SEM1720 DUAL CHANNEL CONDITIONER FOR TEMPERATURE SENSORS

- **TWO RTD, THERMOCOUPLE OR POTENTIOMETER**
- **ISOLATED mA or VOLTAGE OUTPUTS**
- **ISOLATED UNIVERSAL AC/DC POWER SUPPLY**
- **MATHS AND PROFILING TOOLS IN SOFTWARE**
- **DIRECT USB CONFIGURATION**

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 an input sensor or to a maths function of both sensor signals. This powerful feature allows the device to operate in several 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 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.

FEATURE HIGHLIGHTS

FLEXIBLE
The SEM1720, with its wide range of temperature input options (including potentiometer and mV ranges), with comparison functions between channels, paired with the configuration functionality it has to offer, is a flexible and versatile tool for many varied temperature applications. Live readings can be displayed to a PC via the configuration software.

UNIVERSAL SUPPLY
Supply: From 20 VDC to 240 VAC and everything in-between, the auto-detecting power supply is simple but effective, giving the SEM1720 the capability to be powered from a variety of supplies.

MULTIPLE CONFIGURATIONS
The device offers the user eight programable pre-set configuration set-ups, 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.

RTD SENSOR INPUT (Channels 1 & 2)		**SPECIFICATIONS @20˚C**
Type RTD	**Range**	**Accuracy/Stability/Notes**
Pt100 ~ 0.00385 (IEC)	(-200 to 850) ˚C (-320 to 1560) ˚F	1 Reading/Second ± 0.15 ˚C + (0.05 % of FSR)
Pt100 ~ 0.00391 (IPTS-68)	(-200 to 630) ˚C (-320 to 1160) ˚F	
Pt100 ~ 0.00392 (IPTS-68)		
Pt100 ~ 0.00393 (ITS-90)	(-200 to 960) ˚C (-320 to 1760) ˚F	
Ni 100 ~ 0.00618 (DIN)	(-60 to 180) ˚C (-76 to 320) ˚F	
Ni120 ~ 0.00672 (Nickel A)	(-80 to 260) ˚C (-112 to 460) ˚F	
Cu100 ~ 0.00427		
Cu 53 (GOST)	(-50 to 180) ˚C (-58 to 320) ˚F	
RTD Connection		2 or 3 wire
RTD Lead Resistance		20 Ω Maximum
RTD Lead effect		0.015 ˚C / Ω
FSR = Full Scale range		
Temperature stability over the range (-10 to 50) ˚C ±0.015 % FSR / ˚C		

THERMOCOUPLE SENSOR INPUT (Channels 1 & 2)			**SPECIFICATIONS @20˚C**
Type	**Range**	**Stability**	**Accuracy/Notes**
K	(-200 to 1370) ˚C (-320 to 2498) ˚F	±0.05 % FSR/˚C	1 Reading/Second ± 0.5 ˚C + (0.1 % of FSR))
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	±0.08 % FSR/˚C	
T	(-200 to 400) ˚C (-320 to 750) ˚F	±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	(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	±0.05 % FSR/˚C	± 10 uV 1 Reading/Second
Impedance (Thermocouple)			1 MΩ
Open Circuit sensor bias			0.2 uA
Cold junction automatic tracking (-20 to 70) ˚C		± 0.05 ˚C	± 0.5 ˚C
FSR = Full Scale Range			
*1 Only over the range (800 to 1600) ˚C, *2 Cold junction tracking range (0 to 70)˚C			

PROCESS INPUTS			**SPECIFICATIONS @20˚C**
Type	**Range**	**Stability**	**Accuracy**
mV	±200 mV (Max ± 230 mV)	± 0.04 % FSR/˚C	±0.1% of FSR
Potentiometer*1	(0 to 100) % of pot travel	± 0.05 %/˚C	
FSR = Full Scale range			
*1 (0 to 1) K Ohm minimum; (0 to 100) K Ohm maximum			

OUTPUT ANALOGUE mA CURRENT (Channels 1 & 2)		**SPECIFICATIONS @20°C**
Type/Function	**Range/Description**	**Accuracy/Notes**
Two wire current Sink or source	(0 to 20) mA (4 to 20) mA User mA, any within full range	(mA output /2000) or 5 uA (Whichever is the greater)
Calibration Accuracy		± 5 uA
Supply in sink mode	(11 to 30) V DC, 24 V nominal	SLEV
Maximum load current source	(0 to 20) mA	Maximum load 550 Ω
Maximum load current sink	Supply voltage @24 Vdc	Maximum load 650 Ω
Response time	< 500 ms to reach 95 % of final value; Start-up time < 3 s	
Loop voltage effect		Loop ripple 0.03 % of FSR;
Supply sensitivity	Supply ripple rejection < ± 5 uA error @ 1 V rms 50 Hz ripple	
Protection	Reverse connection and over-voltage protection. Maximum over-voltage current 100 mA	
Galvanic Isolation	500 V to input: 3750 V to Supply and Relays	
Current Output Damping	Programmable rise and fall (0 to 250) seconds, for a (0 to 20) mA swing.	
Thermal stability	Zero at 20 °C	± 2 uA/°C typically
The mA output range can be set to anywhere within the maximum capability		

OUTPUT ANALOGUE VOLTAGE (Channels 1 & 2)		**SPECIFICATIONS @20°C**
Type/Function	**Range/Description**	**Accuracy/Stability/Notes**
Two wire voltage	(0 to 10) VDC User V, any within full range	± 5 mV
Calibration Accuracy		± 5 mV
Maximum output		10.1 VDC
Min Load	10 KΩ User Configurable correction for Load	
Response time	< 500 ms to reach 95 % of final value; Start-up time < 3 s	
Current drive		± 2 mA, minimum load 5 KΩ @ 10 VDC
Thermal stability	Zero at 20 °C	± 1 mV/°C
Voltage generated across 500 Ω resistor		
The voltage output range can be set to anywhere within the maximum capability		

USB CONFIGURATION USER INTERFACE		
Type/Options/Function	**Description**	**Notes**
Configuration hardware	USB mini B	Cable not included
Configuration software	USBSpeedLink	Download www.status.co.uk
Operating system	Microsoft Windows	Windows 7 or later

USB CONFIGURATION USER INTERFACE (Channels 1 & 2)		
Type/Options/Function	**Description**	**Notes**
Configuration: basic or advanced	Select mode on connection to instrument	Some options only available in advanced mode
Input Type Scale	 High, low	RTD list, T/C list, mV, Slide wire Any within range
Output configuration Type Scale Fixed output Error signal Load correction Output damping mA, V	 Output signal High, low For diagnostics Up, down, user For voltage output Rise/fall for full range	 mA, V mA, V any value within output range mA, V any value within output range User = any value within output range In ohms (0 to 250) s
Maths functions Profile tool (interpolation) Output source selection	Derived from CH1, CH2 Probe fail options CH1, CH2 CH1, CH2	A+B, average, track (high or low) On fail swap input, on fail go to setpoint Up to 22 segments X, Y data Comparison options
Live data	Input Signal Output signal Cold junction Record live data Store configuration to PC	Value mA, V value °C Save data to CSV file Save data to file
Multiple configurations	Eight configurations can be saved to the instrument. Select by using the DIP switch behind front cover	
Other device options	Tag number	20 Characters

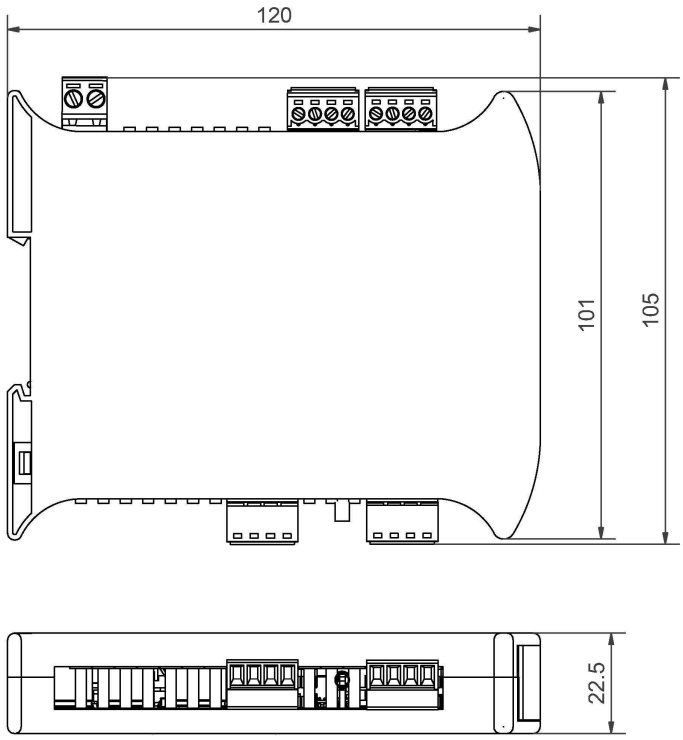
GENERAL	
Function	**Description**
Power supply	(20 to 240) V DC SELV, (20 to 240) V AC 50/60 Hz
Power	3 W max
Protection	Internal fuse, over-voltage, external protection recommended
Galvanic Isolation Supply to I/P and O/P ports	4000 VDC test, 253 VAC working
Galvanic Isolation I/P to O/P	3750 VDC test, 250 VAC working
Start-up time	4 s
Response time	200 ms
Indication (State LED)	Green = OK Red = input/output/configuration error indication
Note	USB terminal shares the same GND as CH1 output

MECHANICAL	
Function	**Description**
Dimensions	120 mm (from back of rail) x 22.5 mm wide x 106 mm high
Enclosure colour	Grey
Material	Blend PC/ABS self-extinguishing
Connections	Two-part screw connectors for power, inputs, outputs
Weight	145 g approximate
Rail mount	DIN 60715

ENVIRONMENTAL	
Function	**Description**
Ambient temperature	Operating/Storage (-30 to 70) °C
Ambient Humidity	Operating/Storage (10 to 90) %RH non-condensing
Protection requirement	Device must be installed in an enclosure offering >IP65 Protection
USB configuration ambient	(10 to 30) °C

APPROVALS	
EMC	BS EN 61326: Note - Sensor input wires to be less than 30 m to comply
Electrical Safety	BS EN 61010-1
Ingress protection	BS EN 60529
RoHS	Directive 2011/65/EU

MECHANICAL



ORDER CODE	SEM1720

ACCESSORIES	
USB configuration software	USBSpeedLink free of charge from www.status.co.uk
Loop powered display	Refer to www.status.co.uk
48-200-0001-01	Standard USB A to USB mini B cable for configuration

To maintain full accuracy, annual calibration is required. Contact support@status.co.uk for details
The data in this document is subject to change. Status Instruments Ltd. assumes no responsibility for errors

Status Instruments Ltd
Status Business Park
Gannaway Lane, Tewkesbury
Gloucestershire, UK
GL20 8FD

Tel: +44 (0)1684 296818
Fax: +44 (0)1684 293746
Email: sales@status.co.uk
Website: www.status.co.uk