

Modbus TCP with Isolated 4-20mA output  
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**FEATURES**

- Interface Ethernet 10/100 Base-T, Modbus TCP Server
- 4 isolated output channels
- Configurable Analogue Outputs for mA and Volt
- Isolated power source for each channel to power passive loads
- Integrated web server to set the analogue outputs via browser
- Remotely programmable
- Connection by removable screw-terminals
- LED signalling for Link/Act Ethernet, power supply
- Galvanic isolation on all the ways
- UL / CE mark
- In compliance to EN-50022 DIN rail mounting


**GENERAL DESCRIPTION**

The device DAT8024 is a Modbus TCP server unit that can drive up to 4 analogue output signals via digital commands. To the outputs it is possible to connect either active or passive current loops up to 20 mA or voltage signals up to 10 V. **The output channels are electrically isolated from each other.**

**For each channel it is provided an isolated power source in order to power passive current loops.**

On request it is available a dedicated software version that allows to use the device as a Client unit to be connected to only one server device with possibility of scaling function. The device with such dedicated software version is identified by six additional figures reported after the main code on the batch label.

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, setting of the analogue outputs 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 (outputs and power supply) and RJ45 plug (Ethernet).

The DAT8024 is in compliance with the Directive UL 61010-1 for US market and with the Directive CSA C22.2 No 61010-1 for the Canadian market.

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. It 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 outputs 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)**

<b>In compliance with Ethernet IEEE 802.3</b>  <b>Network interface</b> Ethernet 10/100Base-T <b>Protocol</b> Modbus TCP <b>Max. cable length</b> 100 meters <b>Number of socket</b> 16			<b>Output Accuracy (1)</b> mA ± 10 uA Volt ± 5 mV  <b>Load Resistance</b> mA ≤ 500 Ω Volt ≥ 5 kΩ	<b>POWER SUPPLY</b> Power supply voltage 18 .. 30 Vdc Reverse polarity protection 60 Vdc max Current Consumption(**) 200 mA max							
<b>ANALOGUE OUTPUTS</b>			<b>Thermal drift (1)</b> Full Scale ± 0,01 %/°C	<b>ISOLATION</b> Power Supply / Ethernet 1500 Vac, 50 Hz, 1 min Outputs / Power supply 1500 Vac, 50 Hz, 1 min Outputs / Ethernet 1500 Vac, 50 Hz, 1 min Output / Output 1500 Vac, 50 Hz, 1 min							
<table border="1"> <thead> <tr> <th>Output Type</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Current mA</td> <td>0 mA</td> <td>+20 mA</td> </tr> <tr> <td>Voltage Volt</td> <td>0 V</td> <td>+10 V</td> </tr> </tbody> </table>	Output Type	Min	Max	Current mA	0 mA	+20 mA	Voltage Volt	0 V	+10 V	<b>Auxiliary Supply (for each channel)</b> ≥ 12 Vdc @ 20 mA	<b>ENVIRONMENTAL CONDITIONS</b> Operative Temperature -10°C .. +60°C UL Operative Temperature -10°C .. +40°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
Output Type	Min	Max									
Current mA	0 mA	+20 mA									
Voltage Volt	0 V	+10 V									
<b>Rise Time (10% to 90%)</b> 15 ms  <b>Sampling Time</b> 50 ms			<b>CONNECTIONS</b> Ethernet RJ-45 (on terminals side) Outputs/Power Supply Removable screw-terminals	<b>MECHANICAL SPECIFICATIONS</b> Material Self-extinguish plastic IP Code IP20 Wiring wires with diameter 0.8÷2.1 mm <sup>2</sup> /AWG 14-18 Tightening Torque 0.5 N m Mounting in compliance with DIN rail standard EN-50022 Weight about 160 gr.							
(1) Referred to output Span (difference between max. and min. values)  (**) 4 Operative Auxiliary Supply @20mA			<b>EMC ( for industrial environments )</b> Immunity EN 61000-6-2 Emission EN 61000-6-4 <b>UL</b> US Standard UL 61010-1 Canadian Standard CSA C22.2 No 61010-1 CCN NRAQ/NRAQ7 Typology Open Type device Classification Industrial Control Equipment File Number E352854								

## 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:**

**- 10 mm if the UL certification is required.**

**- 5 mm if the UL certification is not required.**

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	Output type (1-0)	R/W
40032	Output type (3-2)	R/W
40041	Analogue Output (0)	R/W
40042	Analogue Output (1)	R/W
40043	Analogue Output (2)	R/W
40044	Analogue Output (3)	R/W
40049	Power Up (0)	R/W
40050	Power Up (1)	R/W
40051	Power Up (2)	R/W
40052	Power Up (3)	R/W
40057	Safe (0)	R/W
40058	Safe (1)	R/W
40059	Safe (2)	R/W
40060	Safe (3)	R/W

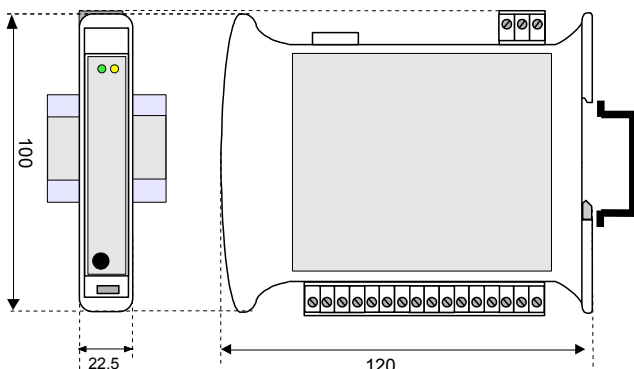
**Additional registers (highlighted in red) foreseen only for Client versions. The register are not available for the standard device.**

40101	Input Scale (0)	R/W
40102	Input Scale (1)	R/W
40103	Input Scale (2)	R/W
40104	Input Scale (3)	R/W
41225	Enable Advanced Functions	R/W
41231-41234	Physical ZERO (0-3)	R/W
41241-41244	Physical SPAN (0-3)	R/W
41251-41254	Output ZERO (0-3)	R/W
41261-41264	Output SPAN (0-3)	R/W
41272	Start Register	R/W
41273	Number of Registers	R/W
41277	Delay Polling	R/W

## LIGHT SIGNALLING

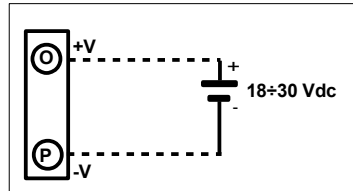
LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINK	Watchdog alarm
STS	YELLOW	OFF	Device in RUN modality
		BLINK	Device in INIT modality

## MECHANICAL DIMENSIONS (mm)

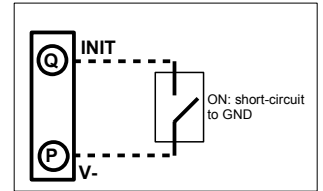


## CONNECTIONS

### POWER SUPPLY(\*)



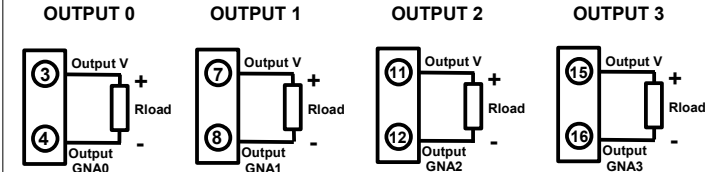
### INIT



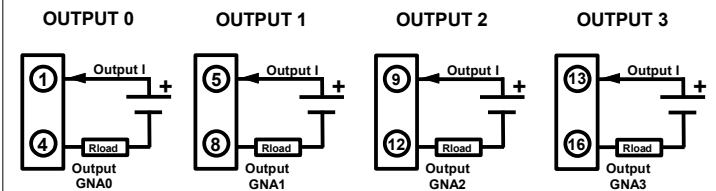
(\*) Note: for UL installation the device must be powered using a power supply unit classified NEC class 2 or SELV and Limited Energy

### ANALOGUE OUTPUTS

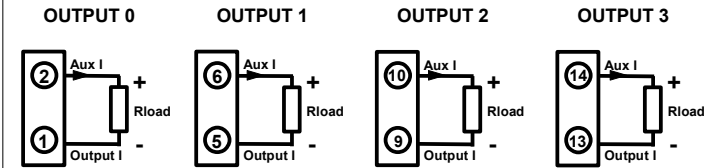
#### VOLTAGE



#### PASSIVE mA OUTPUT



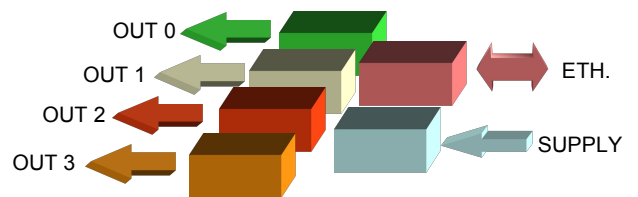
#### ACTIVE mA OUTPUT



#### NOTES:

"GNA0", "GNA1", "GNA2" and "GNA3" are isolated between them.

## ISOLATIONS STRUCTURE



### HOW TO ORDER:

-Standard Server device "DAT8024"

-Dedicated Client device with Read Input function 03 enabled: "DAT8024 041016"

-Dedicated Client device with Read Holding function 04 enabled: "DAT8024 240218"

Note: the device is provided with default configuration as:

IP address : 192.168.1.100

Modbus address: 1



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.