

## All Way Signal Isolation Converter

**DAT 4235**
**FEATURES**

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- Galvanic isolation at 1500 Vac on the 3 ways
- Configurable output in current or voltage with Damping function
- Configurable by Personal Computer by cable CVPROG
- High accuracy
- Device configurable via micro-USB without power supply
- EMC compliant – CE / UKCA mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN50035


**GENERAL DESCRIPTION**

The converter DAT 4235 measures and linearises the temperature characteristic of RTDs sensors, converts the linear variation of resistance, converts a standard active current signal or a voltage signal even coming from a potentiometer connected on its input. The device measures and linearises the standard thermocouples with internal cold junction compensation. In function of programming, the values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both in time and in temperature.

On the front side of the device there is the led PWR to signal the correct state of the power supply.

The programming of the device can be performed also without power supply using the proper cable connected to the micro USB connector on the front side of the device. With cable connected, the led PWR will be lighted on signalling the connection to the USB port. The programming of the DAT 4235 is made by a Personal Computer using the software **DATAPRO** or later versions, developed by DATEXEL, that runs under the operative system "Windows™". By use of it, it is possible to configure the converter to interface it with the most used sensors. In case of sensors with a no-standard output characteristic, it is possible to execute, via software, a "Custom" linearisation (per step) to obtain an output linearised signal. For Resistance and RTDs sensors it is possible to program the cable compensation with 3 or 4 wires; for Thermocouples it is possible to program the Cold Junction Compensation (CJC) as internal or external.

It is possible to set the minimum and maximum values of input and output ranges in any point of the scale, keeping the minimum span shown in the table below. Moreover it is available the option of alarm for signal interruption (burn-out) that allows to set the output value as high or low out of scale.

For the device it is foreseen the damping function that allows to set a programmable filter up to 30 seconds to reduce eventual fast variations on the input signals. **The terminals of the current signal on input side must be only connected to active current loop.** The 1500 Vac isolation between input, power supply and output eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

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 connection of power supply, input and output must be done as indicated in the section "Wiring". It is possible to set the converter on field as indicated in the section "Programming"; this operation can be done both with device powered on and powered off.

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

INPUT				OUTPUT				GENERAL SPECIFICATIONS	
Input type	Min	Max	Span min	Signal type	Min	Max	Span min		
<b>TC (CJC int./ext.)</b>				Direct current	-20 mA	20 mA	4 mA	Supply voltage	18 .. 30 Vdc
J	-200°C	1200°C	50 °C	Reverse current	20 mA	- 20 mA	4 mA	Reverse polarity protection	60 Vdc max
K	-200°C	1370°C	50 °C	Direct voltage	-10 V	10 V	1 V	<b>Current consumption</b>	
S	-50°C	1760°C	400 °C	Reverse voltage	10 V	-10 V	1 V	Current output	55 mA max.
R	-50°C	1760°C	400 °C					Voltage output	35 mA max
B	400°C	1820°C	400 °C	<b>Output resolution</b>				<b>ISOLATION</b>	
E	-200°C	1000°C	50 °C	Current	± 7 uA or ± 15 uA (2)			On all the ways	1500 Vac, 50 Hz, 1min.
T	-200°C	400°C	50 °C	Voltage	± 5 mV			<b>ENVIRONMENTAL CONDITIONS</b>	
N	-200°C	1300°C	50 °C	<b>Out of scale values</b>				Operative Temperature	-40°C ..+85°C
<b>Voltage</b>				Max. values	about 21.5 mA or 10.5 Vdc			Storage Temperature	-40°C.. +85°C
mV	-400 mV	+400 mV	2 mV	Min. values	about -21.5 mA or -10.5 Vdc			Humidity (not condensed)	0 .. 90 %
mV	-100 mV	+700 mV	2 mV	<b>Output Load Resistance (Rload)</b>				Maximum Altitude	2000 m
<b>RTD(*) 2,3,4 wire</b>				Current output	≤ 600 Ω			Installation	Indoor
Pt100	-200°C	850°C	40°C	Voltage output	≥ 600 Ω			Category of installation	II
Pt1000	-200°C	200°C	50°C	Limitation current	about 30 mA			Pollution Degree	2
Ni100	-60°C	180°C	20°C	<b>Response time (10+ 90%)</b>	about 50 ms			<b>MECHANICAL SPECIFICATIONS</b>	
Ni1000	-60°C	150°C	50°C	<b>Thermal drift (1)</b>				Material	Self-extinguish plastic
<b>RES. 2,3,4 wire</b>				Full scale	± 0.01% / °C			IP Code	IP20
Low	0 Ω	300 Ω	10 Ω	CJC	± 0.01% / °C			Wiring	wires with diameter 0.8÷2.1 mm² /AWG 14-18 0.8 N m
High	0 Ω	2000 Ω	200 Ω	<b>Damping</b>				Tightening Torque	0.8 N m
<b>Potentiometer</b>				Selectable from 0.1 to 30 seconds.				Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
(nominal value < 50 KΩ)	0 %	100 %	10%	Value 0: function not active.				Weight	about 90 g.
<b>Voltage</b>	-10 V	10 V	0,5 V					<b>CERTIFICATIONS</b>	
<b>Current</b>	-20 mA	20 mA	2 mA					<b>EMC ( for the Industrial Environments )</b>	
<b>Input calibration (1)</b>								Immunity	EN 61000-6-2
RTD	> of ±0.1% f.s. or ±0.2°C							Emission	EN 61000-6-4
Low res.	> of ±0.1% f.s. or ±0.15 Ω							<b>UKCA (ref S.I. 2016 N°1091 )</b>	
High res.	> of ±0.2% f.s. or ±1 Ω							Immunity	BS EN 61000-6-2
mV, TC	> of ±0.1% f.s. or ±18 uV							Emission	BS EN 61000-6-4
Volt	> of ±0.1% f.s. or ± 2 mV								
mA	> of ±0.1% f.s. or ± 6 uA								
<b>Linearity (1)</b>									
TC	± 0.2 % f.s.								
RTD	± 0.1 % f.s.								
<b>Input impedance</b>									
TC, mV	≥= 10 MΩ								
Volt	≥= 1 MΩ								
Current	~ 50 Ω								
<b>Line resistance influence</b>									
TC, mV	≤=0.8 uV/Ohm								
RTD 3 wires	0.05%/Ω (50 Ω balanced max.)								
RTD 4 wires	0.005%/Ω (100 Ω balanced max.)								
<b>RTD sensor current</b>	Typical 0.350 mA								
<b>CJC comp.</b>	± 0.5°C								

(1) referred to input Span (difference between max. and min. values)

(2) referred to the output ± 20 mA.

(\*) For temperature sensors it is possible to set the input range also in °F; to made the conversion use the formula: °F = (°C/5)+32

## CONFIGURATION AND CALIBRATION

**Notice: before to execute the next operations, check that the drivers of the cable CVPROG in use have been previously installed in the Personal Computer.**

### - CONFIGURATION

- 1) Open the plastic label protection on front side of the device.
- 2) If not previously done install the drivers of the CVPROG cable.
- 3) Connect the two plugs of cable CVPROG to the Personal Computer (USB plug) and to the device (uUSB plug).
- 4) Run the software DATAPRO or later versions.
- 5) Set the parameters of configuration.
- 6) Program the device.

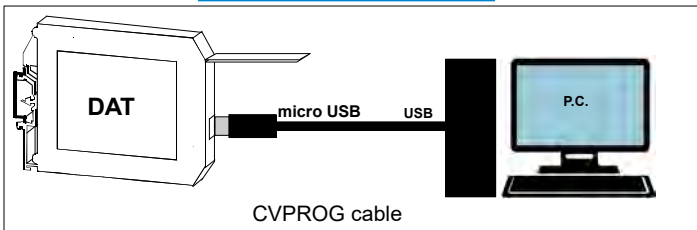
### - CALIBRATION CONTROL

**Notice: during this operation the device must be always powered.**

**With software running:**

- 1) Connect on the input a calibrator set with minimum and maximum values referred to the electric signal or to the temperature sensor to measure.
  - 2) Set the calibrator at the minimum value.
  - 3) Verify that the device provides on output the minimum setted value.
  - 4) Set the calibrator at the maximum value.
  - 5) Verify that the device provides on output the maximum setted value.
  - 6) In case of regulation of value obtained in the step 3 and 5, use the ZERO and SPAN regulators of software
- The variation introduced from these regulators must be calculated as percentage of the input range.
- 7) Program the device with the new parameters.

## DAT4235 PROGRAMMING

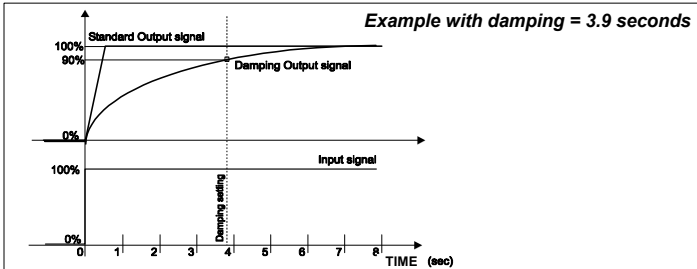


CVPROG cable

## LIGHT SIGNALLING

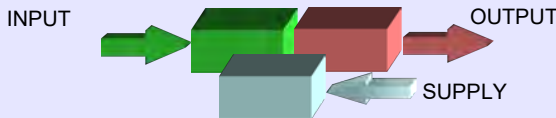
LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered / Usb connected
		OFF	Device not powered

## DAMPING FUNCTION(\*\*)

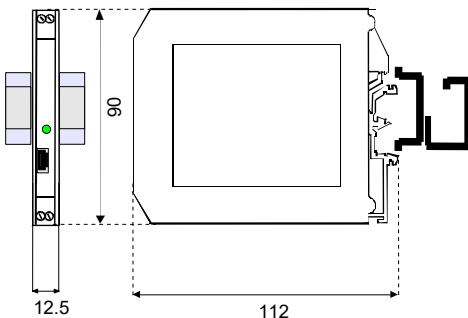


(\*\*)For RTD input with span lower than 50°C (122°F) and for Thermocouple input with span lower than 100°C (212°F) the damping must be set as at least 0.5 s

## ISOLATION STRUCTURE



## DIMENSIONS (mm)



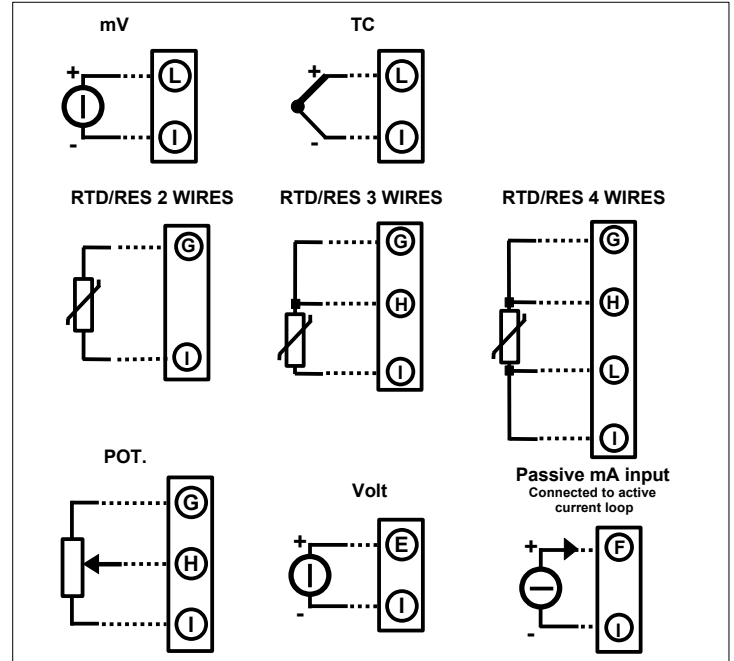
The symbol reported on the product indicates that the product itself must not be considered as a domestic waste. It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste. For more information contact the proper office in the user's city, the service for the waste treatment or the supplier from which the product has been purchased.

## INSTALLATION INSTRUCTIONS

The device is suitable for DIN rail mounting. It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables.

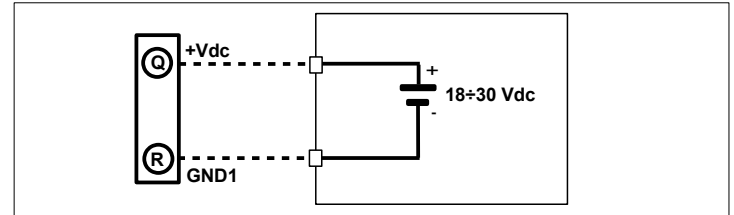
## WIRING

### INPUT CONNECTIONS

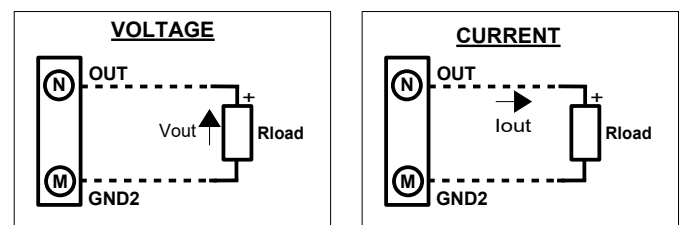


Terminal I = GND3

### POWER SUPPLY CONNECTIONS



### OUTPUT CONNECTIONS



Note: terminal P = M = GND2

## HOW TO ORDER

The DAT4235 is provided as requested on the Customer's order. Refer to the section "Technical specification" to determine input and output ranges. In case of the configuration is not specified, the parameters must be set by the user.

### ORDER CODE EXAMPLE:

DAT4235 / Pt100 / 3 wires / 0 ÷ 200 °C / S.L. / 4 ÷ 20 mA / Burn-out up

