

FEATURES

- Measure of the frequency for digital contacts from Namur, TTL, NPN, PNP, Tachometer, Volt sensors
- 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
- CE / UKCA 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 insulation 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.

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 input ,output and power supply 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			GENERAL SPECIFICATIONS	
Input type		Output type	Min	Max	Span min	
Namur (DIN 19234) 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		Current	0 mA	20 mA	4 mA	Power supply voltage 20 .. 30 Vdc
		Voltage	0 V	10 V	1 V	Reverse polarity protection 60 Vdc max
		Output calibration				Current consumption
		Current		± 7 uA		Current output 90 mA max.
		Voltage		± 5 mV		Voltage output 30 mA max. (+ 10mA for each Relay output active)
		Aux. Voltage		>12V @ 20 mA		ISOLATION
						Among all ways 1500 Vac, 50 Hz, 1 min
		Burn-out values				ENVIRONMENTAL CONDITIONS
		Max. output value		22 mA or 11 V		Operative Temperature -20°C .. +60°C
		Min. output value		0 mA or -0.6 V		Storage Temperature -40°C.. +85°C
TTL Low level Trig. < 0.8 V High level Trig. > 2.0 V Impedance > 20 KOhm		Output load Resistance - Rload				Humidity (not condensed) 0 .. 90 %
		Current output		< 500 Ω		Maximum Altitude 2000 m
		Voltage output		> 10 KΩ		Installation Indoor
		Short circuit current		30 mA max.		Category of installation II
PNP Low level Trig. < 4.0 V High level Trig. > 7.0 V Aux. Voltage 17 V – 20 mA Impedance ~ 2.2 KOhm		Transistor Output				Pollution Degree 2
		Max. load (Resistive only)		30 Vdc, 100mA		MECHANICAL SPECIFICATIONS
						Material Self-extinguish plastic
Tacho Max. Voltage 30 Vpp Low level Trig. < -50 mV High level Trig. > +50 mV Impedance > 100 KOhm		Relay Outputs (Only for version "-R")				IP Code IP20
		Max. Load (Resistive)		250 Vac, 2A		Wiring wires with diameter 0.8±2.1 mm² /AWG 14-18
		Isolation between terminals		1000 Vac max		Tightening Torque 0.8 N m
Voltage (programmable) Trigger Level 0.05 V ÷ 7.0 V Aux. Voltage 5 ÷ 17 V @ 20 mA Impedance > 20 Kohm						Mounting in compliance with DIN rail standard EN-50022 and EN-50035
						Weight about 90 g
						CERTIFICATIONS
Frequency 0.1 Hz ÷ 20 KHz Sample Time < 50ms + period						EMC (for the Industrial Environments)
						Immunity EN 61000-6-2
						Emission EN 61000-6-4
						UKCA (ref S.I. 2016 N°1091)
						Immunity BS EN 61000-6-2
						Emission BS EN 61000-6-4

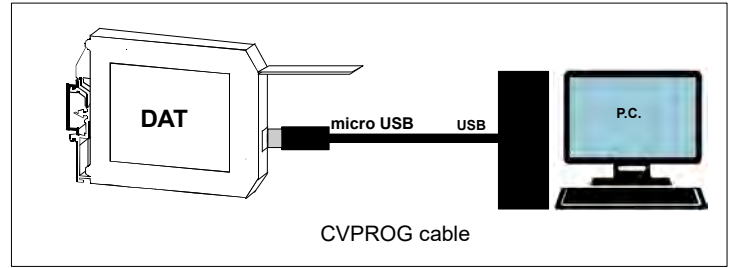
PROGRAMMING

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.

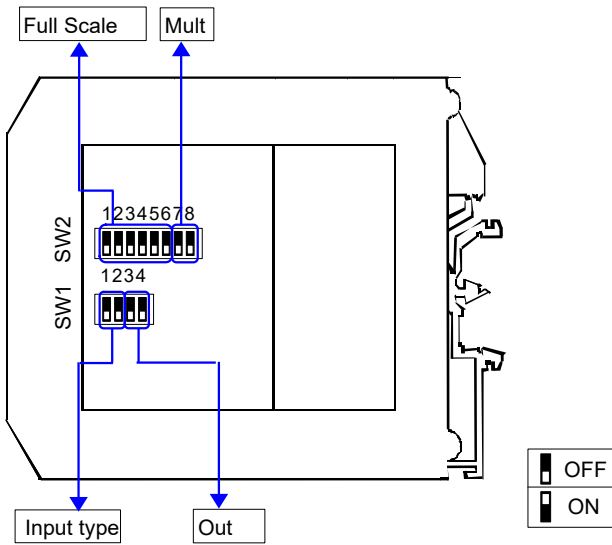


To configure the device follow the next steps:

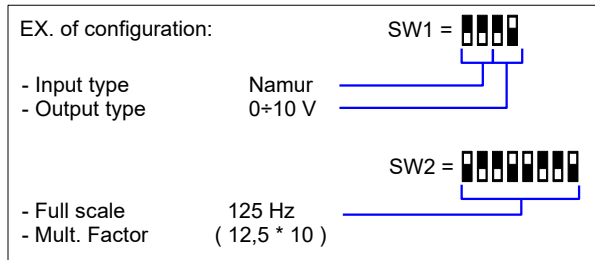
- 1) Open the protection plastic label on the front of the device.
- 2) Connect the two plugs of cable CVPROG to the Personal Computer (USB plug) and to the device (uUSB plug) .
- 3) Run the software
- 4) Select the COM port in use and click on "Open COM".
- 5) Select the device and connect to it.
-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

For information about the software refer to its 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	
<input type="checkbox"/>	<input type="checkbox"/>	Namur
<input type="checkbox"/>	<input type="checkbox"/>	Tacho
<input type="checkbox"/>	<input type="checkbox"/>	NPN/TTL
<input type="checkbox"/>	<input type="checkbox"/>	PNP

Tab.2

Output type

SW1	3 4	
<input type="checkbox"/>	<input type="checkbox"/>	0-20 mA
<input type="checkbox"/>	<input type="checkbox"/>	4-20 mA
<input type="checkbox"/>	<input type="checkbox"/>	0-10 V
<input type="checkbox"/>	<input type="checkbox"/>	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
<input type="checkbox"/>	<input type="checkbox"/>	1000	<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	<input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>	16
<input type="checkbox"/>	<input type="checkbox"/>	100	<input type="checkbox"/>	<input type="checkbox"/>	0.5	<input type="checkbox"/>	<input type="checkbox"/>	8.5	<input type="checkbox"/>	<input type="checkbox"/>	16.5
<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	9	<input type="checkbox"/>	<input type="checkbox"/>	17
<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	1.5	<input type="checkbox"/>	<input type="checkbox"/>	9.5	<input type="checkbox"/>	<input type="checkbox"/>	17.5
			<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	18
			<input type="checkbox"/>	<input type="checkbox"/>	2.5	<input type="checkbox"/>	<input type="checkbox"/>	10.5	<input type="checkbox"/>	<input type="checkbox"/>	18.5
			<input type="checkbox"/>	<input type="checkbox"/>	3	<input type="checkbox"/>	<input type="checkbox"/>	11	<input type="checkbox"/>	<input type="checkbox"/>	19
			<input type="checkbox"/>	<input type="checkbox"/>	3.5	<input type="checkbox"/>	<input type="checkbox"/>	11.5	<input type="checkbox"/>	<input type="checkbox"/>	19.5
			<input type="checkbox"/>	<input type="checkbox"/>	4	<input type="checkbox"/>	<input type="checkbox"/>	12	<input type="checkbox"/>	<input type="checkbox"/>	20
			<input type="checkbox"/>	<input type="checkbox"/>	4.5	<input type="checkbox"/>	<input type="checkbox"/>	12.5	<input type="checkbox"/>	<input type="checkbox"/>	20.5
			<input type="checkbox"/>	<input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>	13	<input type="checkbox"/>	<input type="checkbox"/>	21
			<input type="checkbox"/>	<input type="checkbox"/>	5.5	<input type="checkbox"/>	<input type="checkbox"/>	13.5	<input type="checkbox"/>	<input type="checkbox"/>	21.5
			<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>	14	<input type="checkbox"/>	<input type="checkbox"/>	22
			<input type="checkbox"/>	<input type="checkbox"/>	6.5	<input type="checkbox"/>	<input type="checkbox"/>	14.5	<input type="checkbox"/>	<input type="checkbox"/>	22.5
			<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	15	<input type="checkbox"/>	<input type="checkbox"/>	23
			<input type="checkbox"/>	<input type="checkbox"/>	7.5	<input type="checkbox"/>	<input type="checkbox"/>	15.5	<input type="checkbox"/>	<input type="checkbox"/>	23.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	24
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	24.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	25
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	25.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	26
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	26.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	27
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	27.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	28
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	28.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	29
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	29.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	30
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	30.5
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	31
			<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	31.5

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:

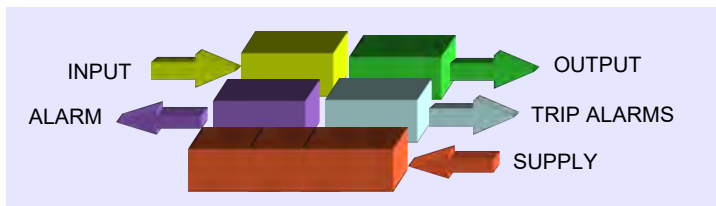
- If panel temperature exceeds 45°C and the device is powered with high power supply value (> 27 Vdc).
- Use of output active current.
- Use of the input auxiliary supply.

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.

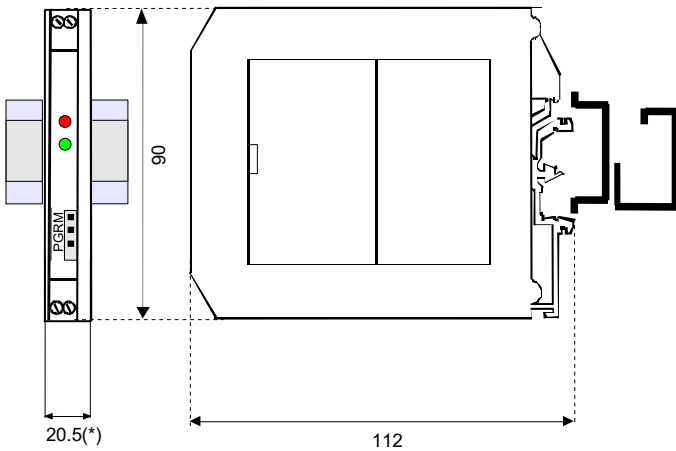
Install the device in a place without vibrations.

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)

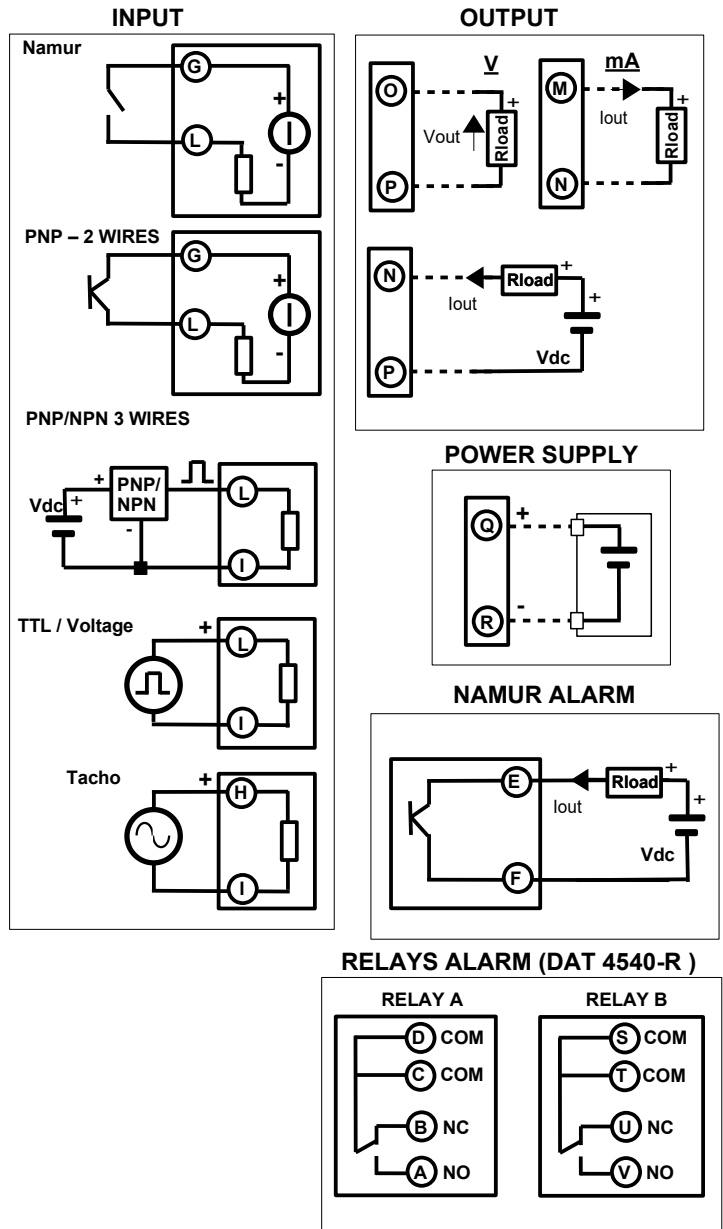


(*) **NOTE:**
 "-R" Version: 20.5 mm thickness
 Standard Version: 12.5 mm thickness



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.

CONNECTIONS



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:

