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- 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).

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.


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)

<table>
<thead>
<tr>
<th>Output type</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage V</td>
<td>0 V</td>
<td>+10 V</td>
</tr>
<tr>
<td>Current mA</td>
<td>0 mA</td>
<td>+20 mA</td>
</tr>
</tbody>
</table>

Output calibration

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10 mV</td>
<td>±20 µA</td>
</tr>
</tbody>
</table>

Load resistance

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 5 KΩ</td>
<td>&lt; 500 Ω</td>
</tr>
</tbody>
</table>

Thermal drift

| Full scale | 100 ppm max |

Auxiliary Voltage

12V @ 20mA (4 channels)

Rise time

Analog output Slew-rate (independent programmation for each channel)

<table>
<thead>
<tr>
<th>Voltage</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>

Data Transmission

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>115.2 Kbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max distance</td>
<td>1.2 Km</td>
</tr>
</tbody>
</table>

Power Supply

Supply Voltage

18 .. 30 Vdc

Current consumption

30 mA @ 24 Vdc

100 mA max

Polarity inversion protection

60 Vdc max

Isolation

Input – RS485

2000 Vac 50 Hz, 1 min.

Supply – Input

2000 Vac 50 Hz, 1 min.

Supply – RS485

2000 Vac 50 Hz, 1 min.

Temperature & Humidity

Operating temperature

-10°C .. +60°C

Storage temperature

-40°C .. +85°C

Humidity (non condensing)

0 .. 90 %

Housing

Material

Self-extinguishing plastic

Mounting

EN-50022 DIN rail

Weight

~ 150 g.

EMC (for industrial environments)

Immunity

EN 61000-6-2

Emission

EN 61000-6-4
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 cases:
- 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

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

MECHANICAL DIMENSIONS (mm)

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

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