

DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS Mobile and Lab 24-channel Voltage/ICP[®] Input Module

Simcenter/V24-II/2406/20240625

Product Information Sheet

Summary

Occupying a single slot in the Simcenter SCADAS Mobile or Lab frame, the twenty-four channels V24 modules support multiple signal conditioning, A/D conversion and signal processing capability in one single- slot extension board.

Supported transducers



Typical applications



- 24 channel input modules module for 8 tri-axial, 24 individual accelerometers
- Supporting ICP and MEMS type accelerometers

FEATURES

- 24-bit analog to digital conversion with 23 kHz bandwidth
- 140 dB dynamic range eliminates the need for range setting
- Smart sensor support according to IEEE1451.4
- Detection of overload and cable check errors for each ICP sensor
- 0.05 Hz AC coupling extends low frequency range
- Current boost circuit reducing settling time for ICP sensor

V24-II input module

Incorporating eight high quality 9-pin LEMO connectors, each input supports data acquisition in X, Y & Z directions using tri-axial accelerometers. Each V24-II module can acquire up to 24 signals with the possibility for complementary adjacent modules for additional channel count.

Signal conditioning

With multiple input ranges (± 10 V, ± 1 V, ± 0.316 V) and embedded ICP power supply to the transducers the module provides seamless sensor support for wide range of applications. V24-II 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.

In support of dynamic testing of large structures with extremely low resonant frequencies, an additional software selectable (0.05Hz, 0.1Hz, 0.5Hz, 7Hz) AC coupling extends low frequency range of ICP accelerometers.

The V24-II also supports MEMS type DC accelerometers. A supply voltage

of 6 V is provided in support of the latest generation of DC accelerometers.

Analogue to digital conversion

24-bit $\Sigma\Delta$ ADC with a maximum sampling frequency of 51.2 kHz; digital filter with 100 dB alias protection provides an alias free bandwidth of 23 kHz.

A four-pole analog anti-alias filter precedes each ADC with a selectable range of 150 dB/oct. digital decimation filters reduce the bandwidth in steps of 2 and 2.5, providing a guaranteed alias suppression of 100 dB in all measurement bandwidths.

(Note: Activating one or more channels on a V24-II will reduce the maximum sample rate of other modules in the same frame or in connected saecondary frames to 51.2 kHz maximum!)

Signal processing

The V24-II is equipped with a low-power high-performance DSP, on-line calibration and on-line broadband RMS calculation, independent of the number of channels.

Product Information Sheet

General information		V24-II specifications
Product name	SCM-V24-II, SCL-V24-II	
Description	Simcenter SCADAS Mobile and Lab 24 channel V/ICP input module	
Inputs	Twenty-four (24) V/ICP inputs	
Input ranges differential input	N.A.	
Input ranges V/ICP input	± 10 V, ± 1 V, ± 0.316 V	
Digital interface	N.A.	
Outputs	N.A.	
Transducer connector	Eight (8) 9 pin LEMO 0B connector for sensor input	
Supported transducers		
	AC, DC and ICP coupled sensors	
	Voltage and ICP sensors	
	Sensors that require supply; V24-II provides 6.5V power from a common supply	
A/D Converter		
Max. sampling rate	51.2 kHz, can be downsampled in steps of 2 and 2.5.	
Max. bandwidth (filter off, -3 dB)	Note: activating one V24-II channel will limit channels of other modules to 51.2kHz 23 kHz	
ADC Architecture	24 bit Sigma Delta ADC	
Coupling	DC, AC, ICP	
Filter		
High Pass Filter	Software selectable high pass filter with 0.05Hz, 0.1 Hz, 0.5 Hz and 7 Hz cut off frequencies.	
AC Coupling	Hardware: 0.048 Hz $\pm 3\%$.	
Decimation filter	Reduces bandwidth prior to signal processing; bandwidth can be down-sampled in steps of 2 and 2.5.	
Analog anti-alias filter	Better than 100 dB	
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	7 W available for the module and the sensors (during normal operation, no overload and ICP supply switched on).	

Product Information Sheet

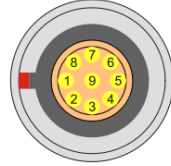
Power feedback	<p>LED on the module front panel, providing information on connection, power status and any sensor supply overload/underload. During system booting and startup, the LED on channel 1 will be used to indicate module status (active) using a different LED color and/or blinking pattern.</p> <table border="1"> <tr> <td> <p>LED Modes ICP: Green Voltage: Blue TEDS reading: Yellow blinking</p> </td> <td> <p>Alarm Overload: Red ICP error: Yellow/Red blinking TEDS listen mode: Green or Blue blinking</p> </td> </tr> </table>		<p>LED Modes ICP: Green Voltage: Blue TEDS reading: Yellow blinking</p>	<p>Alarm Overload: Red ICP error: Yellow/Red blinking TEDS listen mode: Green or Blue blinking</p>
<p>LED Modes ICP: Green Voltage: Blue TEDS reading: Yellow blinking</p>	<p>Alarm Overload: Red ICP error: Yellow/Red blinking TEDS listen mode: Green or Blue blinking</p>			
ICP sensor supply	3.5 mA ±0.1mA over the Simcenter SCADAS Mobile operating temperature range.			
Active sensor supply	6.5 VDC supply current of maximum 12 mA+/-5% /LEMO connector with in-rush current protection.			
Input impedance				
Single ended mode	10MΩ ±1% 270pF			
Signal to noise ratio (SNR)				
±10 V	105 dB			
±1 V	105 dB			
±0.316 V	95 dB			
	Measured between 100Hz to 20KHz, with 32k block size, 16 averages			
Spurious Free Dynamic Range (SFDR)				
±10 V	135 dB			
±1 V	135 dB			
±0.316 V	130 dB			
	Between 100Hz and 20kHz, measured with block size of 51200 and 1Hz bins, Auto Power Spectrum after 16 averages			
Crosstalk				
±10 V	102 dB			
±1 V	115 dB			
±0.316 V	115 dB			
	Tested at 1.5kHz frequency			
Total Harmonic Distortion (THD)				
±10 V				
±1 V	85 dB			
±0.316 V				
	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			

Product Information Sheet

Residual offset	
	Better than 0.1% at 22°C ± 2°C
Gain drift at SCADAS operating temperature range	
±10 V	10 ppm/°C
±1 V	30 ppm/°C
±0.316 V	40 ppm/°C
Offset drift	
±10 V	40 µV/°C
±1 V	5 µV/°C
±0.316 V	3 µV/°C
Phase match between any two channels (at 9.9 kHz)	
±10 V, ±1 V, ±0.316 V	0.6°
Protection	
Input protection	All input pins are protected against ±40 V overvoltage (without damage). Other pins (supply, sense) are not protected against overvoltage.
Sensor check	ICP sensor check for open loop and short circuit detection.
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 °C to +55 °C
Storage temperature range	-20 °C to +70 °C
Housing	
Dimensions	1 Simcenter SCADAS slot
Connector and pinning layout	
Pin layout	<p>Connector type: LEMO-EGG.0B.309</p> <p>Mating connector:</p>

CONNECTION

9-pin LEMO:
V24 - channels 1 to 8



Chassis = Analog Ground
Not connected implicates:
DO NOT USE

LEMO-FGG.0B.309.CLADxx

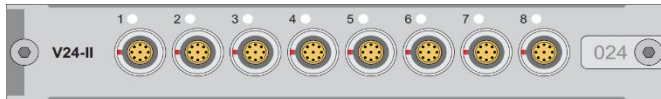
Pin details:

1. Not connected
2. Ground - B
3. IN - B
4. Not connected
5. +6V5 supply
6. IN - C
7. Ground - C
8. IN - A
9. Ground - A

SCL-V24-II



SCM-V24-II



**Ordering information
for Simcenter SCADAS
Mobile and SCADAS Lab
V24**

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-V24-II: Simcenter SCADAS Mobile twenty-four-channel input module for tri-axial sensors

SCL-V24-II: Simcenter SCADAS Lab twenty-four-channel input module for tri-axial sensors

Options

SCx-CAS14: adapter cable to convert 9-pin

LEMO to three BNC connectors

Cables

Cables for Triaxial and MEMS sensors are directly available from PCB or Dytran

