Phone: +1 561 779 5660 E-mail : Info@datexel.com - Web Site www.datexel.com

Dual RTD Temperature Converter

DAT 2166

FEATURES

- **Pt100 input**
- **Input range programmable either with °C or °F unit measure**
- **Zero e Span values programmable by DIP-switches**
- **Voltage or current linearised outputs**
- **Good accuracy and performance stability**
- **EMC compliant – CE / UKCA mark**
- **DIN rail mounting in according to EN-50022 and EN-50035 standards**

GENERAL DESCRIPTION

The double channel converter DAT 2166 is designed to provide on the output two linearised voltage or current signals proportional with the temperature characteristics of the Pt100 sensors connected on its inputs. It is possible to connect on the input both 3 wire Pt100 and 2 wire Pt100.
The user can program the input ranges and the output signal type of each channel by the proper DIP-switches available after opening the suitable door located on the side of device.
The regulation of Zero and Span values is made by the ZERO and SPAN potentiometers located on the front side of device.
Moreover, an isolation of 1000 Vac is provided among the channels; it allows to avoid signal errors due to the ground loops and to reduce eventual R.F. Interferences.
It is housed in a plastic enclosure of 12.5 mm thickness suitable for DIN rail mounting in according to EN-50022 and EN-50035 standards .

OPERATIVE INSTRUCTIONS

The connections must be made as shown in the section "Wiring".
The configuration of input and output ranges values is made by DIP-switches (refer to the sections “Input ranges table” and “Output ranges table”).
After the converter configuration, it is necessary to calibrate it using the ZERO and SPAN; this operation is illustrated in the section “DAT 2166: Configuration and calibration ".
To install the device refer to the section “Installation instructions”.

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

INPUT (2 CHANNELS)

RTD Pt100 2 or 3 wires in compliance to IEC 60751

Configurability for Span

Minimum value	40 °C 104 °F
Configuration	From 40 °C to 450 °C From 104 °F to 842 °F

Configurability for Zero

Configuration	From -80 °C to 50 °C From - 112 to 122 °F

Input calibration (1)
Pt100 ± 0.1% f.s.

Linearity (2)
Pt100 ± 0.15 % f.s.

Line resistance influence (1)
Pt100 0.05 % f.s./ohm (100 ohm max. balanced on each wire)

RTD Excitation current
Typical 1 mA

(1)referred to input Span (difference between Val. max. and min.)
(2)inclusive of hysteresis and variations of power supply voltage

OUTPUT (2 CHANNELS)

Signal type
Configurable: 4 ÷ 20 mA, 0 ÷ 20 mA
0÷10 V

Load resistance
Current: ≤ 500 Ω
Voltage: ≥ 5 KΩ

Thermal drift (1)
Full Scale ± 0.03 % of full scale /°C

Out of scale values
Type positive Current: > 20 mA
Voltage: > 10 Vdc

Maximum value: Current: 35 mA
Voltage: 16 Vdc

Response time (10÷ 90%) 300 ms circa

Warm-up time 1 minute

GENERAL SPECIFICATIONS

Power supply voltage	18 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Current consumption max.	Current: 40 mA Voltage:15 mA

ISOLATION

Among the channels	1000 Vac, 50 Hz,1 min.

ENVIRONMENTAL CONDITIONS

Operative temperature	-20°C .. +70°C
Storage temperature	-40°C .. +85°C
Humidity (not condensing)	0 .. 90 %
Maximum Altitude	2000 m slm
Installation	Indoor
Category of Installation	II
Pollution Degree	2

MECHANICAL SPECIFICATIONS

Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm^2 AWG 14-18
Tightening Torque	0.8 N m
Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
Weight	about 90 g.

CERTIFICATIONS

EMC (for the Industrial Environments)

Immunity	EN 61000-6-2
Emission	EN 61000-6-4

UKCA (ref S.I. 2016 N°1091)

Immunity	BS EN 61000-6-2
Emission	BS EN 61000-6-4

DAT 2166: CONFIGURATION & CALIBRATION

1) Calculate the difference between the maximum and the minimum value of the input range (Span).
2) Refer to the " Input range table " and determine in the column " SPAN " the position where the calculated value is included, then referring to the position obtained determine in the column "ZERO", the line in which the minimum value is included .
In the correspondent line is shown as to set the DIP-switches .
3) Set the DIP-switches as indicated .
4) Connect on input a 3 wire Pt100 simulator programmed to supply the maximum and minimum values of the input range or a fixed resistor of the same values.
5) Set the simulator at the minimum temperature or to connect a fixed resistor correspondent to the minimum value .
6) By the ZERO potentiometer of the channel in use calibrate the output at the 4 mA value .
7) Set the simulator at the maximum temperature or to connect a fixed resistor correspondent to the maximum value .
8) By the SPAN potentiometer of the channel in use calibrate the output at the 20 mA value .
9) Repeat the operation from the step 5 to the step 8 until the output value will be correct (3 attempts typically required).
Note: the procedure of configuration is the same for twice measure channels.

Example of configuration: -50/200 °C out 0÷10 Vcc
Span => 200°C - (-50°C) = 250°C;
Input switches configuration (SW1 and/or SW3): Off, Off, Off, Off.
Output switches configuration (SW2 and/or SW4): Off, On, Off, On, Off

INPUT RANGE TABLE

Channels 1 & 2		SW1 & SW3			
SPAN	ZERO	1	2	3	4
< 95°C (203°F)	- 80÷-30°C(-112÷-22°F)		●		
< 95°C (203°F)	- 30÷15°C(-22÷59°F)		●	●	
< 95°C (203°F)	15 ÷ 50°C(59÷122 °F)		●	●	●
95÷200°C(203÷392°F)	- 80÷-30°C(-112÷-22°F)	●	●		
95÷200°C(203÷392°F)	- 30÷15°C(-22÷59°F)	●	●	●	
95÷200°C(203÷392°F)	15÷50°C(59÷122 °F)	●	●	●	●
200÷300°C(392÷572°F)	- 80÷50°C(-112÷122°F)				
300÷450°C(572÷842°F)	- 80÷50°C(-112÷122°F)	●			

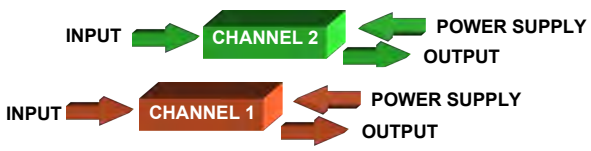
● = DIP SWITCH " ON"

OUTPUT RANGE TABLE

Channel 1 & 2	SW2 & SW4				
OUTPUT SIGNAL	1	2	3	4	5
0÷20 mA	●	●	●		
4÷20 mA	●		●		●
0÷10 V		●		●	
2÷10 V				●	●

● = DIP SWITCH " ON"

ISOLATIONS



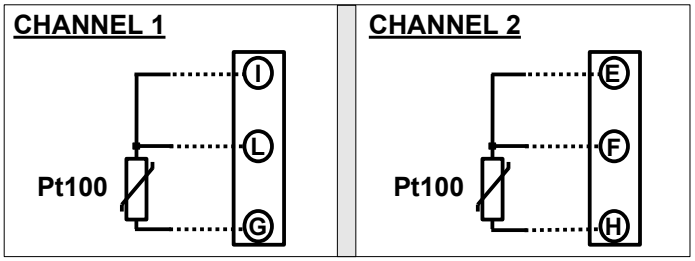
The symbol reported on the product indicates that the product itself must not be considered as a domestic waste.
It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste.
For more information contact the proper office in the user's city , the service for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

INSTALLATION INSTRUCTIONS

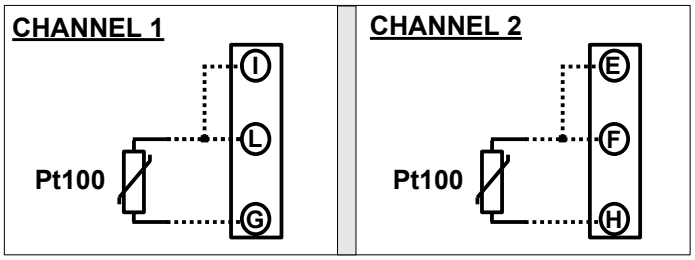
The device is suitable for DIN rail mounting in vertical position.
It is necessary to install the device in a place without vibrations .
Moreover, it is recommended to use shielded cable to connecting signals and to avoid routing conductors near power signal cables.

WIRING

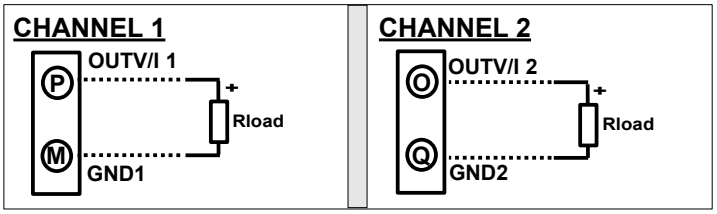
INPUT CONNECTIONS Pt100 3 wires



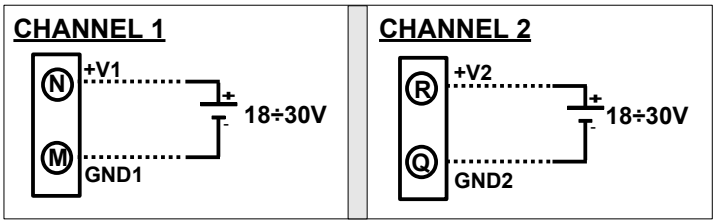
INPUT CONNECTIONS Pt100 2 wires



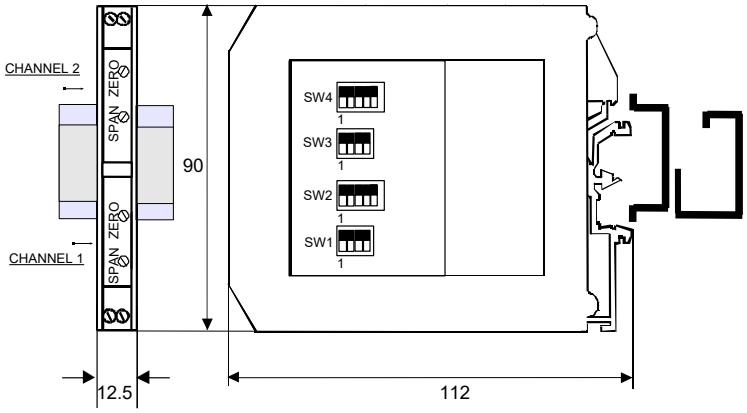
OUTPUT CONNECTIONS



POWER SUPPLY CONNECTIONS



DIMENSIONS (mm) & REGULATIONS



HOW TO ORDER

The device is supplied regulated as requested on the order.
In case of the configuration is not specified, the parameters must be set by the user.

ORDER CODE EXAMPLE:

DAT2166 CH1 = 0÷200°C | 4÷20mA CH2 = 0÷200°C | 4÷20mA

Input range ch 1
Output range ch 1
Input range ch 2
Output range ch 2