

DAT 6011

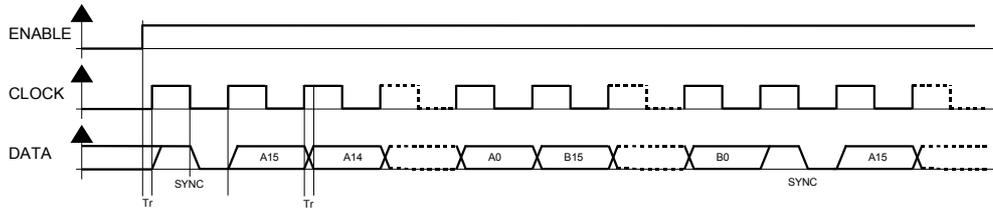


FEATURES

- Acquisition of analogue signals on PLC's digital I/O
- analogue input to any PLC or micro PLC
- Up to 16-bit resolution with Full Scale high accuracy
- 2 input channels
- Configurable input for voltage up to $\pm 1V$ or Tc type J,K, R,S,B,E,T,N
- Configurable by DIP-switch
- Galvanic isolation at 2000 Vac on three ways
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN 50022 and EN-50035

GENERAL DESCRIPTION

The devices of the DAT6000 series are an evolution in the techniques of connection of analogue signals to PLC. The devices of this series amplify, linearise, isolate, filter and convert the analogue signals coming from various sensors in a high resolution digital signal, so, by few and simple instructions downloaded into PLC it is possible to acquire more analogue signals on only one digital input. The digital signal can be connected to any input of the PLC. The digital signal is composed of a series of 16 bits "word" containing the value of the analogue inputs to acquire. The PLC controls the data transmission by a clock signal (CLK) generated from one of its output ports used to ask the device after the enabling of transmission by the enable signal (ENABLE). If the enable signal is high, at each rising edge of clock, the device will provide on the data line (DATA) one of the bit that composes the reading word. Every cycle of reading is composed of 1 synchronism bit and 16 bits for each analogue signal; this means that every reading is composed of 33 bits. The rising edge of the ENABLE signal, managed from the controller, resets the cycle of reading and allows to avoid the reading of the unused input channels; the ENABLE signal can be used also to multiplex more devices to the same PLC's digital input. The DAT6011 accepts on its input two not isolated voltage (up to $\pm 1V$) or thermocouple signals. The 2000 Vac isolation between inputs, power supply and data lines 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 6011 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

Before to install the device, read carefully the section "Installation instructions"

Connect the power supply, the PLC and the analogue inputs as shown in the section Wiring. If necessary, configure the device by the dip-switches available after opening the door on the side of the device as shown in the section "Programming table". The LEDs "PWR" and "DATA" show the state of working of the device; refer to the section "Light signalling" to check the condition of device.

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

Input type	Min	Max	ANALOGUE INPUT		Power supply	
Voltage			Input impedance		Power supply voltage	18 .. 30 Vdc
50 mV	-50 mV	+50 mV	mV, Tc	$\geq 1 M\Omega$	Current consumption	30 mA @ 24 Vdc
100 mV	-100 mV	+100 mV	Thermal drift (1)		Reverse polarity protection	60 Vdc max
500 mV	-500 mV	+500 mV	Full Scale	$\pm 0.005 \% / ^\circ C$	Isolation voltage	
1000 mV	-1000mV	+1000mV	CJC thermal drift		Inputs – PLC	2000 Vac 50 Hz, 1 min.
Thermocouple			Full Scale	$\pm 0.02 \% / ^\circ C$	Power supply – Inputs	2000 Vac 50 Hz, 1 min.
J	-210 °C	+1200 °C	Input line impedance influence (1)		Power supply – PLC	2000 Vac 50 Hz, 1 min.
K	-210 °C	+1372 °C	mV, Tc	$< 0.8 \mu V / \Omega m$	Temperature and Humidity	
R	-50 °C	+1767 °C	Warm-up time	3 minutes for Tc	Operative temperature	-10°C .. +60°C
S	-50 °C	+1767 °C	Response time	~ 0.3 sec.	Storage temperature	-40°C .. +85°C
B	+400 °C	+1825 °C	DIGITAL INTERFACE		Humidity (not cond)	0 .. 90 %
E	-210 °C	+1000 °C	Voltage on terminals	typical 24 Vdc (30 Vdc max.)	Housing	
T	-210 °C	+400 °C	ON state	$> 9 Vdc$	Material	Self-extinguish plastic
N	-210 °C	+1300 °C	Input impedance	4.7 KOhm	Mounting	DIN rail in compliance with EN-50022 and EN-50035 about 50 g.
Input channels:	2		Minimum output load	560 Ohm (2)	Weight	
Input calibration (1)	$\pm 0.05\%$ of f.s.		Max. clock signal frequency	500 Hz	EMC (for industrial environments)	
Linearity (1)			Rise / Fall time (Tr)	$< 0.2 ms$	Immunity	EN 61000-6-2
mV	$\pm 0.1\%$ f.s.				Emission	EN 61000-6-4
Tc	$\pm 0.2\%$ f.s.					
Cold junction compensation	$\pm 0.5 ^\circ C$					

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

(2) The load on the output DATA is controlled with the current taken from the ENABLE signal

INSTALLATION INSTRUCTIONS

The DAT 6011 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 case:

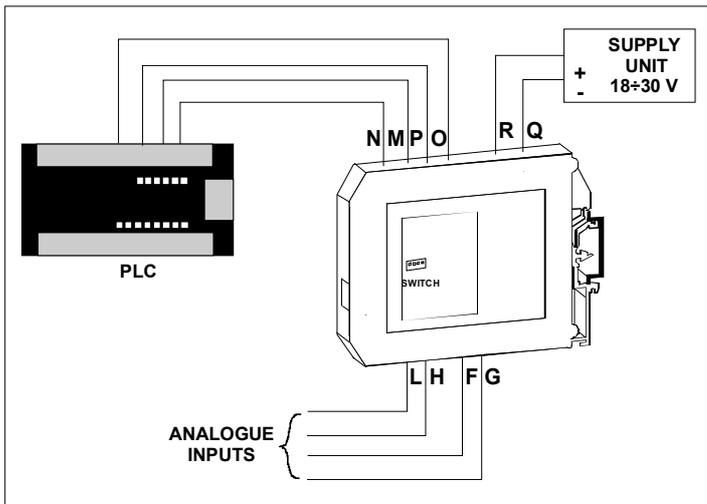
- If panel temperature exceeds 45°C device powered by an high power supply voltage: >27Vdc.

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.

CABLING



PROGRAMMING TABLE

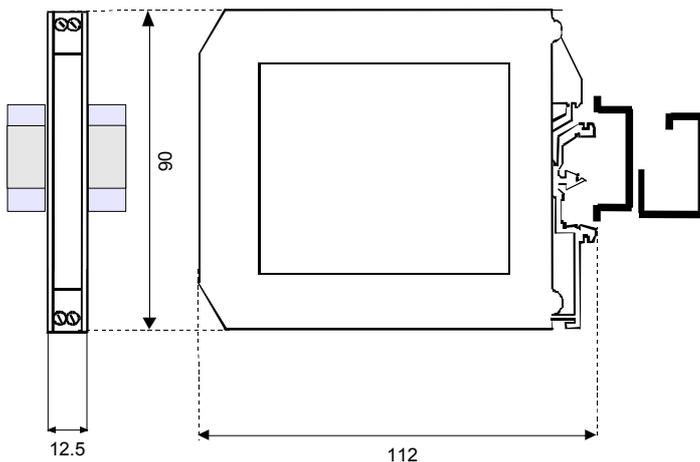
SW4	Filter (CLK)
	1 ms (500 Hz)
●	10 ms (50 Hz)

● = Switch ON

* Specify in phase of order

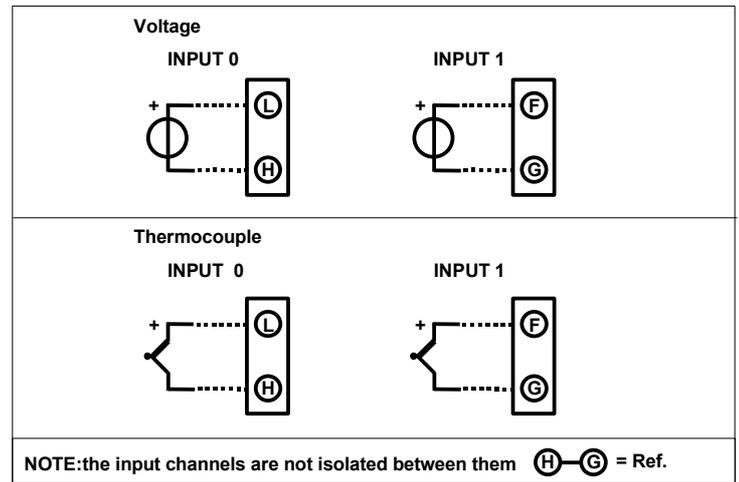
SW3	SW2	SW1	Input *	
			TAB. A	TAB. B
			Tc J	50 mV
		●	Tc K	100 mV
	●		Tc T	500 mV
	●	●	Tc E	1000 mV
●			Tc R	----
●		●	Tc S	----
●	●		Tc B	----
●	●	●	Tc N	----

DIMENSIONS (mm)

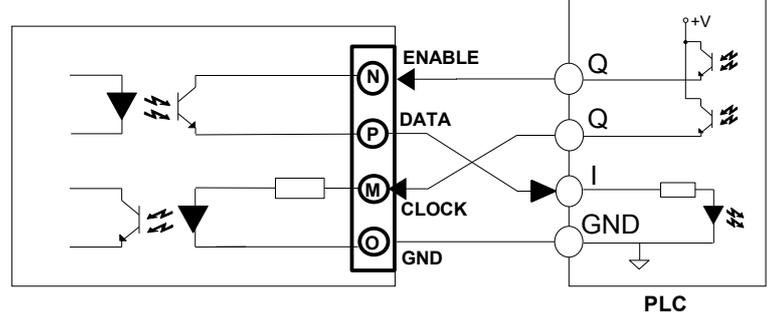


WIRING

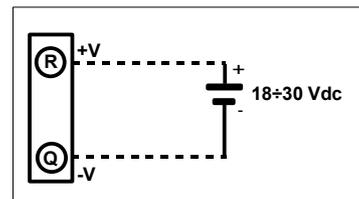
ANALOGUE INPUTS CONNECTIONS



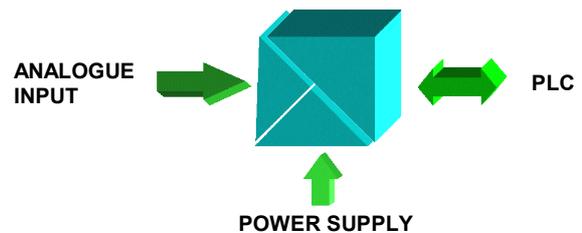
PLC CONNECTION



POWER SUPPLY CONNECTIONS



ISOLATION STRUCTURE



LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
DATA	GREEN	ON	"DATA" Line = 1
		OFF	"DATA" Line = 0

HOW TO ORDER

In phase of order it is necessary to specify the type of table for the input. The DAT 6011 is supplied as requested from the Customer. Refer to the section "Programming table" for the available options

DAT 6011 / **A** / Tc K / 10mS

Table:
A : Thermocouples
B : mV

Input type
(see programming
table)

CLK filter

■ = Requested
□ = Optional