DATEXEL

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UNI EN ISO 9001:2008

**A/D interface for PLC
2 input channels for V, mA**

DAT 6013

FEATURES
- **Acquisition of analog signals on PLC's digital I/O**
- **Analog input to any PLC or micro PLC**
- **Up to 16-bit resolution with Full Scale high accuracy**
- **2 input channels**
- **Configurable input for ± 10 V and ± 20 mA**
- **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 serie are an evolution in the techniques of connection of analog signals to PLC.
The devices of this serie amplify, linearise, isolate, filter and convert the analog 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 analog 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 serie of 16 bits "word" containing the value of the analog 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 analog 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 DAT 6013 accepts on its input not isolated signals coming from sensors with voltage output (up to ± 10 V) or current output (up to ± 20 mA).
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 6013 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.
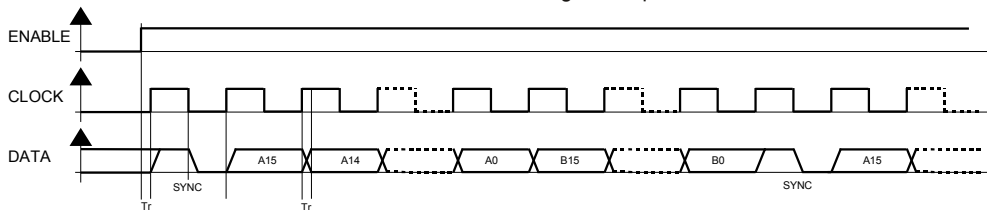
USER INSTRUCTIONS
Before to install the device, read carefully the section "Installation instructions"
Connect the power supply, the PLC and the analog inputs as shown in the section Wiring.
If necessary, configure the device by the dip-switches available after opening the door on the side of the device 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
Voltage 10 V	- 10 V	+ 10 V
Current 20 mA	- 20 mA	+ 20 mA
Input channels: 2		
Input calibration (1) ±0.1% f.s.		
Linearity (1) ±0.1% f.s.		

ANALOG INPUT

Thermal drift (1) Full Scale	± 0.005 % / °C
Input impedance V	>/= 100 Kohm
mA	</= 50 ohm
Warm-up time	3 minutes
Sampling time	~ 0.3 sec.

DIGITAL INTERFACE

Voltage on terminals	typical 24 Vdc (30 Vdc max.)
ON state	> 9 Vdc
Input impedance (ENABLE, CLK)	4.7 KOhm
Minimum output load (DATA)	560 Ohm (2)
Max. clock signal frequency	500 Hz
Rise / Fall time (Tr)	<0.2 ms

Power supply

Power supply voltage	18 .. 30 Vdc
Current consumption	30 mA @ 24 Vdc
Reverse polarity protection	60 Vdc max

Isolation voltage

Inputs – PLC	2000 Vac 50 Hz, 1 min.
Power supply – Inputs	2000 Vac 50 Hz, 1 min.
Power supply – PLC	2000 Vac 50 Hz, 1 min.

Temperature and Humidity

Operative temperature	-10°C .. +60°C
Storage temperature	-40°C .. +85°C
Humidity (not cond)	0 .. 90 %

Housing

Material	Self-extinguish plastic
Mounting	DIN rail in compliance with EN-50022 and EN-50035
Weight	about 50 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)
(2) The load on the output DATA is controlled with the current taken from the ENABLE signal

INSTALLATION INSTRUCTIONS

The DAT 6013 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:
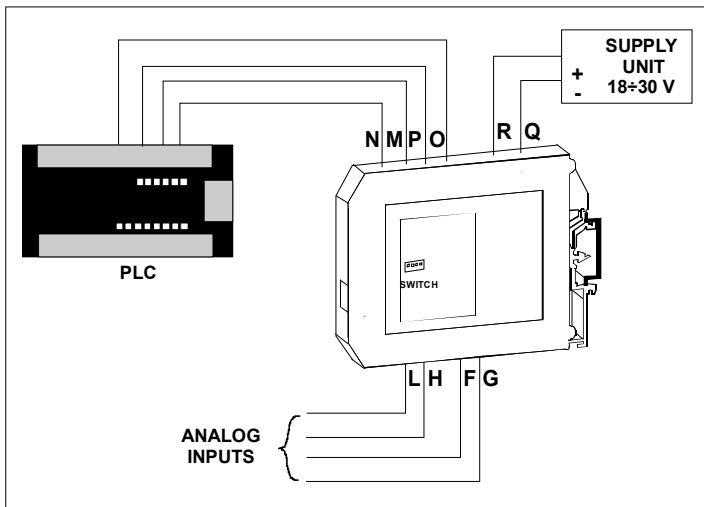- If panel temperature exceeds 45°C device powered by an high power supply voltage: > 27 Vdc.

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.
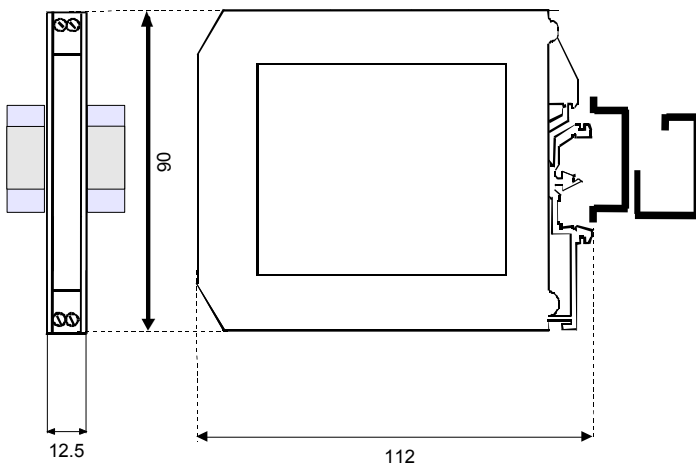
CABLING

PROGRAMMING TABLE

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

● = Switch ON

SW3	SW2	SW1	Input
			10 V
		●	20 mA
	●		----
	●	●	----
●			----
●		●	----
●	●		----
●	●	●	----

DIMENSIONS (mm)

90

12.5

112

WIRING

ANALOG INPUTS CONNECTIONS

VOLTAGE

INPUT 0 — I, H
INPUT 1 — E, G

CURRENT

INPUT 0 — L, H
INPUT 1 — F, G
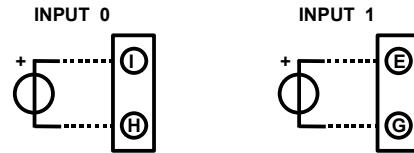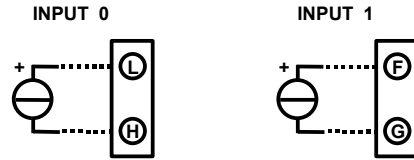
NOTE: the input channel are not isolated between them (H)—(G) = Ref.

PLC CONNECTION

N	ENABLE
P	DATA
M	CLOCK
O	GND
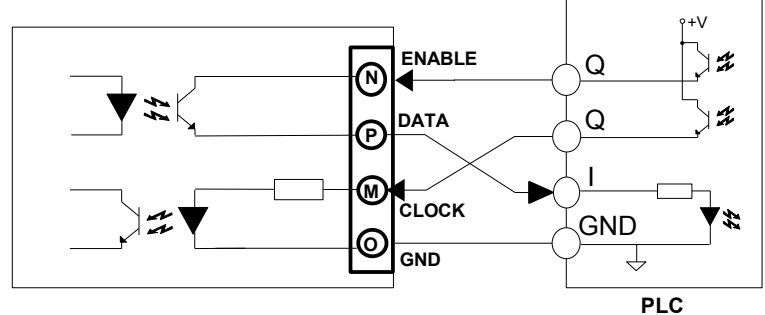
POWER SUPPLY CONNECTIONS

R +V
Q -V

18÷30 Vdc

ISOLATION STRUCTURE

ANALOG INPUT

PLC

POWER SUPPLY
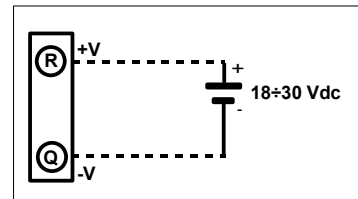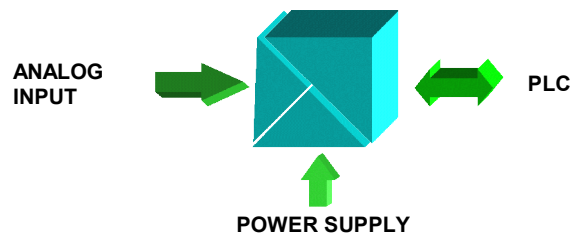
LIGHT SIGNALLING

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 6013 is supplied as requested from the Customer. Refer to the section "Programming table" for the available options

DAT 6013 [10 V] / [10mS]

Input type (see programming table)

CLK filter

▇ = Requested
▢ = Optional

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