12/24VDC, 12 pnp/npn digital inputs, 2 high-speed counter/shaft encoder inputs, 12 transistor outputs, I/O expansion port, 2 RS232/RS485 ports

### Power supply
- **Supply:** 12VDC or 24VDC
- **Permissible range:** 10.2VDC to 28.8VDC with less than 10% ripple
- **Maximum current consumption:**
  - 130mA@24VDC (pnp inputs)
  - 230mA@24VDC (nnp inputs)
  - 240mA@12VDC (pnp inputs)
  - 280mA@12VDC (nnp inputs)

### Digital inputs
- **Nominal input voltage:**
  - 12VDC or 24VDC.
  - See Notes 2 and 3.
- **Input voltages for pnp (source):**
  - For 12VDC: 0-3VDC for Logic ‘0’
  - 8-15.6VDC for Logic ‘1’
  - For 24VDC: 0-5VDC for Logic ‘0’
  - 17-28.8VDC for Logic ‘1’
- **Input voltages for nnp (sink):**
  - For 12VDC: 8-15.6VDC/<1.2mA for Logic ‘0’
  - 0-3VDC/>3mA for Logic ‘1’
  - For 24VDC: 0-5VDC/<2mA for Logic ‘0’
  - 17-28.8VDC/>6mA for Logic ‘1’
- **Input current:**
  - 4mA@12VDC
  - 8mA@24VDC
- **Input impedance:** 3KΩ
- **Response time:**
  - (except high-speed inputs): 10ms typical
- **Galvanic isolation:** None
- **Input cable length:** Up to 100 meters, unshielded

### High-speed counter
- **Specifications:**
  - For high-speed counter input/shaft encoder: See Notes 4 and 5.
  - **Resolution:** 32-bit
  - **Input frequency:** 10kHz max.
  - **Minimum pulse:** 40μs

### Warnings:
- Unused pins should not be connected. Ignoring this directive may damage the controller.
- Improper use of this product may severely damage the controller.
- Refer to the controller's User Guide regarding wiring considerations.
- Before using this product, it is the responsibility of the user to read the product’s User Guide and all accompanying documentation.
Digital outputs
12 pnp (source) outputs
12VDC or 24VDC
Output type
P-MOSFET (open drain)
Isolation
None
Output current
0.5A max.
Max. frequency for normal outputs
50Hz (resistive load)
0.5Hz (inductive load)
High speed output maximum frequency
2kHz (resistive load)
See Note 1.
Short circuit protection
Yes
Short indication
by software
On voltage drop
0.5VDC maximum
Power supply for outputs
Operating voltage
10.2 to 28.8VDC
Nominal operating voltage
12VDC or 24VDC
Note:
1. Output #0 and Output #1 may be used as high-speed outputs.

RS232/RS485 serial ports
Used for:
- Application Download/Upload
- Application Testing (Debug)
- Connect to GSM or standard telephone modem:
  - Send/receive SMS messages
  - Remote access programming
- RS485 Networking
RS232
2 ports
Galvanic isolation
None
Voltage limits
±20V
RS485 (see note)
2 ports
Input voltage
-7 to +12V differential max.
Cable type
Shielded twisted pair, in compliance with EIA RS485
Galvanic isolation
None
Baud rate
110 – 57600 bps
Nodes
Up to 32
Note:
RS232/RS485 is determined by jumper settings and wiring.
Refer to the controller’s User Guide regarding communications.

I/O expansion port
Up to 128 additional I/Os, including digital & analog I/Os, RTD and more.

Miscellaneous
Clock (RTC)
Real-time clock functions
(Date and time).
Battery back-up
7 years typical battery back-up for RTC and system data.
Battery
Coin type, 3V lithium battery, CR2450
Weight
280g (9.87 oz.)
Operational temperature
0 to 50°C (32 to 122°F)
Storage temperature
-20 to 60°C (-4 to 140°F)
Relative Humidity (RH)
5% to 95% (non-condensing)
Mounting method
DIN-rail mounted (IP20/NEMA1)
Panel mounted (IP65/NEMA4X)

Graphic Display
STN, LCD display
Illumination backlight
LED, yellow-green, software-controlled
Display resolution
128x64 pixels
Keypad
Sealed membrane
Number of keys
16
Program
Application memory
448K
Memory Bits (coils)
2048
Memory Integers (registers)
1600
Long Integers (32 bit)
256
Double Word (32 bit unsigned)
64
Floats
24
Timers
192
Counters
24
Data Tables
120K (RAM) / 64K (FLASH)
HMI displays
Up to 255
Execution time
0.8µs for bit operations
The tables below show how to set a specific jumper to change the functionality of the inputs. To open the controller and access the jumpers, refer to the directions at the end of these specifications.

**Important:**
Incompatible jumper settings and wiring connections may severely damage the controller.

**JP8**
Input type (for all digital inputs)

<table>
<thead>
<tr>
<th>To use as</th>
<th>JP8</th>
</tr>
</thead>
<tbody>
<tr>
<td>npn (sink)</td>
<td>A</td>
</tr>
<tr>
<td>pnp (source)*</td>
<td>B</td>
</tr>
</tbody>
</table>

**JP9**
Input voltage (for all digital inputs)

<table>
<thead>
<tr>
<th>To use as</th>
<th>JP9</th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC</td>
<td>A</td>
</tr>
<tr>
<td>24VDC*</td>
<td>B</td>
</tr>
</tbody>
</table>

*Default factory setting

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In this figure, the jumper settings will cause the inputs to function as npn, 24VDC digital inputs

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**Opening the controller’s enclosure**

1. Turn power off before opening the controller.
2. Locate the 4 slots on the sides of the enclosure.
3. Using the blade of a flat-bladed screwdriver, gently pry off the back of the controller as shown in the figure below, exposing the controller’s board.

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