

## SEM1700 SMART UNIVERSAL SIGNAL CONDITIONER

- > **UNIVERSAL INPUT**

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- > **ISOLATED mA or VOLTAGE OUTPUT WITH RELAYS**

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- > **ISOLATED UNIVERSAL AC DC POWER SUPPLY**

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- > **USER TRIM/CONFIGURATION VIA PUSH BUTTONS**

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- > **PC CONFIGURATION USING USB PORT**

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- > **LIVE DATA CAN BE VIEWED ON AN ANDROID PHONE OR TABLET**

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### > **INTRODUCTION**

The SEM1700 is a DIN rail-mounted universal signal conditioner from Status Instruments. It has been designed to accept most common process and temperature sensor inputs and provide the user with a programmable current or voltage output signal, plus dual relays with a programmable delay function. Isolation is provided between input, output and supply. All temperature ranges are linear to temperature. Both input and output loop excitation are provided as well as a fully universal power supply.

Designed for ease of use, a USB interface is fitted for quick and easy configuration. Just connect a standard USB cable between the SEM1700 and your PC. Using our free configuration software. To further help save time, the SEM1700 does not need to be wired to a power supply during the configuration process, it is powered via the USB interface from your PC.

### > **FEATURE HIGHLIGHTS**

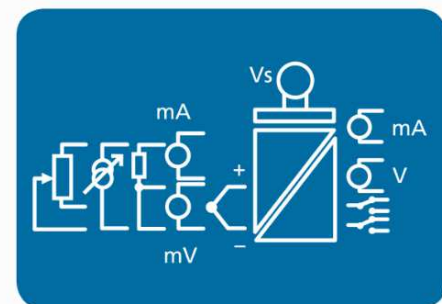
**FLEXIBLE** The SEM1700, with its wide range of input and output options (including two independent relays), paired with the configuration functionality it has to offer, makes it a hugely flexible and versatile tool for many varied applications. Live readings can be displayed to a PC via the configuration software.

**UNIVERSAL** Supply: From 20 VDC to 240 VAC and everything in-between, the auto-detecting power supply is simple but effective, giving the SEM1700 the capability to be powered from a variety of supplies.

**Input:** A wide range of temperature sensors (RTD, T/C) and process inputs, with variable update rates to suit the application, such as a potentiometer needing a quicker update rate.

**Output:** With mA sink and source as well as voltage output options, the SEM1700 can be integrated into process control systems with standard analogue signals. Two relay alarms give additional capabilities.

**USER-FRIENDLY** Designed for ease of use with a universal power supply, I/O options, two-part connectors and simple intuitive software. The SEM1700 also has front of panel push buttons that can be assigned to different functions depending on the application requirements. The SEM1700 is a multi-purpose temperature transmitter/signal conditioning unit.



### **USB PC CONFIGURATION**

The SEM1700 is quick and easy to configure using a standard-type USB lead and the free-of-charge USBSpeedLink Windows software.

**USB ANDROID VIEW** The SEM1700 can be connected to an Android phone or tablet using an OTG USB adaptor. Running a free App, the Android device can then be used to view live data from the SEM1700

# SEM1700 SMART UNIVERSAL SIGNAL CONDITIONER

RTD SENSOR INPUT		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	4 Readings/Second ± 0.5 °C + (0.1 % of FSR)
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	10 Readings/Second ± 1.0 °C + (0.1 % of FRS)
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
Temperature stability (over the range (-10 to 50) °C) ±0.015 % FSR / °C		
FSR = Full Scale range		

THERMOCOUPLE SENSOR INPUT		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	4 Readings/Second ± 1.0 °C + (0.1 % of FSR)
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	10 Readings/Second ± 2.0 °C + (0.1 % of FSR)
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			
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 only			

PROCESS INPUTS		SPECIFICATIONS @20°C	
Type	Range	Stability	Accuracy
50 mV	± 50 mV (Max ± 75 mV)	± 0.04 % FSR / °C	1 Reading/Second ±0.04% + (0.1% of FSR)
200 mV	±200 mV (Max ± 230 mV)		
1 V	± 1 V (Max ± 1.3 V)		
10 V	± 10 V (Max ± 11 V)		
mA	± 25 mA (Max ±30 mA)		
Slide wire*1	(0 to 100) % of pot travel	± 0.05 % / °C	10 Readings/Second ± 0.2 % + (0.1 % of FSR)
Ohms	(20 to 400) Ω Max (0 to 480) Ω	± 0.025 % FSR / °C	
Voltage Input Impedance		1 MΩ	
Current Input Impedance		20 Ω	
Resistance Connection		2 or 3 Wire	
Slide wire pot minimum		(0 to 1) KΩ	
Slide wire pot maximum		(0 to 1) MΩ	
FSR = Full Scale range			

# SEM1700 SMART UNIVERSAL SIGNAL CONDITIONER

OUTPUT ANALOGUE mA CURRENT		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	(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	SELV
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	± 1 uA/°C typically
The mA output range can be set to anywhere within the maximum capability		

OUTPUT ANALOGUE VOLTAGE		SPECIFICATIONS @20°C
Type/Function	Range/Description	Accuracy/Stability/Notes
Two wire voltage	(0 to 10) VDC User VDC	± 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		

OUTPUT RELAY		SPECIFICATIONS @20°C
Type/Function	Range/Description	Accuracy/Stability/Notes
Form C relay contacts		Dual independent
Contact rating	(240 V ac rms @ 1 A; 30 V dc @ 1 A) Resistive Load	
Isolation	To any other port 3750 V	
Response time	Typically < 2 x selected input reading/second	

USB CONFIGURATION USER INTERFACE		
Type/Options /Function	Description	Notes
Configuration hardware	USB mini B	Cable not included
Configuration software	USBSpeedLink	Download <a href="http://www.status.co.uk">www.status.co.uk</a>
Operating system	Microsoft Windows	Windows 7 or later
Input configuration Type Scale Configure range	High, low High, low	RTD list, T/C list, mA, mV, V, Ohms, Slide wire Any within range Push-button, select option in software

# SEM1700 SMART UNIVERSAL SIGNAL CONDITIONER

<b>USB CONFIGURATION USER INTERFACE (continued)</b>		
<b>Type/Options/Function</b>	<b>Description</b>	<b>Notes</b>
Output configuration		
Type	Output signal	mA, V
Scale	High, low	mA, V any value within output range
Error signal	Up, down, user	User = any value within output range
Load correction	For voltage output	In ohms
Damping mA, V	Rise/fall for full range	(0 to 250) s
User trim	At 4 mA and 20 mA	Push-button, select option in software
Relay	Change-over type	Two independently settable
Action	Hi, low, inverted	
Set point	Any value within range	In engineering units
Dead band		In engineering units
Relay delay	Relay on, relay off	(0 to 250) s
Live data	Input Signal	Value
	Output signal	mA, V value
	Cold junction	°C
	Record live data	Save data to CSV file
	Store configuration to PC	Save data to file
Configuration with push button	Button function selection	Configure range, user trim, off
Other device options	Tag number	15 Characters

<b>ANDROID USER INTERFACE</b>		
<b>Type/Function</b>	<b>Range/Description</b>	<b>Accuracy/Stability/Notes</b>
Hardware	USB Lead	OTG plus A to Mini B
Software	USBVeiwLink	Download from Google play store
Read live data	Signal Output	°C, °F, Ω, mV, V, Ω, %, mA, V, Relay state

<b>GENERAL</b>	
<b>Function</b>	<b>Description</b>
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
Galvanic Isolation Supply	Supply to any port 3750 V
Galvanic Isolation Supply	Relays to any port 3750 V
Galvanic Isolation I/P to O/P	500 VDC / 48 VDC working
Update Rate (Resolution)	1 readings/second (16 Bits); 4 Readings/second (14 Bits); 10 readings/second (12 Bits)
Indication (State LED)	Green Flashing = OK Green Solid = input/output/configuration error indication
Relay 1, Relay 2 LEDs	Red LEDs: Not in alarm = LED off, in alarm = LED on

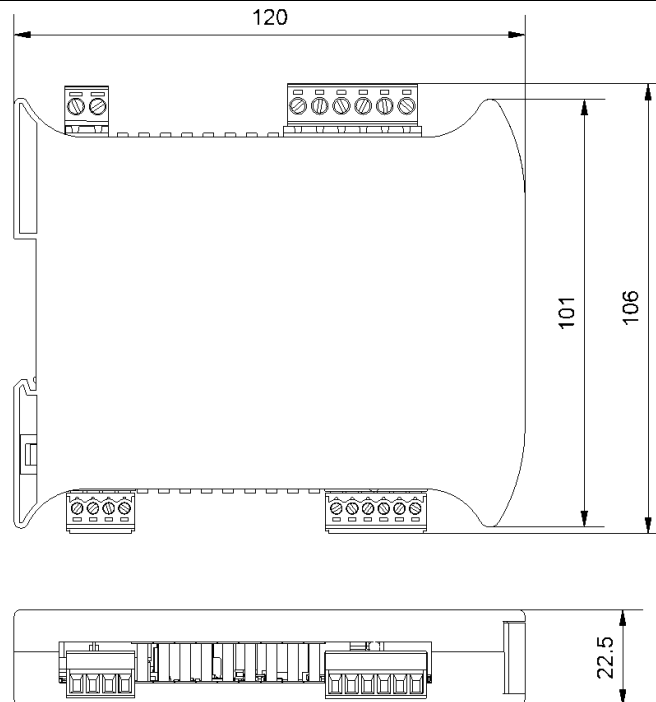
<b>MECHANICAL</b>	
<b>Function</b>	<b>Description</b>
Dimensions	120 mm (from back of rail) x 22.5 mm wide x 106 mm high
Enclosure colour	Grey
Material	Blend PC/ABS self-extinguishing
Connections	Two-part screw connectors for power, inputs, outputs, relays
Weight	145 g approximate
Rail mount	DIN 60715

# SEM1700 SMART UNIVERSAL SIGNAL CONDITIONER

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
Ingress protection	BS EN 60529
Electrical Safety	BS EN 61010-1
RoHS	Directive 2011/65/EU

## MECHANICAL



<b>ORDER CODE</b>	<b>SEM1700</b>
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ACCESSORIES	
USB configuration software	USBSpeedLink free of charge from <a href="http://www.status.co.uk">www.status.co.uk</a>
Android live data view	USBViewLink (free of charge from Google play store)
Loop powered display	Refer to <a href="http://www.status.co.uk">www.status.co.uk</a>
USB Leads	Contact <a href="mailto:sales@status.co.uk">sales@status.co.uk</a>

To maintain full accuracy, annual calibration is required. Contact [support@status.co.uk](mailto:support@status.co.uk) for details  
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