DATEXEL

Thermocouple to Ethernet 8 channel Isolated
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UNI EN ISO 9001:2008

Modbus TCP/IP server
8 input channels isolated in pairs
for mV and Tc

DAT 8018

RoHS Compliant   CE   lead-free

FEATURES
- Interface Ethernet 10/100 Base-T, Modbus TCP Server
- 8 input channels isolated in pairs
- Input configurable for mV and Tc
- Integrated web server for acquiring the status of the analogue inputs via browser
- Remotely programmable
- Connection by removable screw-terminals
- LED signalling for Link/Act Ethernet, power supply
- Galvanic isolation on all the ways
- CE mark
- In compliance to EN-50022 DIN rail mounting

GENERAL DESCRIPTION
The device DAT8018 is a Modbus TCP server unit that can convert up to 8 analogue signals applied to the input in engineering units in digital format.
The inputs can be connected to sensors with mV or thermocouple output.
The input channels are electrically isolated in pairs.
The device guarantees high accuracy and a stable measure versus time and temperature. In order to ensure the safety plant, the device is equipped with a Watch-Dog Timer system. The Ethernet interface allows reading and writing in real time the values of the internal registers of the device.
The LEDs of signalling of Ethernet activity and power supply allow a direct monitoring of the system functionality.
The built-in Web Server allows the remote visualization, acquisition of the analogue inputs and the access to the main Ethernet programming parameters. The device is also configurable by the software *Dev9K*, a free IDE developed by DATEXEL.
The connection is made by removable screw-terminals (inputs and power supply) and RJ45 plug (Ethernet).
The device realizes a full electrical isolation between the lines, introducing a valid protection against the effects of all ground loops eventually existing in industrial applications. The device is housed in a rough self-extinguishing plastic enclosure which, thanks to its thin profile of 22.5 mm only, allows a high density mounting on EN-50022 standard DIN rail.

USER INSTRUCTIONS
Before to install the device, please read the "Installation Instruction" section.
To configure the device use the INIT modality (refer to the User Guide of the device). Connect power supply, Ethernet and analogue inputs as shown in the "Wiring" section. The LEDs state depends on the working condition of the device: see the "Light Signalling" section to verify the device working state.
To perform configuration and calibration operations, read the instructions in the User Guide of the device.
To simplify handling or replacing of the device, it is possible to remove the wired terminals even with the device powered.

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

In compliance with Ethernet IEEE 802.3		
Network interface	Ethernet 10/100Base-T	
Protocol	Modbus TCP	
Max. cable length	100 meters	
Number of socket	16	

INPUT

Input Type	Min	Max
Voltage		
mV	-250 mV	+250 mV
Thermocouple		
J	-210 °C	+1200 °C
K	-210 °C	+1372 °C
R	-50 °C	+1767 °C
S	-50 °C	+1767 °C
B	+400 °C	+1825 °C
E	-210 °C	+1000 °C
T	-210 °C	+400 °C
N	-210 °C	+1300 °C

Input Accuracy (1)
The greater than
± 0.05% f.s. and ± 5uV

Max linearity error (1)
mV   ± 0.1 % f.s.
Tc   ± 0.2 % f.s.

Max Cold junction compensation error (CJC)   ± 2°C

Input impedance
mV, Tc   ≥ 1 MΩ

Lead wire resistance influence (1)
mV, Tc   < 0.8 uV/Ohm

Thermal drift (1)
Full Scale   ± 0.005 %/°C

Thermal drift CJC
Full Scale   ± 0.02 %/°C

Sampling time (8 channels) 150 ms

Warm-up time   3 min.

POWER SUPPLY
Power supply voltage   14 .. 30 Vdc
Reverse polarity protection   60 Vdc max
Current Consumption   115 mA max

ISOLATION
Power Supply / Ethernet   1500 Vac, 50 Hz, 1 min
Inputs / Power supply   1500 Vac, 50 Hz, 1 min
Inputs / Ethernet   1500 Vac, 50 Hz, 1 min
Input / Input   1500 Vac, 50 Hz, 1 min

ENVIRONMENTAL CONDITIONS
Operative Temperature   -10°C .. +60°C
Storage Temperature   -40°C .. +85°C
Humidity (not condensed)   0 .. 90 %
Maximum Altitude   2000 m
Installation   Indoor
Category of installation   II
Pollution Degree   2

CONNECTIONS
Ethernet   RJ-45 (on terminals side)
Inputs/Power Supply   Removable screw terminals

MECHANICAL SPECIFICATIONS
Material   Self-extinguish plastic
IP Code   IP20
Wiring   wires with diameter
0.8÷2.1 mm² /AWG 14-18
Tightening Torque   0.5 N m
Mounting   in compliance with DIN rail standard EN-50022
Weight   about 160g

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)

INSTALLATION INSTRUCTIONS

The device is suitable for fitting to DIN rails in vertical position.
For optimum operation and long life follow these instructions:

When the devices are installed side by side it is necessary to separate them by at least 5 mm

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.

MAPPING MODBUS REGISTERS

Register Position	Description	Access
40002	Firmware [0]	RO
40003	Firmware [1]	RO
40004	Name [0]	R/W
40005	Name [1]	R/W
40007	Node ID	R/W
40011	System Flags	R/W
40013	Watchdog timer	R/W
40031	Input type Channels (1-0)	R/W
40032	Input type Channels (3-2)	R/W
40033	Input type Channels (5-4)	R/W
40034	Input type Channels (7-6)	R/W
40041	Analogue Input (0) - Ch0	RO
40042	Analogue Input (1) - Ch1	RO
40043	Analogue Input (2) - Ch2	RO
40044	Analogue Input (3) - Ch3	RO
40045	Analogue Input (4) - Ch4	RO
40046	Analogue Input (5) - Ch5	RO
40047	Analogue Input (6) - Ch6	RO
40048	Analogue Input (7) – Ch7	RO
40050	Break status	RO

LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINK	Watchdog alarm
STS	YELLOW	OFF	Device in RUN modality
		BLINK	Device in INIT modality

MECHANICAL DIMENSIONS (mm)
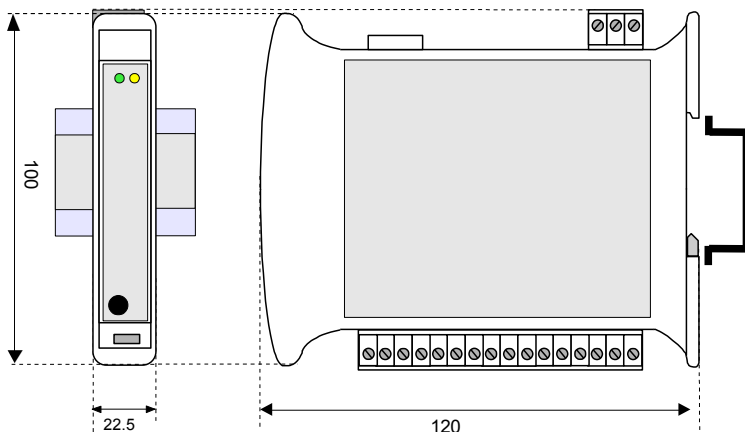
CONNECTIONS

POWER SUPPLY

14÷30 Vdc
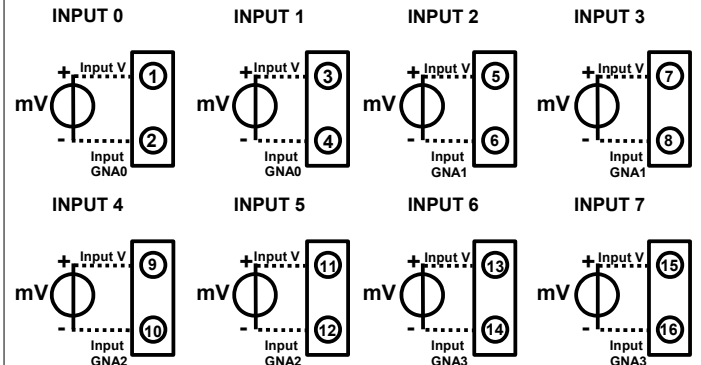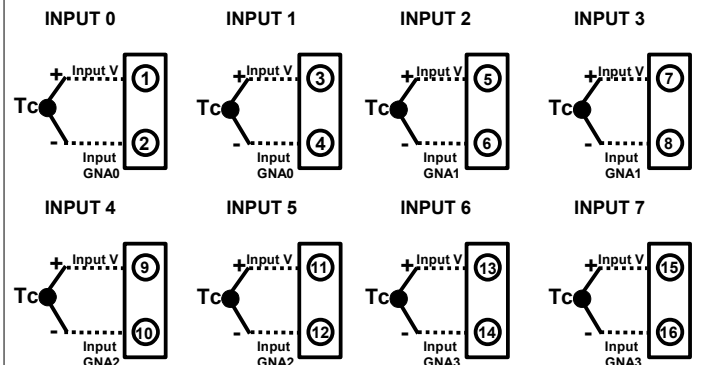
INIT

ON: short-circuit to GND
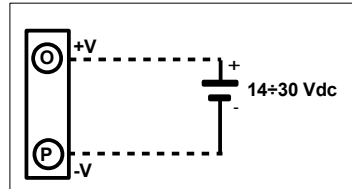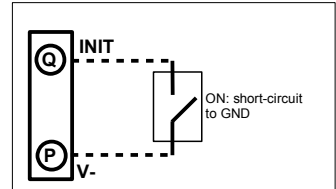
ANALOGUE INPUTS

VOLTAGE

THERMOCOUPLE

NOTES:
Terminals "2" and "4" (neg. reference "GNA0") are internally connected.
Terminals "6" and "8" (neg. reference "GNA1") are internally connected.
Terminals "10" and "12" (neg. reference "GNA2") are internally connected.
Terminals "14" and "16" (neg. reference "GNA3") are internally connected.
The references "GNA0", "GNA1", "GNA2" and "GNA3" are isolated from each other.

ISOLATIONS STRUCTURE

CH0 - CH1
CH2 - CH3
CH4 - CH5
CH6 - CH7
ETH.
SUPPLY
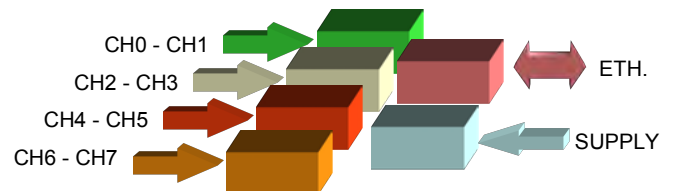
HOW TO ORDER

" DAT 8018 "
Note: the device is provided with default configuration as:
IP address : 192.168.1.100
Modbus address: 1