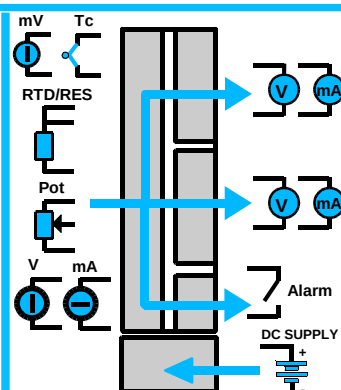




Via Lago di Molveno 20, 36015 Schio (VI)
Phone: +39 0445661722 Fax: +39 0445661792

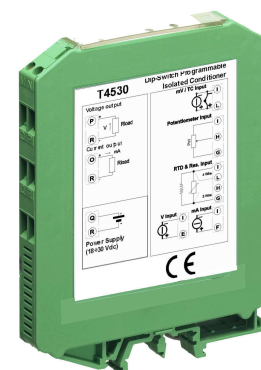
FEATURES

- Universal configurable input for: mV, Tc, RTD, Res, Potentiometer, V and mA
- Two outputs configurable in current or voltage
- Trip alarm
- Configurable by dip-switch or PC
- High accuracy
- On-field reconfigurable
- Galvanic isolation among all the ways
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



Universal isolated converter
configurable by Dip-Switch or PC
double output & trip amplifier

TS-4530



GENERAL DESCRIPTION

The universal isolated converter TS-4530 is able to measure and linearise voltage, current and resistance signals, potentiometers and the standard thermocouples and RTDs with, if required, the cold junction compensation, the wires compensation. For mV, V and mA input it is possible to set an option for the fast sampling (option HS) or to extract the square root of the measured signal (option SQRT). In function of programming, the measured values are converted in a current or voltage signal on the two outputs. Moreover an output contact is available as trip alarm.

The device guarantees high accuracy and performances stability both versus time and temperature.

The programming is made by the dip-switch located in the window on the side of the enclosure. By means of dip-switches it is possible to select the input type and range and the output type without recalibrate the device.

Moreover, by Personal Computer the user can program all of the device's parameters for his own necessity; the programming by PC allows to set the two outputs with independent settings and the parameters of the Trip Alarm.

The 1500 Vac galvanic isolation on all ways (input, outputs and power supply) eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

The TS-4530 is in compliance with the Directive 2004/108/EC on the Electromagnetic Compatibility.

It is housed in a plastic enclosure of 12.5 mm thickness suitable for DIN rail mounting in compliance with EN-50022 and EN-50035 standards.

USER INSTRUCTIONS

The converter must be powered by a direct voltage applied to the terminals U and V.

The analogue channel measures the value from the sensor connected to the terminals C-D-E-F-G-H-I-L and transmits the output measures on the terminals M-N-O-P (OUT A) and the terminals Q-R-S-T (OUT B). A contact for the trip alarm is available on the terminals A-B.

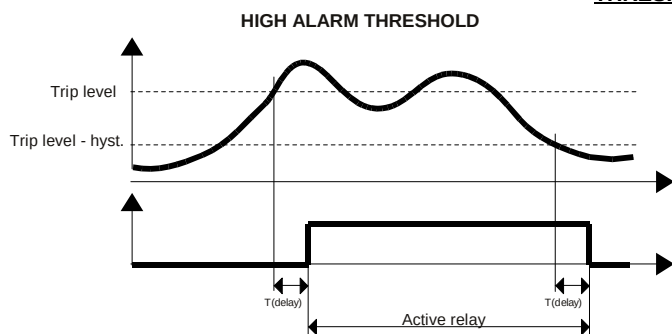
The input and output connections must be made as shown in the section "Connections".

It is possible to configure the converter on field by dip-switch or Personal Computer as shown in the section " Programming ". The configuration by dip-switches can be made also if the device is powered (note: after the configuration the device takes some seconds to provide the right output measure).

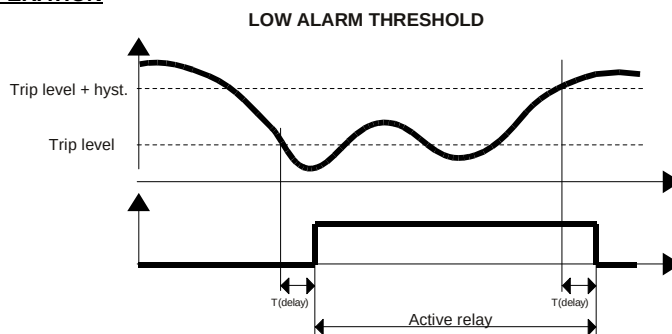
TECHNICAL SPECIFICATIONS (Typical @ 25 °C and in nominal conditions)

INPUT				Linearity (1) TC, RTD ± 0.1 % f.s. mV, V, mA ± 0.05 % f.s. Input impedance TC, mV ≥ 10 MΩ mA ~22 Ω RTD excitation current RTD, Res 400 uA Aux. Voltage >18V @ 20mA Line resistance influence (1) TC, mV ≤0.8 uV/Ohm RTD 3 wires 0.05%/Ω (50Ω max balanced) RTD 4 wires 0.005%/Ω (100Ω max balanced) Thermal drift (1) Full scale ± 0.01% / °C CJC ± 0.01% / °C CJC Comp. ± 0.5°C				ALARM TRIP	
Input type	Min	Max	Span min					Contact	SPST
TC (CJC int./ext.)									
J	-200°C	1200°C	100°C						
K	-200°C	1300°C	100°C						
S	0°C	1750°C	400°C						
R	0°C	1750°C	400°C						
B	0°C	1850°C	400°C						
E	-200°C	1000°C	100°C						
T	-200°C	400°C	100°C						
N	-200°C	1300°C	100°C						
Voltage									
mV	-100 mV	+90 mV	5 mV						
mV	-100 mV	+200 mV	10 mV						
mV	-100 mV	+800 mV	20 mV						
RTD (2, 3, 4 wires)									
Pt100	-200°C	850°C	50°C						
Pt1000	-85°C	185°C	30°C						
Ni100	-60°C	180°C	50°C						
Ni1000	-60°C	150°C	30°C						
RES. (2, 3, 4 wires)	0 Ω	500 Ω	50 Ω						
	0 Ω	2000 Ω	50 Ω						
Pot. (Rnom.< 50KΩ)	0 %	100 %	10 %						
Voltage	-10 V	10 V	1 V						
Current	0 mA	20 mA	1 mA						
Calibration (1)	the higher of ±0.1% and ±12 uV the higher of ±0.1% and ±0.2°C the higher of ±0.1% and ±0.15 ± 0.05 % f.s. the higher of ±0.1% and ± 2 mV the higher of ±0.1% and ± 6 uA ± 0.5 % f.s (opt. HS)			OUTPUT (2 CHANNELS)					
				Output type	Min	Max	Min Span		
				Current	0 mA	20 mA	4 mA		
				Voltage	0 V	10 V	1 V		
				Output calibration Current ± 7 uA Voltage ± 5 mV Aux. Voltage >12V @ 20mA Burn-out values Max. output value 22 mA or 11 V Min. output value 0 mA or -0.6 V Output load Resistance - Rload Current output < 500 Voltage output > 10 KΩ Short circuit current 30 mA max. Response time (10÷ 90%) about 400 ms 100 ms (option HS)					
				POWER SUPPLY Power supply voltage 20 .. 30 Vdc Reverse polarity protection 60 Vdc max Current consumption Current output 90 mA max. Voltage output 30 mA max.					
				ISOLATION Among all the ways 1500 Vac, 50 Hz, 1 min					
				TEMPERATURE AND HUMIDITY Operative temperature -20°C .. +60°C Storage temperature -40°C.. +85°C Humidity (not condensed) 0 .. 90 %					
				HOUSING Material Self-extinguishing plastic Mounting DIN rail in compliance with EN-50022 and EN-50035 Weight about 90 g.					
				EMC (for industrial environments) Immunity EN 61000-6-2 Emission EN 61000-6-4					

THRESHOLD OPERATION



For the high alarm the relay goes on when the input signal is higher than the trip level and after the delay time. The relay goes off only when the input signal is lower than the trip level minus the hysteresis value or when reaches the minimum value of the input scale and after the delay time.



For the low alarm the relay goes on when the input signal is lower than the trip level and after the delay time. The relay goes off only when the input signal is higher than the trip level plus the hysteresis value or when reaches the maximum value of the input scale and after the delay time.

PROGRAMMING

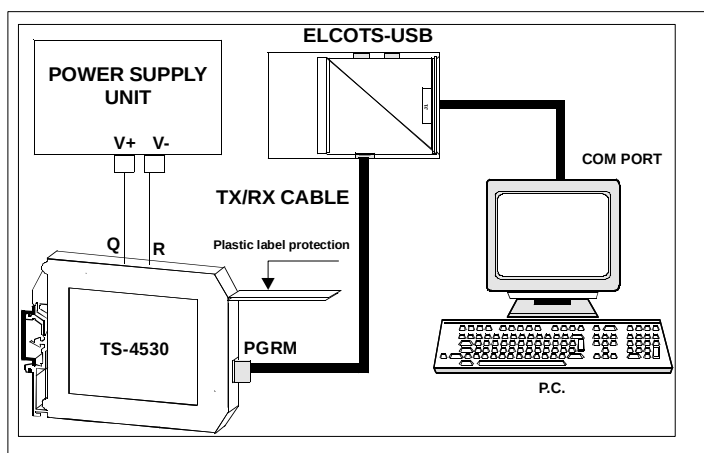
CONFIGURATION BY PC

By software DATESOFT it is possible to:

- set the default programming of the device;
- program the options not available with the dip-switch;
- (burn-out level, CJC offset, trip alarm settings, fast sampling, etc...);
- read, in real time, the input and output measures;
- follow the dip-switches configuration wizard.

To configure the device follow the next steps:

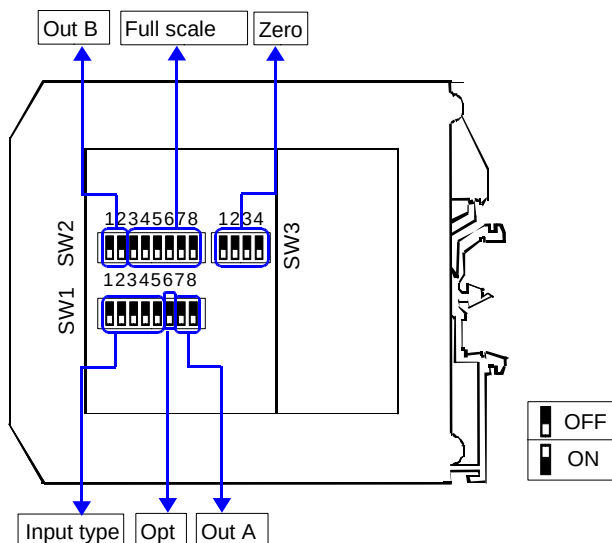
- 1) Power-on the device.
- 2) Open the protection plastic label on the front of the device.
- 3) Connect the interface ELCOTS-USB to the PC (COM port) and to the device (PGRM connector).
- 4) Open DATESOFT.
- 5) Select the COM port in use.
- 6) Click on "Open COM".
- 7) Click on the icon "Program".
- 8) Set the programming data.
- 9) Click on the icon "Write" to send the programming data to the device.



Warning: during these operations the device must always be powered and the TX/RX cable always connected.
For information about DATESOFT refer to the software's user guide.

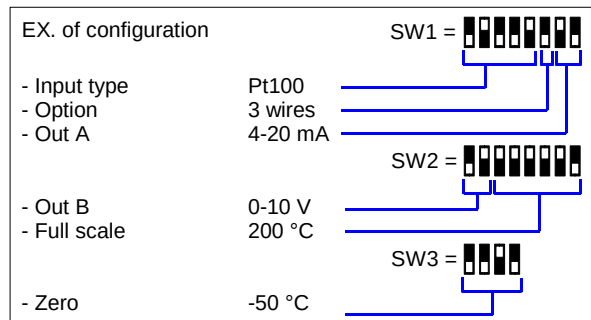
CONFIGURATION BY DIP-SWITCHES

- 1) Open the suitable door on the side of the device.
- 2) Set the input type by the dip-switch SW1 [1..5] (see TAB.1)
- 3) Set the output A type by the dip-switch SW1 [7..8] and SW2 [1..2] (see TAB.2)
- 4) Set, if available, the input option by the dip-switch SW1 [6] (see TAB.3)
- 5) Set the minimum input scale value (Zero) by the dip-switch SW3 [1..4] (see TAB.4)*
- 6) Set the maximum input value (Full scale) by the dip-switch SW2 [3..8] (see TAB.4)*



NOTE:

- It is also possible to set the dip-switches using the wizard of the configuration software following the procedure described in the section "Configuration by PC" until the step 6 and clicking on icon "Switch".



TAB.4c – Resistance < 2 Kohm input scale settings.

Zero		Full Scale		Full Scale		Full Scale		Full Scale	
SW3 1 2 3 4	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω
	Default		Default		800		1150		1600
	0		500		820		1175		1650
	150		520		840		1200		1700
	200		540		860		1225		1750
	250		560		880		1250		1800
	300		580		900		1275		1850
	350		600		920		1300		1900
	400		620		940		1325		1950
	450		640		960		1350		2000
	500		660		980		1375		2000
	550		680		1000		1400		2000
	600		700		1025		1425		2000
	650		720		1050		1450		2000
	700		740		1075		1475		2000
	750		760		1100		1500		2000
	800		780		1125		1550		2000

TAB.4d – Resistance < 500 ohm input scale settings

Zero		Full Scale		Full Scale		Full Scale		Full Scale	
SW3 1 2 3 4	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω
	Default		Default		125		210		370
	0		50		130		220		380
	10		55		135		230		390
	20		60		140		240		400
	30		65		145		250		410
	40		70		150		260		420
	50		75		155		270		430
	75		80		160		280		440
	100		85		165		290		450
	125		90		170		300		460
	150		95		175		310		470
	175		100		180		320		480
	200		105		185		330		490
	225		110		190		340		500
	250		115		195		350		500
	300		120		200		360		500

TAB.4e – Potentiometer input scale settings

Zero		Full Scale		Full Scale		Full Scale		Full Scale	
SW3 1 2 3 4	%	SW2 3 4 5 6 7 8	%	SW2 3 4 5 6 7 8	%	SW2 3 4 5 6 7 8	%	SW2 3 4 5 6 7 8	%
	Default		Default		34		66		98
	0		5		36		68		100
	15		6		38		70		100
	20		8		40		72		100
	25		10		42		74		100
	30		12		44		76		100
	35		14		46		78		100
	40		16		48		80		100
	45		18		50		82		100
	50		20		52		84		100
	55		22		54		86		100
	60		24		56		88		100
	65		26		58		90		100
	70		28		60		92		100
	75		30		62		94		100
	80		32		64		96		100

TAB.4f – Current input scale settings

Zero		Full Scale											
SW3 1 2 3 4	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA
	Default		Default		8		11.5		16		16.5		16.5
	0		5		8.2		11.75		16.5		16.5		16.5
	1.5		5.2		8.4		12		17		17		17
	2		5.4		8.6		12.25		17.5		17.5		17.5
	2.5		5.6		8.8		12.5		18		18		18
	3		5.8		9		12.75		18.5		18.5		18.5
	3.5		6		9.2		13		19		19		19
	4		6.2		9.4		13.25		19.5		19.5		19.5
	4.5		6.4		9.6		13.5		20		20		20
	5		6.6		9.8		13.75		20		20		20
	5.5		6.8		10		14		20		20		20
	6		7		10.25		14.25		20		20		20
	6.5		7.2		10.5		14.5		20		20		20
	7		7.4		10.75		14.75		20		20		20
	7.5		7.6		11		15		20		20		20
	8		7.8		11.25		15.5		20		20		20

TAB.4g – Voltage input scale settings

Zero		Full Scale											
SW3 1 2 3 4	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt
	Default		Default		3.4		6.6		9.8		9.8		9.8
	0		0.5		3.6		6.8		10		10		10
	1.5		0.6		3.8		7		10		10		10
	2		0.8		4		7.2		10		10		10
	2.5		1		4.2		7.4		10		10		10
	3		1.2		4.4		7.6		10		10		10
	3.5		1.4		4.6		7.8		10		10		10
	4		1.6		4.8		8		10		10		10
	4.5		1.8		5		8.2		10		10		10
	5		2		5.2		8.4		10		10		10
	5.5		2.2		5.4		8.6		10		10		10
	6		2.4		5.6		8.8		10		10		10
	6.5		2.6		5.8		9		10		10		10
	7		2.8		6		9.2		10		10		10
	7.5		3		6.2		9.4		10		10		10
	8		3.2		6.4		9.6		10		10		10

INSTALLATION INSTRUCTIONS

The device is suitable for fitting to DIN rails in the vertical position. For optimum operation and long life follow these instructions:

When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following cases:

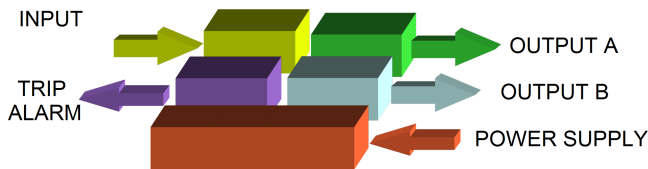
- If panel temperature exceeds 45°C.
- Use of high power supply value ($> 27 \text{ Vdc}$).
- Use of one or both current outputs.
- Use of active current input.

Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.

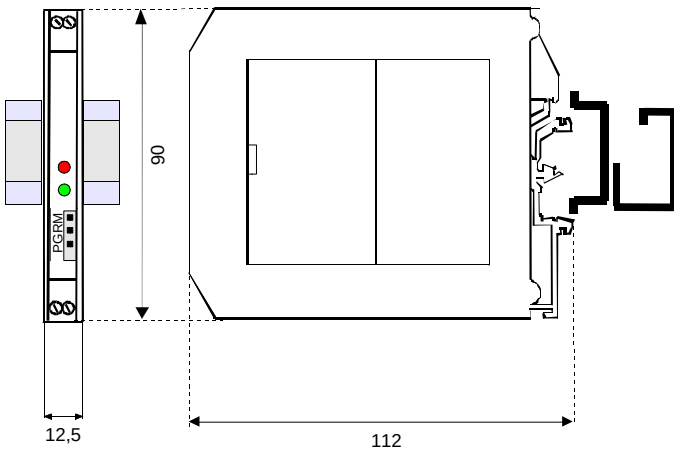
Install the device in a place without vibrations.

Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...) and to use shielded cable for connecting signals.

ISOLATION STRUCTURE

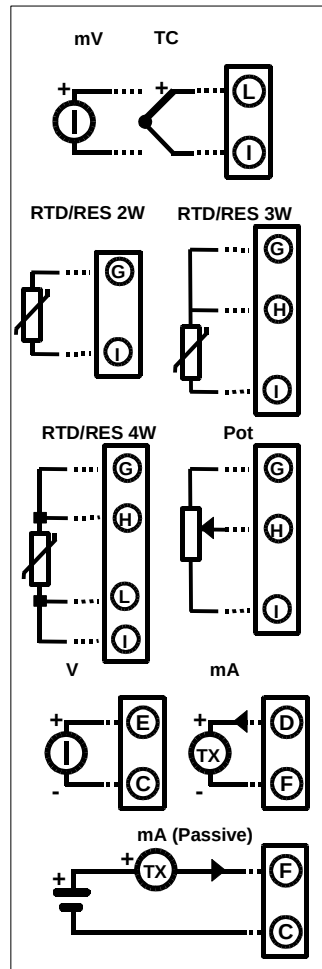


DIMENSIONS (mm)



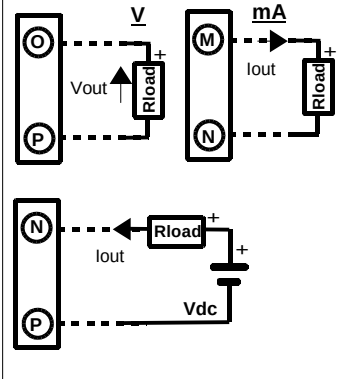
CONNECTIONS

INPUT SIDE

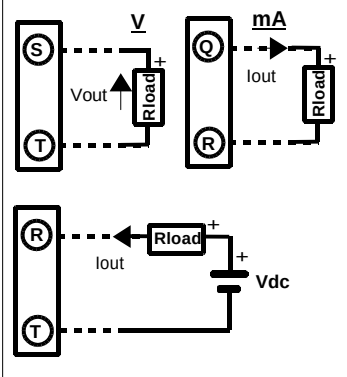


OUTPUTS SIDE

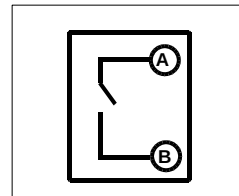
OUT A



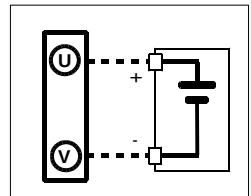
OUT B



TRIP ALARM CONTACT



POWER SUPPLY



LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINKING	Wrong dip-switches settings
ALARM	RED	ON	Trip alarm active
		OFF	Trip alarm not active

HOW TO ORDER

The device is provided as requested on the Customer's order. Refer to the section "Programming" to determine the input and output ranges. In case of the configuration is not specified, the parameters must be set by the user.

ORDER CODE EXAMPLE:

TS-4530 / Pt100 / 0 ÷ 200 °C / 4 ÷ 20 mA / 4 ÷ 20 mA / 3wires

