

Two Wire Signal Transmitter

DAT 4535

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
- CE / UKCA 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.

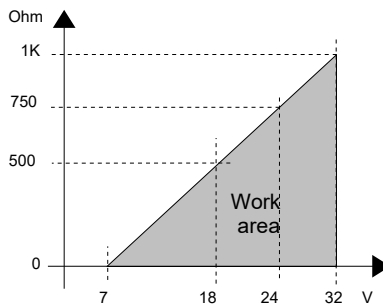
The 1500 Vac galvanic isolation eliminates the effects of all ground loops eventually existing and allows the use of the transmitter in heavy environmental conditions found in industrial applications.

USER INSTRUCTIONS

The wiring must be made as shown in section "Connections". Rload is the input impedance of instruments on the current loop; to obtain a correct measure, its value must be calculated in function of the power supply value (see section "Technical specification – Load characteristic"). 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				OUTPUT				GENERAL SPECIFICATIONS	
Input type	Min	Max	Span min	Output type	Min	Max	Span min		
TC (CJC int./ext.)				Current	4 mA	20 mA	4 mA	Supply voltage	7 .. 32 Vdc
J	-200°C	1200°C	100°C					Reverse polarity protection	60 Vdc max
K	-200°C	1300°C	100°C	Output calibration				ISOLATION	
S	0°C	1750°C	400°C	Current		± 7 uA		Input – Power supply/Out	1500 Vac, 50 Hz,1 min.
R	0°C	1750°C	400°C	Burn-out values				ENVIRONMENTAL CONDITIONS	
B	0°C	1820°C	400°C	Max. output value		21.8 mA		Operative Temperature	-40°C ..+85°C
E	-200°C	1000°C	100°C	Min. output value		2.4 mA		Storage Temperature	-40°C.. +85°C
T	-200°C	400°C	100°C	Response time (10÷ 90%)		about 400 ms		Humidity (not condensed)	0 .. 90 %
N	-200°C	1300°C	100°C	Delay on output		Programmable from 0 to 30 sec.		Maximum Altitude	2000 m
Voltage				Load characteristic – Rload (maximum load value on current loop per power supply value)				Installation	Indoor
mV	-100 mV	+90 mV	5 mV					Category of installation	II
mV	-100 mV	+200 mV	10 mV					Pollution Degree	2
mV	-100 mV	+800 mV	20 mV					MECHANICAL SPECIFICATIONS	
RTD (2, 3, 4 wires)								Material	Self-extinguish plastic
Pt100	-200°C	850°C	50°C					IP Code	IP20
Pt1000	-85°C	185°C	30°C					Wiring	wires with diameter 0.8÷2.1 mm ² /AWG 14-18
Ni100	-60°C	180°C	50°C					Tightening Torque	0.8 N m
Ni1000	-60°C	150°C	30°C					Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
RES. (2, 3, 4 wires)								Weight	about 90 g.
	0 Ω	500 Ω	50 Ω					CERTIFICATIONS	
	0 Ω	2000 Ω	50 Ω					EMC (for the Industrial Environments)	
Pot. (Rnom.<50KΩ)								Immunity	EN 61000-6-2
	0 %	100 %	10 %					Emission	EN 61000-6-4
Voltage								UKCA (ref S.I. 2016 N°1091)	
	-10 V	10 V	1 V					Immunity	BS EN 61000-6-2
Current								Emission	BS EN 61000-6-4
	0 mA	20 mA	1 mA						
Input accuracy (1)									
mV, TC	> of ±0.1% f.s. or ±12 uV								
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								
Linearity (1)									
Tc, RTD	± 0,1 % f.s.								
mV, V, mA	± 0,05 % f.s.								
Input impedance									
TC, mV	≥ 10 MΩ								
mA	~22 Ω								
Line resistance influence (1)									
TC, mV	≤0.8 uV/Ohm								
RTD 3 wires	0.05%/Ω (50Ω max balanced)								
RTD 4 wires	0.005%/Ω (100Ω max balanced)								
RTD,Res current	400 uA								
Thermal drift (1)									
Full Scale	± 0.01% / °C								
CJC	± 0.01% / °C								
CJC Comp.	± 0.5°C								



(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.

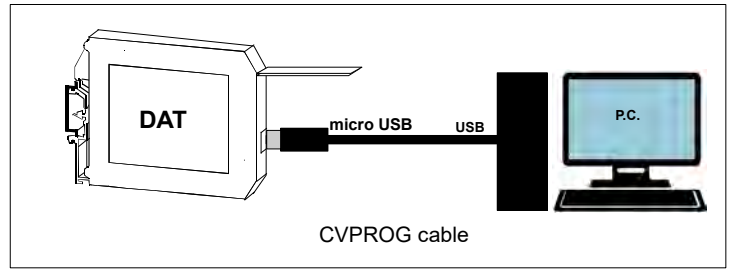
By software DATAPRO it is possible to:

- 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.

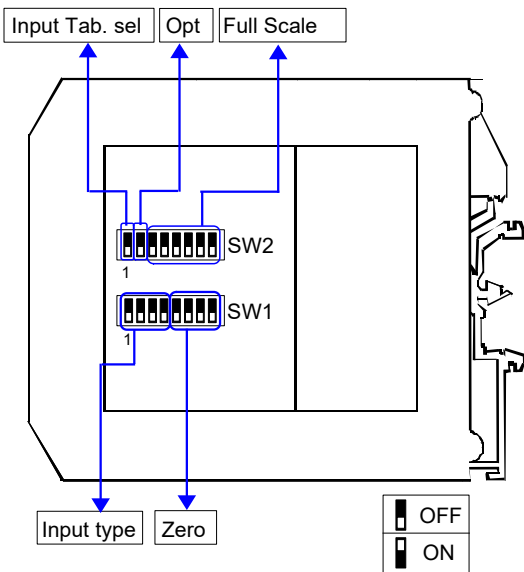
To configure the device follow the next steps:

- 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
- 4) Select the COM port in use and click on "Open COM".
- 5) Select the device and connect to it.
- 6) Set the programming data.
- 7) Click "Write" to send the programming data to the device.

For information about the software refer to the its user guide.

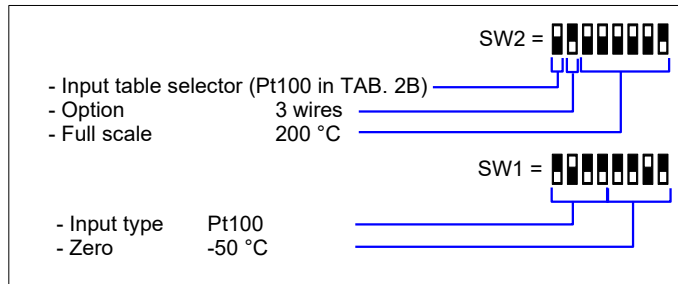


CONFIGURATION BY DIP-SWITCHES



- 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	
<input type="checkbox"/>	TAB. 2A (mV, Volt, mA, TC)
<input type="checkbox"/>	TAB. 2B (Res, RTD, Pot.)

TAB.2A – Input type selection

SW1	SW1	
1 2 3 4	1 2 3 4	
<input type="checkbox"/>	<input type="checkbox"/>	EPROM *
<input type="checkbox"/>	<input type="checkbox"/>	90 mV
<input type="checkbox"/>	<input type="checkbox"/>	200 mV
<input type="checkbox"/>	<input type="checkbox"/>	800 mV
<input type="checkbox"/>	<input type="checkbox"/>	10 V
<input type="checkbox"/>	<input type="checkbox"/>	20 mA
<input type="checkbox"/>	<input type="checkbox"/>	-----
<input type="checkbox"/>	<input type="checkbox"/>	-----
<input type="checkbox"/>	<input type="checkbox"/>	Tc J
<input type="checkbox"/>	<input type="checkbox"/>	Tc K
<input type="checkbox"/>	<input type="checkbox"/>	Tc R
<input type="checkbox"/>	<input type="checkbox"/>	Tc S
<input type="checkbox"/>	<input type="checkbox"/>	Tc T
<input type="checkbox"/>	<input type="checkbox"/>	Tc B
<input type="checkbox"/>	<input type="checkbox"/>	Tc E
<input type="checkbox"/>	<input type="checkbox"/>	Tc N

TAB.2B – Input type selection

SW1	SW1	
1 2 3 4	1 2 3 4	
<input type="checkbox"/>	<input type="checkbox"/>	Res. 2KΩ
<input type="checkbox"/>	<input type="checkbox"/>	Res. 500Ω
<input type="checkbox"/>	<input type="checkbox"/>	Pt100
<input type="checkbox"/>	<input type="checkbox"/>	Ni100
<input type="checkbox"/>	<input type="checkbox"/>	Pt 1K
<input type="checkbox"/>	<input type="checkbox"/>	Ni 1K
<input type="checkbox"/>	<input type="checkbox"/>	Pot. <500Ω
<input type="checkbox"/>	<input type="checkbox"/>	Pot. <50KΩ
<input type="checkbox"/>	<input type="checkbox"/>	-----
<input type="checkbox"/>	<input type="checkbox"/>	-----

TAB.3 - Option

SW2	CJC	RTD/RES
2		
<input type="checkbox"/>	External	3 wires
<input type="checkbox"/>	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.4a – mV, Tc Input scale settings

Zero		Full Scale							
SW1 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C
Default		Default		75		225		700	
-200		0		80		250		750	
-100		5		85		255		800	
-80		10		90		275		850	
-60		15		95		300		900	
-50		20		100		325		950	
-40		25		110		350		1000	
-30		30		120		375		1100	
-20		35		130		400		1200	
-10		40		140		425		1300	
0		45		150		450		1400	
10		50		160		475		1500	
20		55		170		500		1600	
50		60		180		550		1750	
100		65		190		600		1800	
150		70		200		650		1850	

TAB.4b – Pt100, Pt1K, Ni100, Ni1K Input scale settings

Zero		Full Scale							
SW1 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C	SW2 3 4 5 6 7 8	°C
Default		Default		75		210		370	
-200		0		80		220		380	
-150		5		85		230		390	
-100		10		90		240		400	
-50		15		95		250		425	
-40		20		100		260		450	
-30		25		110		270		475	
-20		30		120		280		500	
-10		35		130		290		525	
0		40		140		300		550	
5		45		150		310		600	
10		50		160		320		650	
20		55		170		330		700	
30		60		180		340		750	
50		65		190		350		800	
100		70		200		360		850	

TAB.4c – Resistance < 2KOhm Input scale settings

Zero		Full Scale							
SW1 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω	SW2 3 4 5 6 7 8	Ω
Default		Default		800		1150		1600	
0		500		820		1175		1650	
150		520		840		1200		1700	
200		540		860		1225		1750	
250		560		880		1250		1800	
300		580		900		1275		1850	
350		600		920		1300		1900	
400		620		940		1325		1950	
450		640		960		1350		2000	
500		660		980		1375		2000	
550		680		1000		1400		2000	
600		700		1025		1425		2000	
650		720		1050		1450		2000	
700		740		1075		1475		2000	
750		760		1100		1500		2000	
800		780		1125		1550		2000	

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

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

TAB.4e – Potentiometer Input scale settings

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

TAB.4f – mA Input scale settings

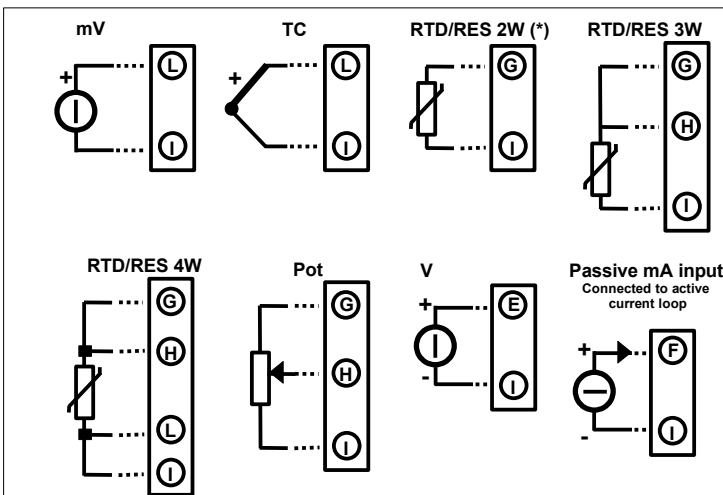
Zero		Full Scale							
SW1		SW2		SW2		SW2		SW2	
5	6	7	8	3	4	5	6	7	8
mA	mA	mA	mA	mA	mA	mA	mA	mA	mA
Default	Default	Default	Default	8	11.5	16			
0	0	5	5	8.2	11.75	16.5			
1.5	1.5	5.2	5.2	8.4	12	17			
2	2	5.4	5.4	8.6	12.25	17.5			
2.5	2.5	5.6	5.6	8.8	12.5	18			
3	3	5.8	5.8	9	12.75	18.5			
3.5	3.5	6	6	9.2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

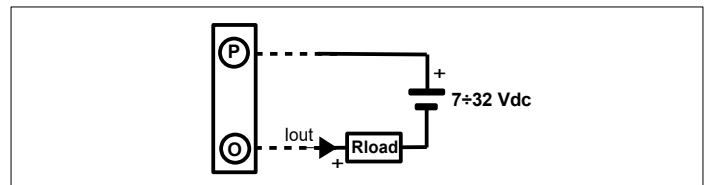
INPUT CONNECTION



Terminal I = GND INPUT

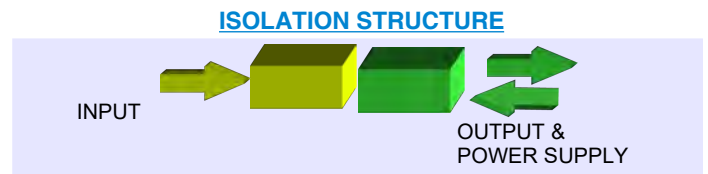
Note: if the device is programmed by dip switches for RTD / RES with 2 wires connection make a short circuit between the terminals I and L and the terminals G and H.

POWER SUPPLY / OUTPUT CONNECTION

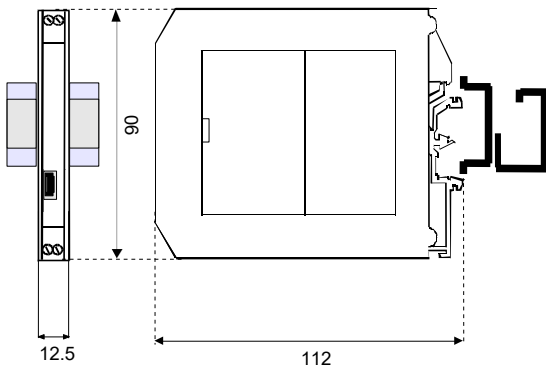


Terminal P = N; Terminal O = M

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



DIMENSIONS (mm)



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 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

