DATEXEL

PC Programmable Thermocouple Temperature Transmitter
Phone: +1 561 779 5660 E-mail : Info@datexel.com - Web Site www.datexel.com

Two wire universal transmitter

DAT 1015

FEATURES

- **Configurable input for RTD, TC, mV, Resistance and Potentiometer**
- **Damping function on output**
- **4 ÷ 20 mA configurable output on current loop**
- **Configurable by Personal Computer**
- **High accuracy**
- **On-field reconfigurable**
- **Configurable by interface PRODAT05 or PRODAT06 without power loop connected**
- **EMC compliant – CE mark**
- **Suitable for DIN B in-head mounting**
- **Option for DIN rail mounting in compliance with EN 50022 (DIN RAIL Option)**

GENERAL DESCRIPTION

The transmitter DAT 1015 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 voltage signal even coming from a potentiometer connected on its input. Moreover the DAT 1015 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 1015 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.
On the device is provided the function "Damping" that allows the user to set a programmable filter up to 30 seconds to reduce eventual sudden variations of the input signal.
The programming of the device can be executed without the power loop connected using the interface PRODAT05 or PRODAT06.
It is housed in a self-extinguish plastic enclosure suitable for DIN B in-head mounting.
Moreover (by proper mounting kit) it is possible to mount the DAT 1015 on DIN rail.

USER INSTRUCTIONS

The transmitter DAT 1015 must be powered by a direct voltage between 10 to 32 V and applied to the terminals +V and -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 " DAT1015: 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	100 °C
K	-200°C	1370°C	100 °C
S	-50°C	1760°C	400 °C
R	-50°C	1760°C	400 °C
B	400°C	1820°C	400 °C
E	-200°C	1000°C	100 °C
T	-200°C	400°C	100 °C
N	-200°C	1300°C	100 °C
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	-100mV	+700mV	2 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

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

Output calibration
Current   ± 7 uA

Input impedance
TC, mV   >= 10 MΩ

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

Line resistance influence
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.)

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. output value about 20.5 mA
Min. output value about 3.8 mA
Max. fault value about 21.6 mA
Min. fault value about 3.5 mA

Damping time constant
Selectable from 0.3 to 30 s.
Value 0: function not active.

(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   -40°C .. +85°C
Storage temperature   -40°C .. +85°C
Humidity (not condensed)   0 .. 90 %

Housing
Material   PC + ABSV0
Mounting   DIN B head or bigger
Weight   about 50 g.
Dimensions   Ø = 43 mm ; H = 24 mm

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 1015: CONFIGURATION AND CALIBRATION

- CONFIGURATION WITH POWER LOOP CONNECTED

1) Power-on the DAT1015 by a direct voltage between 10 ÷ 32 V or (only to configure) by a 9 V battery .
2) Remove the protection plastic cap on DAT 1015.
3) Connect the interface PRODAT to the Personal Computer and to device. (see section " DAT1015: PROGRAMMING WITH POWER LOOP CONNECTED").
4) Run the software PROSOFT.
5) Set the parameters of configuration .
6) Program the device.

- CONFIGURATION BY PRODAT05

1) Remove the protection plastic cap on DAT 1015.
2) Connect the interface PRODAT to the Personal Computer and to device. (see section " DAT1015: PROGRAMMING BY PRODAT ").
3) Run the software PROSOFT.
4) Set the parameters of configuration .
5) Program the device.

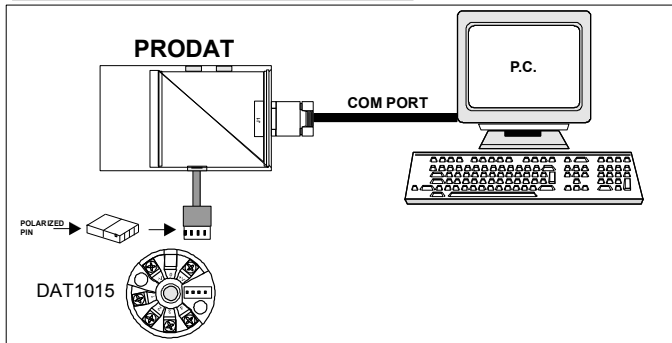### - CALIBRATION CONTROL

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 1015 provides on output the minimum setted value.
4) Set the calibrator at the maximum value.
5) Verify that the DAT 1015 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 .
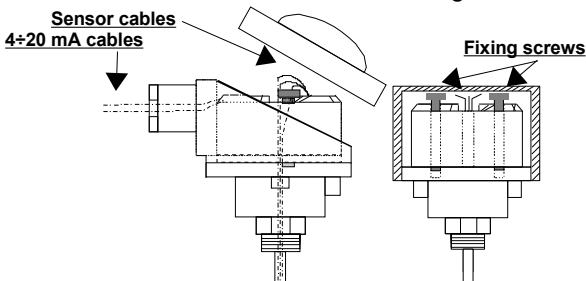7) Program the device with the new parameters .
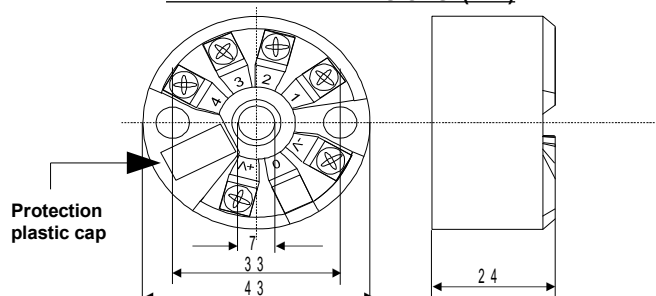
DAT1015: PROGRAMMING WITH POWER LOOP CONNECTED
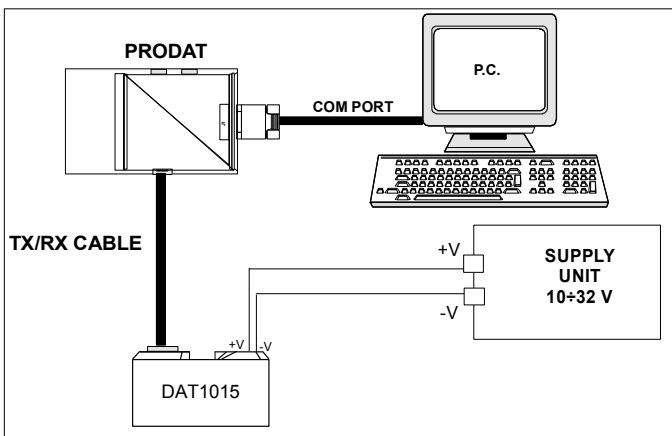
DAT1015: PROGRAMMING BY PRODAT


DIN B in-head mounting

MECHANICAL DIMENSIONS (mm)

Datexel reserves its rights to modify totally or in part the characteristics of its products without warning at any time .

INSTALLATION INSTRUCTIONS

The device DAT 1015 is suitable for direct DIN B in-head mounting. The transmitter must be fixed inside the probe by the proper kit.
By apposite stirrup, provided on request, it is possible to mount the device on DIN rail in compliance with EN-50022. It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .
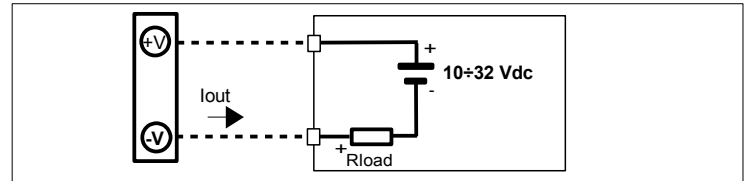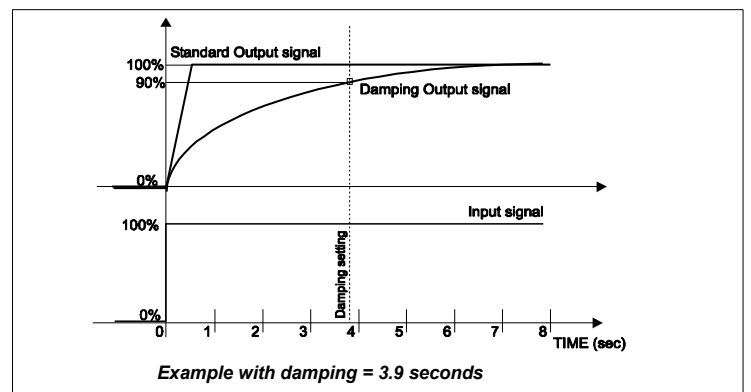
DIN rail mounting (DIN RAIL Option)

Stirrup **Fixing screw**
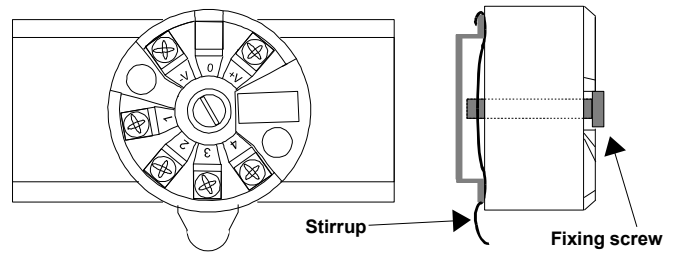
DAT1015: CONNECTIONS

INPUT CONNECTIONS

Terminal 1 = GND INPUT
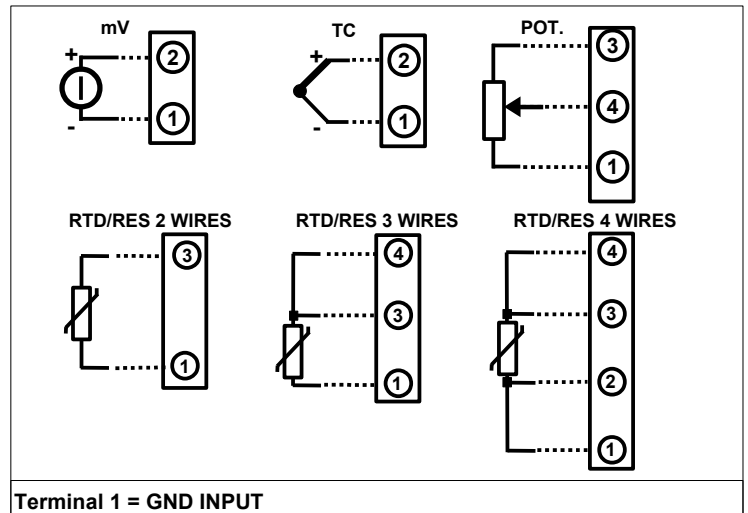
OUTPUT/POWER SUPPLY CONNECTIONS

DAMPING FUNCTION

Example with damping = 3.9 seconds

HOW TO ORDER

The DAT1015 is provided as requested on the Customer's order.
Refer to the section "Technical specification" to determine input and output ranges.
The mounting kit for DIN rail is provided **only on request** with code DIN RAIL.
In case of the configuration is not specified, the parameters must be set by the user.

ORDER CODE EXAMPLE:

DAT 1015 / 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