DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS Mobile and Lab Four-channel general purpose signal output module

Simcenter/DAC4/2406/20240625

Product Information Sheet

Summary

Multi-channel signal generation

DAC4 is a general-purpose signal generation module for Simcenter SCADAS Mobile and Simcenter SCADAS Lab, containing four single-ended BNC output channels generating programmable or user defined signals. It provides multi-channel excitation signals needed for a variety of stimulus and response signals, such as multiple input multiple output modal testing or normal mode testing.

Supported transducers

Typical applications 

BENEFITS

- Four channel independent output signals for different application in noise and vibration
- Ultra low noise and distortion

FEATURES

- 24-bit D/A converters for a dynamic range of 108 dB
- Bandwidth of up to 40 kHz
- Noise, sine, burst noise, swept sine signal generation
- Slow start/stop
- Smooth Transition Algorithm for transient free amplitude control

A high-performance DSP supports the generation of a variety of standard excitation signals such as true random, burst random with variable burst length, impulse, sine, swept sine, noise and pink noise. These signal types are selectable and can be generated on all output channels with maximum amplitude of ±10V and up to a bandwidth of 40 kHz.

Ultra-low noise and distortion outputs
Low noise and distortion are ensured using glitch-free 24-bit bit-stream D/A converters, analogue and digital reconstruction filters, and up-sampling digital filters with noise shaping. Each change in signal amplitude uses the Smooth Transition Algorithm STA to eliminate transients in the output signal. STA also supports slow start/stop functionality. Only when the output signals are virtually zero, the output relays can be operated to connect or isolate the output connector from the Simcenter SCADAS system.

Output level
Maximum output voltage of ±10 V can be attenuated in software down to ±300 mV
20 mA output current per channel

Feedback indicators
Front panel LED indicator for active/inactive output (green) and channel error / overload (red)

Random output signals
Uncorrelated baseband noise with crest factor of 3.5 in continuous or burst mode; zoomed noise with crest factor of 5 in continuous or burst mode

Sine output signals
Sine with amplitude and phase control; swept sine with amplitude, phase and sweep speed control

User defined output signals
Continuous output of previously measured / defined signals in the form of DAC replay

Synchronization
- Phase matched DAC4 channels with output channels on the system controller
- Full synchronization of multiple DAC4 modules
- Operable in daisy chain configuration (except for vibration control)

Safety shut-down
- Incorporated safety mechanism in case of short circuit, power failure or communication loss
- Independent shut-down of all output channels in a controlled manner within 14 ms

Product Information Sheet

General information	DAC4 specifications
Product name	SCM-DAC4, SCL-DAC4
Description	Simcenter SCADAS Mobile and Lab Four-channel general purpose signal output module
Input ranges differential input	-
Input ranges charge input	-
Input ranges V/ICP input	-
Digital interface	-
Outputs	Maximum output voltage of ±10 V can be attenuated in software down to ±300 mV 20 mA output current per channel
Transducer connector	Single ended voltage output via grounded BNC socket, short circuit protected
A/D Converter	
Max. bandwidth (filter off, -3 dB)	Maximum bandwidth of 40 kHz
DAC Architecture	24 bit Sigma Delta DAC. Upper frequency: 40 kHz Increments: sine control 0.019Hz (periodic excitation), 0.1mHz increments (Normal Modes)
Coupling	DC coupled output
Power	
Power consumption/power budget	Operating: 4 W Full load: 5.2 W
Input impedance	
Output impedance	50 Ω
Signal to noise ratio (SNR)	
	>Better than 110 dB Noise floor is below -155 dB referred to maximum output signal for 20 kHz bandwidth
	Measured between 20Hz to 20KHz, with 32k block size, 16 averages
Spurious Free Dynamic Range (SFDR)	
	Better than 150 dB referred to maximum output signal for 20 kHz bandwidth

	Measured between 100Hz to 20KHz, with 32k block size, 16 averages
Total Harmonic Distortion (THD)	
	Better than -104 dB while generating a sine wave of 1 kHz at 3 dB below full scale
	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* *The level of deviation and the corrected adjustment are included in the Adjustment Report document
Residual offset	
	Better than 0.1% at 22°C ± 2°C. Less than 2 mV.
Offset drift	
	Better than ±0.1 % between -20 ºC and +55 ºC.
Phase match between any two channels (up to 2 kHz)	
	Better than 2.5 deg
Protection	
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
Error detection methods	Error detection. Overload checks are notified to the host and through the “Status” LED
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
Connector and pinning layout	
	Connector type: 4x BNC

SCM-DAC4

SCL-DAC4

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-DAC4: SCADAS Mobile Four-channel general purpose signal output module

SCL-DAC4: SCADAS Lab Four-channel general purpose signal output module