DATEXEL

Intrisically safe two-wire universal smart transmitter

DAT 2015 IS

FEATURES
CENELEC EEX ia IIC T4,T5,T6 approvals
Certified according to ATEX 94/9/EC:
CESI Ex-02 ATEX 115
Production Notification Certificate:
CESI 02 ATEX 116Q
Applicable in zones with explosion risk (ZONE 0)
RTD, TC, mV, Resistor and Potentiometer input
Configurable by Personal Computer
High accuracy and performance's stability
In compliance with EMC standards - CE Mark
DIN rail type mounting
Available as configured device on user specifications

APPLICATIONS
Temperature Monitoring and Control for:
- Process Controls
- Automation Systems
- Energy Sources Management

GENERAL INFORMATION

Introduction
The DAT 2015 IS is a "smart" transmitter capable to perform many functions such as: Linearized temperature measurement with thermocouple or RTD sensors; conversion of a linear resistance variation to a standard analog current of 4-20 mA; conversion of a voltage signal, even coming from a potentiometer connected to its input, to a 4-20 mA linearized signal. Its very thin profile allows to mount a "smart" transmitter even at a pitch of only 12.5 mm on the DIN rail.

General
The device is built around a microprocessor core which controls any device function in a continuos and reliable mode by an efficient program developped by DATEXEL. The unit can be configured to accept input from a wide range of sensors and electrical parameters. Thanks to its versatility of use, it greatly reduces the warehouse stock satisfying a wide variety of needs; thus it offers immediate and evident economical advantages. By means of its continuos self calibrating operation, controlled by the microprocessor, the device guarantees an excellent accuracy and very stable measurement, both in time and in the operating temperature.Moreover, with this operating mode, the device is not longer subject to the usual variations of the circuit parameters. The units are manufactured by using high quality and high precision electronic components which are assembled by the SMT technology; both these elements are the indispensable tools to realize a very reliable device. The DAT 2015 IS, developed, manufactured and tested in strict accordance with the quality assurance standard ISO 9001 / EN 29001, is in compliance with the directive 89/336/CEE on the electromagnetic compatibility and the CE mark confirms the compliance of the product. The device is housed in a rough self estinguish plastic container suitable for mounting on DIN rails. A version of this device for mounting on DIN B head is also available.

Input types
The DAT 2015 IS is configurable for any of the following input types:
- **RTD** input for PT100, PT1000, Ni100 and Ni1000. The cable compensation is possible by 3 or 4 wire connection.
- **Thermocouple** input for 8 different types. The Cold Junction Compensation is selectable as internal or external.
- **Voltage** input up to -100/+700 mV.
- **Resistance** input for linear resistance measurement from 20 Ohm to 2 KOhm with 3 or 4 wire compensation.
- **Potentiometer** input from 20 Ohm to 2 KOhm.

Output
Programmable or standard 4 - 20 mA current output. Programmable Sensor Burnout as "Upscale" or "Downscale". Protection against polarity reversal is provided.

Set-Up
All the configurable functions and parameters are easily programmed by means of a PC with a software package, named PROSOFT, developed by DATEXEL. This "guide lines menu" type program operates under "Windows9x/NTTM" on a PC which communicates, via an interface adapter, with the DAT 2015 IS. The adapter is connected through a cable to an apposite connector situated on the transmitter (for more detailed information, see the figure in the next page).
IMPORTANT: On request the transmitter can be supplied configured for the desired sensor type and calibrated for the specific range as defined in the order (see "HOW TO ORDER ").

Application advices
In order to guarantee a correct and safe operation of the transmitter the following requirements must be strictly satisfied:
1)The power supply voltage (intrinsically safe) applied between -V e +V terminals must be included between 11 V and 30 V values .
2)The maximum power supplied by the safety barrier must be not higher then 0.75 W.
Moreover transmitter must be mounted so as to have environmental protection of IP54 grade in external and IP4x grade or better for the application in closed or protected area.

Configuration options for DAT 2015 IS Transmitter (use this checklist when ordering configured units):

INPUT

A	RTD type:
	
	O Pt100
	O Ni100
	O Pt1000
	O Ni1000
	
	Range:
		TC type:
		
		O type J
		O type K
		O type S
		O type R
		O type B
		O type E
		O type T
		O type N
		Range:
			Resistance range:
			20 Ohm to 2000 Ohm
			
			Range:
				Potentiometer range:
				O 20 Ohm to
				   200 Ohm
				O 200 Ohm to
				   500 Ohm
				O 0.5 Kohm to
				   2 Kohm
				
				ZERO:
				SPAN:
					Voltage input range:
					-100 mV to 700 mV
					
					Range:

B	Linearization: O Standard linearization RTD, TC	Linearization: O No linearization O Customer linearization (specify):

C	RTD options: O 2-wire O 3-wire O 4-wire	TC options: O Intern. CJC O Extern. CJC	Res. Options: O 2-wire O 3-wire O 4-wire

OUTPUT

D	Output current range: O 4 - 20 mA O 20 - 4 mA O Special (specify):

E	Sensor Burnout: O Upscale O Downscale		F	Temperature Range: O T6, T5 O T6, T5, T4 ('HT')

HOW TO ORDER:

**A-Not configured device:**   **DAT 2015 IS**

   Code: A   B   C   D   E   F

B-Configured device: **DAT2015IS / TC K-0..1200°C / S.L. / Int. C.J.C. / 4..20mA / Upscale HT***

(*) That above is an example of how to order a transmitter for TC type K sensor, operating in the 0 to 1200°C range, with standard linearization, with internal C.J.C., with an output of 4 to 20 mA and with upscale sensor burnout. The "HT" option indicates the model which can be used whit a maximum operating temperature of 85 °C (T4).
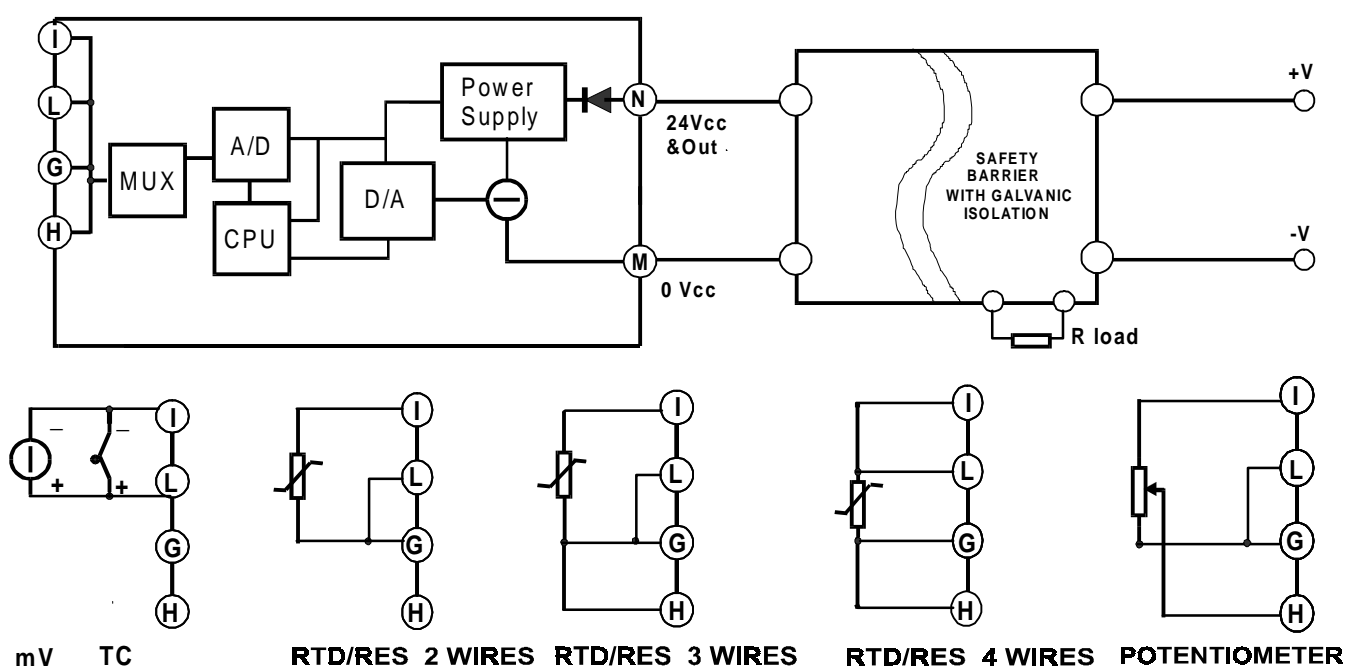
MECHANICAL DIMENSIONS (mm.)
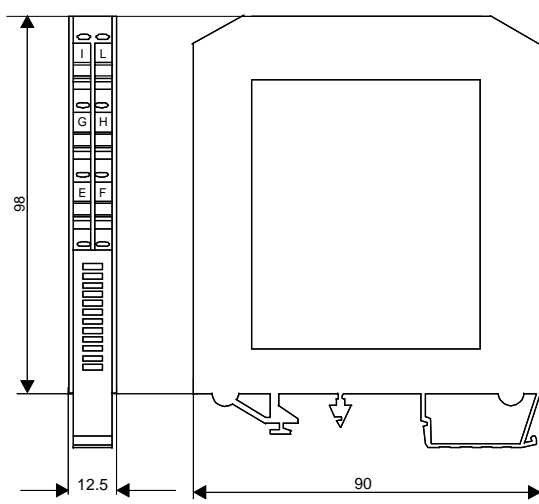
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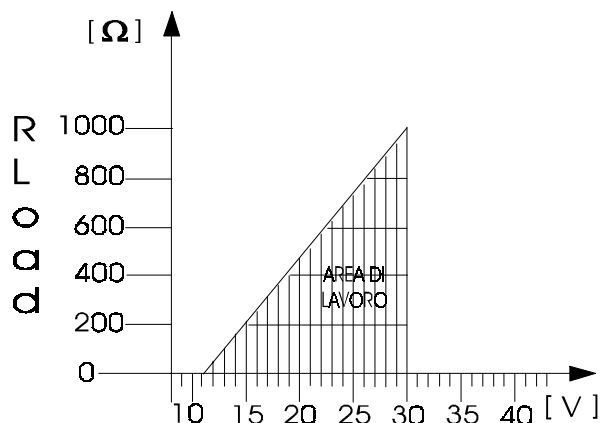
DAT 2015 IS

DAT 2015 IS BLOCK AND WIRING DIAGRAM

mV   TC   RTD/RES 2 WIRES   RTD/RES 3 WIRES   RTD/RES 4 WIRES   POTENTIOMETER

CONFIGURATION

This operation is carried out, using a Personal Computer with "Windows9x/NT™" operating system, by the software PROSOFT, specifically developped by DATEXEL, and by the interfacing adatpter PRODAT-03 and protection cable CVPR-03.

The software includes a window-type program by which the operator is guided through the operations to be executed. Once the data are inputed, a few seconds is the time necessary to complete a configuration cycle.

The parameters which is possible to configure are illustrated in the "Configuration options" in the page here at side. Furthermore it is possible, in the same phase, to program the "zero" and the "full scale" values. The calibration of the device is made automatically, with the maximum accuracy, without the need of any mechanical regulation. The configuration is normally made at the factory in conformity to the customer' s order or, alternatively, in one of the most used configuration:

DAT2015 IS / Pt100-0..200°C / S.L. / 3-wire / 4..20mA / Upscale.

The device can be reconfigured for any number of times. This operation is possible also when the device is operating in the plant or in the field because it is possible, by software, to interrupt momentarily the normal operation which restarts automatically after the configuration.

The complete configuration system (which includes: interface module PRODAT-03, protection cable CVPR-03 and software) is supplied from DATEXEL at convenient price.

ATTENTION!The connection between transmitter and interface adapter PRODAT-03 must be made ONLY IN SAFE ZONE and using the protection cable CVPR-03.

DAT 2015 IS   PRODAT-03

CVPR-03

DAT 2015 IS

DAT 2015 IS Technical Specifications

(typical @ 25°C and in the nominal conditions)

Input

RTD

Input	Min	Max	Span Min
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

TC

Input	Min	Max	Span Min
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

Voltage

Input	Min	Max	Span Min
mV	-100	+700	2 mV

Potentiometer

Range	Min	Max	Span Min
Ohm	0÷20	0÷200	10%
Ohm	0÷200	0÷500	10%
KOhm	0÷0.50	0÷50	10%

Resistance

Input	Min	Max	Span Min
Low	20 Ohm	300 Ohm	10 Ohm
High	300 Ohm	2000 Ohm	200 Ohm

Input impedence
TC, mV   >/=10 MOhm

Lead wire resistance influence
TC, mV   >/=0.8uV/Ohm
RTD 3-wire   0.05%/Ohm (50 Ohm max) (2)
RTD 4-wire   0.005%/Ohm (100 Ohm max)

RTD Sensor Current
Typical   0.350 mA

Ex data

Output /Supply	Input
Ui = 30V	Uo = 6,2V
Ii = 100mA	Io = 100mA
Pi = 0,75W	Po = 500mW
Li = 0,1mH	Lo = 3,6mH
Ci = 10nF	Co = 5uF

Output

Current Output
Signal range   (4 - 20 mA) or (20 - 4 mA)
Load Resistance   (see Load Characteristic)

Accuracy

Linearity

Linearity	TC	±0.2 % (1)
	RTD	±0.1 % (1)

Calibration
RTD   The larger of ±0.1%(1) and ±0.2 °C
Res. Low   The larger of ±0.1%(1) and ±0.15 Ohm
Res. High   The larger of ±0.2%(1) and ±1 Ohm
mV, TC   The larger of ±0.1%(1) and ±10 uV
Cold junction comp.   ±0.5 °C
Output current   ±7 uA

Thermal Drift
Full Scale   ±0.01%/°C
Cold junction Compensation   ±0.01%/°C

Common data

Supply
Supply Voltage   11 - 30 Vdc
                     Pmax = 0.75 W
                     Imax = 100 mA
Polarity protected   60 Vdc

Temperature & Humidity
Operating temperature   T4: -20 °C to +85 °C ('HT' vers. only)
                        T5: -20 °C to + 70 °C
                        T6: -20 °C to + 55 °C
Storage Temperature   -40 °C to +100 °C
Humidity (non-condensig)   0 to 90%

EMC
Emission   EN50081-2
Immunity   EN50082-2
RF Immunity tested for 10V/m up to 1000MHz

Response time
Rise time(10 - 90 %)   0.4 sec. approx.

Housing
Material   Selfestinguishing plastic
Mounting   DIN rail type DIN 46277
Weight   Approx. 50 g

Note:(1) of input span
     (2) Balancing required

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