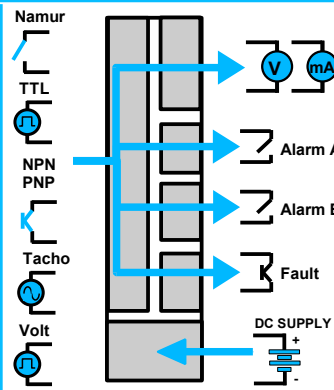


# DAT 4540



## FEATURES

- Measure of the frequency for the following digital contacts input:  
**Namur, TTL, NPN, PNP, Tachometer, Volt**
- Configurable output as current or voltage
- Double optional trip alarm
- Fault alarm condition for Namur sensor
- Configurable by Dip-switch or PC
- High accuracy
- On-field reconfigurable
- Galvanic insulation among all ways
- EMC compliant – CE mark
- Suitable for DIN rail mounting in according to EN-50022 and EN-50035 standards



## GENERAL DESCRIPTION

The isolated frequency converter DAT 4540 is able to measure, up to 20 KHz, the frequency of TTL, Namur, NPN, PNP and Tachometer digital signals. In function of programming, the measured values are converted in a current or voltage signal. Moreover two relays are available in order to be programmed as trip alarm (version “-R”). For the Namur input is continuously checked the integrity of the sensor; in case of fault (short circuit or interruption), on the transistor output is generated an alarm.

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 and the output type without recalibrate the device.

By PC, the user can program all the parameters of the devices for his own necessities.

The galvanic isolation on all ways (input, outputs and power supply) eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

The DAT 4540 is in compliance with the directive 2004/108/EC on the Electromagnetic Compatibility.

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 converter must be powered by a direct voltage applied to the terminals Q and R.

The analog channel measures the value from the sensor connected to the terminals the I, L, G, H and transmits the output measure on the terminals N, M, O and P.

The connections for the trip alarms are available between th terminals A-B-C-D and S-T-U-V (version -R); the digital contact (N.C.) of the Fault alarm for the Namur sensor is available between the terminals E-F. The input and output connections must be made as shown in the section "Connections".

It is possible to configure the converter on field by dip-switch or Personal Computer as shown in the section " Programming ". The configuration by dip-switches can be made also if the device is powered (note: after the configuration the device takes some seconds to provide the right output measure ).

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

INPUT	OUTPUT				RELAY OUTPUTS	
	Output type	Min	Max	Min Span		
<b>Namur ( DIN 19234 )</b> Low level Trig. < 1.2 mA High level Trig. > 2.1 mA Aux. Voltage 8.2 V – 8 mA Impedance ~ 1000 Ohm Interruption Alarm < 0.2 mA Short Circuit Alarm > 7.0 mA  <b>TTL</b> Low level Trig. < 0.8 V High level Trig. > 2.0 V Impedance > 20 KOhm  <b>PNP</b> Low level Trig. < 4.0 V High level Trig. > 7.0 V Aux. Voltage 17 V – 20 mA Impedance ~ 2.2 KOhm  <b>Tacho</b> Low level Trig. < -50 mV High level Trig. > +50 mV Impedance > 100 Kohm  <b>Voltage (programmable)</b> Trigger Level 0.05 V + 7.0 V Aux. Voltage 5 ÷ 17 V @ 20 mA Impedance > 20 Kohm	Current	0 mA	20 mA	4 mA	<b>Relay Outputs (Only for version “-R”)</b> N° 2 SPDT Max. Load (Resistive) 250 Vac, 2A Isolation between terminals 1000 Vac max  <b>Transistor Output</b> Max. load (Resistive) 30 Vdc, 100mA  <b>POWER SUPPLY</b> Power supply voltage 20 .. 30 Vdc Reverse polarity protection 60 Vdc max  <b>Current consumption</b> Current output 90 mA max. Voltage output 30 mA max. (+ 10mA for each Relay output active )  <b>ISOLATION</b> Among all ways 1500 Vac, 50 Hz, 1 min  <b>TEMPERATURE AND HUMIDITY</b> Operative temperature -20°C .. +60°C Storage temperature -40°C.. +85°C Humidity (not condensed) 0 .. 90 %  <b>HOUSING</b> Material Self-extinguishing plastic Mounting DIN rail in compliance with 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	
	Voltage	0 V	10 V	1 V		
	<b>Output calibration</b>					
	Current	± 7 uA				
	Voltage	± 5 mV				
	<b>Aux. Voltage</b>	>12V @ 20 mA				
	<b>Burn-out values</b>					
	Max. output value	22 mA or 11 V				
	Min. output value	0 mA or -0.6 V				
	<b>Output load Resistance - Rload</b>					
Current output	< 500 Ω					
Voltage output	> 10 KΩ					
Short circuit current	30 mA max.					
Frequency	0.1 Hz + 20 KHz					
Sample Time	< 50ms + period					

## PROGRAMMING

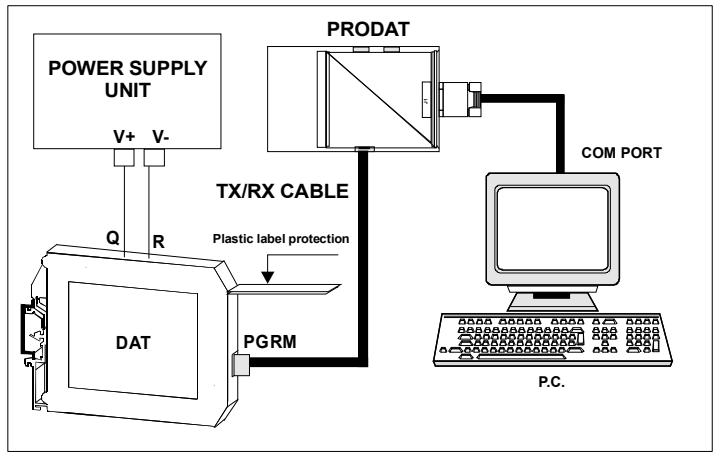
### CONFIGURATION BY PC

By software DATESOFT 2.5 and later releases 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, etc...);
- read, in real time, the input and output measures;
- follow the dip-switches configuration wizard.

To configure the device follow the next steps:

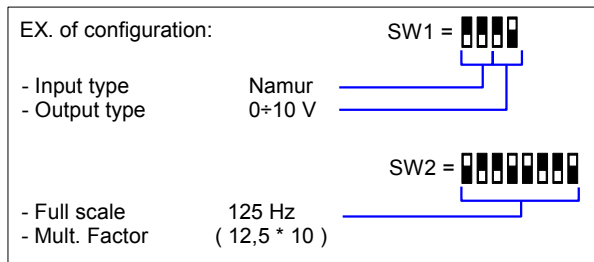
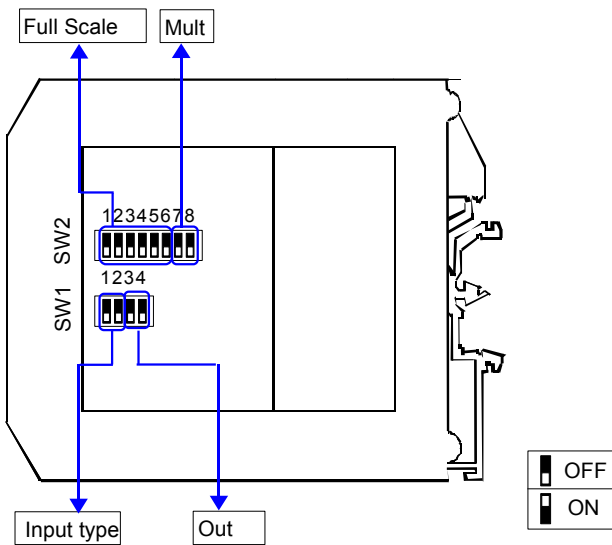
- 1) Power-on the device.
- 2) Open the protection plastic label on the front of the device.
- 3) Connect the interface PRODAT to the PC (COM port) and to the device (PGRM connector).
- 4) Open DATESOFT2.5 .
- 5) Select the COM port in use.
- 6) Click on "Open COM".
- 7) Click on "Program".
- 8) Set the programming data.
- 9) Click on "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-SWITCH

- 1) Open the suitable door on the side of the device.
- 2) Set the input type by the dip-switch SW1 [1..2] (see TAB.1)
- 3) Set the output type by the dip-switch SW1 [3..4] (see TAB.2)
- 4) Set the input Full Scale value by the dip-switch SW2 [1..6] (see TAB.3)
- 5) Set the multiplication factor by the dip-switch SW2 [7..8] (see TAB.3)



NOTE:

- It is also possible to see how to set the dip-switches using the wizard of the configuration software (connect the device to the PC following the procedure described in the section "Configuration by PC")

### DIP-SWITCH CONFIGURATION TABLES

TAB.1  
Input type

SW1	1 2	
		Namur
		Tacho
		TTL
		PNP

Tab.2  
Output type

SW1	3 4	
		0-20 mA
		4-20 mA
		0-10 V
		0-5 V

TAB.3 – Full Scale settings

Mult. Factor		Full Scale									
SW2	7 8	Mult	SW2	1 2 3 4 5 6	Hz	SW2	1 2 3 4 5 6	Hz	SW2	1 2 3 4 5 6	Hz
		1000			Default			8			16
		100			0.5			8.5			16.5
		10			1			9			17
		1			1.5			9.5			17.5
					2			10			18
					2.5			10.5			18.5
					3			11			19
					3.5			11.5			19.5
					4			12			20
					4.5			12.5			20.5
					5			13			21
					5.5			13.5			21.5
					6			14			22
					6.5			14.5			22.5
					7			15			23
					7.5			15.5			23.5

## 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 and the device is powered with high power supply value ( $> 27$  Vdc).
- Use of output active current.
- Use of the input auxiliary supply.

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.

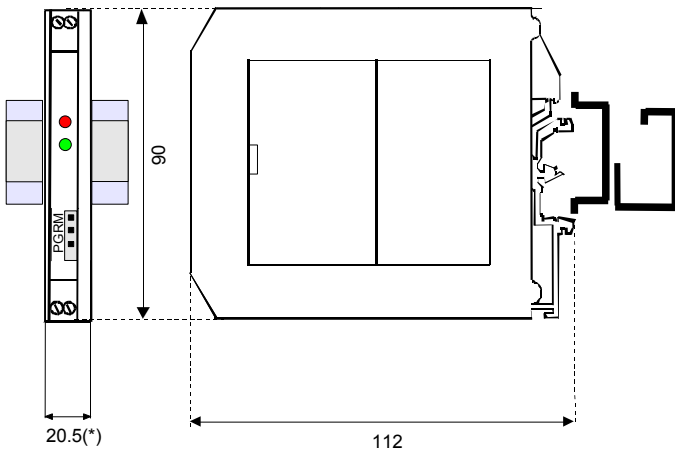
Install the device in a place without vibrations.

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.

## ISOLATION STRUCTURE



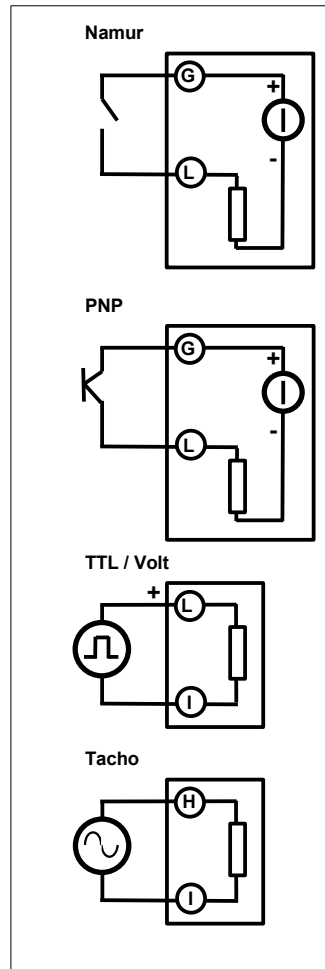
## DIMENSIONS (mm)



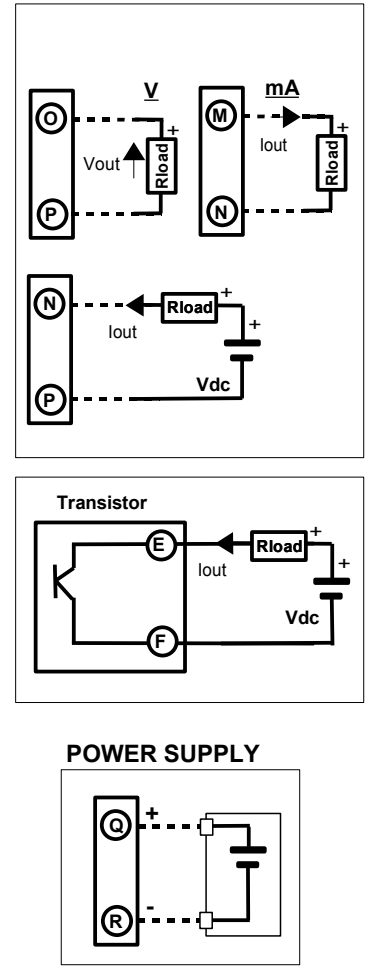
(\*) **NOTE:**  
 "-R" Version: 20.5 mm thickness  
 Standard Version: 12.5 mm thickness

## CONNECTIONS

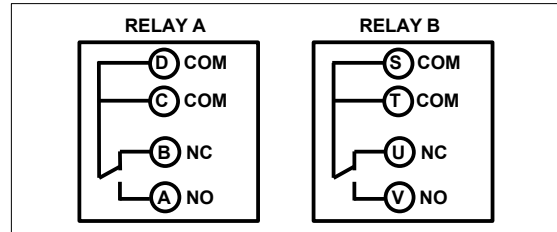
### INPUT



### OUTPUT



### RELAY OUTPUTS (only for DAT 4540-R)



### LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINKING	Wrong dip-switch setting
ALARM	RED	ON	Trip Alarm or Fault Alarm active
		OFF	Trip Alarm or Fault Alarm not active

### HOW TO ORDER

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

### ORDER CODE EXAMPLE:

