DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS Mobile and Lab Eight-channel Voltage/ICP® Input Module

Simcenter/V8/VS8/2406/20240625

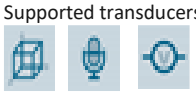
Product Information Sheet

Summary

The V8 is a Simcenter SCADAS Mobile and Lab input module supporting full voltage and ICP signal conditioning and signal processing for eight channels.

The V8 series offer the unique combination of ultra-low power consumption, high performance 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 CAMAC connectors or via BNC connectors (V8B and VS8B occupying two slots)
- Low power and high bandwidth architecture

FEATURES

- Smart sensor support
- Analog and digital overload detection with LED indication on front-panel
- 24-bit analog to digital conversion with 92 kHz bandwidth
- 150 dB dynamic range eliminates the need for range setting
- Built-in calibration for improved specifications over a longer period
- VS8: additional support of SPDIF digital audio formats for all standard audio sample rates

In addition, the VS8 modules provide the same specification as V8, but with additional support for SPDIF digital audio sources. The V8B and VS8B two slot wide input modules equipped with eight BNC connectors to be able to eliminate cable conversion.

Signal conditioning
Each input channel has a voltage amplifier with an input range from ±316 mV to ±10 V and includes ICP power supply to the transducers.

The V8 and VS8 have an ICP cable check circuit to detect an open loop in the sensor cable. Errors are indicated through a front-panel LED for optimum user feedback and simultaneously transferred to the host.
For acoustic applications, an additional 7 Hz AC coupling reduces low frequency signals that might otherwise overload the input amplifier.

Anomaly detection
The input module has an ICP cable check circuit to detect an open loop in the sensor cable; errors are indicated through a front-panel LED for optimum user feedback and are simultaneously transferred to the host.

Smart sensor support
Both V8 and VS8 versions support smart sensors according to IEEE 1451.4 without changing the cables. The module can read the Transducer Electronic Data Sheet (TEDS) with essential information including sensor type, sensitivity, calibration date, coordinates etc.

The input modules are using low-power high performance 24-bit sigma-delta analogue to digital converters. A 4-pole analogue anti-alias filter precedes each ADC. Running at a maximum sample rate of 204.8 kHz, the V8 and VS8 supports both vibration and acoustic applications. A wide range of digital decimation filters reduces bandwidth in steps of 2 and 2.5.

Calibration
Factory gain & offset calibration factors are stored in non-volatile RAM.

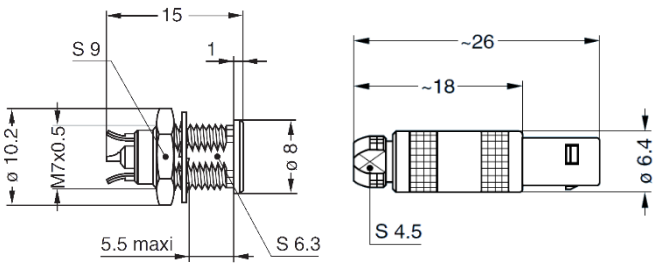
Analogue to digital conversion

SPDIF support with VS8

General information	V8 specifications
Product name	SCL-V8, SCL-V8B, SCL-V8B-RT, SCL-V8-RT, SCL-VS8, SCL-VS8B, SCM-V8B-E, SCM-V8B-RT, SCM-V8-E, SCM-V8-RT, SCM-VS8B-E, SCM-VS8-E
Description	Simcenter SCADAS 8 channel V/ICP input module
Inputs	Eight (8) time-synchronous V/ICP inputs, single ended voltage input via grounded CAMAC or BNC sockets
Input ranges differential input	N.A.
Input ranges V/ICP input	±10 V, ±3.16 V, ±1 V, ±0.316 V
Digital interface	Digital audio interface (VS8): Channel 7 and 8 can be set to either analog or digital mode for support of SPDIF formats with HMS data; accurate synchronous sample rate conversion provides an alias suppression of 125 dB; all standard audio sample rates (32 kHz, 44.1 kHz, 48 kHz, 96 kHz) are supported.
Outputs	N.A.
Transducer connector	Eight (8) CAMAC or BNC (B version) connector for sensor input
Supported transducers	
	AC, DC and ICP coupled sensors Voltage and ICP 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
Filter	
High Pass Filter	Software selectable high pass filter with 0.5 Hz, 7 Hz, 25Hz and 60Hz cut off frequencies.
AC Coupling	0.48 Hz ±6 %, 7 Hz ±2 %
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	
	3.8 W (during normal operation, no overload and ICP supply switched on).

Power consumption/power budget	
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 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 ±0.1mA from 28V Source over the LMS SCADAS Mobile operating temperature range.
Input impedance	
Single ended mode	1 MΩ ±1% || 260 pF
Slew rate	
V/ICP (single ended)	20V/µs
Signal to noise ratio (SNR)	
±10 V, ±3.16 V, ±1 V	115 dB
±0.316 V	110 dB
	Measured between 100Hz to 20KHz, with 32k block size, 16 averages
Spurious Free Dynamic Range (SFDR)	
±10 V, ±3.16 V, ±1 V	150 dB
±0.316 V	148 dB
	Measured between 100Hz to 20KHz, with 32k block size, 16 averages
Crosstalk	
±10 V, ±3.16 V, ±1 V, ±0.316 V	120 dB
	Tested at 1.5kHz frequency
Total Harmonic Distortion (THD)	
±10 V, ±3.16 V, ±1 V	94 dB

±0.316 V	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
amplitude accuracy temperature	
	< ± 0.1 % between 5 ºC and 40 ºC
Residual offset	
	Better than 0.1% at 22°C ± 2°C
Offset drift	
	< ± 0.1 % between 5 ºC and 40 ºC
Phase match between any two channels (at 9.9 kHz)	
±10 V, ±3.16 V, ±1 V, ±0.316 V	0.2°
Protection	
Input protection	40V peak (28Vrms) continuously without damage.
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 (CAMAC), Two SCADAS slots (BNC)	
Connector and pinning layout		
Pin layout		**Connector type:** CAMAC Chassis: ERN.00.250.CTL **Mating connector:** FFA.00.250.CTAC29

Ordering information SCADAS Mobile Modules

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-V8-E: Simcenter SCADAS Mobile enhanced V/ICP/TEDS 8-channel, with CAMAC sockets, including adaptor cables to BNC

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SCM-V8-E: Simcenter SCADAS Mobile enhanced V/ICP/TEDS 8-channel, with CAMAC sockets, including adaptor cables to BNC

SCM-V8B-E: Simcenter SCADAS Mobile two slot wide, enhanced V/ICP/TEDS 8-channel with BNC connectors

SCM-VS8-E: Simcenter SCADAS Mobile enhanced V/ICP/TEDS 8-channel with CAMAC sockets and digital audio support, including adaptor cables to BNC, AES/EBU converter with RCA to BNC cable for direct SPDIF connection

SCM-VS8B-E: Simcenter SCADAS Mobile enhanced V/ICP/TEDS 8-channel with digital audio support, with BNC connectors for direct SPDIF connection

SCM-V8-RT: Simcenter SCADAS Mobile enhanced V/ICP/TEDS 8-channel, CAMAC sockets, includi

cables to BNC. EtherCAT support with SCM-ESO64 module

SCM-V8B-RT: Simcenter SCADAS Mobile two slot wide, enhanced V/ICP/TEDS 8-channel with BNC connectors. EtherCAT support with SCM-ESO64 module

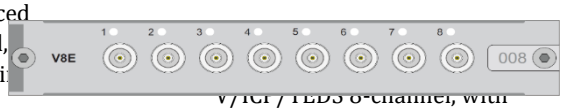
Ordering information SCADAS Lab Modules

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

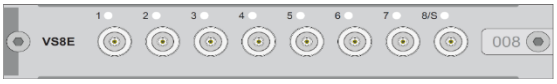
Please check with your local representative for full details.

SCL-V8: Simcenter SCADAS Lab 8-channel with CAMAC sockets and V/ICP inputs with TEDS support

SCL-V8B: Simcenter SCADAS Lab enhanced V/ICP/TEDS 8-channel with BNC connectors



V/ICP/TEDS 8-channel, with CAMAC sockets and digital audio



support, including adaptor cables to BNC, AES/EBU converter with RCA to BNC cable for direct SPDIF connection

SCL-VS8B: Simcenter SCADAS Lab enhanced V/ICP/TEDS 8-channel with digital audio support, with BNC connectors for direct SPDIF connection

SCL-V8-RT: Simcenter SCADAS Lab enhanced V/ICP/TEDS 8-channel, with CAMAC sockets, including adaptor cables to BNC. EtherCAT support with SCM-ESO64 module

SCL-V8B-RT: Simcenter SCADAS Lab two slot wide, enhanced V/ICP/TEDS 8-channel with BNC connectors. EtherCAT support with SCM-ESO64 module

Note: SCM-V8B-E and SCM-VS8B-E not shown in images above