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UNI EN ISO 9001:2008

PC programmable isolated universal signal converter

DAT 4135

FEATURES

- **Configurable input for RTD, TC, mV, V, mA, Resistance and Potentiometer**
- **Galvanic isolation at 2000 Vac**
- **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 4135 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 4135 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 4135 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 2000 Vac isolation between input and power supply/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. The DAT 4135 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 DAT 4135 must be powered by a direct voltage between 18 to 30 V applied to the terminals R(+Vdc) and Q (GND2) as shown in the section "Power supply connections".
The output signal, in voltage or current, is provided to the terminals N(OUT) and M (GND2), 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 " DAT4135: 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	0 mA	20 mA	4 mA
Reverse current	20 mA	0 mA	4 mA
Direct voltage	0 V	10 V	1 V
Reverse voltage	10 V	0 V	1 V

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
Voltage	± 5 mV

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	<=0.8 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. values	about 23 mA or 10.8 Vdc
Min. values	about 0 mA or 0 Vdc

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

Response time (10÷ 90%) about 400 ms

Power supply

Power supply voltage	18 .. 30 Vdc
Reverse polarity protection	60 Vdc max

Isolation voltage

Input/Power supply-Output	2000 Vac,50 Hz, 1 min

Current consumption

Current output	40 mA max.
Voltage output	20 mA max.

Output Load Resistance (Rload)

Current output	</= 650 Ω
Voltage output	>/= 3.5 KΩ
Limitation current	about 25 mA

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 4135: CONFIGURATION AND CALIBRATION

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

- CONFIGURATION

1) Power-on the DAT4135 by a direct voltage between 18 ÷ 30 V .
2) Open the plastic label protection on front side of DAT 4135.
3) Connect the interface PRODAT to the Personal Computer and to device (connector PGRM - see section " DAT4135: PROGRAMMING").
4) Run the software PROSOFT.
5) Set the parameters of configuration .
6) Program the device.

- CALIBRATION CONTROL

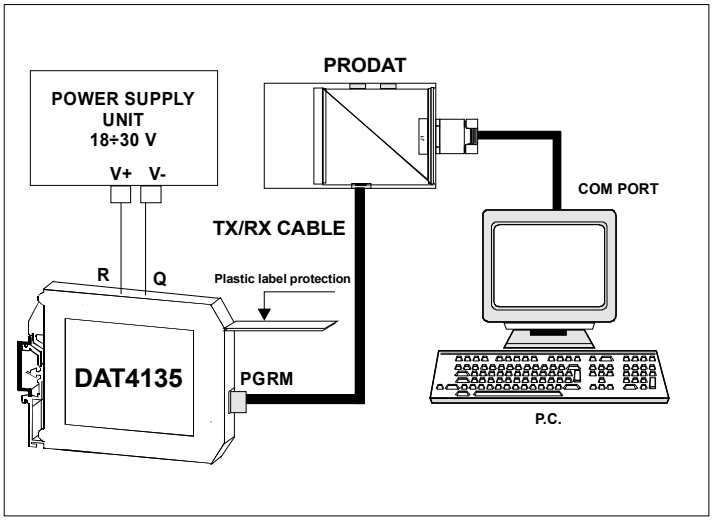
With software PROSOFT running:

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 4135 provides on output the minimum setted value.
4) Set the calibrator at the maximum value.
5) Verify that the DAT 4135 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.

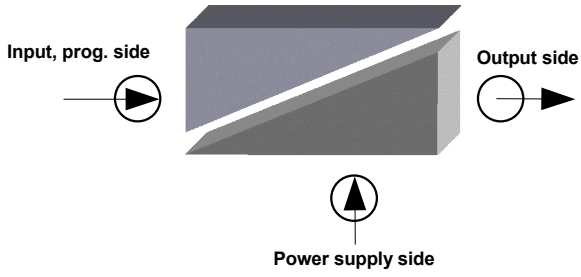
The variation introduced from these regulators must be calculated as percentage of the input range .

7) Program the device with the new parameters .

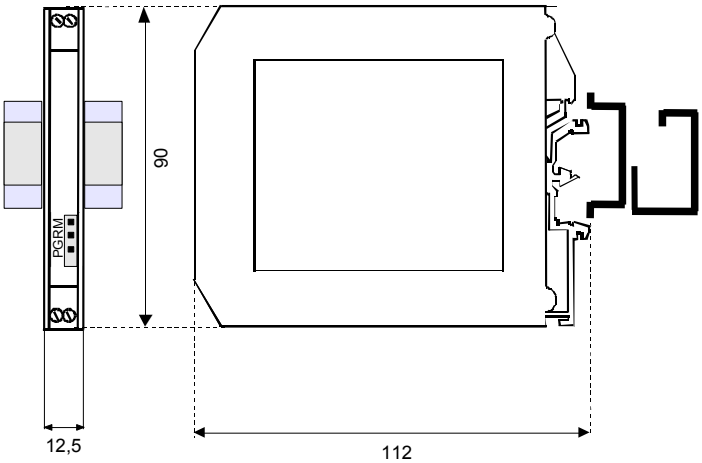
DAT 4135: PROGRAMMING



ISOLATION STRUCTURE



DIMENSIONS (mm) & CONNECTOR PGRM

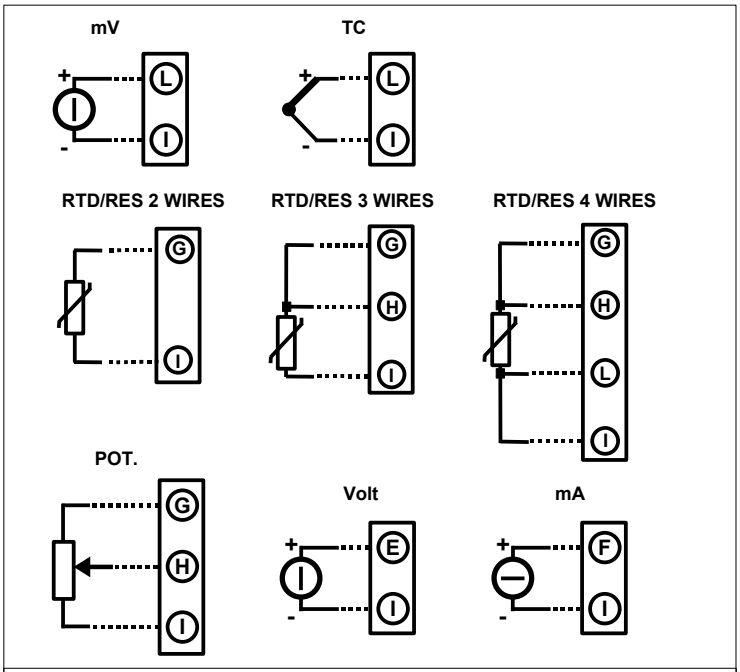


INSTALLATION INSTRUCTIONS

The device DAT 4135 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 .

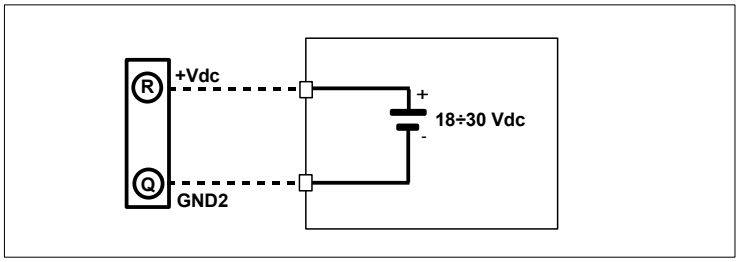
DAT4135: CONNECTIONS

INPUT CONNECTIONS

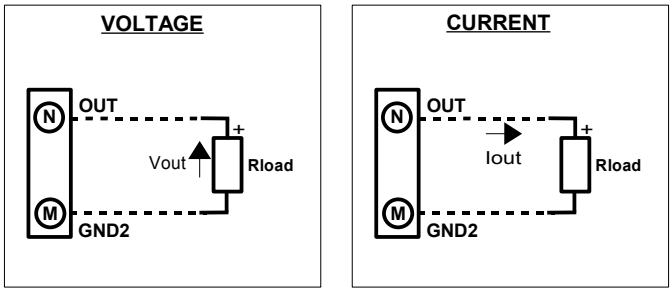


Terminal I = GND1

POWER SUPPLY CONNECTIONS



OUTPUT CONNECTIONS



Note: terminal P = GND2; terminal O = Not connected (NC)

HOW TO ORDER

The DAT4135 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 4135 / 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