DUAL CHANNEL SIGNAL CONDITIONER FOR TEMPERATURE SENSORS

SEM1720

|	
➤	DUAL CHANNEL WITH 5 PORT ISOLATION (3.75 kV)
➤	ACCEPTS RTD, THERMOCOUPLE OR POTENTIOMETER SENSORS
➤	UNIVERSAL VOLTAGE AND CURRENT OUTPUTS
➤	MATHS FUNCTIONS BETWEEN CHANNELS
➤	PROBE REDUNDANCY SWITCHING
➤	EIGHT USER CONFIGURED PRESET RANGES
➤	ONBOARD PROFILER TEMPERATURE TO OUTPUT PROCESS UNITS

➤ INTRODUCTION

SEM1720 is a dual channel signal conditioner designed to accept RTD, Thermocouple or Potentiometer sensors and provide isolated, industrial process output signals in mA or Volts. Each output channel may be linked to either input sensor or to a maths function of both sensor signals. This powerful feature allows the device to operate in a number of different modes.

The output signal can also be adjusted over the full working ranges (0 to 20) mA or (0 to 10) V, to provide common or custom process signals, examples (4 to 20) mA, (0 to 1) mA, (1 to 5) V.

SEM1720 is configured using the free USB SpeedLink software that allows the user to configure the device without requiring calibration equipment. Maths functions on each channel can be set up using the software as well as a 22 segment profile tool. Input output simulation tools for diagnostic purposes are also available.

The device offers the user eight preset ranges selected by removing the front panel and setting a three position switch. This allows the user to store configurations in the device rather than programme the device on site.

STATUS INSTRUMENTS
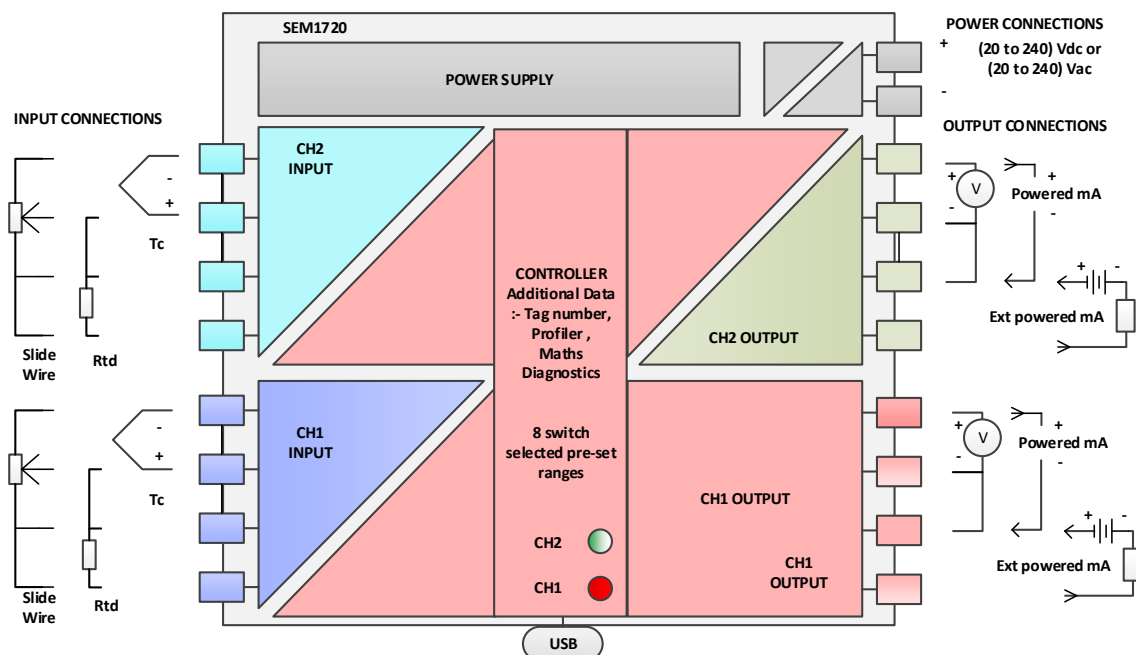
DIN RAIL MOUNT DUAL SIGNAL TEMPERATURE/ISOLATOR/SPLITTER

➤ PC CONFIGURATION

Equipment

Computer	Running Windows XP or later with USB port
USB Cable	A to mini B

Method
Load PC with USB SpeedLink software.
Connect device USB port to PC USB port using cable.
Run software, set configuration required and save to device.

➤ SPECIFICATIONS @ 20 °C

INPUTS (Channels 1 & 2)

RTD

Type	Pt100,Ni100,Ni120,Cu100,Cu53
User Range	Any range within full range
Connection	Three wire
Accuracy	See tables
Stability	See tables
Excitation	< 450 uA

Thermocouple

Type	K,J,T,R,S,N,B,C,D,U,G,(mV)
User Range	Any range within full range
Impedance	1 MΩ
Accuracy	See tables
Stability	See tables
Cold junction	(-20 to 70) ˚C ± 0.5 ˚C
	Tracking ± 0.05˚C/˚C

Slide Wire

Type	(0 to 100) K Ohm pot maximum (0 to 1) K Ohm minimum
User Range	any range within full range
Connection	Three wire plus link
Accuracy	± 0.05%

Signal Preset

Type	User software preset

Sensor Offset

Range	± 10 ˚C

Maths Functions

User set Setpoint	SP1, SP2

User selects
CH1, CH2
CH1 + CH2
Average CH1, CH2
CH1 - CH2
Absolute (Unsigned result) CH1 - CH2
Highest CH1 or CH2
Lowest CH1 or CH2
CH1 < SP1 = CH1 else CH2
CH1 > SP1 = CH1 else CH2
CH2 < SP2 = CH2 else CH1
CH2 > SP2 = CH2 else CH1
CH1 on fail SP1
CH1 on fail CH2
CH2 on fail SP2
CH2 on fail CH1

Profiler

Optional advanced mode	User linearization 22 segment. Maths signal to process units.

OUTPUTS (Channels 1 & 2)

Output channels can be independently set to monitor one of Maths temperature signal or profiler output.

Source (Advanced Mode Only)
Fixed output provided for diagnostics.
PROFILE A
PROFILE B
PROFILE A + PROFILE B
Average, PROFILE A, PROFILE B
PROFILE A - PROFILE B
Absolute (Unsigned result) PROFILE A - PROFILE B
Highest PROFILE A or PROFILE B
Lowest PROFILE A or PROFILE B

Current Range

Full Range	(0 to 20) mA
User Range	Any range within full range
Max Range	(0 to 23.1) mA
Calibration Accuracy	± 5 uA
Stability	±5 uA / ˚C
Current sink	Supply voltage (10 to 30) V dc
Loop Voltage effect	0.2 uA / V (Sink Mode)
Current source	Max Load 700 R
Output Connection	Screw Terminal

Voltage Range

Full Range	(0 to 10) V
User Range	Any range within full range
Max Range	(0 to 10.1) V
Accuracy	±5 mV
Stability	±1 uV / ˚C
Voltage Load	Min 1 KΩ
Output Connection	Screw Terminal

Isolation (To BS EN 61010)

Supply to Input/Output	
Working Voltage	253 V ac
Isolation test voltage	4000 V dc
Input output ports	
Max Voltage (fault)	250 V ac
Isolation test voltage	3750 V dc

Note: USB terminal shares the same GND as CH1 output

General Specification

Update time	200 mS
Response Time	200 mS
Start up time	4 seconds
Preset Ranges	8 Switch select user configured

Supply

Range	(20 to 240) V DC, (20 to 240) V AC 50/60 Hz Power 3 W @ full output current
Protection	Internal fuse (0.5 A) + Over Voltage protection. External protection recommended

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❯ CONFIGURATION

Configuration

The following applies to both channels independently.
All eight User selected switch position can be configured
using the configuration tool. This allows user to set eight
different configurations into one unit. The full configuration
set up can be saved to and loaded from file (*.hex).

Input Signal

Type	RTD, Thermocouple, mV Slide Wire
Setpoint	Fixed User Setpoint.
Preset	Preset Input to Setpoint
Error Signal	Fail High, Low or Setpoint
Offset	Sensor Correction
Maths Functions	Derived from CH1 & CH2 Inputs
User Profile Tool (Advanced Mode)	Segment (4 to 22) Input range to process range.

Tag Number — 20 characters

Optional Profiler — Enter x,y segments data

Output Signal Source (Advanced Mode) — Selects output channel source Derived from profile outputs

Process out signal

Process Out Low	Any point within indicated process range.
Process Out High	Any point within indicated process range.

Output Signal

Type	(0 to 20) mA, (0 to 10) V
Low Signal Out	Any point within type range
High Signal Out	Any point within type range
Damping	Independent Rise & Fall

Diagnostics

Set Input	User selected
Fixed Output	User selected
Record feature	Time Stamp Process value Output value

❯ ENVIRONMENT MECHANICAL

Environmental

Ambient operating range	(-20 to +70) ˚C
Ambient storage temperature	(-40 to +85) ˚C
Ambient humidity range	(10 to 90) % RH non condensing
Warm-up time	1 minute to full accuracy

❮ STATUS INSTRUMENTS
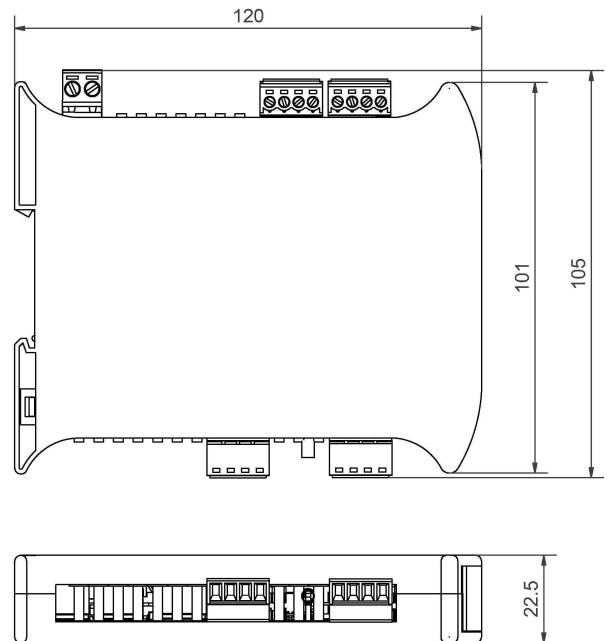
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➤ INPUT ACCURACY

INPUT	RANGE	ACCURACY	STABILITY WITH TEMPERATURE
Thermocouples			
K	(-200 to 1370) ˚C (-320 to 2498) ˚F	1 Reading / Second ± 0.5 ˚C + (0.1 % of FRS)	±0.05 % FSR/˚C
J	(-200 to 1200) ˚C (-320 to 2190) ˚F		
E	(-200 to 1000) ˚C (-320 to 1832) ˚F		
N	(-180 to 1300) ˚C (-292 to 2372) ˚F	4 Readings / Second ± 1.0 ˚C + (0.1 % of FRS)	±0.08 % FSR/˚C
T	(-200 to 400) ˚C (-320 to 750) ˚F	10 Readings / Second ± 2.0 ˚C + (0.1 % of FRS)	±0.15 % FSR/˚C
R [1] [2]	(-10 to 1760) ˚C (-148 to 3200) ˚F		±0.10 % FSR/˚C
S [1] [2]			
L	(-100 to 600) ˚C (-148 to 1100) ˚F		±0.08 % FSR/˚C
B [1] [2]	(0 to 1600) ˚C (32 to 3000) ˚F		±0.10 % FSR/˚C
U	(0 to 600) ˚C (32 to 1100) ˚F		±0.08 % FSR/˚C
C(W5) [2]	(0 to 2300) ˚C (32 to 4200) ˚F		±0.05 % FSR/˚C
D(W3) [2]			
G(W) [2]			
mV	(-200 to 200) mV	± 10 uV 1 Reading/Second	±0.05 % FSR/˚C
RTD			
Pt100.00385 (IEC)	(-200 to 850) ˚C (-320 to 1560) ˚F	1 Reading / Second ± 0.15 ˚C + (0.05 % of FRS)	±0.015 % FSR/˚C
Pt100 .00391 (IPTS-68)	(-200 to 630) ˚C (-320 to 1160) ˚F		
Pt100 .00392 (IPTS-68)			
Pt100 .00393 (ITS-90)	(-200 to 960) ˚C (-320 to 1760) ˚F	4 Readings / Second ± 0.5 ˚C + (0.1 % of FRS)	
Ni 100 .00618 (DIN)	(-60 to 180) ˚C (-76 to 320) ˚F		
Ni120 .00672 (Nickel A)	(-80 to 260) ˚C (-112 to 460) ˚F	10 Readings / Second ± 1.0 ˚C + (0.1 % of FRS)	
Cu100 .00427			
Cu 53 (GOST)	(-50 to 180) ˚C (-58 to 320) ˚F		

Key   rdg = reading; FSR = Full Scale range ; [1] Only over the range (800 to 1600) ˚C, [2] cold junction tracking range(0 to 70) ˚C

ORDER CODE: SEM1720

ACCESSORIES:
USB A to mini B Cable   48-200-0001-01
USB SpeedLink Software   available at status.co.uk

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