

# Universal signal converter DAT 2115



## FEATURES

- Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer
- Configurable output in current or voltage
- Configurable by Personal Computer
- High accuracy
- On-field reconfigurable
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN50035

## GENERAL DESCRIPTION

The converter DAT 2115 is able to execute many functions such as : measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of a standard active current signal , conversion of a voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 2115 is able to measure and linearise the standard thermocouples with internal cold junction compensation. In function of programming, the measured values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both in time and in temperature.

The programming of the DAT 2115 is made by a Personal Computer using the software PROSOFT, developed by DATEXEL, that runs under the operative system "Windows™". By use of PROSOFT, 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 .

The DAT 2115 is in compliance with the standard 89/336/CEE 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 DAT 2115 must be powered by a direct voltage between 18 to 30 V applied to the terminals R(+Vdc) and Q (GND) as shown in the section "Power supply connections".

The output signal, in voltage or current, is provided to the terminals N(OUT) and M (GND), as shown in the section "Output connections".

The input connections must be made as shown in the section "Input connections".

To configure, calibrate and install the converter, refer to sections " DAT 2115: configuration and calibration" and "Installation Instructions".

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

Input type	Min	Max	Min. span	Input calibration (1)	Response time (10÷ 90%)
<b>TC(*) CJC int./ext.</b>				RTD > of ±0.1% f.s. or ±0.2°C	about 400 ms
J	-200°C	1200°C	2 mV	Low res. > of ±0.1% f.s. or ±0.15 Ω	<b>Power supply</b> Power supply voltage 18 .. 30 Vdc Reverse polarity protection 60 Vdc max  <b>Current consumption</b> Current output 40 mA max. Voltage output 20 mA max.  <b>Output Load Resistance (Rload)</b> Current output <= 650 Ω Voltage output >= 3,5 KΩ Limitation current about 25 mA  <b>Temperature &amp; humidity</b> Operative temperature -20°C .. +70°C Storage temperature -40°C .. +85°C Humidity (not condensed) 0 .. 90 %  <b>Housing</b> Material Self-extinguish plastic Mounting DIN rail in compliance with EN-50022 and EN-50035 Weight about 90 g.  <b>EMC (for industrial environemnts )</b> Immunity EN 61000-6-2 Emission EN 61000-6-4
K	-200°C	1370°C	2 mV	High res. > of ±0.2% f.s. or ±1 Ω	
S	-50°C	1760°C	2 mV	mV, TC > of ±0.1% f.s. or ±18 uV	
R	-50°C	1760°C	2 mV	Volt > of ±0.1% f.s. or ± 2 mV	
B	400°C	1820°C	2 mV	mA > of ±0.1% f.s. or ± 6 uA	
E	-200°C	1000°C	2 mV	<b>Output calibration</b>	
T	-200°C	400°C	2 mV	Current ± 7 uA	
N	-200°C	1300°C	2 mV	Voltage ± 5 mV	
<b>RTD(*) 2,3,4 wires</b>				<b>Input impedance</b>	
Pt100	-200°C	850°C	50°C	TC, mV >= 10 MΩ	
Pt1000	-200°C	200°C	50°C	Volt >= 1 MΩ	
Ni100	-60°C	180°C	50°C	Current ~ 50 Ω	
Ni1000	-60°C	150°C	50°C	<b>Linearity (1)</b>	
<b>Voltage</b>				TC ± 0.2 % f.s.	
mV	-400 mV	+400 mV	2 mV	RTD ± 0.1 % f.s.	
mV	-100 mV	+700 mV	2 mV	<b>Line resistance influence</b>	
Volt	- 10 V	+10 V	500 mV	TC, mV, V <=0.8 uV/Ohm	
<b>Potentiometer (Nominal value)</b>				RTD 3 wires 0.05%/Ω (50 Ω balanced max.)	
	0 Ω	200 Ω	10%	RTD 4 wires 0.005%/Ω (100 Ω balanced max.)	
	200 Ω	500 Ω	10%	<b>RTD excitation current</b>	
	0.5 KΩ	50 KΩ	10%	Typical 0.350 mA	
<b>RES. 2,3,4 wires</b>				<b>CJC comp.</b> ± 0.5°C	
Low	0 Ω	300 Ω	10 Ω	<b>Thermal drift (1)</b>	
High	0 Ω	2000 Ω	200 Ω	Full scale ± 0.01% / °C	
<b>Current</b>				CJC ± 0.01% / °C	
mA	-10 mA	+24 mA	2 mA	<b>Burn-out values</b>	
<b>Output type</b>	<b>Min</b>	<b>Max</b>	<b>Min. span</b>	Max. values about 23 mA or 10,8 Vdc	
Direct current	0 mA	20 mA	4 mA	Min. values about 0 mA or 0 Vdc	
Reverse current	20 mA	0 mA	4 mA	(1) referred to input Span (difference between max. and min. values)	
Direct voltage	0 V	10 V	1 V		
Reverse voltage	10 V	0 V	1 V		

(\*) For temperature sensors it is possible to set the input range also in F degrees; to made the conversion use the formula: °F = (°C\*9/5)+32)

**DAT 2115: CONFIGURATION AND CALIBRATION**

**Warning: during these operations the device must always be powered.**

**- CONFIGURATION**

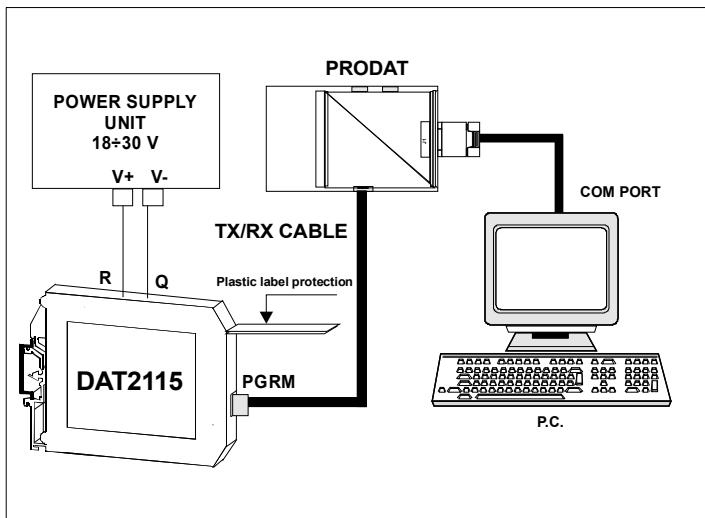
- 1) Power-on the DAT 2115 by a direct voltage between  $18 \pm 30$  V .
- 2) Open the plastic label protection on front side of DAT 2115.
- 3) Connect the interface PRODAT to the Personal Computer and to device (connector PGRM - see section "DAT 2115: PROGRAMMING") .
- 4) Run the software PROSOFT.
- 5) Set the parameters of configuration .
- 6) Program the device.

**- CALIBRATION CONTROL**

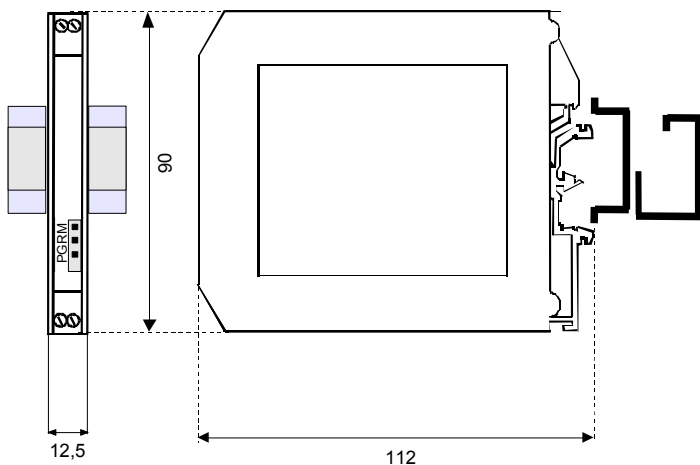
**With software PROSOFT running:**

- 1) Connect on the input a calibrator setted 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 DAT 2115 provides on output the minimum setted value.
- 4) Set the calibrator at the maximum value.
- 5) Verify that the DAT 2115 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 PROSOFT. The variation introduced from these regulators must be calculated as percentage of the input range .
- 7) Program the device with the new parameters .

**DAT 2115: PROGRAMMING**



**DIMENSIONS (mm) & CONNECTOR PGRM**



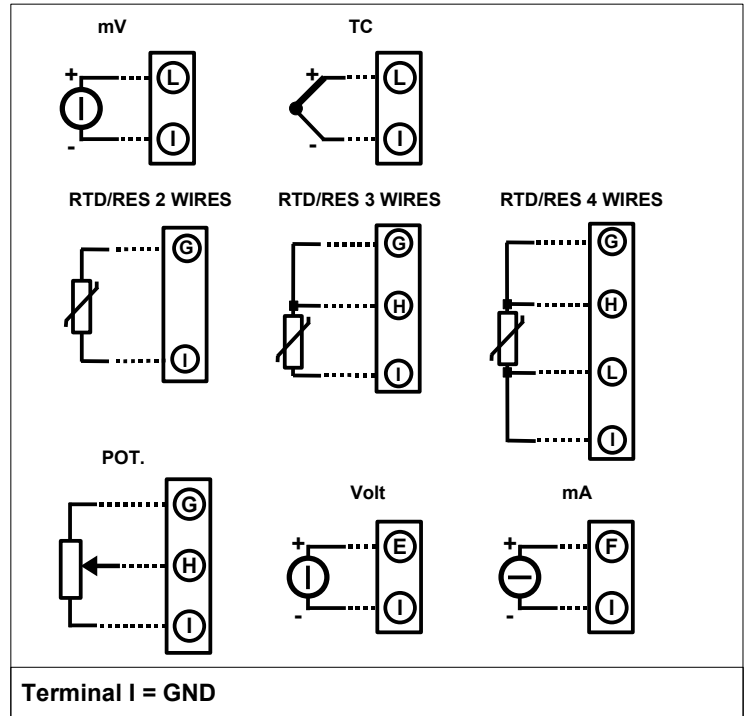
**INSTALLATION INSTRUCTIONS**

The device DAT 2115 is suitable for DIN rail mounting.

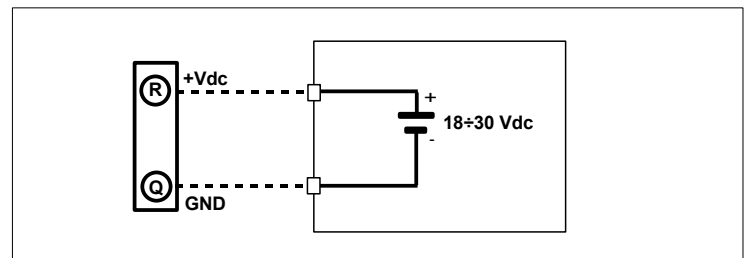
It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .

**DAT 2115: CONNECTIONS**

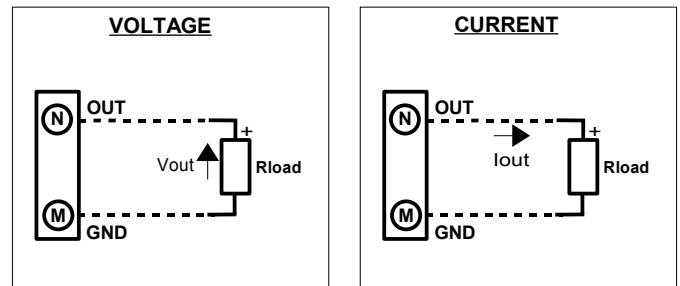
**INPUT CONNECTIONS**



**POWER SUPPLY CONNECTIONS**



**OUTPUT CONNECTIONS**



**Note: terminal P = GND; terminal O = Not connected (NC)**

**HOW TO ORDER**

The DAT 2115 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:**

