UNI EN ISO 9001:2008

PC programmable two wire universal transmitter

DAT 2015

FEATURES

- **Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer**
- **4 ÷ 20 mA configurable output on current loop**
- **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**

CE

GENERAL DESCRIPTION

The transmitter DAT 2015 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 2015 is able to measure and linearise the standard thermocouples with internal cold junction compensation. The measured values are converted in a 4÷20 mA current signal . The device guarantees high accuracy and performances stability both in time and in temperature.
The programming of the DAT 2015 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 transmitter 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 2015 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 transmitter DAT 2015 must be powered by a direct voltage between 10 to 32 V and applied to the terminals P(+V) and O (-V) or to the terminals N(+V) and M (-V).
The 4÷20 mA output signal is measurable in the power loop as shown in the section "Output/Power supply connections"; Rload is the input impedance of instruments on the current loop; to obtain a correct measure, the value of Rload will be calculated as function of the power supply value (see section "Technical specification – Load characteristic").
The input connections must be made as shown in the section "Input connections".
To configure, calibrate and install the transmitter refer to sections " DAT2015: configuration and calibration" and "Installation Instructions".

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

Input type	Min	Max	Min. span
TC(*) CJC int./ext.			
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV
RTD(*) 2,3,4 wires			
Pt100	-200°C	850°C	50°C
Pt1000	-200°C	200°C	50°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	50°C
Voltage			
mV	-400 mV	+400 mV	2 mV
mV	-100 mV	+700 mV	2 mV
Volt	- 10 V	+10 V	500 mV
Potentiometer			
(Nominal value)	0 Ω	200 Ω	10%
	200 Ω	500 Ω	10%
	0.5 KΩ	50 KΩ	10%
RES. 2,3,4 wires			
Low	0 Ω	300 Ω	10 Ω
High	0 Ω	2000 Ω	200 Ω
Current			
mA	-10 mA	+24 mA	2 mA

Output type	Min	Max	Min. span
Direct current	4 mA	20 mA	4 mA
Reverse current	20 mA	4 mA	4 mA

Input calibration (1)
RTD   > of ±0.1% f.s. or ±0.2°C
Low res.   > of ±0.1% f.s. or ±0.15 Ω
High res.   > of ±0.2% f.s. or ±1 Ω
mV, TC   > of ±0.1% f.s. or ±18 uV
Volt   > of ±0.1% f.s. or ± 2 mV
mA   > of ±0.1% f.s. or ± 6 uA

Output calibration
Current   ± 7 uA

Input impedance
TC, mV   >= 10 MΩ
Volt   >= 1 MΩ
Current   ~ 50 Ω

Linearity (1)
TC   ± 0.2 % f.s.
RTD   ± 0.1 % f.s.

Line resistance influence
TC, mV   <=0.4 uV/Ohm
RTD 3 wires   0.05%/Ω (50 Ω balanced max.)
RTD 4 wires   0.005%/Ω (100 Ω balanced max.)

RTD excitation current
Typical   0.350 mA

CJC comp.   ± 0.5°C

Thermal drift (1)
Full scale   ± 0.01% / °C
CJC   ± 0.01% / °C

Burn-out values
Max. value   about 22.5 mA
Min. value   about 3.6 mA

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

Response time (10÷ 90%)   about 400 ms

Power supply
Power supply voltage   10 .. 32 Vdc
Reverse polarity protection   60 Vdc max

Load characteristic - Rload (maximum load value on current loop per power supply value)

Temperature & humidity
Operative temperature   -20°C .. +70°C
Storage temperature   -40°C .. +85°C
Humidity (not condensed)   0 .. 90 %

Housing
Material   Self-extinguish 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

(*) 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 2015: CONFIGURATION AND CALIBRATION

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

- CONFIGURATION

1) Power-on the DAT2015 by a direct voltage between 10 ÷ 32 V or (only to configure) by a 9 V battery .
2) Open the plastic label protection on front side of DAT 2015.
3) Connect the interface PRODAT to the Personal Computer and to device (connector PGRM - see section " DAT2015: 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.
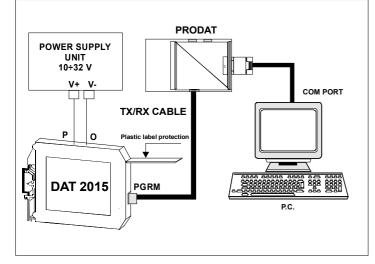2) Set the calibrator at the minimum value.
3) Verify that the DAT 2015 provides on output the minimum setted value.
4) Set the calibrator at the maximum value.
5) Verify that the DAT 2015 provides on output the maximum setted value.
6) In case of regulation of value obtained in the step 3 and 5, use the ZERO and SPAN regulators of software PROSOFT.
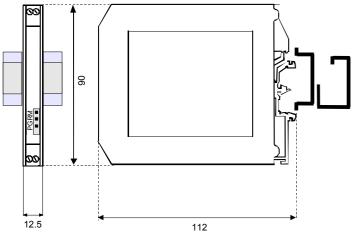The variation introduced from these regulators must be calculated as percentage of the input range .
7) Program the device with the new parameters .

DAT 2015: PROGRAMMING
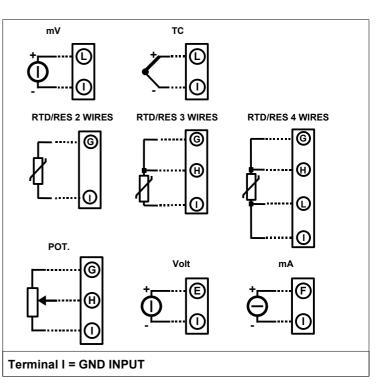

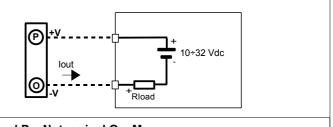### DIMENSIONS (mm) & CONNECTOR PGRM

INSTALLATION INSTRUCTIONS

The device DAT 2015 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 .

DAT2015: CONNECTIONS

INPUT CONNECTIONS

Terminal I = GND INPUT

OUTPUT / POWER SUPPLY CONNECTIONS

Terminal P = N; terminal O = M

Note: terminals R = Q = Not Connected (NC)

HOW TO ORDER

The DAT2015 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:

DAT 2015 / Pt100 / 3 wires / 0 ÷ 200 °C / S.L. / 4 ÷ 20 mA / Burn-out up

- Input type
- Sensor options :
  RTD/RES:2,3,4 wires
  TC: CJC int. or ext.
- Input range
- (*) Linearisation options:
  S.L.: standard linearisation.
  N.L.: no linearisation.
  C.L.: linearisation by step (Custom):
  specify input curve
- Output range
- High or low Out of scale