

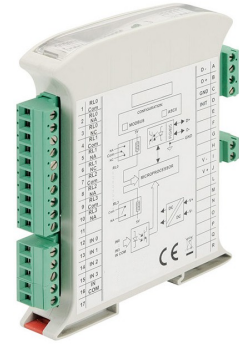


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**Remote I/O module  
 4 channel V / mA output  
 on RS-485 network**

# TU-E3024

- Field-Bus remote data acquisition
- RS-485 Master/Slave communication type
- MODBUS RTU/ASCII protocol
- 4 channel output
- Voltage or Current configurable outputs
- Watch-Dog Alarm
- Remotely Configurable
- 2000 Vac 3-way Galvanic Isolation
- High Accuracy
- EMC compliance – CE mark
- DIN rail suitable mounting - EN-50022 compliance



## GENERAL DESCRIPTION

The TU-E3024 device generates up to 4 output analog signals from digital commands. Data values are transmitted with MODBUS RTU/ASCII protocol on the RS-485 network (RS-232 interface is available).  
 It is possible to generate voltage signals up to 10V and current signals up to 20mA, both active or passive loops.  
 By means of a 16 bit converter, the device guarantee a high accuracy and a stable measure versus time and temperature.  
 To ensure the plant safety, two Watch-Dog timer alarms are provided.  
 The 2000 Vac isolation between input, power supply and serial line removes eventual ground-loop effects, allowing the use of the device even in the heavy environmental conditions.  
 TU-E3024 is in compliance with the Directive 2004/108/EC on the electromagnetic compatibility.  
 The device is housed in a rough self-extinguishing plastic container which, thanks to its thin profile of 17.5mm only, allows a high density mounting on EN-50022 standard DIN rail.

## COMMUNICATION PROTOCOLS

The TU-E3024 is designed to work with the MODBUS RTU/ASCII protocol: standard protocol in field-bus; allows to directly interface TU-E3000 series devices to the larger part of PLCs and SCADA applications available on the market.  
 For the protocol instructions, see the relative User Guide.

## USER INSTRUCTIONS

Before to install the device, please read the "Installation Instruction" section.  
 If the module configuration is unknown, it can be hardly to establish a communication with them; connecting the INIT terminal to the GND terminal (ground), at the next power-up the device will be self-configured in the default settings (see Operating User Guide).  
 Connect power supply, serial bus and analog outputs as shown in the "Wiring" section.  
 The "PWR" LED state depending to the working condition of the device: see the "Light Signaling" section to verify the device working state.  
 To perform configuration and calibration operations, read the instructions in the Operating User Guide.  
 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)

Output type	Min	Max																			
<b>Voltage</b> V	0 V	+10 V	<b>Auxiliary Voltage</b> 12V @ 20mA (4 channels)  <b>Rise time</b> Analog output Slew-rate (independent programming for each channel)																		
<b>Current</b> mA	0 mA	+20 mA																			
<b>Output calibration</b> Voltage ±10 mV Current ±20 µA			<table border="1"> <thead> <tr> <th>Voltage V/s</th> <th>Current mA/s</th> </tr> </thead> <tbody> <tr><td>0.125</td><td>0.250</td></tr> <tr><td>0.250</td><td>0.500</td></tr> <tr><td>0.500</td><td>1.000</td></tr> <tr><td>1.000</td><td>2.000</td></tr> <tr><td>2.000</td><td>4.000</td></tr> <tr><td>4.000</td><td>8.000</td></tr> <tr><td>Immediate</td><td>Immediate</td></tr> </tbody> </table>	Voltage V/s	Current mA/s	0.125	0.250	0.250	0.500	0.500	1.000	1.000	2.000	2.000	4.000	4.000	8.000	Immediate	Immediate	<b>Power Supply</b> Supply Voltage 18 .. 30 Vdc Current consumption 30 mA @ 24 Vdc 100 mA max Polarity inversion protection 60 Vdc max	
Voltage V/s	Current mA/s																				
0.125	0.250																				
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4.000	8.000																				
Immediate	Immediate																				
<b>Load resistance</b> Voltage > 5 KΩ Current < 500 Ω			<b>Isolation</b> Input – RS485 2000 Vac 50 Hz, 1 min. Supply – Input 2000 Vac 50 Hz, 1 min. Supply – RS485 2000 Vac 50 Hz, 1 min.																		
<b>Thermal drift</b> Full scale 100 ppm max			<b>Temperature &amp; Humidity</b> Operating temperature -10°C .. +60°C Storage temperature -40°C .. +85°C Humidity (non condensing) 0 .. 90 %																		
			<b>Housing</b> Material Self-extinguishing plastic Mounting EN-50022 DIN rail Weight ~ 150 g.																		
			<b>EMC ( for industrial environments )</b> Immunity EN 61000-6-2 Emission EN 61000-6-4																		
			<b>Data Transmission</b> Baud Rate 115.2 Kbps Max distance 1.2 Km																		

## INSTALLATION INSTRUCTIONS

The TU-E3024 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 at least one of the overload conditions exist.
- If panel temperature exceeds 35°C and at least two of the overload conditions exist.

The overload conditions are the following:

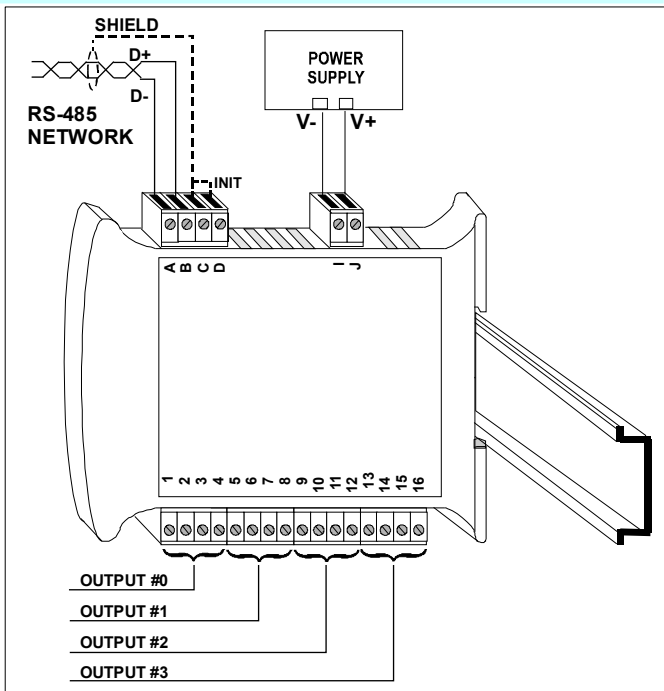
- High supply voltage: >27Vdc
- Use of the auxiliary power supply

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.

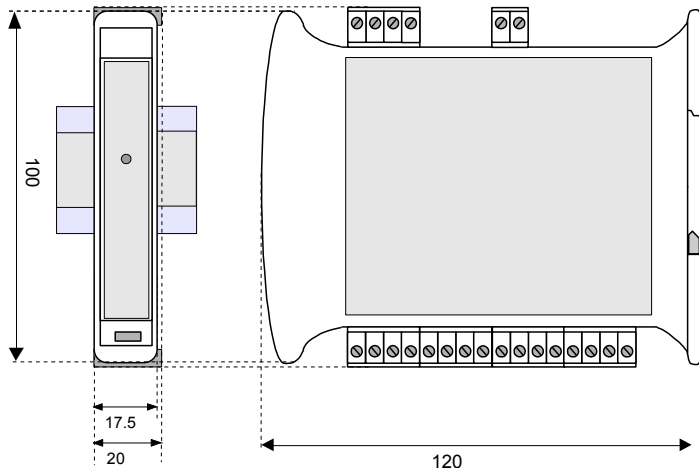
## CABLING



## LIGHT SIGNALING

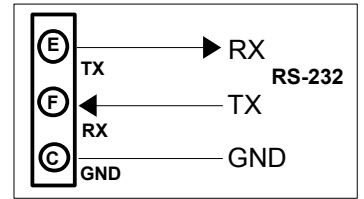
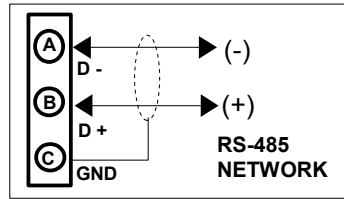
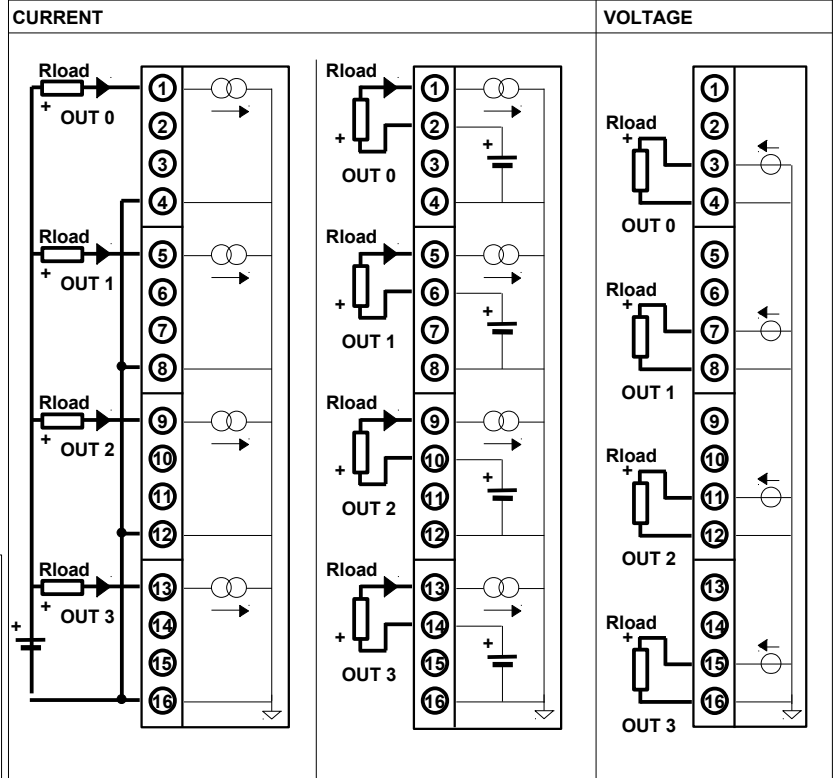
LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered / Wrong RS-485 cabling.
		FAST BLINK	Communication in progress (blink frequency depends to baud-rate)
		1 second BLINK	Watch-Dog Alarm condition

## MECHANICAL DIMENSIONS (mm)

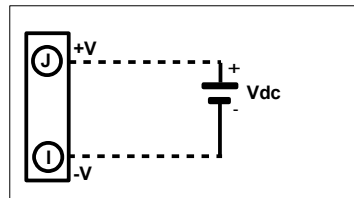


## WIRING

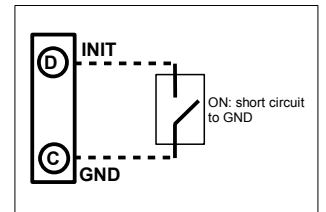
### ANALOG OUTPUT WIRING



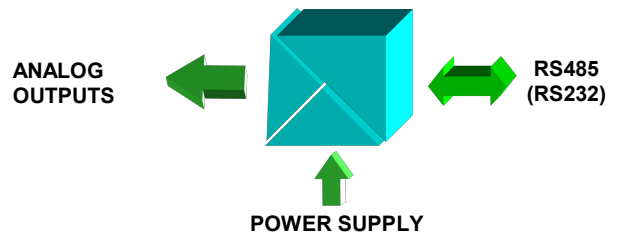
### POWER SUPPLY WIRING



### INIT WIRING



## ISOLATION DIAGRAM



## HOW TO ORDER

In the order phase, it is mandatory to specify the interface type (RS485 or RS232). TU-E3024 can be supplied with the configuration specified by the customer. Please refer to the "Technical Specification" section for the output type available.

### ORDER CODE:

TU-E 3024 **485** mA



■ = Requested  
□ = Optional