DIGITAL INDUSTRIES SOFTWARE

Simcenter SCADAS RS 20-channel Thermocouple Unit

Simcenter/SCRS-TC20/2024/20240610

Product Information Sheet

Summary

Simcenter SCADAS RS

20-channel Thermocouple Unit

The SCRS TC20 is part of the Simcenter SCADAS RS data acquisition units. It combines 20 channels of thermocouple signal conditioning in a single unit.

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BENEFITS

- 20 thermocouple channel inputs with selectable type per channel: J,K,N,R,S,T,E,B
- Inter channel isolation up to 100 V
- 16 kSamples/s combined throughput
- Up to 800 Hz sample rate at 24 bits
- Wide temperature range from -40 °C (-40 °F) to +65 °C (149 °F)
- On-board ITS-90 linearization per type
- Burnout detection
- On-board Simcenter SCADAS RS Configuration App

FEATURES

- Easy mounting and instrumentation
- Easy stacking of units without tools
- Centralized and distributed configurations
- Daisy chaining with single cable for power and data
- Low power
- 100 g Shock and 10 g vibration resistance
- Water and dust tight IP66/IP67 certified
- Standardized connector for analog inputs
- Use with Simcenter Testlab or with the on board App (accessible through any web browser)

Simcenter SCADAS RS

Product Family

Simcenter SCADAS RS is part of the Simcenter SCADAS signal conditioning and data acquisition systems and is designed for demanding test conditions.

Units connect in daisy chain to a Recorder unit for autonomous operation or in combination with a PC, tablet, or smartphone.

Use Simcenter Testlab or the on board Simcenter SCADAS RS Configuration or Recorder App for instrumentation, channel setup, calibration, sensor validation, measurement control, data viewing on-line and after a measurement.

Units are powered from an Uninterruptable Power Supply Unit (UPS) with flexible power distribution across multiple units.

Typical Sensors

Temperature sensors (thermocouple principle).

Conditioning Options

• Thermocouple types: J,K,N,R,S,T,E,B

General

Product code	SCRS-TC20
Description	Simcenter SCADAS RS 20-channel Thermocouple Unit
Inputs	20 thermocouple inputs
Other connections	2x daisy chain (power and data)
Dimensions	W255 mm x H85 mm x D90 mm (W10" x H3.34" x D3.54")
Weight	1.7 kg (3.75 lb) (approximately, without cables)
Power consumption	Up to 7 W
Power input	From daisy chain, UPS or Siemens certified AC/DC adapter

Unit Feedback

Sensor anomalies	Following sensor information is reported via LED and in the user interface: • Burnout detection (during instrumentation): > 550 Ω
Unit information	Following unit information is reported via LED and to the user interface • Unit status (booting, upgrading, identification, internal error, active) • Channel enabled

Unit Mounting

Mounting options	Units can be mounted individually (mounting holes available). Units can be stacked (no tools required). Units can be mounted with tie-down straps using mounting clamp (optional).
Maximum distance	Up to 50 m between two units. Up to 30 m from sensor to unit input connector. Extra UPS units may be required, depending on distance between units. It is recommended to add a UPS at the long end of a 50 m cable.

Activation

Boot time	< 40 s when a REC unit is present in the system

General Signal Conditioning Specifications

Sampling	0.2 Hz to 800 Hz, with decimation filters.
	Sample rate independently selectable per channel, for all channels [Hz]:
	    0.2, 0.3, 04, 0.6, 0.8,
	    {1, 1.2, 2, 3, 4, 6, 8}: x1, x10, x100

Analog anti-aliasing filter	20 Hz (passive 2nd order)
Alias protection	Guaranteed by digital anti-aliasing decimation filters adapted to selected sample rate
Measurement bandwidth	Maximum 20 Hz (-3 dB)
Digital decimation filters	Linear phase with automatically corrected delay
Throughput	16 kSamples/s (20 ch@800 Hz)
Grounding and isolation	Units have a provision for grounding. Internal supply signal grounds isolated from chassis. Channels isolated from each other.
Isolation voltage	Isolation voltage: ±100 V
Time & phase accuracy (inter Unit)	Time accuracy better than 1 µs.

Thermocouple Conditioning Specifications

Supported sensors/signals	Thermocouple sensors: types J,K,N,R,S,T,E,B
Input connection	Differential
Input ranges	Adapted to all supported thermocouple types. Maximum voltage without damage: ±40 V (differential pins referred to signal ground).
Cold junction compensation	Yes, independent per channel. Accuracy better than 0.3 °C.
Linearization	ITS-90 (International Temperature Scale) compliant on-board. Per channel and type. Accuracy better than 0.002 °C.
Common Mode Rejection Ratio at 45 Hz (± 3σ)	> 140 dB (100 Hz sample rate)
Accuracy (± 3σ)	Internal temperature sources are controlled by design. At full operating temperature range, accuracy better than:

Types:	E	J	K	N	B, R, S	T
[% range]			0.1			0.2
[°C]	1.27	1.41	1.64	1.57	1.82	1.34
[°F]	2.29	2.54	2.95	2.83	3.28	2.41

Except types B, R, S measuring >1000 °C at operating temperature -40 °C to -30 °C: better than 0.15 % (2.73 °C or 4.91 °F).

Input impedance	4 MΩ

Output

Digital interface	1x proprietary low latency, high speed digital output for RT applications (i.e., to ECAT unit)

Environmental Certification

Temperature range	Operating: -40 °C to +65 °C (-40 °F to 149 °F) Storage: -40 °C to +85 °C (-40 °F to 185 °F) Because of internal heating, please exercise caution when touching the housing and connectors and attached accessories at ambient temperatures higher than 40 °C. Ensure proper protection (i.e., gloves) against burns or other injuries.
Ambient pressure	0.5 bar to 1.3 bar. Altitude: -2000 m (mining) to 5000 m (mountains).
Water and dust protection	IP66/IP67 (Unit only). Not applicable to mated connections (standard Mini TC does not support this IP rating).
Humidity	Fully protected against humidity. Feet vents equalize internal and external pressure and allow an outgoing path for humidity and moisture, being expulsed during warming up and cooling down during normal usage.
Vibration	MIL-STD-810G, method 514.6, procedure I, category 24, 20-2000 Hz, random vibration 10 g (rms), 1 h per axis. NOTE: Tested against more severe conditions than required by MIL-STD-810G (10 instead of 7.7 grms).
Shock	MIL-STD-810G, method 516.6, procedure I, trapezoidal shock, 100 g (peak), 11 ms, three shocks per direction
Drop	MIL-STD-810G method 516.6, Procedure IV – Transit Drop (26 drops from a height of 122 cm on each surface, edge and corner)
Salt protection	Standard Mini TC connectors not immune
ESD	EN61000-4-2 level 4 ISO10605
EMC requirements	IEC 61326-1
Calibration	Compliant with ISO17025. Calibration formally traceable to international measurement standards from our accredited ISO17025:2017 fully compliant laboratory.
Certifications	CE, FCC

Connectors and Pinout

Thermocouple Input connector chassis type	Mini TC female
Thermocouple Input connector plug type	Mini TC male

Thermocouple Input connector pinout

-   +

Minimize external temperature sources such airflow over the front panel to minimize influence to the cold junction points.

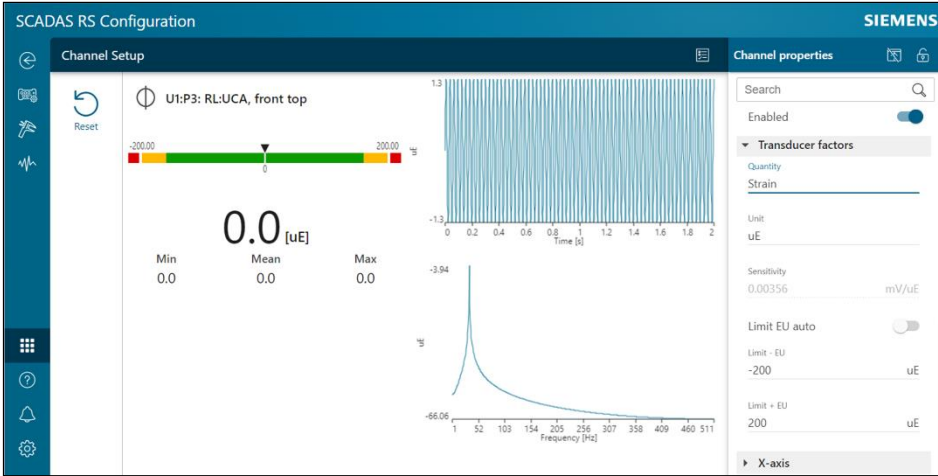|	
Daisy Chain connector chassis	YCP-TIA12FCG-08FPEZX-000X
Daisy Chain connector plug	YCP-TPR12FCX-08MSEEX-065X

On-board Simcenter SCADAS RS Configuration App

General	License-free software embedded on the SCADAS RS unit. Accessible through any web browser via UTP connection.
Instrumentation	• Single channel setup • Channel list (grid and card views) • Persist settings on unit
Monitoring	• Status info: health status, warnings and alarms • Statistics: overall and instantaneous • Time data • Frequency data (FFT) • Variety of customizable displays: digital, analog, strip chart, XY, 2D

Detailed Info	See Simcenter SCADAS RS Configuration App

Ordering Information

SCRS-TC20	Simcenter SCADAS RS 20-channel Thermocouple Unit

Options and Accessories

Connectivity	SCRSA-CABD01	Daisy chain cable, 0.4 m
	SCRSA-CABD02	Daisy chain cable, 1 m
	SCRSA-CABD03	Daisy chain cable, 5 m
	SCRSA-CABD04	Daisy chain cable, 10 m
	SCRSA-CABD05	Daisy chain cable, 50 m
	SCRSA-CABN01	Daisy chain cable to RJ45, 5 m
	SCRSA-CAB-ADP2	UTP to USB Ethernet adapter for PC
Mechanic	SCRSA-CAB001	Grounding cable, 3 m
	SCRSA-CASE01	Travel case single unit
	SCRSA-CASE02	Travel case 6 units
	SCRSA-ACC-001	Side clamps (set of 2)
	SCRSA-ACC-002	Brackets (set of 2)
	SCRSA-ACC-005	Stacking tools (set of 4)
Power	SCRSA-ACDC-01	AC/DC adapter unit

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