

Isolated Modbus RTU 4-20mA Output

DAT 10024

FEATURES

- Modbus Server device on RS-485
- Modbus RTU/ Modbus ASCII protocol
- 4 output channels configurable for voltage and current
- Communication parameters configurable by dip-switches
- Watch-Dog Alarm
- Remotely Configurable
- 1500 Vac 3-ways Galvanic Isolation
- LEDs of signalling on front side for power supply and communication
- Connection by removable screw terminals
- High Accuracy
- CE/UKCA mark
- DIN rail mounting in compliance with EN-50022



GENERAL DESCRIPTION

The device drives up to 4 voltage signals up to 10V or current up to 20mA connected both in active and passive loop in digital format.

The data are transmitted with MODBUS RTU / MODBUS ASCII protocol over the RS-485 network.

To ensure the plant safety, a Watch-Dog timer alarm is provided. The output channels are configurable independently.

For each channel it is possible to set:

Type and output value;

preset of the value at the power up (Power-up) separated for output voltage and current;

preset of safety value (Safe) separated for output voltage and current.

It is possible to generate voltage signals up to 10V and current signals up to 20mA, both active or passive loops.

The device guarantees high accuracy and stable measure versus time and temperature.

The isolation between the parts of circuit removes eventual ground-loop effects, allowing the use of the device even in the heavy environmental conditions. The device is housed in a 6 module DIN rough self-extinguishing plastic box for mounting on EN-50022 standard DIN rail.

USER INSTRUCTIONS

Before to install the device, please read the "Installation Instruction" section.

It is possible to configure the device in two modes: by the dip-switches located on the front of the device or via software using the INIT modality.

Connect the terminal INIT to the terminal REF; 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 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)

ANALOGUE OUTPUT (4 CHANNELS)			SERIAL OUTPUT	GENERAL SPECIFICATIONS
Output Type	Min	Max	Data Transmission RS-485 asynchronous serial Baud Rate 115.2 Kbps Max. distance 1.2 Km – 4000 ft	Power supply voltage 20 .. 30 Vdc Reverse polarity protection 60 Vdc max Current consumption @ 24 Vdc 125 mA max. Max. Current consumption 150 mA
Current mA	0 mA	+20 mA		ISOLATION Among all the ways 1500 Vac, 50 Hz, 1 min
Voltage Volt	0 V	+10 V		
Output Accuracy Current ± 10 uA Voltage ± 5 mV				
Thermal drift Full scale ± 0.01 % / °C				
Load resistance Voltage ≥ 5 KΩ Current ≤ 500 Ω				
Auxiliary Voltage (4 channels) ≥ 13Vdc @ 20mA				ENVIRONMENTAL CONDITIONS Operative temperature -20°C .. +60°C Storage temperature -40°C .. +85°C Humidity (not condensing) 0 .. 90 % Maximum Altitude 2000 m slm Installation Indoor Category of Installation II Pollution Degree 2
Response time (from 10 % to 90 %) 15 ms				
Sample time 50 ms				
			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 with DIN rail standard EN-50022 Weight about 200 g.	
			CERTIFICATIONS EMC (for the Industrial Environments) Immunity EN 61000-6-2 Emission EN 61000-6-4 UKCA (ref S.I. 2016 N°1091) Immunity BS EN 61000-6-2 Emission BS EN 61000-6-4	

INSTALLATION INSTRUCTIONS

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

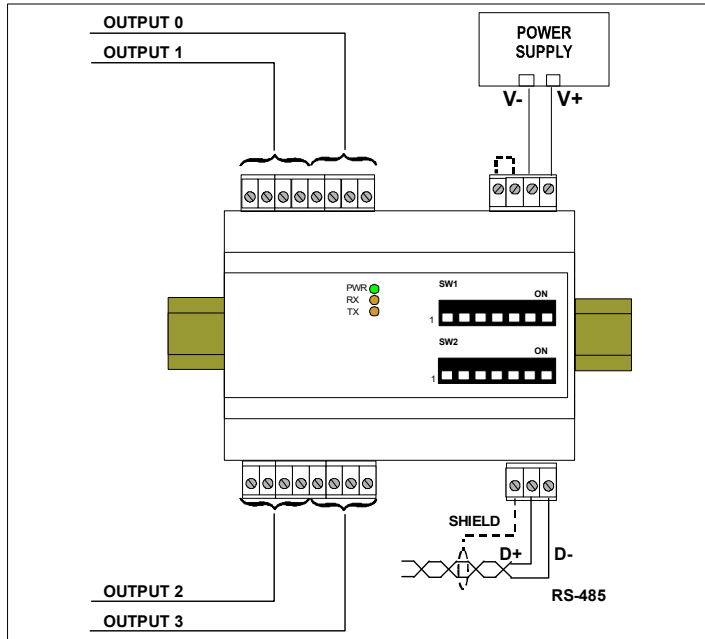
When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following case:
- If panel temperature exceeds 45°C and power supply voltage 18 Vdc.

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.

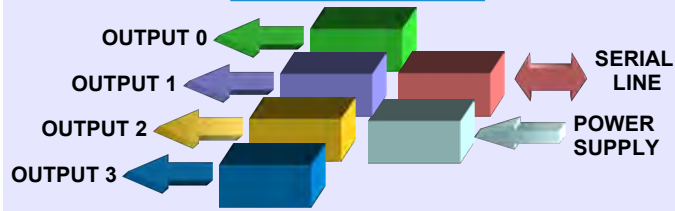
TERMINALS OVERVIEW



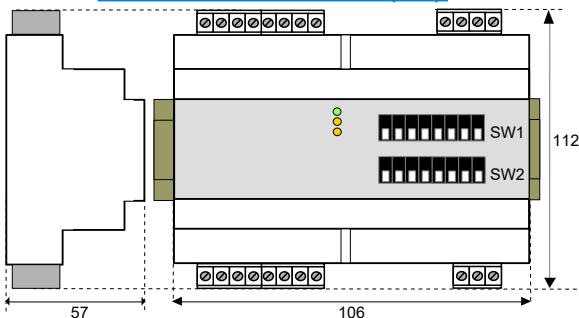
LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINK	~1 sec. - Watch-Dog alarm condition occurred
RX	ORANGE	BLINK	Stream of data over receiving line of RS-485
		OFF	No data over receiving line of RS-485
TX	ORANGE	BLINK	Stream of data over transmission line of RS-485
		OFF	No data over transmission line of RS-485

ISOLATION STRUCTURE



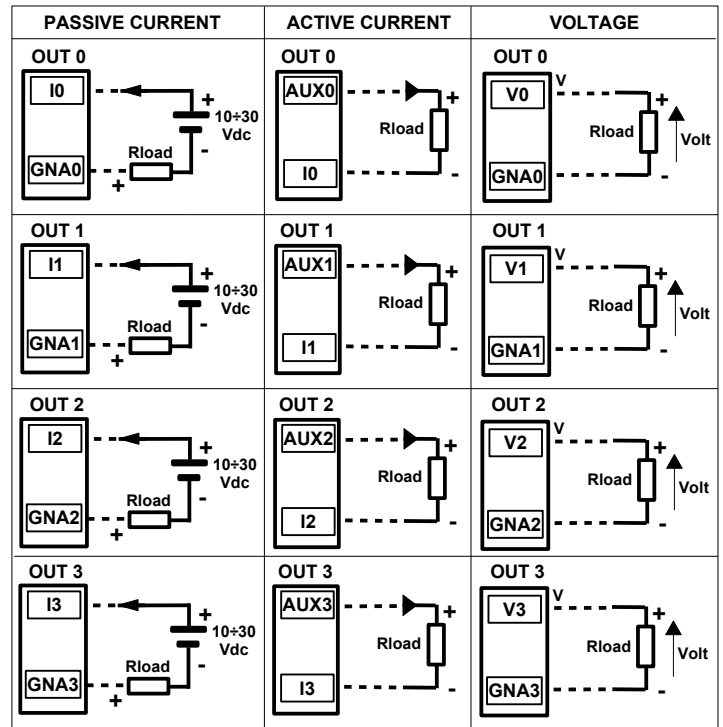
MECHANICAL DIMENSIONS (mm)



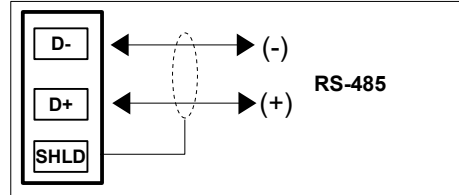
The symbol reported on the product indicates that the product itself must not be considered as a domestic waste.
It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste.
For more information contact the proper office in the user's city, the service for the waste treatment or the supplier from which the product has been purchased.

WIRING

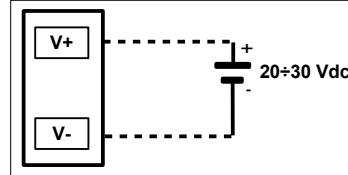
ANALOGUE OUTPUTS



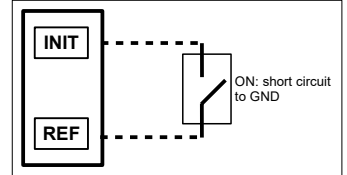
SERIAL LINE RS-485



POWER SUPPLY



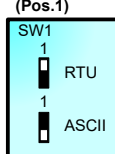
INIT



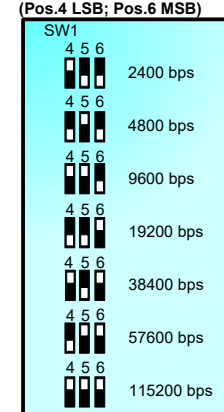
DIP-SWITCHES : TABLES OF CONFIGURATION

Warning: set all the dip-switches in OFF position to access to the device in EEPROM modality (the device will follow all the communication parameters set by software) or INIT. Power-off the device before to change the set of the dip-switches.

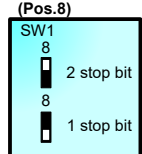
TAB.1 Modality settings (Pos.1)



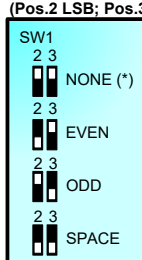
TAB.3 Baud rate settings (Pos.4 LSB; Pos.6 MSB)



TAB.4 Stop Bit settings (Pos.8)



TAB.2 Parity settings (Pos.2 LSB; Pos.3 MSB)



Note (*):

- in Modbus RTU Modality the setting is NONE; number of bit = 8
- in Modbus ASCII Modality the setting is MARK; number of bit = 7

DIP POSITION

ON OFF

HOW TO ORDER

The device can be supplied with the configuration specified by the customer.

DAT 10024 / mA — Output type

TAB.5 Address Selection 1+247 (Pos.1 LSB; Pos.8 MSB)

SW2	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
	EEPROM	Address 38	Address 76	Address 114	Address 152	Address 190	Address 228
	Address 1	Address 39	Address 77	Address 115	Address 153	Address 191	Address 229
	Address 2	Address 40	Address 78	Address 116	Address 154	Address 192	Address 230
	Address 3	Address 41	Address 79	Address 117	Address 155	Address 193	Address 231
	Address 4	Address 42	Address 80	Address 118	Address 156	Address 194	Address 232
	Address 5	Address 43	Address 81	Address 119	Address 157	Address 195	Address 233
	Address 6	Address 44	Address 82	Address 120	Address 158	Address 196	Address 234
	Address 7	Address 45	Address 83	Address 121	Address 159	Address 197	Address 235
	Address 8	Address 46	Address 84	Address 122	Address 160	Address 198	Address 236
	Address 9	Address 47	Address 85	Address 123	Address 161	Address 199	Address 237
	Address 10	Address 48	Address 86	Address 124	Address 162	Address 200	Address 238
	Address 11	Address 49	Address 87	Address 125	Address 163	Address 201	Address 239
	Address 12	Address 50	Address 88	Address 126	Address 164	Address 202	Address 240
	Address 13	Address 51	Address 89	Address 127	Address 165	Address 203	Address 241
	Address 14	Address 52	Address 90	Address 128	Address 166	Address 204	Address 242
	Address 15	Address 53	Address 91	Address 129	Address 167	Address 205	Address 243
	Address 16	Address 54	Address 92	Address 130	Address 168	Address 206	Address 244
	Address 17	Address 55	Address 93	Address 131	Address 169	Address 207	Address 245
	Address 18	Address 56	Address 94	Address 132	Address 170	Address 208	Address 246
	Address 19	Address 57	Address 95	Address 133	Address 171	Address 209	Address 247
	Address 20	Address 58	Address 96	Address 134	Address 172	Address 210	
	Address 21	Address 59	Address 97	Address 135	Address 173	Address 211	
	Address 22	Address 60	Address 98	Address 136	Address 174	Address 212	
	Address 23	Address 61	Address 99	Address 137	Address 175	Address 213	
	Address 24	Address 62	Address 100	Address 138	Address 176	Address 214	
	Address 25	Address 63	Address 101	Address 139	Address 177	Address 215	
	Address 26	Address 64	Address 102	Address 140	Address 178	Address 216	
	Address 27	Address 65	Address 103	Address 141	Address 179	Address 217	
	Address 28	Address 66	Address 104	Address 142	Address 180	Address 218	
	Address 29	Address 67	Address 105	Address 143	Address 181	Address 219	
	Address 30	Address 68	Address 106	Address 144	Address 182	Address 220	
	Address 31	Address 69	Address 107	Address 145	Address 183	Address 221	
	Address 32	Address 70	Address 108	Address 146	Address 184	Address 222	
	Address 33	Address 71	Address 109	Address 147	Address 185	Address 223	
	Address 34	Address 72	Address 110	Address 148	Address 186	Address 224	
	Address 35	Address 73	Address 111	Address 149	Address 187	Address 225	
	Address 36	Address 74	Address 112	Address 150	Address 188	Address 226	
	Address 37	Address 75	Address 113	Address 151	Address 189	Address 227	