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.
## PC CONFIGURATION

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Computer</th>
<th>Running Windows XP or later with USB port</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB Cable</td>
<td>A to mini B</td>
<td></td>
</tr>
</tbody>
</table>

### 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)

<table>
<thead>
<tr>
<th>RTD</th>
<th>Type</th>
<th>Pt100, Ni100, Ni120, Cu100, Cu53</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Range</td>
<td>Any range within full range</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Three wire</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>See tables</td>
<td></td>
</tr>
<tr>
<td>Stability</td>
<td>See tables</td>
<td></td>
</tr>
<tr>
<td>Excitation</td>
<td>&lt; 450 uA</td>
<td></td>
</tr>
</tbody>
</table>

### Thermocouple

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

### Slide Wire

<table>
<thead>
<tr>
<th>Type</th>
<th>(0 to 100) K Ohm pot maximum (0 to 1) K Ohm minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Range</td>
<td>any range within full range</td>
</tr>
<tr>
<td>Connection</td>
<td>Three wire plus link</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 0.05%</td>
</tr>
</tbody>
</table>

### Signal Preset

| Type          | User software preset                             |

### Sensor Offset

| Range         | ± 10 °C                                            |

### Maths Functions

| User set      | 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

### 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

- Average, 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

### Galvanic 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
- LED Indication (STATE): LED: Green = OK Red = input / output error
- LED: Green = OK Red = input / output error
- 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
DIN RAIL MOUNT DUAL SIGNAL TEMPERATURE/ISOLATOR/SPLITTER

**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**
- Segment (4 to 22)
- Input range to process range.

**Tag Number**
- 20 characters

**Optional Profiler**
- Enter x,y segments data

**Output Signal Source**
- Selects output channel source
- Derived from profile outputs

**Process out signal**
- Any point within indicated process range.
- 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**
- User selected
- User selected
- 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

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- Ambient operating range: (-20 to +70) °C
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## INPUT ACCURACY

<table>
<thead>
<tr>
<th>INPUT</th>
<th>RANGE</th>
<th>ACCURACY</th>
<th>STABILITY WITH TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermocouples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>K</strong></td>
<td>(-200 to 1370) °C (-320 to 2498) °F</td>
<td>1 Reading / Second</td>
<td>±0.5 °C + (0.1 % of FRS)</td>
</tr>
<tr>
<td><strong>J</strong></td>
<td>(-200 to 1200) °C (-320 to 2190) °F</td>
<td></td>
<td>±0.05 % FSR/°C</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>(-200 to 1000) °C (-320 to 1832) °F</td>
<td></td>
<td>±0.08 % FSR/°C</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>(-180 to 1300) °C (-292 to 2372) °F</td>
<td></td>
<td>±0.15 % FSR/°C</td>
</tr>
<tr>
<td><strong>T</strong></td>
<td>(-200 to 400) °C (-320 to 750) °F</td>
<td></td>
<td>±0.10 % FSR/°C</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>(-10 to 1760) °C (-148 to 3220) °F</td>
<td></td>
<td>±0.15 % FSR/°C</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>(-100 to 600) °C (-148 to 1100) °F</td>
<td></td>
<td>±0.08 % FSR/°C</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>(0 to 1600) °C (32 to 3000) °F</td>
<td></td>
<td>±0.10 % FSR/°C</td>
</tr>
<tr>
<td><strong>U</strong></td>
<td>(0 to 600) °C (32 to 1100) °F</td>
<td></td>
<td>±0.08 % FSR/°C</td>
</tr>
<tr>
<td><strong>C(W5)</strong></td>
<td>(0 to 2300) °C (32 to 4200) °F</td>
<td></td>
<td>±0.05 % FSR/°C</td>
</tr>
<tr>
<td><strong>D(W3)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>G(W)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>mV</strong></td>
<td>(-200 to 200) mV</td>
<td></td>
<td>±10 µV 1 Reading/Second</td>
</tr>
<tr>
<td>RTD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt100.00385 (IEC)</td>
<td>(-200 to 850) °C (-320 to 1560) °F</td>
<td>1 Reading / Second</td>
<td>±0.15 °C + (0.05 % of FRS)</td>
</tr>
<tr>
<td>Pt100 .00391 (IPTS-68)</td>
<td>(-200 to 630) °C (-320 to 1160) °F</td>
<td></td>
<td>±0.015 % FSR/°C</td>
</tr>
<tr>
<td>Pt100 .00392 (IPTS-68)</td>
<td>(-200 to 960) °C (-320 to 1760) °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt100 .00393 (ITS-90)</td>
<td>(-200 to 960) °C (-320 to 1760) °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni 100 .00618 (DIN)</td>
<td>(-60 to 180) °C (-76 to 320) °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni120 .00672 (Nickel A)</td>
<td>(-80 to 260) °C (-112 to 460) °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu100 .00427</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu 53 (GOST)</td>
<td>(-50 to 180) °C (-58 to 320) °F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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**ORDER CODE:** SEM1720

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