer Electronic Data Sheet (TEDS) with essential information including sensor type, sensitivity, calibration date, coordinates etc.

The ultra-low-noise charge input supports full-scale ranges from 316pC to 10,000pC full scale. A digital high-pass filter can be switched on to eliminate pyroelectric noise.

Analogue to digital conversion
The VC8 uses low-power high performance 204.8 kHz 24-bit sigma-delta analogue to digital converters.

A 4-pole analogue anti-alias filter precedes each ADC. A wide range of digital decimation filters reduces the bandwidth in steps of 2 and 2.5.

Specifications VC8
Input function
Single ended voltage, ICP or charge input via grounded microdot socket.

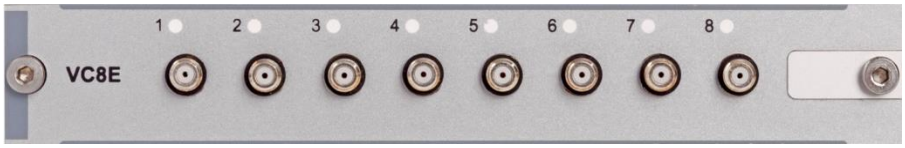
Product Information Sheet

General information	VC8 specifications
Product name	SCL-VC8, SCM-VC8-E
Description	Simcenter SCADAS Mobile and Lab Eight-channel Input Module for Voltage, ICP® and Charge
Input ranges differential input	-
Input ranges charge input	±316 pC, ±1,000 pC, ±3,160 pC, ±10,000 pC
Input ranges V/ICP input	±316 mV, ±1 V, 3.16 V, ±10 V
Transducer connector	Eight (8) Microdot connector for sensor input
Supported transducers	
	AC, DC, ICP and charge coupled sensors Voltage and ICP sensors Piezoelectric charge sensors
A/D Converter	
Max. sampling rate	204.8 kHz, can be downsampled in steps of 2 and 2.5
Max. bandwidth (filter off, -3 dB)	92 kHz
ADC Architecture	24 bit Sigma Delta ADC
Coupling	DC, AC, ICP, charge in single ended mode
Filter	
High Pass Filter	Software selectable high pass filter with 0.5 Hz, 7 Hz, 25Hz and 60Hz cut off frequencies.
AC Coupling	Voltage mode: 0.48 Hz ± 3 %, 7 Hz ± 2 % Charge mode: 0.48 Hz ± 6 %
Decimation filter	Reduces bandwidth prior to signal processing; bandwidth can be down-sampled in steps of 2 and 2.5.
Analog anti-alias filter	4-pole Equal Time Delay filter with 164 kHz cut-off frequency and 0.01 dB flatness, 150 dB/oct digital filter with 100 dB alias protection provides an alias free bandwidth of 92 kHz
Transducer identification	
TEDS	TEDS class 1 (ICP sensors) supported according to IEEE 1451.4 Maximum TEDS cable length is 80 m
Power	
Power consumption/power budget	During normal operation, no overload and ICP supply switched on: 5.25 W

Power feedback	LED on the module front panel, providing information on connection, power status and any sensor supply overload/underload. During system booting and startup, the LED on channel 1 will be used to indicate module status (active) using a different LED color and/or blinking pattern. **LED Modes** ICP: Green Charge: Blue TEDS reading: Yellow blinking	**Alarm** Overload: Red ICP error: Yellow/Red blinking TEDS listen mode: Green or Blue blinking
ICP sensor supply	3.5 mA±15 % from 28 V isolated source, over the SCADAS Mobile operating temperature range.	
Input impedance		
ICP mode (AC)	1 MΩ ±1% || 260 pF	
Slew rate		
V/ICP (single ended)	20V/µs	
Charge input	3.4V/µs	
Signal to noise ratio (SNR)	**Charge input (typical)**	**Single ended input (typical)**
±10 V	-	107 dB
±3.16 V		
±1 V		106 dB
±0.316 V		101 dB
±10,000 pC	107 dB	-
±3,160 pC	105 dB	
±1,000 pC	105 dB	
±316 pC	98 dB	
	Measured between 100Hz to 20KHz, with 32k block size, 16 averages	
Spurious Free Dynamic Range (SFDR)	**Charge input (typical)**	**Single ended input (typical)**
±10 V	-	150 dB
±3.16 V		
±1 V		148 dB
±0.316 V		140 dB
±10,000 pC	150 dB	-
±3,160 pC		
±1,000 pC	148 dB	
±316 pC	140 dB	
	Measured between 100Hz to 20KHz, with 32k block size, 16 averages	
Crosstalk	**Charge input (typical)**	**Single ended input (typical)**

±10 V	-	108 dB
±3.16 V		117 dB
±1 V		120 dB
±0.316 V		120 dB
±10,000 pC	104 dB	-
±3,160 pC	110 dB	
±1,000 pC	115 dB	
±316 pC	118 dB	
	Tested at 1.5kHz frequency	
Total Harmonic Distortion (THD)	**Charge input (typical)**	**Single ended input (typical)**
±10 V	-	98 dB
±3.16 V		
±1 V		
±0.316 V		91 dB
±10,000 pC	98 dB	-
±3,160 pC		
±1,000 pC		
±316 pC	91 dB	
	At 1 kHz frequency, 25.6 kHz bandwidth, measured with a block size of 6400 Hz	
Amplitude accuracy		
	At 1 kHz better than +/- 0.1% at 23 °C	
Gain drift		
	< ± 0.1 % between 5 ºC and 40 ºC	
Residual offset	**For DC coupled modes**	
	Better than 0.1% at 22°C ± 2°C	
Offset drift	**Charge input and AC /ICP Voltage**	**Single ended input DC (typical)**
±10 V	N/A	< ± 0.1 % between 5 ºC and 40 ºC
±3.16 V		
±1 V		
±0.316 V		
±10,000 pC	N/A	-
±3,160 pC		
±1,000 pC		

±316 pC		
Phase match between any two channels (at 9.9 kHz)	**Charge input (typical)**	**Single ended input (typical)**
±10 V ±3.16 V ±1 V ±0.316 V	-	0.3°
±10,000 pC ±3,160 pC ±1,000 pC ±316 pC	0.3°	-
Protection		
Input protection	28Vrms continuously without damage, charge input up to: ±50,000 pC	
Sensor check	ICP sensor check for open loop and short circuit detection. ICP cable check checking the sensor bias voltage continuously for open loop and short circuit with indication by LED in the front panel.	
ESD protection	According to EN61000-4-2, level 2 and ISO10605	
EMC protection	Comply with CE-EMC directive, when installed in a SCADAS Mobile frame	
Overload detection and indication	Analog overload detection at the input is combined with digital overload detection after the ADC; overloads are indicated on the front panel LED and transmitted to the host.	
Shock protection	MIL-STD-810G specified in MIL-STD-810G method 516.5, Shock Amplitude: 60 gpk.	
Vibration protection	MIL-STD-810G method 514.5, procedure 1, Category 24: RMS 7.694 g	
Ambient operating temperature range	-20 ºC to +55 ºC	
Storage temperature range	-20 °C to +70 °C	
Housing		
Dimensions	One SCADAS slot (Microdot)	
Connector and pinning layout		
	Connector type: Chassis Microdot 10-32	
	Mating Connector: Microdot 10-32	



SCM-VC8

SCL-VC8

Ordering information

Support of Simcenter SCADAS Frames and Modules may be restricted in specific Simcenter Testlab application workbooks.

Please check with your local representative for full details.

SCM-VC8-E: Simcenter SCADAS Mobile enhanced 8-channel 24-bit ICP/TEDS/Charge input module

SCL-VC8: Simcenter SCADAS Lab enhanced 8-channel 24-bit ICP/TEDS/Charge input module

The Leadtime for VC8 can vary from the standard Leadtime and can last up to 24 weeks.