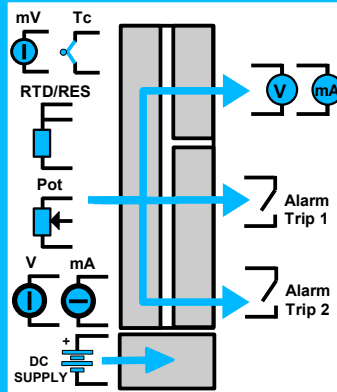


DAT 5024AO



FEATURES

- Universal configurable input for: mV, Tc, RTD, Res, Potentiometer, V and mA
- Two independent alarm trip programmable as high alarm or low alarm
- Two relays SPDT
- One analogue output configurable by PC
- Trip level and hysteresis adjustable by potentiometer
- Delay time adjustable from 1 to 25 seconds
- High accuracy
- Also configurable by PC using CVPROG cable
- Galvanic isolation among all the ways
- CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



DESCRIZIONE GENERALE

The DAT5024AO device is able to accept at its input a wide range of normalized voltage or current signals; it is also able to interface directly to thermocouple or resistance thermometer temperature sensors. The current input makes it possible to connect both active and passive sensors and converters, since a power source (Vaux) is available to power these devices. The thresholds can be configured using DIP-switches both as a maximum and as minimum. The trip level is set by acting on the potentiometer located on the front of the container. It is also possible to set, through potentiometer, the hysteresis and of the delay time for the thresholds.

If the configuration is performed by dip switches, the analog output is 4-20mA by default in relation to the ranges in the "Input type" table.

Through PC programming it is possible to set the type of input, the intervention and release thresholds, the delay and the analogue output without using the test points and the potentiometers.

The software programming procedure can be performed by interfacing the device to the Personal Computer, using the special CVPROG cable provided by DATEXEL and sold separately, without the device having to be connected to an external power supply.

The galvanic isolation eliminates all the effects due to the mass loops that may be present, allowing the use of the device even in the most severe environmental conditions.

It is housed in a plastic enclosure of 20.5 mm thickness suitable for DIN rail mounting in compliance with EN-50022 and EN-50035 standards.

OPERATIVE INSTRUCTIONS

The power, input and output connections must be made according to what is indicated in the "Connections" section.

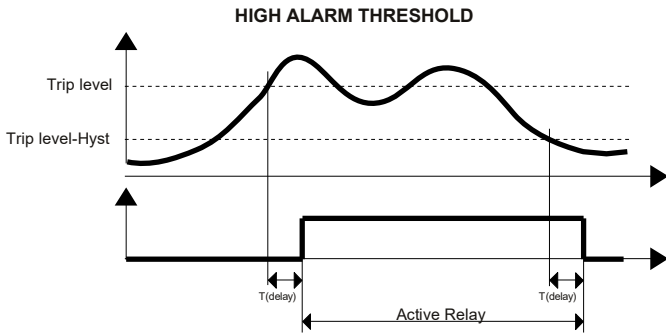
It is possible to configure the field converter via dip-switch using the "Configuration tables" (TAB.1, TAB.2 and TAB.3) and the potentiometers as shown in the section "Setting and adjustment of thresholds". Programming via dip-switch can also take place when the module is powered.

For the PC configuration, use the special CVPROG cable.

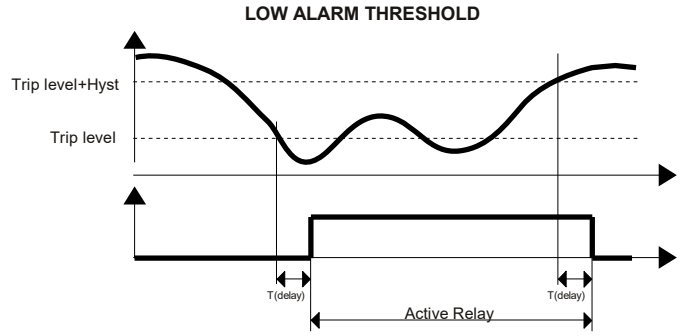
TECHNICAL SPECIFICATIONS (Typical @ 25 °C and in nominal conditions)

INPUT				Input impedance		ALARM TRIP	
Input type	Min	Max	Span min	TC, mV	>= 10 MΩ	Relays Output	N° 2 SPDT
TC (CJC int./ext.)				mA	~22 Ω	Contact rating	2A , 250 Vac 2A , 30 Vdc
J	-200°C	1200°C	100°C	RTD excitation current		Max Voltage	250 Vac (50/60 Hz) 110 Vdc
K	-200°C	1300°C	100°C	RTD, Res	400 uA	Isolation	coil-to-contacts: 4000Vac between contacts: 1000Vac
S	0°C	1750°C	400°C	Aux. Voltage	>18V @ 20mA	Trip level (*)	adjustable from 2% to 98% f.s.
R	0°C	1750°C	400°C	Line resistance influence (1)		Hysteresis (*)	adjustable from 0,5% to 10% f.s.
B	0°C	1850°C	400°C	TC, mV	<=0.8 uV/Ohm	Delay (*)	adjustable from 1 to 25 sec.
E	-200°C	1000°C	100°C	RTD 3w (50Ω max balanced)	0.05%/Ω	Adjustment accuracy (*)	±0,3% f.s.
T	-200°C	400°C	100°C	RTD 4w (100Ω max balanced)	0.005%/Ω	(*) parameters valid only in case of configuration by dip-switch and from potentiometers	
N	-200°C	1300°C	100°C	Thermal drift (1)		ISOLATION	
Voltage				Full scale	± 0.01% / °C	Among all the ways 1500 Vac,50 Hz, 1 min	
mV	-100 mV	+90 mV	5 mV	CJC	± 0.01% / °C	ENVIRONMENTAL CONDITIONS	
mV	-100 mV	+200 mV	10 mV	CJC Comp.	± 1°C	Operative Temperature -20°C .. +60°C	
mV	-100 mV	+800 mV	20 mV	ANALOGUE OUTPUT			
RTD (2, 3, 4 wires)				Output type	Min	Max	Min Span
Pt100	-200°C	850°C	50°C	Current	0 mA	20 mA	4 mA
Pt1000	-85°C	185°C	30°C	Voltage	0 V	10 V	1 V
Ni100	-60°C	180°C	50°C	Output resolution			
Ni1000	-60°C	150°C	30°C	Current	7 uA		
RES. (2, 3, 4 wires)				Voltage	4 mV		
0 Ω	0 Ω	500 Ω	50 Ω	Aux. Voltage	>12V @ 20mA		
0 Ω	0 Ω	2000 Ω	50 Ω	Burn-out values			
Pot. (Rnom.< 50KΩ)				Max. output value	22 mA or 11 V		
0 %	0 %	100 %	10 %	Min. output value	0 mA or -0.6 V		
Voltage				Output load Resistance - Rload			
-10 V	-10 V	10 V	1 V	Current output	< 500 Ω		
Current				Voltage output	> 10 KΩ		
0 mA	0 mA	20 mA	1 mA	Short circuit current	30 mA max.		
Accuracy (1)				Response time (10÷ 90%)	about 400 ms 50 ms (option HS mV,V, mA)		
mV, TC	the higher of ±0.1% and ±12 uV			POWER SUPPLY			
RTD	the higher of ±0.1% and ±0.2°C			Power supply voltage	20 .. 30 Vdc		
Res.	the higher of ±0.1% and ±0.15			Reverse polarity protection	60 Vdc max		
Potentiometer	± 0.05 % f.s.			Current consumption			
Voltage	the higher of ±0.1% and ± 2 mV			Current output	90 mA max.		
mA	the higher of ±0.1% and ± 6 uA			Voltage output	70 mA max.		
mV, V, mA	± 0.5 % f.s (opt. HS)			MECHANICAL SPECIFICATIONS			
Linearity (1)				Material	Self-extinguish plastic		
TC, RTD	± 0.1 % f.s.			IP Code	IP20		
mV, V, mA	± 0.05 % f.s.			Wiring	wires with diameter 0.8+2.1 mm ² /AWG 14-18		
(1) referred to the input Span (difference between max. and min.)				Shortening Torque	0.8 N m		
				Mounting	in compliance with DIN rail standard EN-50022 and EN-50035		
				Weight	about 125 g		
				CERTIFICATIONS			
				EMC (for industrial environments)			
				Immunity	EN 61000-6-2		
				Emission	EN 61000-6-4		

THRESHOLD OPERATION



For the **high alarm** the relay goes on when the input signal is higher than the trip level and after the delay time. The relay goes off only when the input signal is lower than the trip level minus the hysteresis value or when reaches the minimum value of the input scale and after the delay time.



For the **low alarm** the relay goes on when the input signal is lower than the trip level and after the delay time. The relay goes off only when the input signal is higher than the trip level plus the hysteresis value or when reaches the maximum value of the input scale and after the delay time.

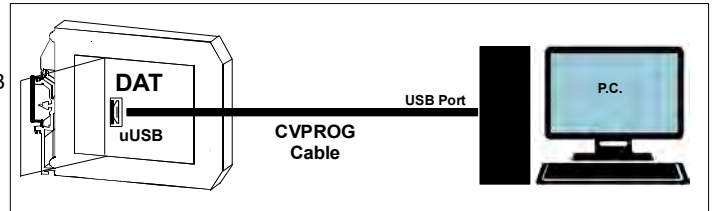
CONFIGURATION BY PC

Through the DATESOFT configuration software it is possible to:

- Set the default settings of the module
- Set the threshold values, the type, the hysteresis and the delay independently of the potentiometers
- Set the options not available via the dip-switches (break level, analog output damping, High Speed function, etc ...)
- Read the input and output measurements in real time
- Follow the dip-switch configuration wizard

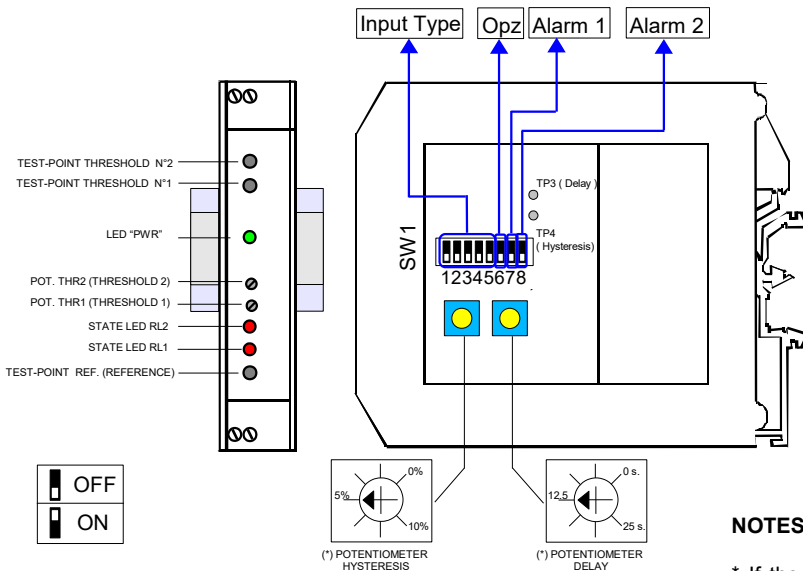
To configure the device, follow the procedure below:

- 1) Open the plastic door on the side of the device
- 2) Connect the CVPROG cable to the Personal Computer and to the microUSB port
- 3) Make sure the dip-switches are all OFF (EPROM configuration - see TAB.1)
- 3) Open the configuration program.
- 4) Select the COM port to which the device is connected.
- 5) Press the "Open COM" button.
- 6) Select the "Program" window
- 7) Set the programming data.
- 8) Press the "Write" button to send the programming data.

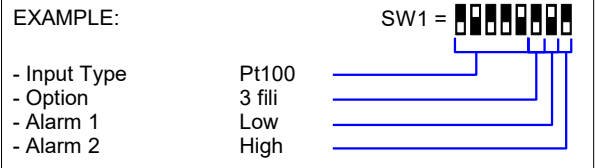


Warning: during the whole procedure the device must always be powered and the connection cable must not be disconnected.
For detailed information on the operation of the configuration program, refer to the relevant operating manual.

CONFIGURATION BY DIP-SWITCH



- 1) Open the door on the side of the device.
- 2) Set the type of input on the dip-switches SW1 [1..5] (see TAB.1)
- 3) Set the type of threshold on the dip-switches SW1 [7..8] (see TAB.2A and TABLE 2B)
- 4) Set, if required, the options on the SW1 dip-switch [6] (see TABLE 3)



NOTES:

- * If the dip-switches SW1 [1..5] are all set to the OFF position ("EPROM"), the entire configuration set via PC will be loaded
- * Possible incorrect configurations on the dip-switches will be signaled with the PWR LED flashes.
- * If the dip-switch SW1 [6] is set to the ON position and a measurement is being performed for RTD or 2-wire resistor, it is necessary to short-circuit the I-L and G-H terminals.

TAB.1 – Input Type

SW1 1 2 3 4 5	SW1 1 2 3 4 5	SW1 1 2 3 4 5
	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.2A

SW1 7	LEVEL
	High
	Low

TAB.2B

SW1 8	LEVEL
	High
	Low

TAB.3

SW1 6	CJC	RTD/RES
	External	3 wires
	Internal	2/4 wires

ALARM TRIP SETTING AND ADJUSTMENT

The level of the thresholds is set by acting on the potentiometers placed on the front of the container. To determine the correct operation of the thresholds, perform the following steps:

1- Set the desired "Input Type" via dip bank SW1 and using TAB.1. Set the Option (dip 6) where required TAB.3.

2- Calculate the value corresponding to the threshold, in relation to the measurement scale, according to the following formula:

$$V = ((\text{threshold} - \text{min}) / (\text{max} - \text{min})) * 4$$

The "max" and "min" values are listed in the "Input types" table of the Technical Specifications and "threshold" is the desired value expressed in the same unit of measurement.

3 - The value obtained, which will be between 0 and 4, indicates the voltage in Volt to which the potentiometers "THR1" must be set for the threshold n ° 1 and "THR2" for the threshold n ° 2. The value of the potentiometer can be checked by measuring, with the use of a voltmeter, the voltage on the test-points "TP1" for the threshold n ° 1 and "TP2" for the threshold n ° 2. The potentiometers and test-points for setting the thresholds are placed on the front of the container.

4 - Set the type of threshold (maximum or minimum) for the threshold "1" and for the "2" threshold through the dip-switches 7 and 8 of "SW1" accessible from the door on the side of the container.

5 - Adjust the hysteresis and delay level, by acting on the accessible potentiometers by opening the door on the side of the container, measuring the voltage on the "TP3" test points for the delay and "TP4" for the hysteresis.

The value of the thresholds and hysteresis is set by acting on the relative potentiometers, which provide a 0-4V continuous voltage proportional to the input signal scale (0 volts correspond to the minimum value and 4V corresponds to the full scale) on the test points (TP1 , TP2). Both measurements must refer to the "REF" test point.

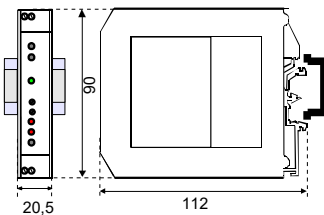
NOTES:

- The maximum value of the thresholds is limited to 98% of the input range, while the minimum value is limited to 2%.
- The minimum hysteresis value is fixed at 0.5% of the input range.
- The "threshold + hysteresis" and "threshold-hysteresis" values are limited so as not to exceed the limits of the measurement scale.
- The delay time delays both the switching on and the relay. The minimum time between switching on and off a relay is approximately 1 second.
- The hysteresis level and the delay time are the same for both thresholds.
- It is possible to configure a different hysteresis value for each threshold only via PC.

ISOLATION STRUCTURE



MECHANICAL DIMENSIONS (mm)



LIGHT SIGNALLING

LED	COLOR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINKING	Wrong dip-switches settings
RELAY 1 RELAY 2	RED	ON	Trip alarm active
		OFF	Trip alarm not active

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 fitting to DIN rails in the vertical position. For optimum operation and long life follow these instructions:

When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following cases:

- If panel temperature exceeds 45°C.
- Use of high power supply value (> 27 Vdc).
- Use of one or both current outputs.
- Use of active current input.

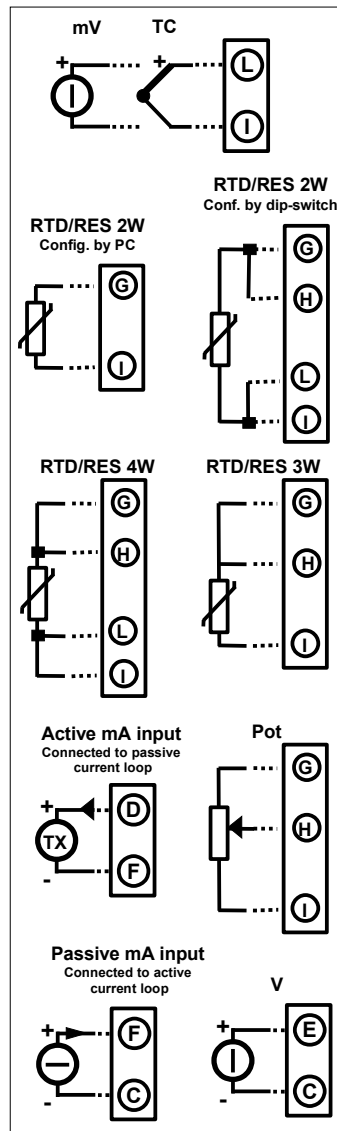
Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.

Install the device in a place without vibrations.

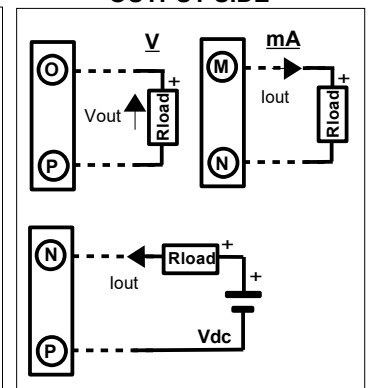
Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...) and to use shielded cable for connecting signals.

CONNECTIONS

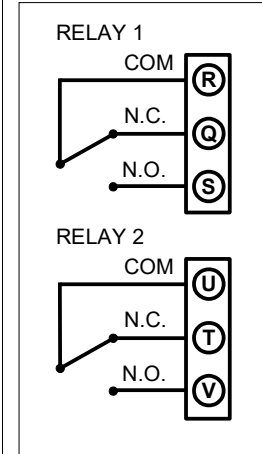
INPUT SIDE



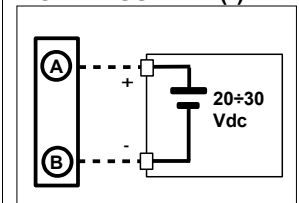
OUTPUT SIDE



CONTACTS OF RELAYS



POWER SUPPLY (*)



(*) Note: the device must be powered using a power supply unit classified NEC class 2 or SELV

HOW TO ORDER

The device is provided as requested on the Customer's order. (specify all the necessary parameters in the order).

ORDER CODE EXAMPLE:

DAT5024AO