DATEXEL

UNI EN ISO 9001:2008

DIN Rail Signal Transmitter
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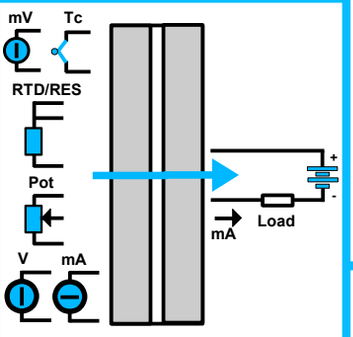
Universal isolated transmitter configurable by Dip-Switch or PC

DAT4535

FEATURES

- **Universal configurable input for: mV, Tc, RTD, Res, Potentiometer, V and mA**
- **Configurable current output from 4 to 20 mA**
- **Configurable by dip-switch or PC**
- **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 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

Input type	Min	Max	Min. Span
TC (CJC int./ext.)			
J	-200°C	1200°C	100°C
K	-200°C	1300°C	100°C
S	0°C	1750°C	400°C
R	0°C	1750°C	400°C
B	0°C	1850°C	400°C
E	-200°C	1000°C	100°C
T	-200°C	400°C	100°C
N	-200°C	1300°C	100°C
Voltage			
mV	-100 mV	+90 mV	5 mV
mV	-100 mV	+200 mV	10 mV
mV	-100 mV	+800 mV	20 mV
Volt	-10 V	10 V	1 V
RTD (2, 3, 4 wires)			
Pt100	-200°C	850°C	50°C
Pt1000	-85°C	185°C	30°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	30°C
RES. (2, 3, 4 wires)	0 Ω	500 Ω	50 Ω
	0 Ω	2000 Ω	50 Ω
Pot. (Rnom.< 50KΩ)	0 %	100 %	10 %
Current	0 mA	20 mA	1 mA

Input calibration (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, Pot	± 0.1 % f.s.
mV, V, mA	± 0.05 % f.s.

Input impedance

TC, mV	>= 10 MΩ
Volt	>= 1 MΩ
mA	~22 Ω

RTD excitation current

RTD,Res	400 uA

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)

Thermal drift (1)

Full Scale	± 0.01% / °C
CJC	± 0.01% / °C
CJC Comp.	± 0.5°C

OUTPUT

Output type	Min	Max	Min. span
Current	4 mA	20 mA	4 mA

Output calibration

Current	± 7 uA

Burn-out values

Max. output value	21.8 mA
Min. output value	2.4 mA

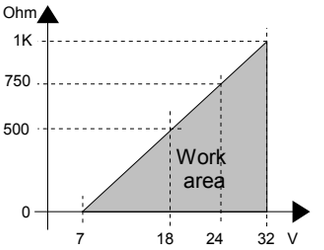
Response time (10÷ 90%) about 400 ms

Delay on output Programmable from 0 to 30 sec.

POWER SUPPLY

Supply voltage	7 .. 32 Vdc
Reverse polarity protection	60 Vdc max

Load characteristic - Rload (maximum load value on current loop per power supply value)



ISOLATION

Input – Power supply/Out 1500 Vac, 50 Hz,1 min.

ENVIRONMENTAL CONDITIONS

Operative Temperature	-40°C ..+85°C
Storage Temperature	-40°C.. +85°C
Humidity (not condensed)	0 .. 90 %
Maximum Altitude	2000 m
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.

EMC (for industrial environments)

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

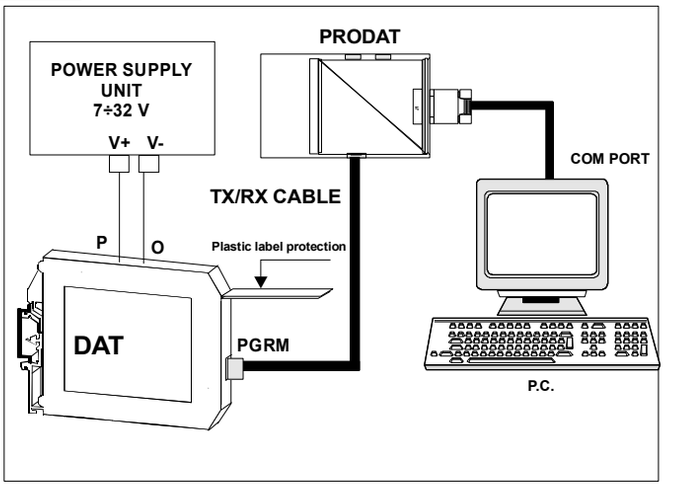
(1) referred to input Span (difference between max. and min. values)

PROGRAMMING

CONFIGURATION BY PC

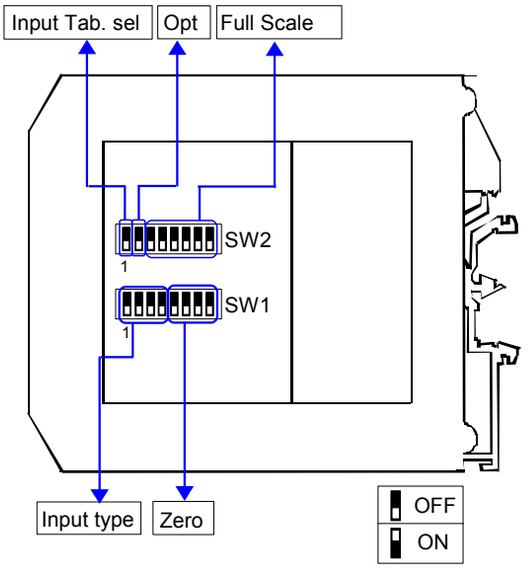
By software DATESOFT from version 2.7 it is possible to:
- set the default programming of the device;
- program the options not available with the dip-switch;
  (burn-out level, CJC offset, trip alarm settings, delay on output, etc...);
- read, in real time, the input and output measures;
- follow the dip-switches configuration wizard.

To configure the device follow the next steps:
1) Power-on the device.
2) Open the protection plastic label on the front of the device.
3) Connect the interface PRODAT to the PC (COM port)
   and to the device (PGRM connector).
4) Open DATESOFT.
5) Select the COM port in use.
6) Click on “Open COM”.
7) Click on the icon “Program”.
8) Set the programming data.
9) Click on the icon “Write” to send the programming data to the device.



Warning: during these operations the device must always be powered and the TX/RX cable always connected.
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)

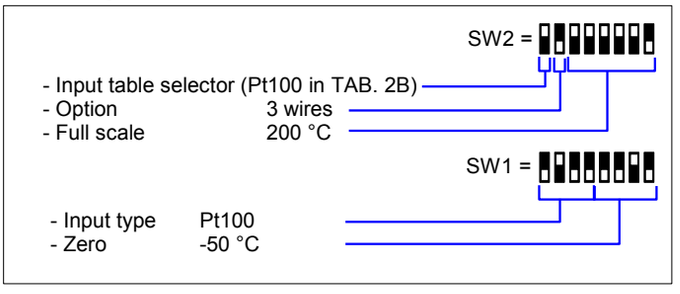
3) Set the input type by the dip-switches SW1 [1..4] (see TAB.2A and TAB.2B)

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] (see TAB.4)*

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

TAB.2A – Input type selection

SW1 1 2 3 4		SW1 1 2 3 4	
■■■■	EPROM *	■■■■	Tc J
■■■■	90 mV	■■■■	Tc K
■■■■	200 mV	■■■■	Tc R
■■■■	800 mV	■■■■	Tc S
■■■■	10 V	■■■■	Tc T
■■■■	20 mA	■■■■	Tc B
■■■■	-------	■■■■	Tc E
■■■■	-------	■■■■	Tc N

TAB.2B – Input type selection

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

TAB.3 - Option

SW2 2	CJC	RTD/RES
■	External	3 wires
■	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 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 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	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 5 6 7 8	%	SW2 3 4 5 6 7 8	%	SW2 3 4 5 6 7 8	%	SW2 3 4 5 6 7 8	%	SW2 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

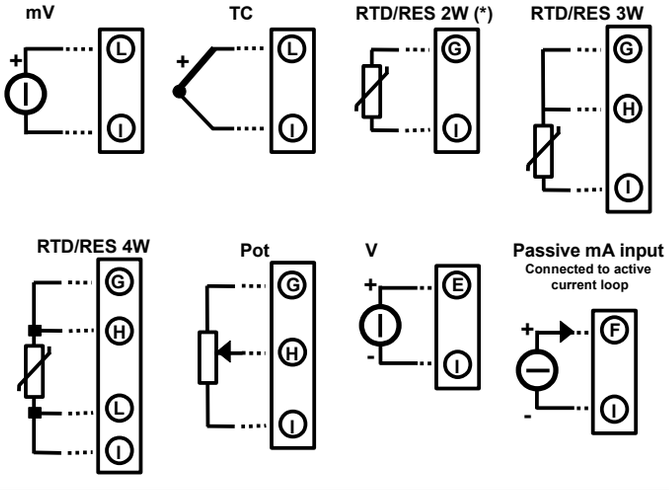
Zero		Full Scale											
SW1 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA	SW2 3 4 5 6 7 8	mA
Default	Default	8	11.5	16
0	5	8.2	11.75	16.5
1.5	5.2	8.4	12	17
2	5.4	8.6	12.25	17.5
2.5	5.6	8.8	12.5	18
3	5.8	9	12.75	18.5
3.5	6	9.2	13	19
4	6.2	9.4	13.25	19.5
4.5	6.4	9.6	13.5	20
5	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 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 3 4 5 6 7 8	Volt	SW2 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

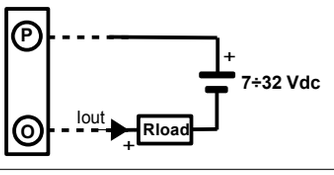
INPUT CONNECTION



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.

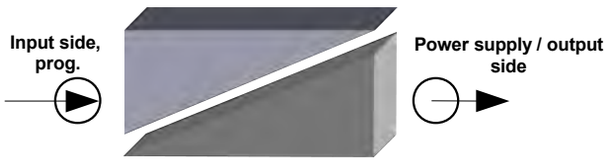
POWER SUPPLY / OUTPUT CONNECTION



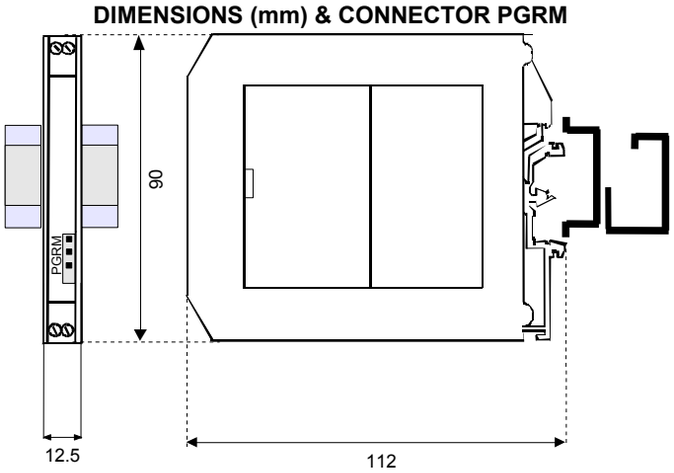
Terminal P = N; Terminal O = M

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

ISOLATION STRUCTURE



DIMENSIONS (mm) & CONNECTOR PGRM



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

- Input type
- Input range
- Options
- Output range

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روبروی پالایشگاه نفت پارس، پلاک ۱۲