HCS BUILDING AUTOMATION

Modbus TCP/IP server
8 isolated input channels in pairs for RTD and Resistences to 2 wires

DAT 8019

FEATURES
- Interface Ethernet 10/100 Base-T, Modbus TCP Server
- 8 isolated input channels in pairs
- Input configurable for RTD, Resistance to 2 wire
- Integrated web server for acquiring the status of the analog inputs via browser
- Remotely programmable
- Connection by removable screw-terminals
- LED signalling for Link/Act Ethernet, power supply
- Galvanic isolation on all the ways
- EMC compliant – CE mark
- In compliance to EN-50022 DIN rail mounting

GENERAL DESCRIPTION

The DAT8019 module is a Modbus TCP server unit that can convert up to 8 analog signals applied to the input in engineering units in digital format.
The inputs can be connected to sensors RTD or resistance to 2 wires.
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 provided 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 of DAT8019 allows the remote visualization, acquisition of the analog 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 RJ-45 plug (Ethernet).
The device DAT8019 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. Connect the terminal INIT to the terminal -V; at the power-on the device will be automatically set in the configuration set-up (refer to the User Guide of the device). Connect power supply, serial bus 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
RTD 2 wires		
Pt100	-200 °C	850 °C
Pt1000	-200 °C	200 °C
Ni100	-60 °C	180 °C
Ni1000	-60 °C	150 °C
RES 2 wires		
Low	0 Ω	500 Ω
High	0 Ω	2000 Ω

Input Accuracy (1)
RTD — ±0,2 % f.s.
Resistance — ±0,2 % f.s.

Linearity (1)
RTD — ±0,1 % f.s.

RTD excitation current
Typical — 0,370 mA

Thermal drift (1)
Full Scale — ± 0,01 %/°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
Consumption (standby)	60 mA tip@ 24Vdc
Consumption (operative)	75 mA max@24Vdc
Consumption (operative)	115 mA max@14Vdc

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

CONNENCTIONS
Ethernet	RJ-45 (on terminals side)
Inputs	Removable screw-terminals
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	0.8 N m
Mounting	in compliance to DIN rail standard EN-50022 and EN-50035
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 in the following case:
- If panel temperature exceeds 45°C and power supply value < 20 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.
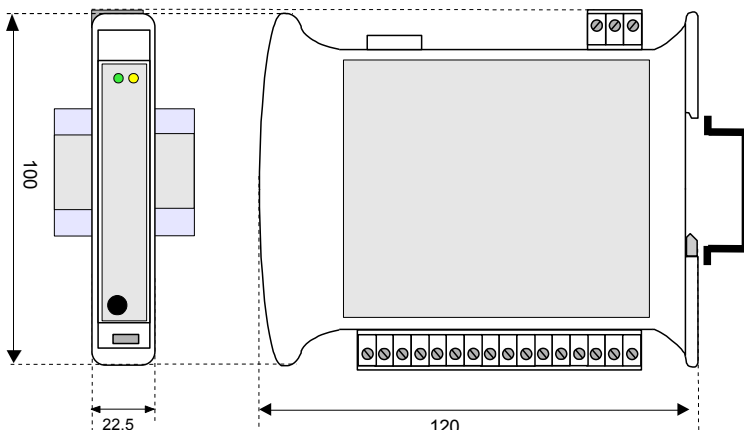
MAPPING MODBUS REGISTERS

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 Ch (1-0)	R/W
40032	Input type Ch (3-2)	R/W
40033	Input type Ch (5-4)	R/W
40034	Input type Ch (7-6)	R/W
40036	Break status	RO
40041	Analog Input (0) - Ch0	RO
40042	Analog Input (1) - Ch1	RO
40043	Analog Input (2) - Ch2	RO
40044	Analog Input (3) - Ch3	RO
40045	Analog Input (4) - Ch4	RO
40046	Analog Input (5) - Ch5	RO
40047	Analog Input (6) - Ch6	RO
40048	Analog Input (7) - Ch7	RO

CONNECTIONS

POWER SUPPLY

14÷30 Vdc

INIT

ON: short-circuit to GND

ANALOG INPUTS

RTD, Res

INPUT 0 — 1, 2, Input GNA0
INPUT 1 — 3, 4, Input GNA0
INPUT 2 — 5, 6, Input GNA1
INPUT 3 — 7, 8, Input GNA1
INPUT 4 — 9, 10, Input GNA2
INPUT 5 — 11, 12, Input GNA2
INPUT 6 — 13, 14, Input GNA3
INPUT 7 — 15, 16, Input GNA3
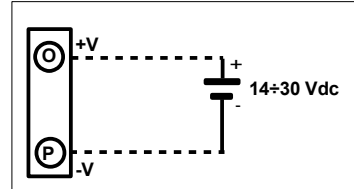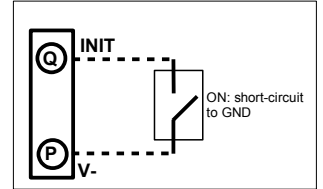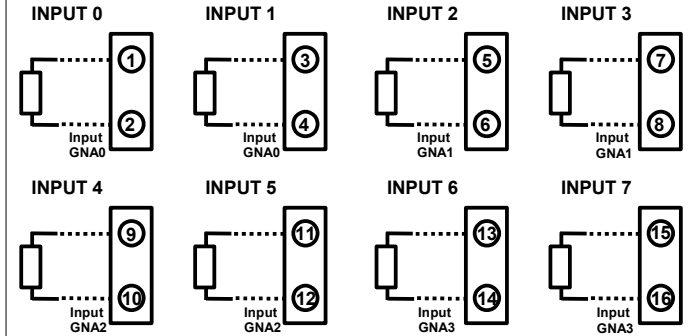
NOTES:
Terminals "2" and "4" connected internally between them (neg. reference "GNA0").
Terminals "6" and "8" connected internally between them (neg. reference "GNA1").
Terminals "10" and "12" connected internally between them (neg. reference "GNA2").
Terminals "14" and "16" connected internally between them (neg. reference "GNA3").

The references "GNA0", "GNA1", "GNA2" and "GNA3" are isolated from each other.

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

ISOLATIONS STRUCTURE

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

MECHANICAL DIMENSIONS (mm)

100
22,5
120
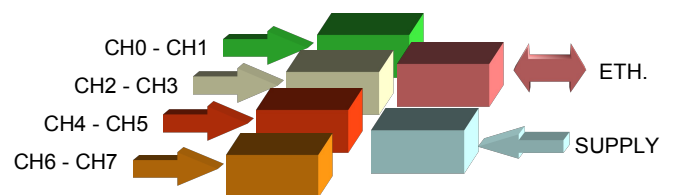
HOW TO ORDER

" DAT 8019 "
Note: the device is provided with default configuration as:
IP address : 192.168.1.100
Modbus address: 1