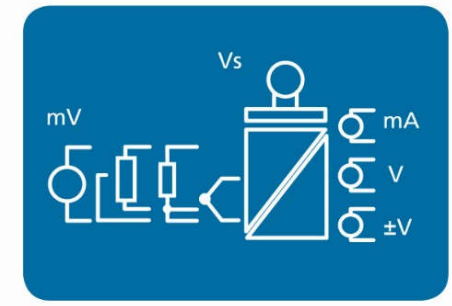
KOS1600T RTD/TC/SLIDE WIRE SIGNAL CONDITIONER

- **RTD, THERMOCOUPLE, THERMISTOR (BMS SENSORS), SLIDE WIRE, mV AND RESISTANCE INPUTS**
- **mA, VOLTAGE OR BIPOLAR VOLTAGE OUTPUT**
- **SENSOR OFFSET (TEMPERATURE)**
- **22 SEGMENT USER LINEARISATION (PROCESS)**
- **CONFIGURATION USING USB PORT**

KOS1600T



INTRODUCTION

The KOS1600T accepts temperature or mV and resistive type inputs. The flexible design allows the use of any resistive sensor within the range of (10 to 10500) Ω. Including Pt100, 500, 1000, Ni or Cu sensors, as well as thermistor sensors, and multiple different thermocouple types, slide wire sensors up to 100 KΩ and direct resistances.

Flexible output configuration offers active or passive mA and bi-polar voltage ranges.

For ease of use, a high-efficiency switch-mode power supply is fitted as standard and does not require any adjustment between ac or dc applications. Operating voltages are (10 to 48) VDC and (10 to 32) VAC.

The free USBSpeedLink programming software offers two programming modes for the KOS1600T: temperature and process. These modes enable the user to configure the product exactly to requirements.

FEATURE HIGHLIGHTS

TEMPERATURE MODE For use with RTD, thermistor, and thermocouple sensors, the KOS1600T has an isolated input and can be programmed in either °C or °F. The KOS1600T sensor-referencing feature allows for close matching to a known reference sensor, eliminating possible sensor errors.

PROCESS MODE The KOS1600T is for use with slide-wire sensors and can also accept mV and resistance inputs. A 22 segment user linearisation table allows for profiling of the input signal for sensors that do not have a “straight line “input to output relationship.

SENSOR LIBRARY The USBSpeedLink software will load each temperature sensor profile to the unit as required. The software library includes all common RTD and thermocouple sensors. The library also includes thermistor sensors, PTC and NTC types; if a required sensor type is not currently in the library, it is possible to create the profile and add it to the library for selection (support@ditel.es for details).

USB CONFIGURATION The KOS1600T does not need to be wired to a power supply during the configuration process; it is powered (for programming only) via the USB interface from a PC.

SIGNAL RETRANSMISSION SCALING The input signal range for retransmission can be selected from any part of the maximum input capability. The output signal range can be selected from any part of the total output capability, for example (0 to 50) °C input to (1 to 5) mA output.

SIGNAL INPUT RESISTANCE		SPECIFICATIONS @20°C
Type	**Range**	**Accuracy / Stability**
Ohms	(10 to 500) Ω (500 to 2500) Ω (2500 to 10500) Ω	± 0.055 Ω ± 0.5 Ω ±10.0 Ω
Excitation current		< 200 uA
Maximum lead resistance		20 Ω
Thermal stability	Zero error at 20 °C (10 to 500) Ω (500 to 2500) Ω (2500 to 10500) Ω	 ± 0.013 Ω/°C ± 0.063 Ω/°C ± 0.27 Ω/°C

SIGNAL INPUT SLIDE-WIRE		SPECIFICATIONS @20°C
Type	**Range**	**Accuracy / Stability**
Potentiometer 3 wire Minimum Maximum	 (0 to 1) KΩ (0 to 100) KΩ	 ± 0.1% of full range ± 0.1% of full range
Excitation current		< 200 uA
Maximum lead resistance	2 or 3 wires	20 Ω
Thermal stability	Zero error at 20 °C,	See resistance stability figures

SIGNAL INPUT mV		SPECIFICATIONS @20°C
Type	**Range**	**Accuracy / Stability**
mV	(-100 to 200) mV *1	± 0.06 mV
*1 The KOS1600T can be configured to any input value between (-200 to 200) mV but accuracies are not given below -100 mV		

SENSOR INPUT RTD		SPECIFICATIONS @20°C
Type	**Range**	**Accuracy / Stability**
PT100 (IEC)	(-200 to 850) °C	±0.2°C ±(0.05% of reading) *1
PT100 0.391	(-200 to 630) °C	
PT100 0.392	(-200 to 630) °C	
PT100 0.393	(-200 to 630) °C	
PT500 (IEC)	(-200 to 850) °C	
Pt1000 (IEC)	(-200 to 600) °C	
Cu53	(-40 to 180) °C	
Cu100	(-80 to 260) °C	
Cu1000	(-80 to 260) °C	
Ni100	(-60 to 180) °C	
Ni120	(-70 to 180) °C	
Ni1000	(-40 to 150) °C	
Excitation current		< 200 uA
Maximum lead resistance	2 or 3 wire	20 Ω per leg
Lead effect		0.002 °C / °C
Thermal stability	Zero error at 20 °C	see resistance stability figures
*1 plus any sensor error		
Library contains more sensor standards/types		

SENSOR INPUT **THERMISTOR (BMS sensors)**		**SPECIFICATIONS @20°C**
Type	**Range**	**Accuracy / Stability**
KTY81, KTY82 -110 -120 KTY81, KTY82 -121 KTY81, KTY82 -210 -220 KTY81, KTY82 -221 KTY81, KTY82 -222 KTY83-110 -210 KTY83-121	(-60 to 155) ˚C	Refer to resistance table and thermistor data sheet for ohms = ˚C relationship to calculate error, or contact support@ditel.es *1
KTY84-130	(-40 to 300) ˚C	
MGC13	(125 to 240) ˚C	
PT&-312	(0 to 500) ˚C	
Thermal stability		Refer to resistance table and thermistor data sheet for ohms = ˚C relationship
Library contains more sensor standards/types		
*1 plus any sensor error		

SENSOR INPUT **THERMOCOUPLE**		**SPECIFICATIONS @20°C**
Type	**Range**	**Accuracy / Stability**
K	(-200 to 1370) ˚C	± 0.1% of full input range ± CJ error *1
J	(-100 to 1200) ˚C	
E	(-200 to 1000) ˚C	
N	(-180 to 1300) ˚C	
T	(-200 to 400) ˚C	± 0.2% of full input range ± CJ error *1
R	(-10 to 1760) ˚C	± 0.1% of full input range ± CJ error *1 over the range (800 to 1600) ˚C
S		
mV	(-10 to 70) mV	± 0.02 % of full input range
Thermal drift	(-20 to 50) ˚C	(± 0.15 ˚C/˚C @ zero) + (± 0.1 ˚C /˚C @ span)
	(50 to 70) ˚C	Typically as above
Any span may be selected; full accuracy is only guaranteed for spans greater than 25°C		
Basic measurement accuracy includes the effects of calibration, linearization and repeatability		
Library contains more standards/types		
*1 plus any sensor error		

COLD JUNCTION (CJ)		**SPECIFICATIONS @20°C**
Type	**Range ˚C**	**Accuracy/ Stability**
Thermistor bead	(-40 to 85)˚C	± 0.5 ˚C
Thermal drift	Zero at 20 ˚C	± 0.05 ˚C/ ˚C

OUTPUT **ANALOGUE mA CURRENT**		**SPECIFICATIONS @20°C**
Type / Function	**Range / Description**	**Accuracy / Stability / Notes**
Two wire current	(0 to 20) mA (4 to 20) mA	(mA output /2000) or 5 uA (Whichever is the greater)
Current source	(0 to 20) mA	Maximum load 750 Ω
Current sink	Supply voltage (10 to 30) Vdc	SELV
Loop voltage effect		0.2 uA/ V (sink mode)
Maximum output		21.5 mA
Thermal stability	Zero at 20 ˚C	1 uA/ ˚C
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 (-10 to 10) VDC	± 5 mV
Maximum output		10.1 VDC, -10.1 VDC
Current drive		± 2 mA, minimum load 5 KΩ @ 10 V
Thermal stability	Zero at 20 °C	± 10 uV/°C
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.ditel.es
Operating system	Microsoft Windows	Windows 7 or later

USB CONFIGURATION USER INTERFACE TEMPERATURE MODE		
Type / options / function	**Description**	**Notes**
Input configuration Input type Sensor type Input scale Sensor offset Filter	 High, low	 Thermocouple, RTD, Thermistor (selected from RTD library) Multiple options from list and library °C, °F any within input range °C, °F (0 to 100) s
Output configuration Type Output scale Error signal	 Output signal High, low Sensor fail detect	 mA, V, ±V mA, V, ±V any within output range Any value within output range
Other device options	Tag number Record live data Store configuration to PC	20 Characters Save data to CSV file Save data to file
Live data	Input Signal Output signal Output % Output signal	Ω, mV °C, °F % of full scale output mA, V, ±V

USB CONFIGURATION USER INTERFACE PROCESS MODE		
Type / options / function	**Description**	**Notes**
Input configuration Input type Input scale Damping Process linearisation Process table Filter Engineering units	 High, low Rise, fall seconds for full range swing Table segments Input to output relationships User defined	 Ω, mV, % (for slide wire) Ω, mV, % any within input range (0 to 3600) s (3 to 22) Ω, mV, % = engineering units (0 to 100) s 4 Characters

Output configuration Process output Type Output scale	 Engineering units high, low Output signal High, low	 Any within range mA, V, ±V mA, V, ±V any within output range
USB CONFIGURATION USER INTERFACE PROCESS MODE (continued)		
Other device options	Tag number Record live data Store configuration to PC	20 Characters Save data to CSV file Save data to file
Live data	Input electrical value Input Process value Output % Output signal	Ω, mV In engineering units % of full scale output mA, V, ±V

GENERAL	
Function	**Description**
Update time	300 ms
Response time	400 ms
Start-up time	5 s (output condition lags)
Warm-up time	120 s until full accuracy
Galvanic isolation	Three way (input, output, supply) 500 VDC
Default configuration	PT100 (0 to 100)°C = (4 to 20) mA, high burnout, no filter, no offset
State LED	Red = fault, green = OK, input and output condition monitored
Supply range Power Protection	(10 to 32) VAC rms, (10 to 48) VDC SELV < 1 W @ full output current Internal resettable fuse (0.5 A) + over-voltage protection

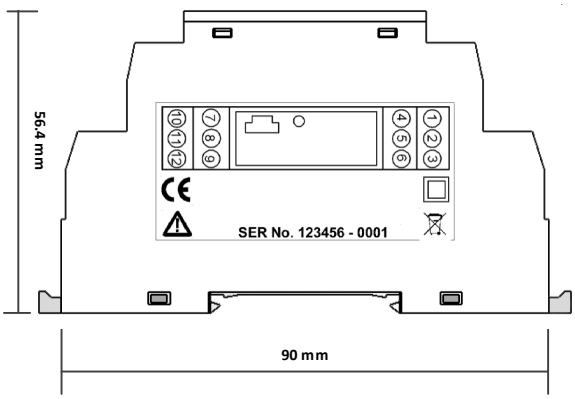
MECHANICAL	
Function	**Description**
Dimensions	17.5 mm width, 56.4 mm depth from rail, 90 mm height
Enclosure	DIN rail mount
Material	Polymide 6.6 self-extinguishing: Grey
Connections	Screw terminals 2.5 mm wire maximum
Weight	55 g approximate

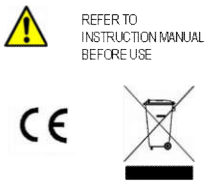
ENVIRONMENTAL	
Function	**Description**
Ambient temperature	Operating/Storage (-30 to 70) °C
Ambient Humidity	Operating/Storage (10 to 90) %RH non-condensing
Protection requirement	Device must be installed in an enclosure offering =>IP64 Protection
USB configuration ambient	(10 to 30) °C

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

MECHANICAL

Dimensions in mm





MECHANICAL DETAIL

Material	Polymide 6.6 self extinguishing
Terminals	Screw terminal
Cable	2.5 mm Max
Colour	Grey

ORDER CODE	KOS1600T

ACCESSORIES	
USB configuration software	USBSpeedLink free of charge from www.ditel.es
Loop powered display	Refer to www.ditel.es
Probe options	Refer to www.ditel.es
48-200-0001-01	Standard USB A to USB mini B cable for configuration

To maintain full accuracy annual calibration is required contact support@ditel.es for details

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