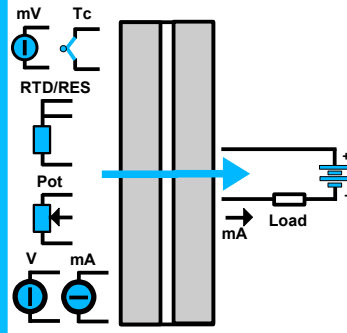


## FEATURES

- Universal configurable input for: mV, Tc, RTD, Res, Potentiometer, V and mA
- Configurable current output from 4 to 20 mA
- Configurable by Dip-switches or by Personal Computer by cable CVPROG
- High accuracy
- On-field reconfigurable
- Galvanic isolation at 1500 Vac
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



## GENERAL DESCRIPTION

The universal isolated transmitter DAT4535 is able to measure and linearise voltage, current and resistance signals, potentiometers and the standard thermocouples and RTDs with, if required, the cold junction compensation and the wires compensation. In function of programming, the measured values are converted and transmitted on the 4-20 mA current loop. The device guarantees high accuracy and performances stability both versus time and temperature. The programming is made by the dip-switch located in the window on the side of the enclosure. By means of dip-switches it is possible to select the input type and range without recalibrate the device. Moreover, by Personal Computer and the cable CVPROG the user can program all of the device's parameters for his own necessity. **The terminals of the current signal on input side must be only connected to active current loop.** The 1500 Vac galvanic isolation eliminates the effects of all ground loops eventually existing and allows the use of the transmitter in heavy environmental conditions found in industrial applications. 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 4535 must be powered by a direct voltage between 7 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 and install the transmitter refer to sections "Programming", "Configuration by dip-switches", "Dip-switches configuration tables" and "Installation Instructions".

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

INPUT				Linearity (1)		POWER SUPPLY	
Input type	Min	Max	Min. Span	Tc, RTD, Pot	± 0.1 % f.s.	Supply voltage	7 .. 32 Vdc
<b>TC (CJC int./ext.)</b>				mV, V, mA	± 0.05 % f.s.	Reverse polarity protection	60 Vdc max
J	-200°C	1200°C	100°C	<b>Input impedance</b>		<b>Load characteristic - Rload</b> (maximum load value on current loop per power supply value)	
K	-200°C	1300°C	100°C	TC, mV	>= 10 MΩ		
S	0°C	1750°C	400°C	Volt	>= 1 MΩ		
R	0°C	1750°C	400°C	mA	~22 Ω		
B	0°C	1850°C	400°C	<b>RTD excitation current</b>			
E	-200°C	1000°C	100°C	RTD, Res	400 uA	<b>ISOLATION</b>	
T	-200°C	400°C	100°C	<b>Line resistance influence (1)</b>		Input – Power supply/Out 1500 Vac, 50 Hz, 1 min.	
N	-200°C	1300°C	100°C	TC, mV	<= 0.8 uV/Ohm	<b>ENVIRONMENTAL CONDITIONS</b>	
<b>Voltage</b>				RTD 3 wires	0.05%/Ω (50Ω max balanced)	Operative Temperature	
mV	-100 mV	+90 mV	5 mV	RTD 4 wires	0.005%/Ω (100Ω max balanced)	-40°C .. +85°C	
mV	-100 mV	+200 mV	10 mV	<b>Thermal drift (1)</b>		Storage Temperature	
mV	-100 mV	+800 mV	20 mV	Full Scale	± 0.01% / °C	-40°C .. +85°C	
Volt	-10 V	10 V	1 V	CJC	± 0.01% / °C	Humidity (not condensed)	
<b>RTD (2, 3, 4 wires)</b>				<b>CJC Comp.</b>	± 0.5°C	0 .. 90 %	
Pt100	-200°C	850°C	50°C	<b>OUTPUT</b>			
Pt1000	-85°C	185°C	30°C	<b>Output type</b>	<b>Min</b>	<b>Max</b>	<b>Min. span</b>
Ni100	-60°C	180°C	50°C	Current	4 mA	20 mA	4 mA
Ni1000	-60°C	150°C	30°C	<b>Output calibration</b>			
<b>RES. (2, 3, 4 wires)</b>				Current	± 7 uA		
0 Ω	500 Ω	50 Ω	<b>Burn-out values</b>				
0 Ω	2000 Ω	50 Ω	Max. output value	21.8 mA			
<b>Pot. (Rnom. &lt; 50KΩ)</b>				0 %	100 %	10 %	Min. output value
<b>Current</b>				0 mA	20 mA	1 mA	2.4 mA
<b>Input calibration (1)</b>				<b>Response time (10÷ 90%)</b> about 400 ms			
mV, TC	> of ±0.1% f.s. or ±12 uV			<b>Delay on output</b> Programmable from 0 to 30 sec.			
RTD	> of ±0.1% f.s. or ±0.2°C						
Res.	> of ±0.1% f.s. or ±0.15 Ω						
Potentiometer	± 0.05 % f.s.						
Volt	> of ±0.1% f.s. or ± 2 mV						
mA	> of ±0.1% f.s. or ± 6 uA						
				<b>MECHANICAL SPECIFICATIONS</b>			
				Material			
				Self-extinguish plastic			
				IP Code			
				IP20			
				Wiring			
				wires with diameter			
				0.8÷2.1 mm <sup>2</sup> /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.			
				<b>EMC ( for industrial environments )</b>			
				Immunity			
				EN 61000-6-2			
				Emission			
				EN 61000-6-4			

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

## PROGRAMMING

### CONFIGURATION BY PC

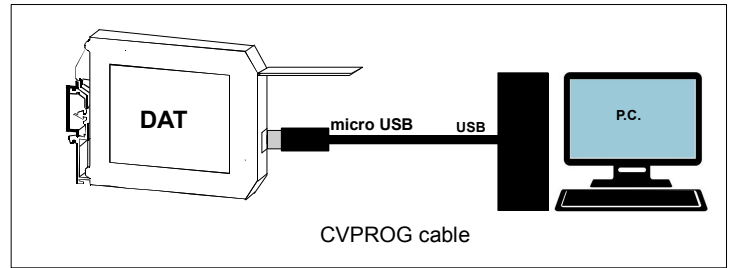
**Notice: before to execute the next operations, check that the drivers of the cable CVPROG in use have been previously installed in the Personal Computer.**

By software DATESOFT from version 2.7 it is possible to:

- set the default programming of the device;
- program the options not available with the dip-switch;  
(burn-out level, CJC offset, trip alarm settings, delay on output, etc...);
- read, in real time, the input and output measures;
- follow the dip-switches configuration wizard.

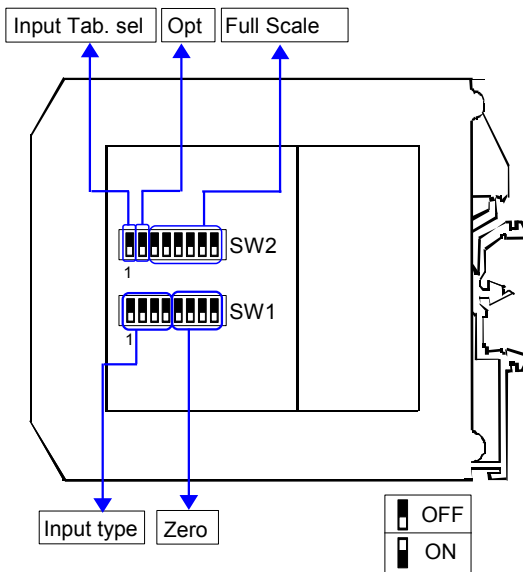
To configure the device follow the next steps:

- 1) Open the protection plastic label on the front of the device.
- 2) Connect the two plugs of cable CVPROG to the Personal Computer (USB plug) and to the device (uUSB plug).
- 3) Run the software DATESOFT
- 4) Select the COM port in use and click on "Open COM".
- 5) Click on the icon "Program".
- 6) Set the programming data.
- 7) Click on the icon "Write" to send the programming data to the device.



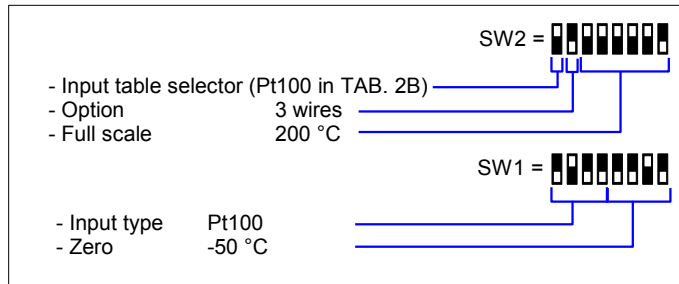
**For information about DATESOFT refer to the software's user guide.**

### CONFIGURATION BY DIP-SWITCHES



- 1) Open the suitable door on the side of the device.
- 2) Set the input table selector by the dip-switch SW2 [1] (see TAB.1)
- 3) Set the input type by the dip-switches SW1 [1..4] (see TAB.2A and TAB.2B)
- 4) Set, if foreseen, the option by dip-switch SW2 [2] (see TAB.3)
- 5) Set the minimum value of the input scale (Zero) by dip-switches SW1 [5..8] (see TAB.4)\*
- 6) Set the full scale value by dip-switches SW2 [3..8]\*

Ex of configuration Pt100 3 wires -50 ÷ 200 °C:



NOTE:

- It is also possible to set the dip-switches using the wizard of the configuration software following the procedure described in the section "Configuration by PC" until the step 6 and clicking on icon "Switch".

### DIP-SWITCH CONFIGURATION TABLES

TAB.1 – Input table selection

SW2	TABLE
1	TAB. 2A (mV, Volt, mA, TC)
2	TAB. 2B (Res, RTD, Pot.)

TAB.2A – Input type selection

SW1	SW1	
1 2 3 4	1 2 3 4	
0 0 0 0	0 0 0 0	EPROM *
0 0 0 0	0 0 0 0	Tc J
0 0 0 0	0 0 0 0	Tc K
0 0 0 0	0 0 0 0	Tc R
0 0 0 0	0 0 0 0	Tc S
0 0 0 0	0 0 0 0	Tc T
0 0 0 0	0 0 0 0	Tc B
0 0 0 0	0 0 0 0	Tc E
0 0 0 0	0 0 0 0	Tc N

TAB.2B – Input type selection

SW1	SW1	
1 2 3 4	1 2 3 4	
0 0 0 0	0 0 0 0	Res. 2KΩ
0 0 0 0	0 0 0 0	Res. 500Ω
0 0 0 0	0 0 0 0	Pt100
0 0 0 0	0 0 0 0	Ni100
0 0 0 0	0 0 0 0	Pt 1K
0 0 0 0	0 0 0 0	Ni 1K
0 0 0 0	0 0 0 0	Pot. <500Ω
0 0 0 0	0 0 0 0	Pot. <50KΩ

TAB.3 - Option

SW2	CJC	RTD/RES
2	External	3 wires
3	Internal	2/4 wires

NOTES:

\* To set the input range refer to the TAB.4 (next pages) referred to the input type selected by TAB.1, TAB.2A and TAB.2B.

\* If the dip-switches SW1 [1..4] and SW2 [1] are all set in the position 0 ("EPROM"), the device will follow the configuration programmed by PC (input type and range, output range and options).

\* If the dip-switches SW1 [5..8] and SW2 [3..8] are all set in the position 0 ("Default"), the device will follow the input scale programmed by PC for the input type selected by the dip-switches SW1[1..4] and SW2[1].

\* If the dip-switch SW2 [2] is set in the ON position and is in progress a measure by Resistance or RTD 2 wires sensor, it is necessary to connect the terminal I to the terminal L and the terminal G to the terminal H.



TAB.4d – Resistance < 500 ohm Input scale settings

Zero		Full Scale													
SW1		SW2		SW2		SW2		SW2		SW2					
5	6	7	8	3	4	5	6	7	8	3	4	5	6	7	8
□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
Ω		Ω		Ω		Ω		Ω		Ω		Ω		Ω	
Default		Default		125		210		370							
0		50		130		220		380							
10		55		135		230		390							
20		60		140		240		400							
30		65		145		250		410							
40		70		150		260		420							
50		75		155		270		430							
75		80		160		280		440							
100		85		165		290		450							
125		90		170		300		460							
150		95		175		310		470							
175		100		180		320		480							
200		105		185		330		490							
225		110		190		340		500							
250		115		195		350		500							
300		120		200		360		500							

TAB.4e – Potentiometer Input scale settings

Zero		Full Scale													
SW1		SW2		SW2		SW2		SW2		SW2					
5	6	7	8	3	4	5	6	7	8	3	4	5	6	7	8
□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
%		%		%		%		%		%		%		%	
Default		Default		34		66		98							
0		5		36		68		100							
15		6		38		70		100							
20		8		40		72		100							
25		10		42		74		100							
30		12		44		76		100							
35		14		46		78		100							
40		16		48		80		100							
45		18		50		82		100							
50		20		52		84		100							
55		22		54		86		100							
60		24		56		88		100							
65		26		58		90		100							
70		28		60		92		100							
75		30		62		94		100							
80		32		64		96		100							

TAB.4f – mA Input scale settings

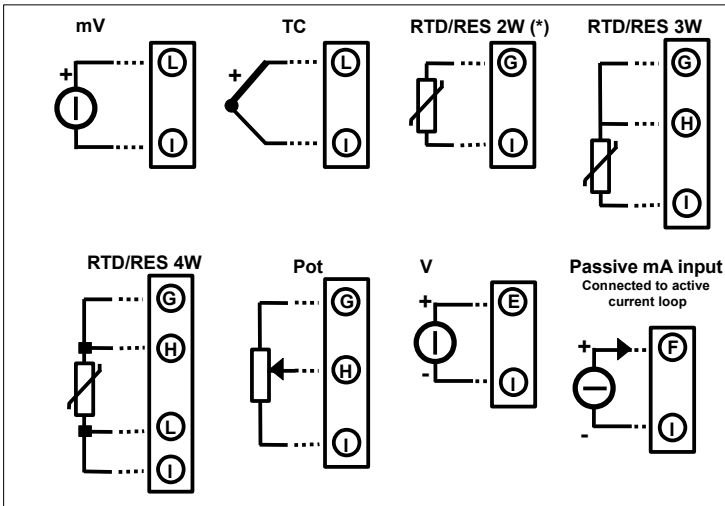
Zero		Full Scale													
SW1		SW2		SW2		SW2		SW2		SW2					
5	6	7	8	3	4	5	6	7	8	3	4	5	6	7	8
□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□	□□□□
mA		mA		mA		mA		mA		mA		mA		mA	
Default		Default		8		11.5		16							
0		5		8.2		11.75		16.5							
1.5		5.2		8.4		12		17							
2		5.4		8.6		12.25		17.5							
2.5		5.6		8.8		12.5		18							
3		5.8		9		12.75		18.5							
3.5		6		9.2		13		19							
4		6.2		9.4		13.25		19.5							
4.5		6.4		9.6		13.5		20							
5		6.6		9.8		13.75		20							
5.5		6.8		10		14		20							
6		7		10.25		14.25		20							
6.5		7.2		10.5		14.5		20							
7		7.4		10.75		14.75		20							
7.5		7.6		11		15		20							
8		7.8		11.25		15.5		20							

TAB.4g – Volt Input scale settings

Zero		Full Scale							
SW1	Volt	SW2		SW2		SW2		SW2	
5 6 7 8		3 4 5 6 7 8	Volt	3 4 5 6 7 8	Volt	3 4 5 6 7 8	Volt	3 4 5 6 7 8	Volt
Default		Default		3.4		6.6		9.8	
0		0.5		3.6		6.8		10	
1.5		0.6		3.8		7		10	
2		0.8		4		7.2		10	
2.5		1		4.2		7.4		10	
3		1.2		4.4		7.6		10	
3.5		1.4		4.6		7.8		10	
4		1.6		4.8		8		10	
4.5		1.8		5		8.2		10	
5		2		5.2		8.4		10	
5.5		2.2		5.4		8.6		10	
6		2.4		5.6		8.8		10	
6.5		2.6		5.8		9		10	
7		2.8		6		9.2		10	
7.5		3		6.2		9.4		10	
8		3.2		6.4		9.6		10	

**CONNECTIONS**

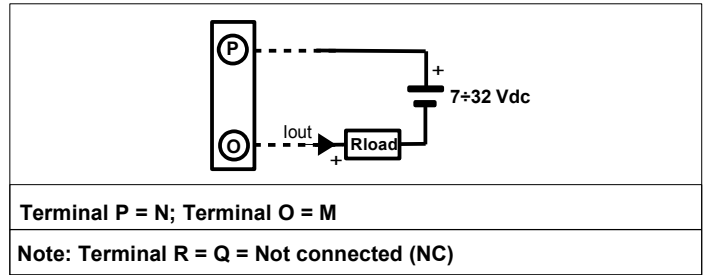
**INPUT CONNECTION**



Terminal I = GND INPUT

Note: if the device is programmed by dip switches for RTD / RES with 2 wires connection make a short circuit between the terminals I and L and the terminals G and H.

**POWER SUPPLY / OUTPUT CONNECTION**



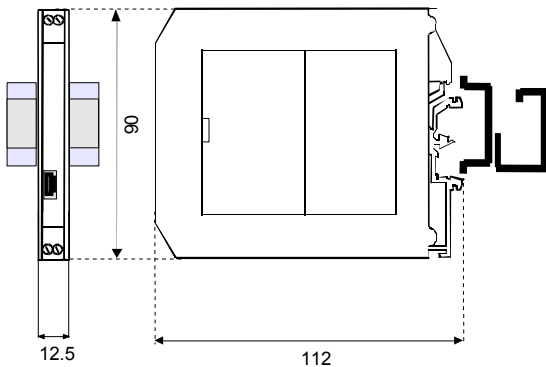
Terminal P = N; Terminal O = M

Note: Terminal R = Q = Not connected (NC)

**ISOLATION STRUCTURE**



**DIMENSIONS (mm)**



**INSTALLATION INSTRUCTIONS**

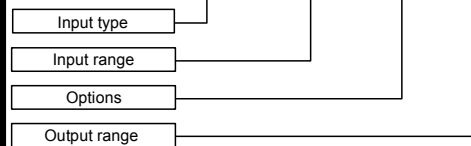
The device DAT 4535 is suitable for DIN rail mounting. It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .

**HOW TO ORDER**

The device is provided as requested on the Customer's order. Refer to the section "Programming" to determine the input ranges. In case of the configuration is not specified, the parameters must be set by the user.

**ORDER CODE EXAMPLE**

**DAT4535 /Pt100 /0 ÷ 200 °C /3 wires /4 ÷ 20 mA**



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.