

# SPECIFICATIONS

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# CHAPTER 2

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## Overview

### Base Hardware

The Productivity® 2000 system is a modular system that requires a base to accommodate the various modules. Bases are available in sizes of 4, 7, 11 and 15 I/O module slots. The base contains additional dedicated slots for the power supply and the CPU unit. You can place any I/O module into any slot without power budget or module type restrictions.

The backplane incorporates a discrete and analog I/O processor, which unloads the I/O module communication task from the CPU. This distributed processing architecture results in outstanding performance at a very low cost. The backplane includes a high-speed communication pathway directly from the CPU to specialty modules and to the discrete and analog module backplane processor.

Up to 8 Remote Slaves (P2-RS and P1-RX) and 4 PS-AMC modules can be connected to a single P2-550 for a remote I/O network. In addition to the P2-RS, P2 CPUs support P1-RX remote bases as well.

The base supports hot swapping and has electronic module keying for each slot.



## P2-04B, P2-07B, P2-11B, P2-15B Bases

The P2-04B, P2-07B, P2-11B, and P2-15B are 4, 7, 11, and 15-slot, local, expansion, and remote I/O bases.

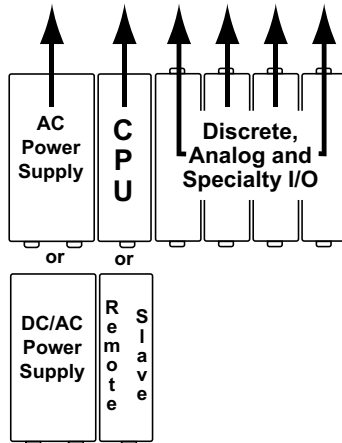
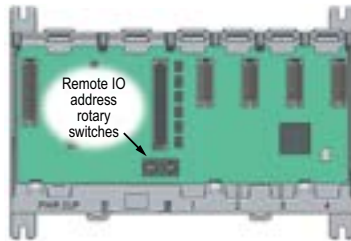


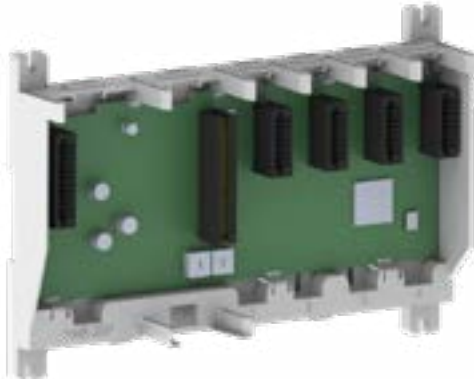
P2-04B 4-Slot Base



*NOTE: See Chapter 5 for base dimensions.*

### Base Configuration





Base Specifications	
Input or Output Modules per Base	4, 7, 11, or 15
Power Supply Slots	1 (P2-01DC, P2-02DC, P2-01AC, or P2-01DCAC)
CPU Slots	1 (P2-550)
Module Types Supported	Discrete, analog and specialty
Module Placement Restrictions	None. Any I/O module may be installed in any I/O slot without power supply budget or module type restrictions.
I/O Module Hot Swap Support	Yes. (All discrete, analog and specialty modules can be software enabled for hot swap operation)
Module Keying	Electronic to slot
Maximum Number of Local Bases	1

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2000 meters max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Heat Dissipation	3W
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*
Weight	P2-04B: 204g (7.2 oz)
	P2-07B: 294g (10.4 oz)
	P2-11B: 430g (15.2 oz)
	P2-15B: 539g (19oz)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

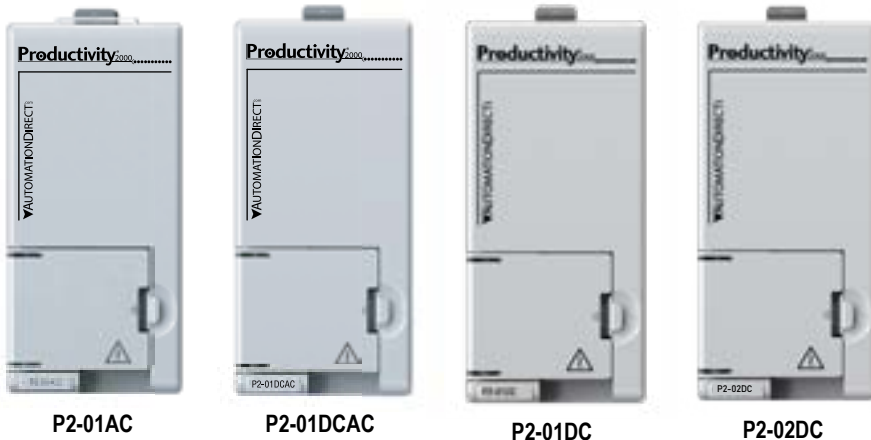
## P2-01AC, P2-01DCAC, P2-01DC and P2-02DC Power Supplies

There are four power supplies available (see table below); all provide isolated 24VDC and 3.3 VDC to the Productivity® 2000 bases.

Productivity 2000 Power Supplies		
Part Number	Source Power	Power Delivered
P2-01AC	100–240 VAC or 125VDC	24VDC, 0.85 A 3.3 VDC, 3.81 A
P2-01DCAC	24VAC or 12–24 VDC	
P2-01DC	24–48 VDC	
P2-02DC	24VDC (± 2%)	24VDC, 1.5 A 3.3 VDC, 4A

### No Power Budgeting

No power budgeting is required with power supply. Any combination of I/O modules may be installed in any slot without power budget considerations.



Terminal Block Specifications	
Number of positions	4 screw terminals
Wire Range	22–12 AWG (0.324 to 3.31 mm <sup>2</sup> ) Solid / Stranded conductor 3/64 in (1.2 mm) insulation maximum Use copper conductors, 75°C or equivalent
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent 1/4 in. (6-7 mm) strip length
Screw Driver Width	1/4 in (6.5 mm) maximum
Screw Size	M3
Screw Torque	7–9 lb-in (0.882–1.02 N·m)

P2-01AC Power Supply

P2-01AC



User Specifications

Input Voltage Range (Tolerance)	100 to 240 VAC (-15% / +10%) 125VDC* (-15%/+20%)
Rated Operating Frequency	50 to 60Hz with ±5% tolerance
Maximum Input Power	37.4 W
Cold Start Inrush Current	23.6 A
Maximum Inrush Current (Hot Start)	25.6 A
Input Fuse Protection (internal)	Micro fuse 250V, 2A non-replaceable
Efficiency	75%
Output	UL Rated: 24VDC, 0.85 A 3.3 VDC, 3.81 A
Maximum Output Power	29W combined
Heat Dissipation	8.4 W
Isolated User 24VDC Output	None
Output Protection for Over Current, Over Voltage, and Over Temperature	Self resetting for both voltage outputs to base
Under Input Voltage Lock-out	<70VAC
Over Input Voltage Lock-out	None
Input Transient Protection	Varistor, plus input choke and filter
Operating Design Life	10 years at full load at 40°C ambient and 5 years at 60°C (140°F) ambient

\*Only available on Rev. B or later modules.

**IMPORTANT!**



Hot-Swapping Information

**Note:** This device cannot be Hot Swapped.

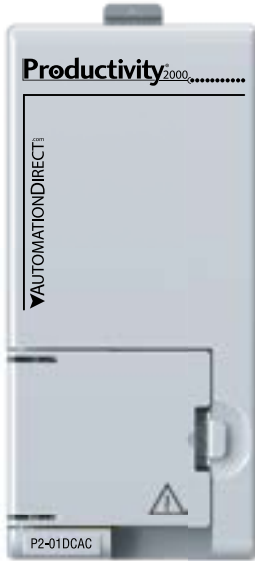
General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Enclosure Type	Open equipment
Voltage Withstand (dielectric)	2100VDC applied for 2s
Insulation Resistance	>10MΩ @ 500VDC
Module Location	Power Supply slot in a Productivity@2000 system.
Weight	294g (10.4 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the D.O.C. for details.

### P2-01DCAC Power Supply

P2-01DCAC



**IMPORTANT!**



#### Hot-Swapping Information

**Note:** This device cannot be Hot Swapped.

#### User Specifications

Input Voltage Range (Tolerance)	24VAC (-10% / +20%)	12–24 VDC (-10% / +20%)
Maximum Input Power	72VA	45W
Maximum Input Ripple	Less than $\pm 5\%$	
Cold Start Inrush Current	45A, 4 $\mu$ S @ 24VDC	
Maximum Inrush Current (Hot Start)	Same as cold start inrush current	
Rated Operating Frequency	50 to 60Hz with $\pm 5\%$ tolerance	
Input Fuse Protection (Internal)	Micro Fuse 250V, 6.3 A Slow blow non-replaceable	
Input Fuse Protection (External)	6A slow blow (recommended)	
Input Reverse Polarity Protection	Yes	
Output Voltages	24VDC, 0.85 A 3.3 VDC, 3.81 A	
Maximum Output Power	32W Combined	
Isolated User 24VDC Output	None	
Output Protection for Over Current, Over Voltage, and Over Temperature	Self resetting for both voltage outputs to base	
Under Input Voltage Lock-out	Yes, <10VDC	
Over Input Voltage Lock-out	No	
Input Transient Protection	Transorb plus input choke/filter	
Operating Design Life	10 years at full load at 40°C ambient and 5 years at 60°C (140°F) ambient	

#### General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Enclosure Type	Open equipment
Voltage Withstand (dielectric)	750VDC applied for 2s
Insulation Resistance	>10M $\Omega$ @ 500VDC
Module Location	Power Supply slot in a Productivity@2000 system.
Weight	284g (10 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

\*Meets EMC and Safety requirements. See the D.O.C. for details.



P2-01DC Power Supply

P2-01DC



**IMPORTANT!**



**Hot-Swapping Information**

**Note:** This device cannot be Hot Swapped.

**User Specifications**

Input Voltage Range (Tolerance)	24 to 48 VDC (-15% / +20% @60°C)
Maximum Input Power	38W
Cold Start Inrush Current	34A
Maximum Inrush Current (Hot Start)	34A
Input Fuse Protection (Internal)	Micro Fuse 250V, 4A Non-replaceable
Efficiency	75%
Output	UL Rated: 24VDC, 0.85 A 3.3 VDC, 3.81 A
Maximum Output Power	29W combined
Heat Dissipation	9W
Isolated User 24VDC Output	None
Output Protection for Over Current, Over Voltage, and Over Temperature	Self resetting for both voltage outputs to base
Under Input Voltage Lock-out	<19.8 V
Over Input Voltage Lock-out	None
Input Transient Protection	Varistor, plus input choke and filter
Operating Design Life	10 years at full load at 60°C (140°F) ambient

**General Specifications**

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Enclosure Type	Open equipment
Voltage Withstand (dielectric)	750VDC applied for 2s
Insulation Resistance	>10MΩ @ 500VDC
Module Location	Power Supply slot in a Productivity@2000 system.
Weight	363g (12.8 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the D.O.C. for details.

### P2-02DC Power Supply

P2-02DC



**IMPORTANT!**



#### Hot-Swapping Information

**Note: This device cannot be Hot Swapped.**

#### User Specifications

Input Voltage Range (Tolerance)	24VDC (±2%)
Maximum Input Power	50W
Cold Start Inrush Current	34A
Maximum Inrush Current (Hot Start)	34A
Input Fuse Protection (Internal)	Micro Fuse 250V, 4A Non-replaceable
Efficiency	90%
Output	24VDC, 1.5 A 3.3 VDC, 4A
Maximum Output Power	45W combined
Heat Dissipation	5W
Isolated User 24VDC Output	None
Output Protection for Over Current, Over Voltage, and Over Temperature	3.3 V output self resetting 24V output fused
Under Input Voltage Lock-out	None
Over Input Voltage Lock-out	None
Input Transient Protection	Transorb, plus input choke and filter
Operating Design Life	>10 years at full load at 60°C (140°F) ambient

#### General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Enclosure Type	Open equipment
Voltage Withstand (dielectric)	Non-Isolated
Insulation Resistance	Non-Isolated
Module Location	Power Supply slot in a Productivity@2000 system.
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the D.O.C. for details.

## Power Connections

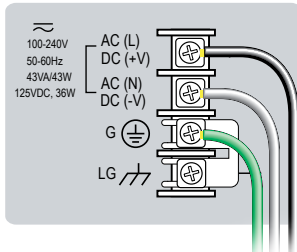
P2-01AC



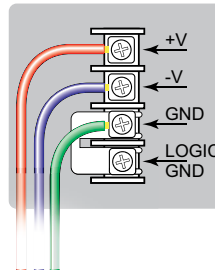
P2-01DCAC



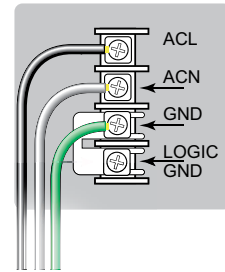
100–240 VAC; 125VDC



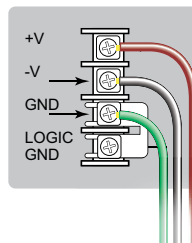
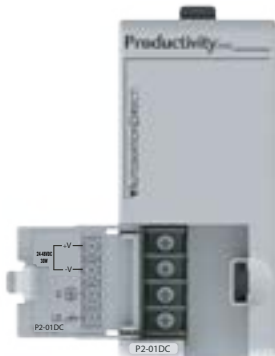
12–24VDC



24VAC



P2-01DC



P2-01DC (24–48 VDC)

P2-02DC (24VDC Input only)

P2-02DC



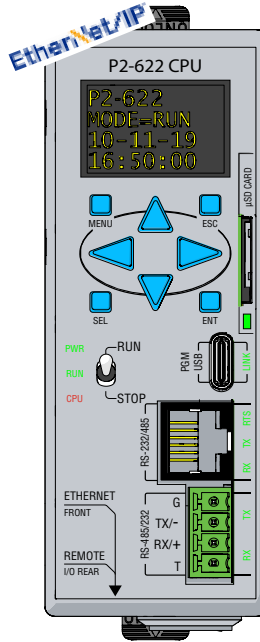
## Grounding

A good common ground reference (earth ground) is essential for proper operation of the Productivity® 2000 system. One side of all control circuits, power circuits and the ground lead must be properly connected to earth ground by either installing a ground rod in close proximity to the enclosure or by connecting to the incoming power system ground. There must be a single-point ground (i.e. copper bus bar) for all devices in the enclosure that require an earth ground.

# Productivity 2000 CPU Modules

Each Productivity2000 system base requires one CPU module be mounted in the controller slot of the unit. The CPU stores and executes the user's program.

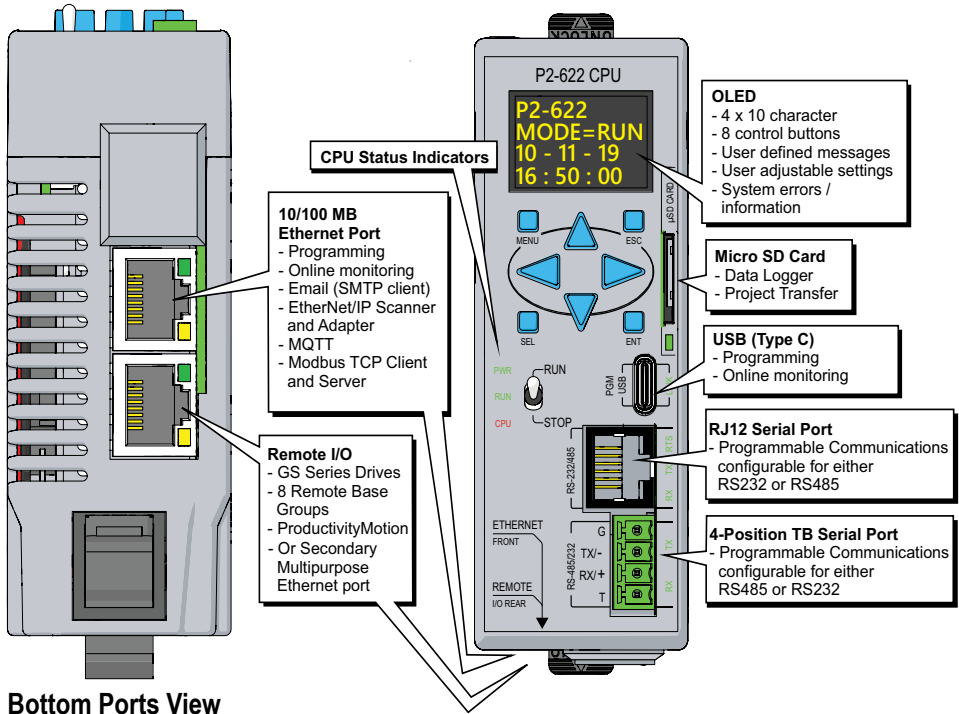
## P2-622 CPU Module



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

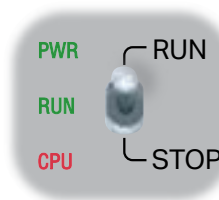


## P2-622 CPU Specifications

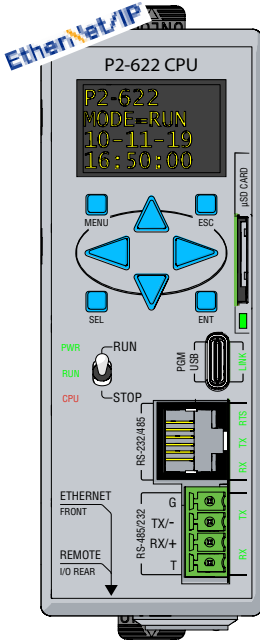


CPU Run/Stop Switch	
RUN position	Executes user program, run-time edits possible
STOP position	Does not execute user program, normal program load position

CPU Status Indicators	
PWR	Green LED is illuminated when power is ON
RUN	Green LED is illuminated when CPU is in RUN mode
CPU	Red LED is illuminated during power ON reset or power down.



## P2-622 CPU Specifications, cont'd



**IMPORTANT!**



### Hot-Swapping Information

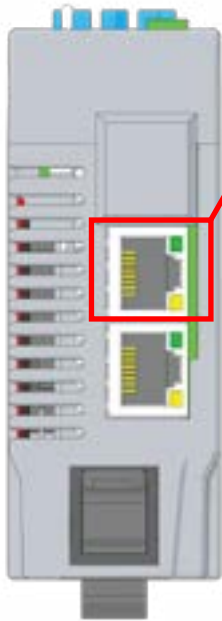
**NOTE: This device cannot be Hot Swapped.**

CPU Specifications															
User Memory	50MB (Includes program, data and documentation)														
Memory Type	Flash and Battery Backed RAM														
Retentive Memory	512KB														
Scan Time	500µs (3K Boolean, 240 I/O)														
Display*	OLED, 4x10 characters, 8 control buttons														
Communications; 5 Integrated Ports	USB IN: Programming, Monitoring, Debug, Firmware ETHERNET: (10/100Mbps Ethernet) Programming, Monitoring, Debug, Firmware, MQTT, Email SMTP Client, Modbus TCP Client (32 Servers) and Server (16 Clients), EtherNet/IP Scanner (32 Adapters) and Adapter (4 scanners) with 8 connections per device. REMOTE I/O: 16 GS-EDRV100 (GS Drives), 8 Remote Base Groups RJ12 RS232/485: Programmable 4 Position TB RS485/232: Programmable (removable terminal block included)														
Data Logging/Project Transfer	microSD card slot														
Hardware Limits of System	9 Base Groups: 1 Local (CPU) + 8 Remote (P2-RS and/or P1-RX) + 4 PS-AMC 4,320 Hardware I/O points (All 32 point modules)														
Instruction Types	<table border="1"> <tr> <td>Application Functions</td> <td>PID</td> </tr> <tr> <td>Array Functions</td> <td>Program Control</td> </tr> <tr> <td>Counters/Timers</td> <td>String Functions</td> </tr> <tr> <td>Communications</td> <td>System Functions</td> </tr> <tr> <td>Data Handling</td> <td>Contacts</td> </tr> <tr> <td>Drum Sequencers</td> <td>Coils</td> </tr> <tr> <td>Math Functions</td> <td>Motion Control</td> </tr> </table>	Application Functions	PID	Array Functions	Program Control	Counters/Timers	String Functions	Communications	System Functions	Data Handling	Contacts	Drum Sequencers	Coils	Math Functions	Motion Control
Application Functions	PID														
Array Functions	Program Control														
Counters/Timers	String Functions														
Communications	System Functions														
Data Handling	Contacts														
Drum Sequencers	Coils														
Math Functions	Motion Control														
Real Time Clock Accuracy	±2s per day typical at 25°C ±10s per day maximum at 60°C														



\* **NOTE:** The OLED display will time-out after approximately 4 hours without interaction. To wake, press any button on the front panel.

## P2-622 CPU Ethernet Ports

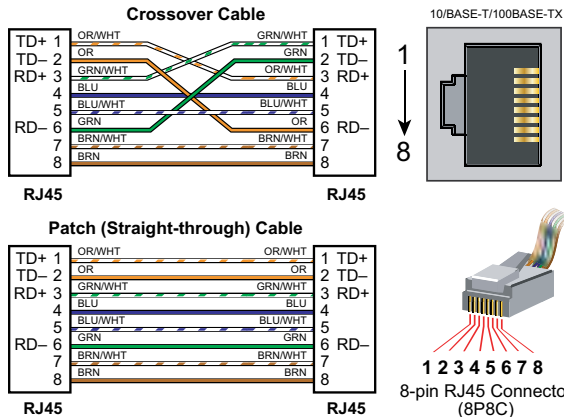


P2-622 Bottom Ports

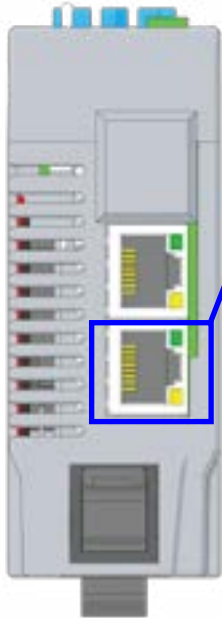
### Ethernet Port (RJ-45 style connector on bottom of CPU) used for:

- Connection to a PC running the ProductivitySuite programming software
- Modbus TCP Client (32 Servers) connections (Modbus requests sent from the CPU)
- Modbus TCP Server (16 Clients) connections (Modbus requests received by the CPU)
- EtherNet/IP Scanner (32 Adaptors)
- EtherNet/IP Adapter (4 scanners) with 8 connections per device.
- Outgoing E-mail
- MQTT Client (4 brokers)

Ethernet Specifications		
Port Name	ETHERNET	REMOTE I/O
Description	Standard transformer isolated Ethernet port with built-in surge protection for programming, online monitoring, firmware, MQTT, Email (SMTP client), Modbus/TCP client/server connections (fixed IP or DHCP) and Ethernet/IP Scanner/Adapter connections..	Standard transformer-isolated Ethernet port with built-in surge protection for connection of ProtoX remote I/O, P2-RS and P1-RX remote slaves, GS Drives with optional communication modules and/or PS-AMC modules. Can be configured as a Secondary multipurpose Ethernet port.
Transfer Rate	RJ45 Yellow LED Off = 10Mbps / On = 100 Mbps	
Port Status LED	RJ45 Green LED Solid when network LINK is established. Flashes when port is active (ACT).	



### P2-622 CPU Ethernet Ports



P2-622 Bottom Ports

#### Remote I/O Port (RJ-45 style connector on bottom of CPU)

- Connection to a Remote I/O network of devices using the Productivity Remote Protocol, e.g. P2-RS, P1-RX, GS Drives, etc.
- Can be user defined and used as a secondary multipurpose ethernet port with the exception that this port does not have Default Gateway or DNS capability.

This feature, currently only available for the P2-622 CPU, allows the Remote I/O port to be user defined enabling the port to function in a similar manner as the External Ethernet port, depending on user configuration.

This will allow the CPU to operate on two different networks, e.g. for IT and OT (operational technology) network separation, with the understanding that **subnets must be different** on the two ports.

Users will be able to discover, go online, perform runtime and stop mode transfers, update firmware, and access the webserver via either or both Ethernet ports (if the Remote I/O port is set to be user defined).



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**NOTE:** If the Remote I/O port is configured as user defined, it will no longer natively support Remote Slaves (P2-RS and P1-RX), AMCs, GS Drives, and Protos X modules.

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**NOTE:** DNS & Default Gateway only work for the External Ethernet port (this affects Email and other ethernet based comms, such as MQTT, that may need to go through a router).

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## P2-622 CPU Programmable RS232/485 Ports

### RJ12 Connector

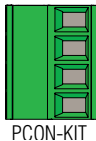
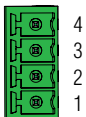
Description	<p>Programmable RS232/485 Port</p> <ul style="list-style-type: none"> <li>- Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built in surge protection</li> <li>- Non-isolated RS-485 port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD/EFT protection and automatic echo cancellation when transmitter is active</li> </ul>
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200
+5V Cable Power	210mA maximum at 5V, ±5%. Reverse polarity and overload protected.
Port Status LED	Green LED illuminated when active for TXD, RXD and RTS
Cable Options	<p>EA-MG-PGM-CBL                  D2-DSCBL                  USB-RS232 with D2-DSCBL                  FA-CABKIT</p>



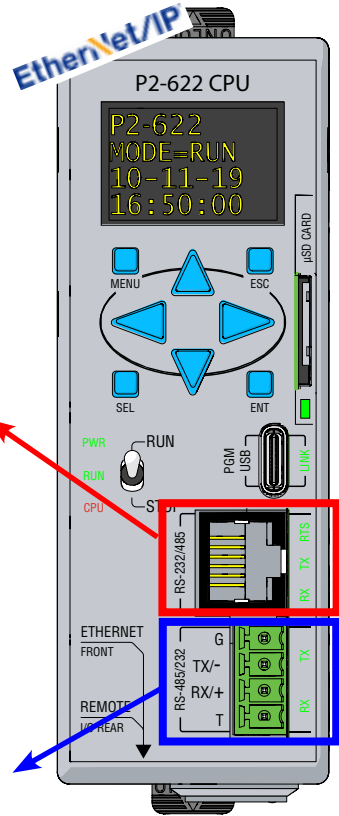
Pin #	RS232	RS485
6	GND	GND
5	RTS	
4	TXD	TXRX-
3	RXD	TXRX+
2	+5V, 210mA	Do not connect
1	GND	GND

### 4 Position Terminal Block

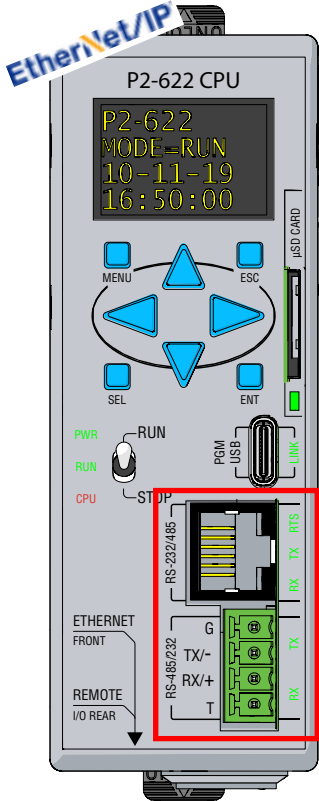
<b>4 Position Terminal Block</b>	
Description	<p>Programmable RS485/232 Port</p> <ul style="list-style-type: none"> <li>- Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built in surge protection</li> <li>- Non-isolated RS-485 port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD/EFT protection and automatic echo cancellation when transmitter is active</li> </ul>
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200
Port Status LED	Green LED illuminated when active for TXD and RXD
Cable Options	Go to AutomationDirect.com for RS232 and 485 cable selection.



Pin #	RS232	RS485
4	GND	GND
3	TXD	TXRX-
2	RXD	TXRX+
1	Do not connect	TERMINATE



## P2-622 CPU Programmable RS232/485 Ports

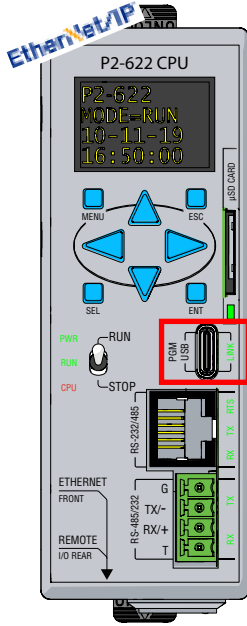


RS-232 Specifications	
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS (RJ12 port only)	Handshaking output for modem control
GND	Logic ground
Maximum Output Load (TXD/RTS)	3k $\Omega$ , 1000 pf
Minimum Output Voltage Swing	$\pm 5V$
Output Short Circuit Protection	$\pm 15mA$

RS-485 Specifications	
TXD+/RXD+	RS-485 transceiver high
TXD-/RXD-	RS-485 transceiver low
GND	Logic ground
Input Impedance	19k $\Omega$
Maximum Load	50 transceivers, 19k $\Omega$ each, 60 $\Omega$ termination
Output Short Circuit Protection	$\pm 250mA$ , thermal shut-down protection
Electrostatic Discharge Protection	Contact: $\pm 4kV$ , Air: $\pm 8kV$ per IEC1000-4-2 Cable is installed for testing
Electrical Fast Transient Protection	1kV per IEC1000-4-4
Minimum Differential Output Voltage	1.5 V with 60 $\Omega$ load
Fail Safe Inputs	Logic high input state if inputs are connected
Maximum Common Mode Voltage	-7.5 V to 12.5 V

## P2-622 CPU USB C Programming Port

Used exclusively for connecting to a PC running the Productivity Suite programming software.



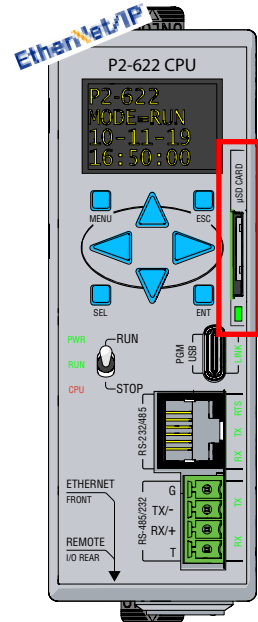
USB C Specifications	
Port Name	PGM USB
Description	Standard USB C Slave input for programming and online monitoring, with built-in surge protection. Not compatible with older full speed USB devices.
Transfer Rate	480 Mbps
Port Status LED	Green LED is illuminated when LINK is established to programming software.
Cables	USB Type A to USB Type C: 6ft cable part # USB-CBL-AC6

## microSD SLOT

Used for data logging or project transfers.

microSD Specifications*	
Description	Standard microSD for data logging or project transfer. Supports wear leveling to maximize data endurance
Maximum Card Capacity	32GB
Performance (SanDisk microSDHC Class 4 memory card)	Speeds up to 20MB/s read and 5MB/s write
Operating Temperature	-25 to 85°C (-13 to 185°F)
Speed Class	Class 4 (4 Mbps)

\*Note: Card not included with unit. (p/n: MICSD-16G)



### P2-622 CPU Battery Installation

#### Battery (Optional)

A battery is included with some CPU modules, but is not installed. The battery may be installed in order to retain the Time and Date along with any tagname values that are set up as retentive. The battery is not needed for program backup.



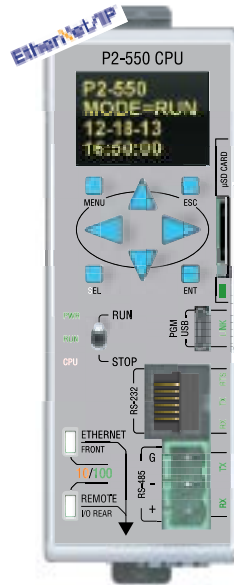
#### Battery (Optional)

D2-BAT-1	Coin type, 3.0 V Lithium battery, 560mA, battery number CR2354
----------	--

**Note:** Although not needed for program backup, a battery is included with some CPU modules. Install this battery if you want the CPU to retain the Time and Date along with any Tagname values that you have set up as retentive.

## P2-550 CPU Module

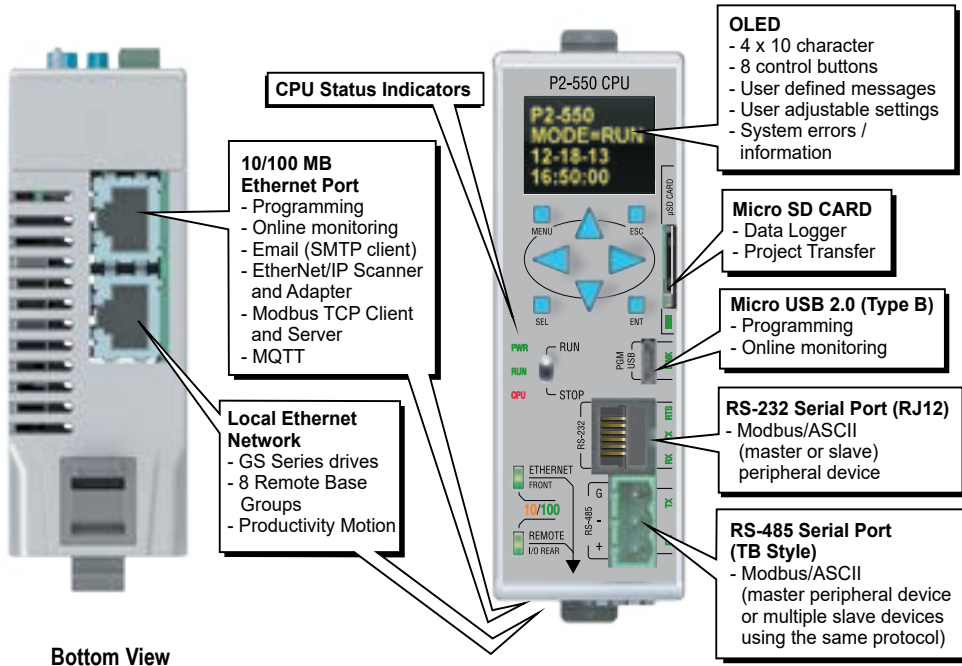
Each Productivity2000 system base requires one CPU module be mounted in the controller slot of the unit. The CPU stores and executes the user's program.



P2-550



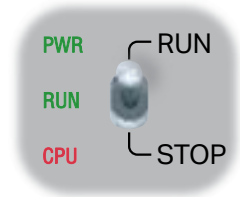
## P2-550 Specifications



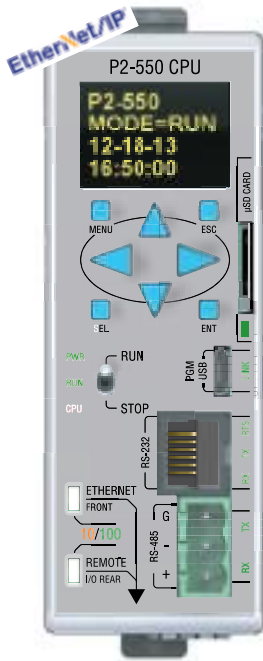
Bottom View

CPU Run/Stop Switch	
RUN position	Executes user program, run-time edits possible
STOP position	Does not execute user program, normal program load position

CPU Status Indicators	
PWR	Green LED is illuminated when power is ON
RUN	Green LED is illuminated when CPU is in RUN mode
CPU	Red LED is illuminated during power ON reset or power down.



# P2-550 Specifications



**IMPORTANT!**



**Hot-Swapping Information**

**Note:** This device cannot be Hot Swapped.

CPU Specifications*															
User Memory	50MB (Includes program, data and documentation)														
Memory Type	Flash and battery-backed RAM														
Retentive Memory	500kB														
Scan Time	500µs (3K Boolean, 240 I/O)														
Display	OLED, 4x10 characters, 8 control buttons; OLED characters are 7x12 with a dot pitch of 0.245 mm; 1.7 mm x 2.94 mm														
Communications; 5 Integrated Ports	<p>USB: Programming, monitoring, debug, firmware</p> <p>ETHERNET: (10/100 Mbps Ethernet) programming, monitoring, debug, firmware, Email SMTP client, MQTT, Modbus TCP client (32 servers) and server (16 Clients), EtherNet/IP scanner (32 Adapters) and Adapter (4 scanners) with 8 connections per device.</p> <p>REMOTE I/O: 16 GS drives, 8 remote base groups, 4 ProtosX TCP couplers, 4 PS-AMC modules</p> <p>RS-232: (RJ12, 1200–115.2 Kbaud) ASCII, Modbus</p> <p>RS-485: Removable terminal included, (1200–115.2 Kbaud) ASCII, Modbus RTU</p>														
Data Logging/Project Transfer	microSD card slot														
Hardware Limits of System	9 Base Groups: 1 Local (P2-55) + 8 Remote (P2-RS and/or P1-RX) + 4 ProtosX TCP couplers + 4 PS-AMC 4,320 Hardware I/O points (All 32 points modules)														
Instruction Types	<table border="0"> <tr> <td>Application functions</td> <td>PID</td> </tr> <tr> <td>Array functions</td> <td>Program control</td> </tr> <tr> <td>Counters/timers</td> <td>String functions</td> </tr> <tr> <td>Communications</td> <td>System functions</td> </tr> <tr> <td>Data handling</td> <td>Contacts</td> </tr> <tr> <td>Drum sequencers</td> <td>Coils</td> </tr> <tr> <td>Math functions</td> <td>Motion control</td> </tr> </table>	Application functions	PID	Array functions	Program control	Counters/timers	String functions	Communications	System functions	Data handling	Contacts	Drum sequencers	Coils	Math functions	Motion control
Application functions	PID														
Array functions	Program control														
Counters/timers	String functions														
Communications	System functions														
Data handling	Contacts														
Drum sequencers	Coils														
Math functions	Motion control														
Real Time Clock Accuracy	±5s per day typical at 25°C (77°F) ±15s per day maximum at 60°C (140°F)														

\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

### OLED Message Display

The P2-550 CPU incorporates a 4 line by 10 character OLED for system alarms, information and for displaying user-defined messages. OLED characters are 7x12 (1.72 mm x 2.94 mm) with a dot pitch of 0.245 mm.

OLED control buttons located beneath the display allow the user to navigate through menu items. These buttons also permit local configuration of time and date settings.

For user defined messages, the display is configured using the Productivity Suite Programming Software. A "Display Page" instruction dialog box allows the user to program text into user-defined tags and display the messages based on the programmed ladder execution.

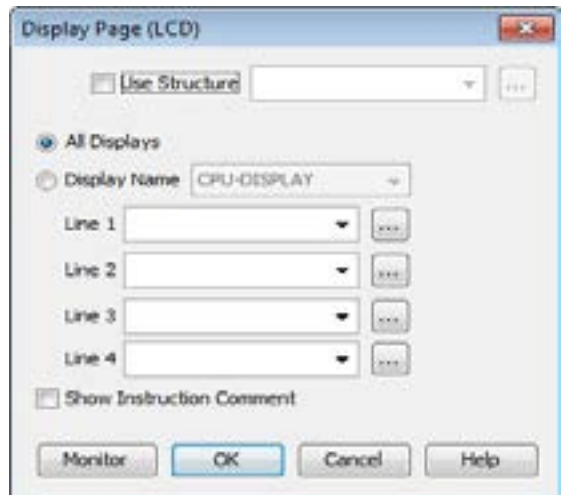


**\* NOTE:** The OLED display will time-out after approximately 4 hours without interaction. To wake, press any button on the front panel.



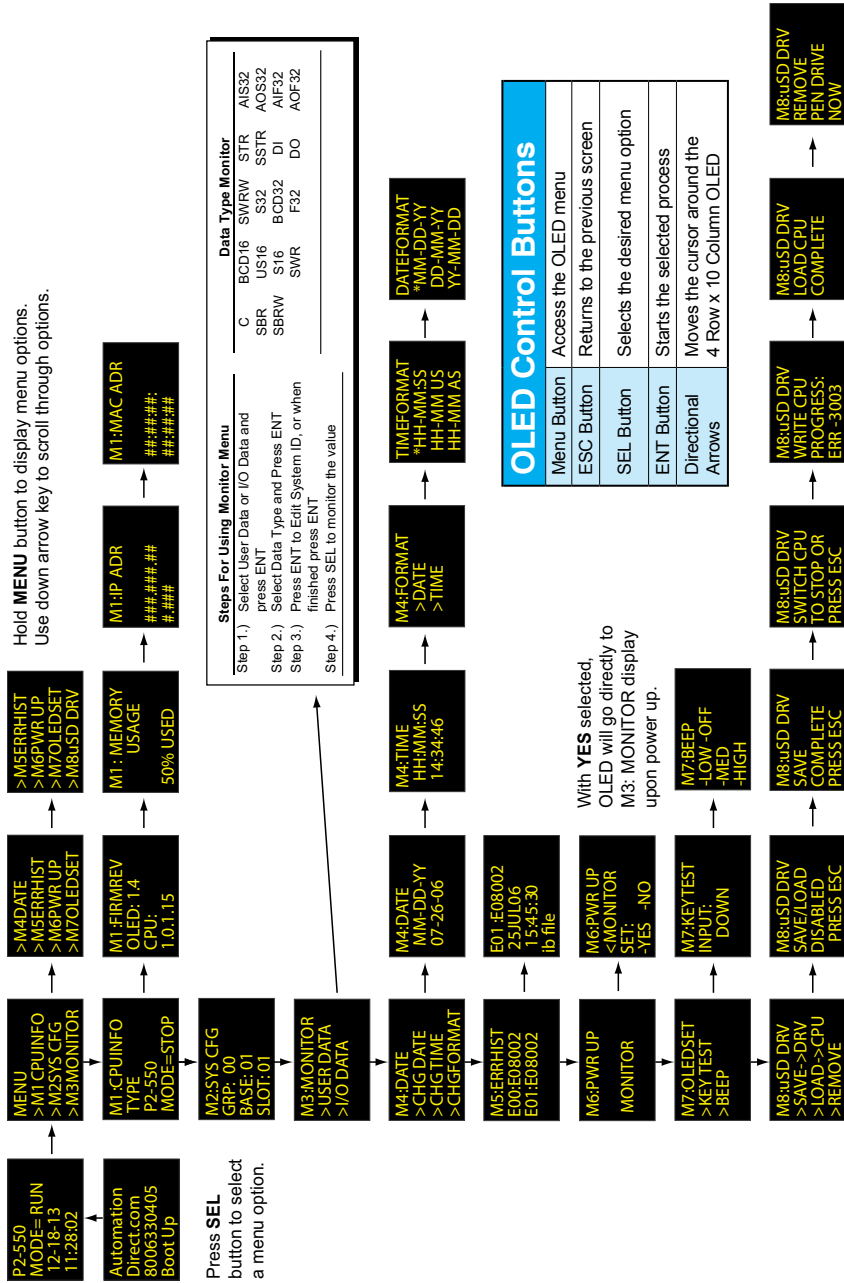
#### OLED Control Buttons

Menu Button	Access the OLED menu
ESC Button	Returns to the previous screen
SEL Button	Selects the desired menu option
ENT Button	Starts the selected process
Directional Arrows	Moves the cursor around the 4-Row x 10-Column OLED





# Front Panel OLED Monitoring and Configuration



### Battery (Optional)

A battery is included with some CPU modules, but is not installed. The battery may be installed in order to retain the Time and Date along with any tagname values that are set up as retentive. The battery is not needed for program backup.

#### Step One:

Press spring lock and swing battery compartment away from CPU.



#### + Step Two:

Insert battery and close compartment.



Take care to insert battery behind metal tab.

### Battery (Optional)

D2-BAT-1

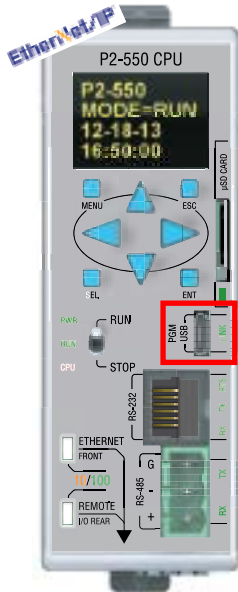
Coin type, 3.0 V Lithium battery, 560mA, battery number CR2354

**Note:** Although not needed for program backup, a battery is included with some CPU modules. Install this battery if you want the CPU to retain the Time and Date along with any Tagname values that you have set up as retentive.

## Port Specifications

The P2-550 CPU has several communications ports and the following pages contain their specifications and pin-out diagrams.

### P2-550

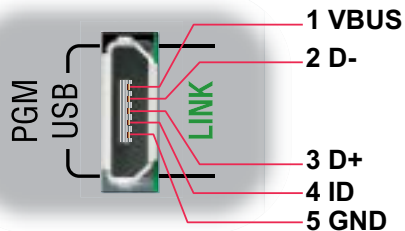


## MICRO USB Programming Port

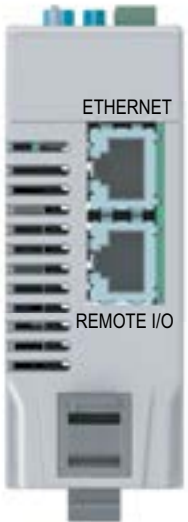
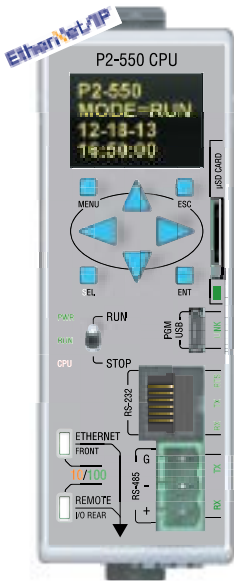
Used exclusively for connecting to a PC running the ProductivitySuite programming software.

### Micro USB Input Specifications

Port Name	MICRO USB
Description	Standard Micro USB slave input for programming and on-line monitoring, with built-in surge protection. Not compatible with older full speed USB devices.
Transfer Rate	480 Mbps
Port Status LED	Green LED is illuminated when LINK is established to programming software.
Cables	USB Type A to Micro USB Type B: 6ft cable part # USB-CBL-AMICB6 15ft cable part # USB-CBL-AMICB15



## P2-550



P2-550 Bottom View

## Ethernet Port (bottom face of CPU)

RJ-45 style connector used for:

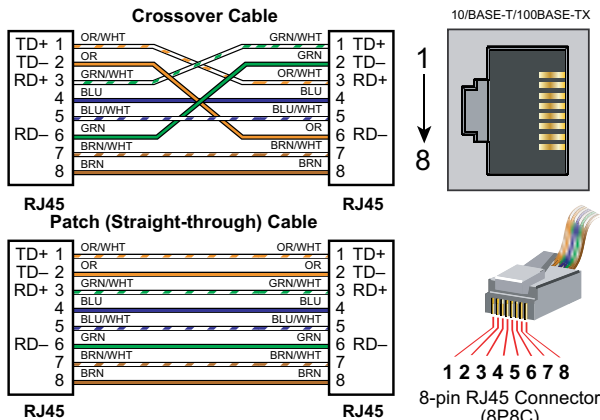
- Connection to a PC running the ProductivitySuite programming software
- Modbus TCP Client (32 Servers) connections (Modbus requests sent from the CPU)
- Modbus TCP Server (16 Clients) connections (Modbus requests received by the CPU)
- EtherNet/IP Scanner (32 Adaptors)
- EtherNet/IP Adapter (4 scanners) with 8 connections per device.
- Outgoing Email

## Remote I/O Port (On bottom of CPU)

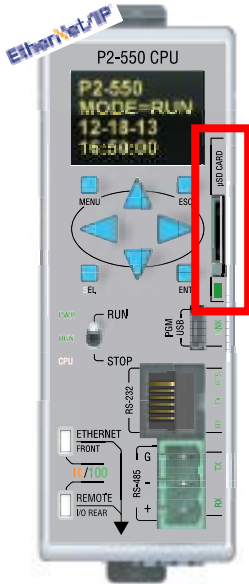
RJ-45 style connector used for connecting to a Remote I/O network consisting of P2-RS and P1-RX remote slaves, ProtosX remote I/O modules, GS Drives with communication modules, and/or PS-AMC modules.

### Ethernet Specifications

Port Name	ETHERNET	REMOTE I/O
Description	Standard transformer-isolated Ethernet port with built-in surge protection for programming, online monitoring, Email (SMTP client), Modbus/TCP client/server connections (fixed IP or DHCP), and EtherNet/IP scanner/apapter connections.	Standard transformer-isolated Ethernet port with built-in surge protection for connection of 16 GS series drives, 8 Remote base groups, and 4 PS-AMC modules.
Transfer Rate	10 Mbps (Orange LED) and 100 Mbps (Green LED) (Auto-crossover).	
Port Status LED	LED is solid when network LINK is established. LED flashes when port is active (ACT).	



P2-550



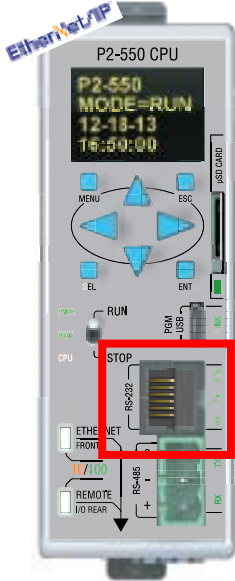
### MICRO SD SLOT

Used for data logging or project transfers.

microSD Specifications*				
Description	Standard microSD for data logging or project transfer. Supports wear leveling to maximize data endurance			
Maximum Card Capacity	32GB			
Transfer Rate (ADATA microSDHC Class 4 memory card)	Mbps	Minimum	Typical	Maximum
	Read	14.3	14.4	14.6
	Write	4.8	4.9	5.1
Operating Temperature	-25 to 85°C (-13 to 185°F)			
Speed Class	Class 4 (4 Mbps)			

\*Note: Card not included with unit.

## P2-550



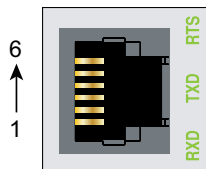
### RS-232 Port

RJ-12 style connector used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII full or half duplex communications
- Custom Protocol Incoming and Outgoing communications

### RS-232 Specifications

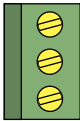
Port Name	RS-232
Description	Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200 baud
+5V Cable Power Source	210mA maximum at 5V, +/- 5%. Reverse polarity and overload protected
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS	Handshaking output for modem control
GND	Logic ground
Maximum Output Load (TXD/RTS)	3kΩ, 1000pf
Minimum Output Voltage Swing	±5V
Output Short Circuit Protection	±15mA
Port Status LED	Green LED is illuminated when active for TXD, RXD and RTS
Cable Options	EA-MG-PGM-CBL D2-DSCBL USB-RS232 with D2-DSCBL FA-CABKIT FA-ISOCAN for converting RS-232 to isolated RS-485



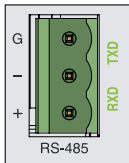
6-pin RJ12 Female Modular Connector

Pin #	Signal	
6	GND	Logic Ground
5	RTS	RS-232 Output
4	TXD	RS-232 Output
3	RXD	RS-232 Input
2	+5V	210mA Maximum
1	GND	Logic Ground

P2-550



Removable connector included. Spare connectors available (part no. P2-RS485CON).



Pin #	Signal
G	GND
-	TXD-/RXD-
+	TXD+/RXD+

RS-485 Port

A 3-pin removable terminal block used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII Incoming and Outgoing communications
- Custom Protocol Incoming and Outgoing communications

RS-485 Port Specifications

Description	Non-isolated RS-485 port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD/EFT protection and automatic echo cancellation when transmitter is active
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200 baud
TXD+/RXD+	RS-485 transceiver high
TXD-/RXD-	RS-485 transceiver low
GND	Logic ground
Input Impedance	19kΩ
Maximum Load	50 transceivers, 19kΩ each, 60Ω termination
Output Short Circuit Protection	±250mA, thermal shut-down protection
Electrostatic Discharge Protection	Contact ±4kV, Air ±8kV per IEC1000-4-2 Cable is installed for testing
Electrical Fast Transient Protection	±1kV per IEC1000-4-4
Minimum Differential Output Voltage	1.5 V with 60Ω load
Fail Safe Inputs	Logic high input state if inputs are unconnected
Maximum Common Mode Voltage	-7.5 V to 12.5 V
Port Status LED	Green LED illuminated when active for TXD and RXD
Cable Options	Go to AutomationDirect.com for RS-485 cables.

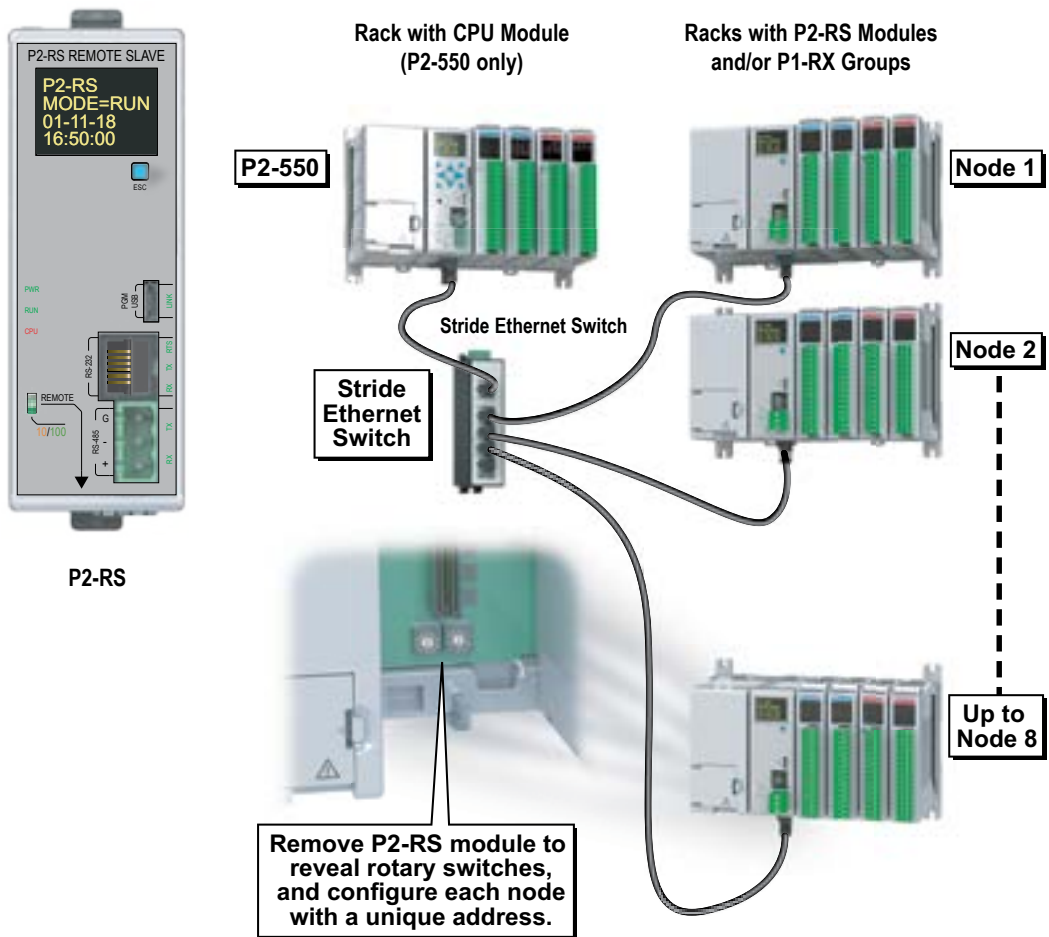
Removable Terminal Block Specifications

Part Number	P3-RS485CON
Number of Positions	3 Screw terminals
Pitch	5mm
Wire Range	28–12 AWG solid Conductor 30–12 AWG Stranded Conductor
Screw Driver Width	1/8 inch (3.175 mm) maximum
Screw Size	M2.5
Screw Torque	4.5 lb-in (0.51 N-m)

## P2-RS Remote Slave Module

The P2-RS is a high-performance Remote Slave module. The module features several communications ports which support Ethernet Remote I/O, and serial devices. The P2-RS also includes a 4 line x 10 character OLED display and an additional USB IN (Mini USB type A) port for remote CPU programming and monitoring.

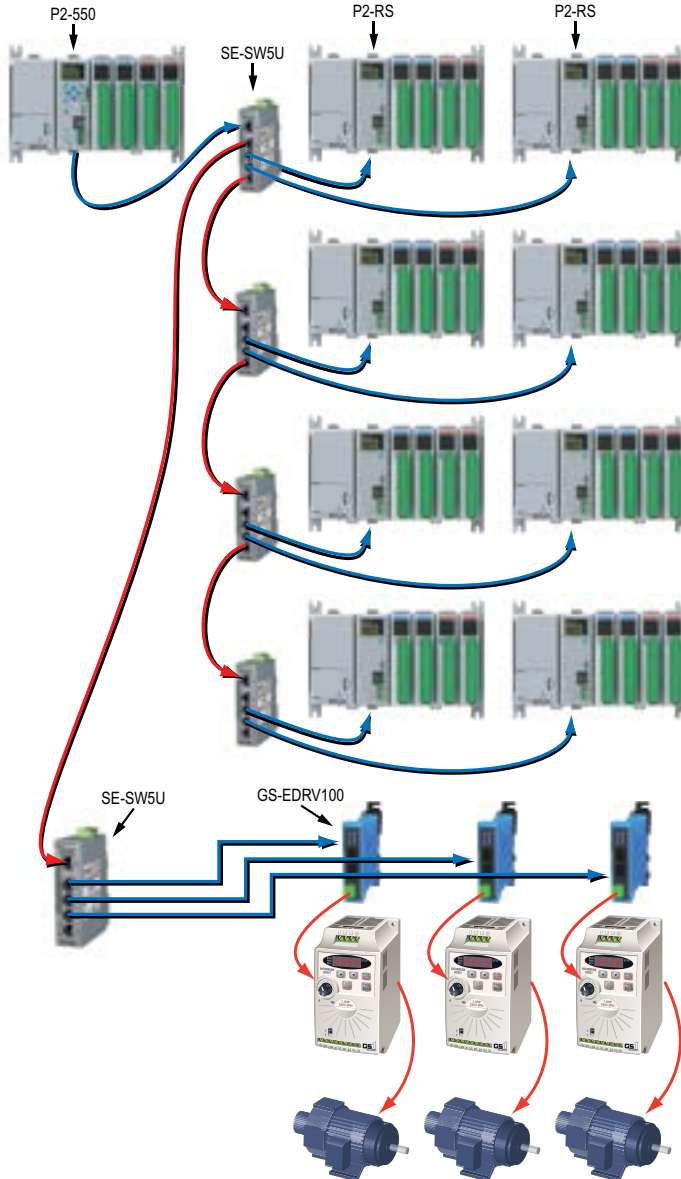
Up to 8 P2-RS remote slaves can be connected to a single P2-550 for a remote I/O network. It also supports [P1-RX](#) remote groups.



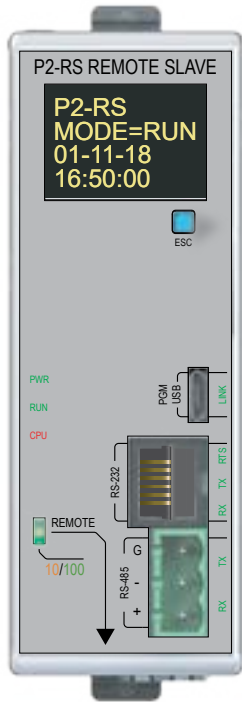


## P2-RS Remote Slave Module Example

Add up to 8 remote bases using P2000 CPUs or up to 4 Remote Bases for P1-550 along with other supported devices on the Remote I/O Ethernet Network



### P2-RS Remote Slave Module Specifications



**IMPORTANT!**



#### Hot-Swapping Information

**Note: This device cannot be Hot Swapped.**

#### Remote Slave Specifications

Mounting Location	Controller slot in remote base
Display*	OLED, 4x10 characters, backlit, 1 OLED wake up button, OLED characters are 7x12 with a dot pitch of 0.245 mm; 1.72 mm x 2.94 mm
Communications	USB: Programming, monitoring, debug REMOTE I/O: (10/100 Mbps Ethernet) RS-232: (RJ12, 1200-115.2k baud) ASCII, Modbus RS-485: (Removable terminal included, 1200-115.2k baud) ASCII, Modbus
Max. Number of Ethernet Remote I/O Bases	8
Max. Number of I/O per CPU System	4,320 (CPU Base with 8 remote I/O bases with 15, 32-point I/O modules per base)

#### General Specifications

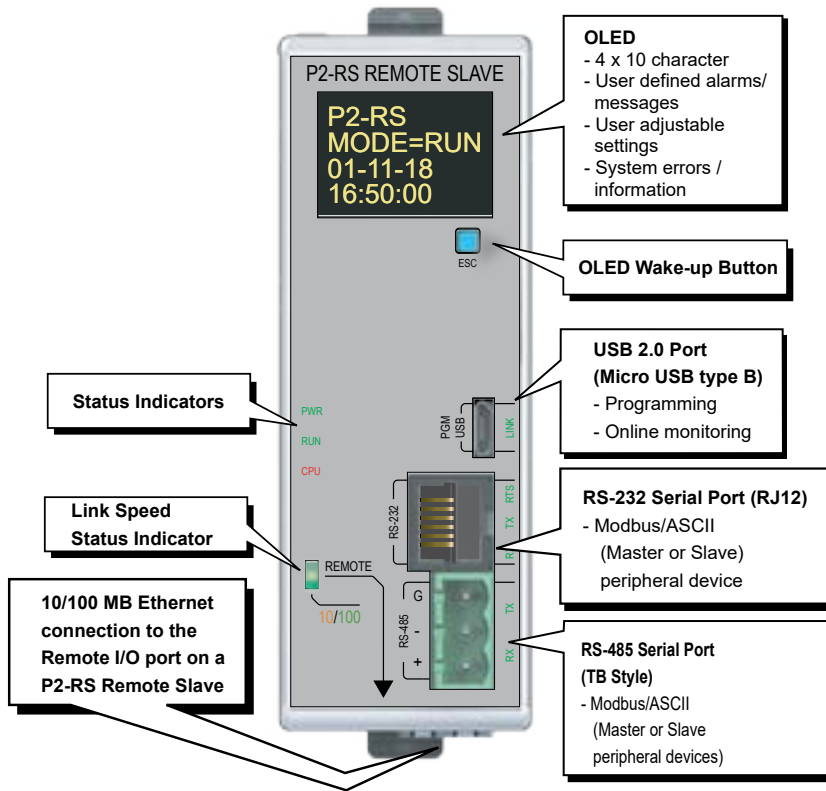
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Heat Dissipation	3.8 W
Overvoltage Category	II
Enclosure Type	Open equipment
Module Location	Controller slot in a remote base in a Productivity@2000 system
Weight	158g (5.6 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 file E139594, Canada & USA CE (EN 61131-2 EMC, EN61010-1 and EN61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.  
NOTE: When using a P2-RS module, you must use current software and firmware version.



\* **NOTE:** The OLED display will time-out after approximately 4 hours without interaction. To wake, press ESC button on the front panel.

## P2-RS Remote Slave Module Front Panel



### Status Indicators

RS Status Indicators	
PWR	Green LED is backlit when power is on
RUN	Green LED is backlit when CPU has valid project file with RS configured.
CPU	Red LED is backlit during power on reset, power down, or watch-dog time-out.

PWR  
RUN  
CPU

### OLED Message Display

The P2-RS incorporates a 4 line x 10 character OLED for system errors and information or for displaying user-defined messages.

OLED characters are 7x12 with a dot pitch of 0.245 mm; 1.72 mm x 2.94 mm.



Wake Up button refreshes timed out display.



**NOTE:** The OLED display will time-out after approximately 4 hours without interaction. To wake, press ESC button on the front panel.

For user-defined messages, the display is configured using the Productivity Suite Programming Software. An LCD Page instruction allows the user to program text into user-defined tags and display the messages based on the ladder execution.

See the Productivity Suite Programming Software Help Files for complete details.

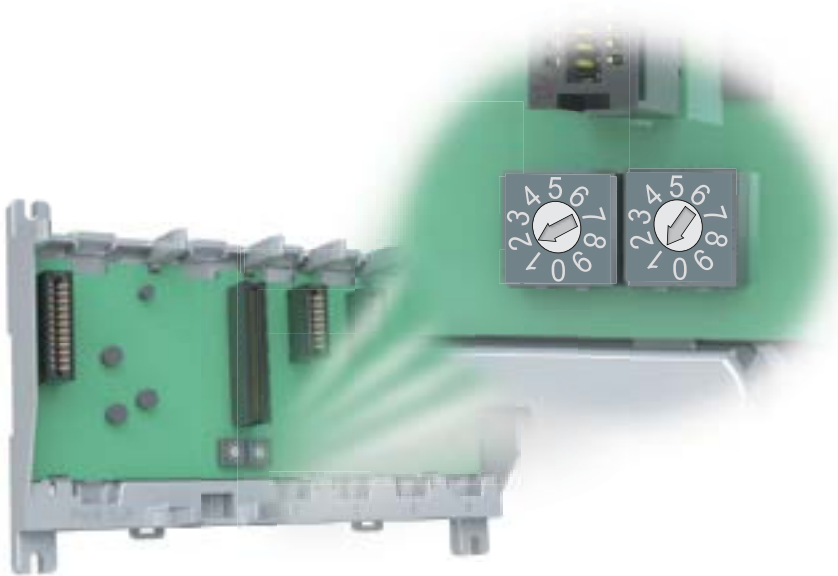
### Setting Remote Slave Address

Each Remote Slave must have a unique address between 1 and 99. The address is set using the two rotary switches located in the base; X10 for setting the tens units and X1 for setting the ones unit.

For example, to set a remote slave address to 21, turn the X10 arrow until it points at number 2 and the X1 arrow until it points at number 1.

#### Important Notes:

- The factory setting of 00 is not a valid address for the Remote Slave.
- Address selection must be set prior to power-up.
- Slave addresses are read only on power-up.
- If there are duplicate P2-RS slave addresses on the same network, a critical error will be displayed on the CPU.

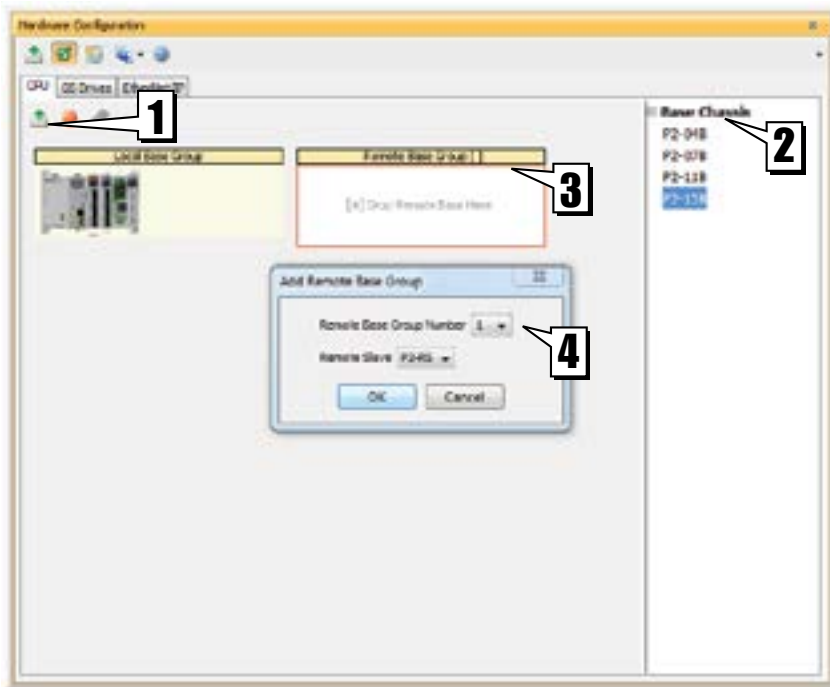


### Setting the Remote Slave Address (continued)

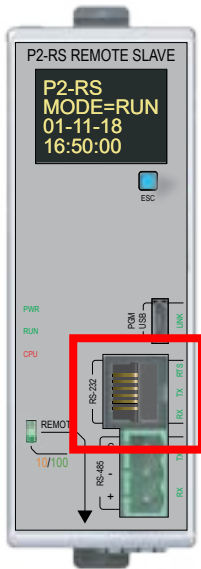
It is also necessary to configure the remote addresses using the ProductivitySuite Programming Software.

For example, if connected online to a Productivity® 2000 system with slaves installed, go to Hardware Configuration and select the Read Configuration (1) icon. The CPU will automatically read the addresses of the remote slaves and add them to the configuration.

If setting up offline, go to Hardware Configuration, select CPU Base Groups (2), and then select Remote Base Group (3). In the Add Remote Base Group (4) window, select the same Remote Base Number as set on the rotary switches.



P2-RS



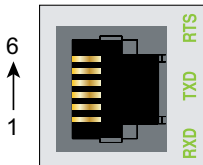
RS-232 Port

RJ-12 style connector used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII full or half duplex communications
- Custom Protocol Incoming and Outgoing communications

RS-232 Specifications

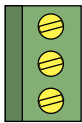
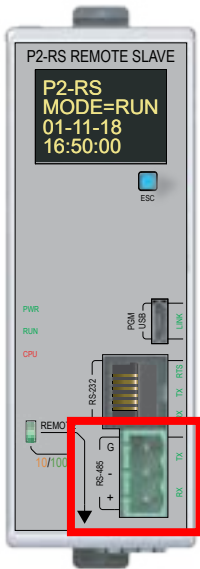
Description	Non-isolated RS-232 DTE port connects the P2-RS as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200 baud
+5V Cable Power Source	210mA maximum at 5V, ±5%. Limited by resettable fuse. Reverse polarity protected
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS	Handshaking output for modem control
GND	Logic ground
Maximum Output Load (TXD/RTS)	3kΩ, 1000pf
Minimum Output Voltage Swing	±5V
Output Short Circuit Protection	±15mA
Port Status LED	Green LED is illuminated when active for TXD, RXD and RTS
Cable Options	D2-DSCBL USB-RS232 with D2-DSCBL FA-CABKIT FA-ISOCAN for converting RS-232 to isolated RS-485



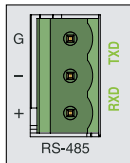
6-pin RJ12 Female Modular Connector

Pin #	Signal	
6	GND	Logic Ground
5	RTS	RS-232 Output
4	TXD	RS-232 Output
3	RXD	RS-232 Input
2	+5V	210mA Maximum
1	GND	Logic Ground

### P2-RS



Removable connector included. Spare connectors available (part no. P2-RS485CON).



Pin #	Signal
G	GND
-	TXD-/RXD-
+	TXD+/RXD+

### RS-485 Port

A 3-pin removable terminal block used for:

- Modbus RTU Master connections
- Modbus RTU Slave connections
- ASCII Incoming and Outgoing communications
- Custom Protocol Incoming and Outgoing communications

### RS-485 Port Specifications

Description	Non-isolated RS-485 port connects the P2-RS as a Modbus/ASCII master or slave to a peripheral device. Includes ESD/EFT protection and automatic echo cancellation when transmitter is active
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, 38400, 57600, and 115200 baud
TXD+/RXD+	RS-485 transceiver high
TXD-/RXD-	RS-485 transceiver low
GND	Logic ground
Input Impedance	19k $\Omega$
Maximum Load	50 transceivers, 19k $\Omega$ each, 60 $\Omega$ termination
Output Short Circuit Protection	$\pm$ 250mA, thermal shut-down protection
Electrostatic Discharge Protection	Contact $\pm$ 4kV, Air $\pm$ 8kV per IEC1000-4-2 Cable is installed for testing
Electrical Fast Transient Protection	$\pm$ 1kV per IEC1000-4-4
Minimum Differential Output Voltage	1.5 V with 60 $\Omega$ load
Fail Safe Inputs	Logic high input state if inputs are unconnected
Maximum Common Mode Voltage	-7.5 V to 12.5 V
Port Status LED	Green LED illuminated when active for TXD and RXD
Cable Options	Go to AutomationDirect.com for RS-485 cables.

### Removable Terminal Block Specifications

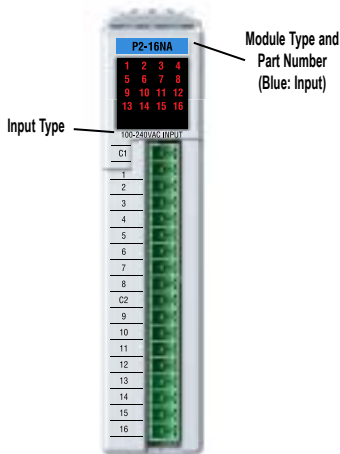
Part Number	P3-RS485CON
Number of Positions	3 screw terminals
Pitch	5mm
Wire Range	28-12 AWG solid conductor 30-12 AWG stranded conductor
Screw Driver Width	1/8 inch (3.175 mm) maximum
Screw Size	M2.5
Screw Torque	4.5 lb-in (0.51 N-m)



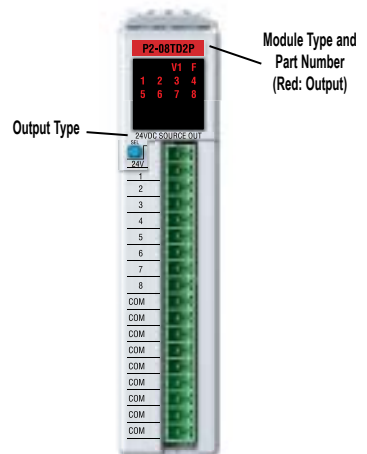
# I/O Modules Overview

A variety of discrete and analog I/O modules are available for use in the P2000 system. Each I/O module is identified as an "Input", "Output", or "Input/Output" module on its front panel using the color coding scheme listed below. See the following pages for discrete I/O module specifications, Chapter 3 for analog I/O module specifications and Chapter 4 for specialty module specifications.

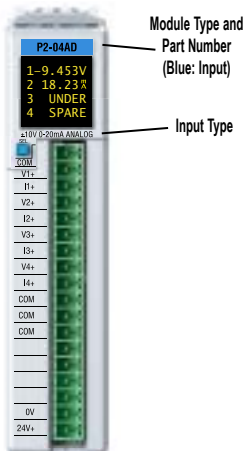
## Discrete Input Modules



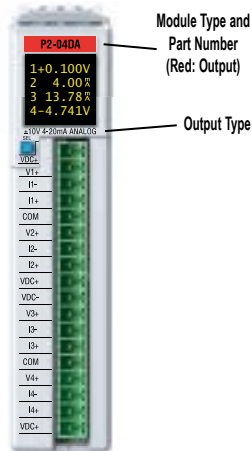
## Discrete Output Modules



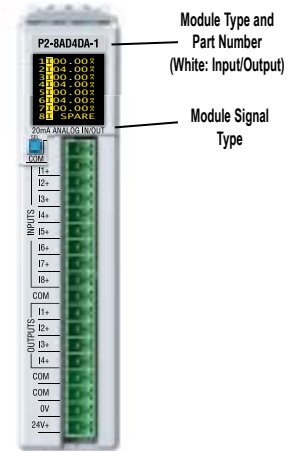
## Analog Input Modules



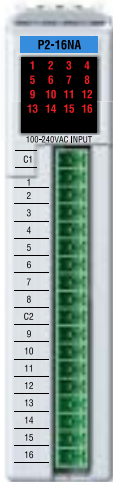
## Analog Output Modules



## Analog Input/Output Modules



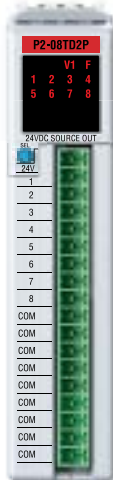
## Discrete I/O Modules



### Discrete Input Modules

#### Productivity2000 Discrete Input Modules

Part Number	Number of Inputs	Description	See Page
P2-08SIM	8	Input Simulator Module	2-43
P2-08ND3-1	8	Sinking/Sourcing 12–24 VDC	2-44
P2-16ND3-1	16	Sinking/Sourcing 12–24 VDC	2-47
P2-16ND-TTL	16	Sinking/Sourcing 3.3–5 VDC	2-50
P2-32ND3-1	32	Sinking/Sourcing 12–24 VDC	2-53
P2-08NE3	8	Sinking/Sourcing 24V AC/DC	2-56
P2-16NE3	16	Sinking/Sourcing AC/DC	2-59
P2-32NE3	32	Sinking/Sourcing 24V AC/DC	2-62
P2-08NAS	8	AC Isolated 100–120 VAC	2-65
P2-16NA	16	AC Isolated 100–240 VAC	2-69



### Discrete Output Modules

#### Productivity2000 Discrete Output Modules

Part Number	Number of Outputs	Description	See Page
P2-08TD1S	8	Isolated Sinking	2-71
P2-08TD2S	8	Isolated Sourcing	2-74
P2-15TD1	15	Sinking	2-77
P2-15TD2	15	Sourcing	2-80
P2-08TD1P	8	Sinking, Protected	2-83
P2-08TD2P	8	Sourcing, Protected	2-86
P2-16TD1P	16	Sinking, Protected	2-89
P2-16TD2P	16	Sourcing, Protected	2-92
P2-16TD-TTL	16	Sourcing, 5VDC	2-95
P2-32TD1P	32	Sinking, Protected	2-98
P2-32TD2P	32	Sourcing, Protected	2-101
P2-08TAS	8	Isolated AC	2-104
P2-16TA	16	AC Output	2-107
P2-06TRS	6	Isolated Relay Output	2-110
P2-08TRS	8	Isolated Relay Output	2-113
P2-16TR	16	Relay Output	2-116

## P2-08SIM Input Simulator Module

The P2-08SIM Input Simulator Module provides 8 toggle switches to simulate input devices.



### Input Specifications

Inputs per Module	8 Internal switches
OFF to ON Response	Max. 20ms
ON to OFF Response	Max. 20ms
Status Indicators	Logic Side (8 points)

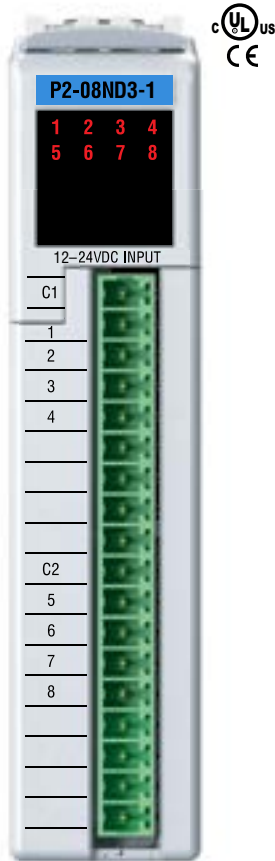
### General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Heat Dissipation	200mW
Enclosure Type	Open equipment
Module Location	Any I/O slot in a Productivity®2000 system.
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada & USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\* Meets EMC and Safety requirements. See the D.O.C. for details.

## P2-08ND3-1 Sinking/Sourcing DC Input

The P2-08ND3-1 Module provides eight 12–24 VDC sinking/sourcing inputs.



Input Specifications	
Inputs per Module	8 (Sinking/Sourcing)
Voltage Rating	12–24 VDC
Input Voltage Range	10.2–26.4 VDC
Peak Voltage	30VDC
Input Current	3.5 mA @ 12VDC 7.5 mA @ 24VDC
Maximum Input Current @ Temp	10mA @ 26.4 VDC
ON Voltage Level*	> 9.5 VDC
OFF Voltage Level	< 7VDC
Maximum ON Current	2mA
Maximum OFF Current	1.6 mA
OFF to ON Response	2ms maximum, 1ms Typical
ON to OFF Response	
Status Indicators	Logic Side (8 points)
Commons	2 (4 points/common) Isolated

Terminal blocks sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-08ND3-1 Sinking/Sourcing DC Input, (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10M $\Omega$ @ 500VDC
Heat Dissipation	325mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL61010-2-201 file E139594, Canada & USA CE (EN61131-2 EMC and EN61010-2-201 Safety*)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

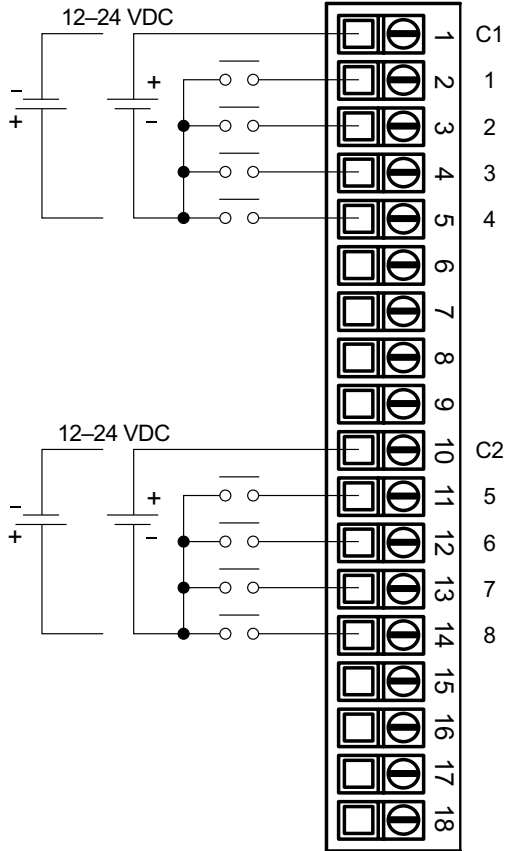
\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

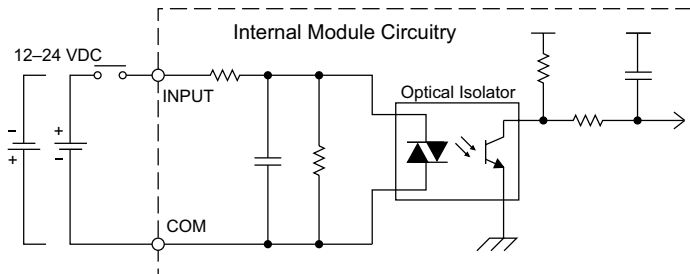
\* Recommended screwdriver TW-SD-MSL-1

# P2-08ND3-1 Sinking/Sourcing DC Input (continued)

## Wiring Diagrams

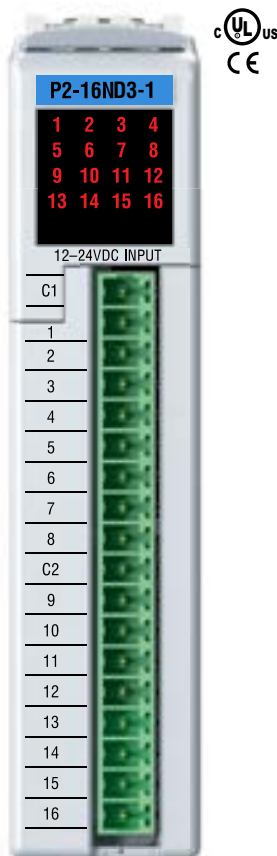


## Equivalent Input Circuit



## P2-16ND3-1 Sinking/Sourcing DC Input

The P2-16ND3-1 Input Module provides sixteen inputs for switches and other devices connected to ground or to supplies ranging from 12–24 VDC.



Input Specifications	
Inputs per Module	16 (Sink/Source)
Voltage Rating	12–24 VDC
Input Voltage Range	10.2–26.4 VDC
Peak Voltage	30VDC
Input Current	3.5 mA @ 12VDC 7.5 mA @ 24VDC
Maximum Input Current @ Temp	10mA @ 26.4 VDC
ON Voltage Level*	> 9.5 VDC
OFF Voltage Level	< 7VDC
Maximum ON Current	2mA
Maximum OFF Current	1.6 mA
OFF to ON Response	2ms Maximum, 1ms Typical
ON to OFF Response	
Status Indicators	Logic Side (16 points)
Commons	2 (8 points/common) Isolated

Terminal blocks sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-16ND3-1 Sinking/Sourcing Input (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500 VDC
Heat Dissipation	400mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIP</b> Link wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL61010-2-201 file E139594, Canada & USA CE (EN61131-2 EMC and EN61010-2-201 Safety*)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

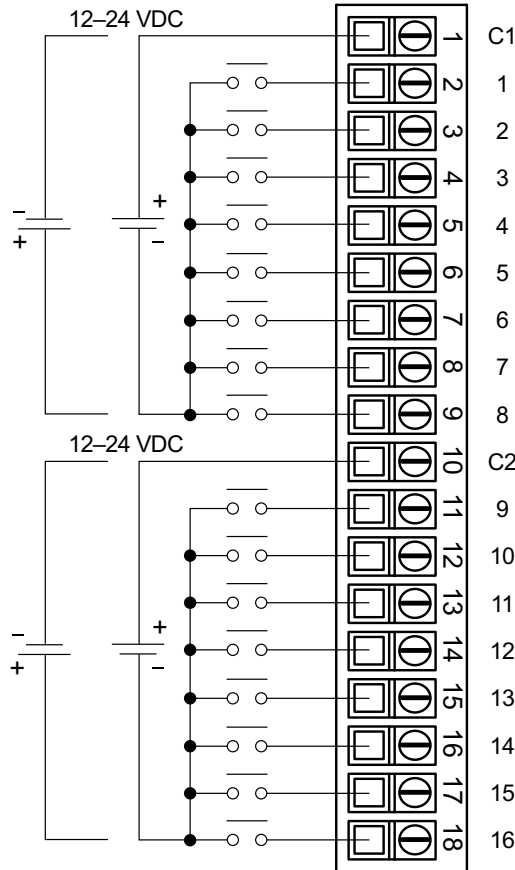
Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

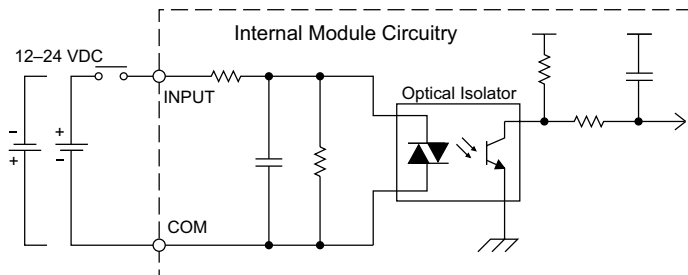


# P2-16ND3-1 Sinking/Sourcing Input (continued)

## Wiring Diagrams

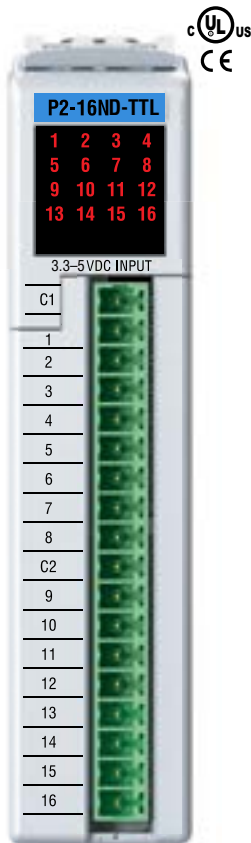


## Equivalent Input Circuit



# P2-16ND-TTL Sinking/Sourcing DC Input

The P2-16ND-TTL Input Module provides sixteen TTL level inputs for use with the Productivity2000 system.



## Input Specifications

Inputs per Module	16 (Sink/Source)
Voltage Rating	3.3–5 VDC
Input Voltage Range	3.3–5 VDC $\pm$ 10%
Input Current	6mA @ 3.3 VDC 8mA @ 5VDC
Maximum Input Current	10mA @ 5.5 VDC
Input Impedance	820 $\Omega$
ON Voltage Level*	> 2.2 VDC
OFF Voltage Level	< 0.8 VDC
Maximum ON Current	1.4 mA
Maximum OFF Current	1mA
OFF to ON Response	Max. 2ms; 1ms Typical
ON to OFF Response	
Status Indicators	Logic Side (16 points)
Commons	2 (8 points/common) Isolated

Terminal blocks sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-16ND-TTL Sinking/Sourcing Input (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	1800VAC applied for 1 second
Insulation Resistance	>10MΩ @ 500 VDC
Heat Dissipation	400mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals**	UL 61010-1 and UL 61010-2-201 File E139594, Canada & USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

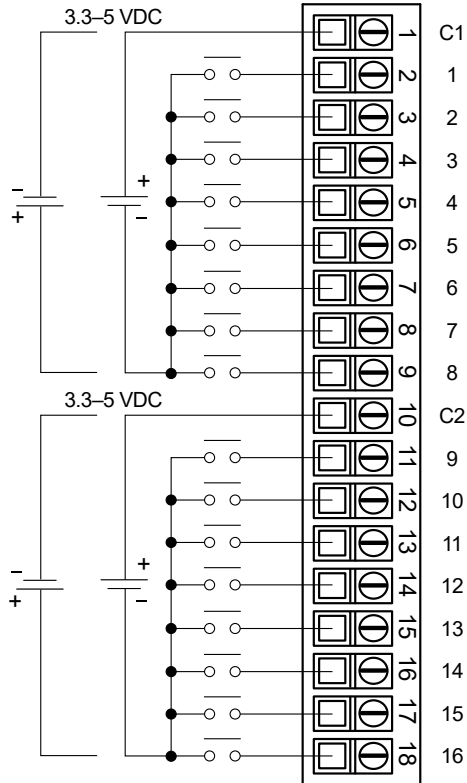
\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	N/A
Screw Size	M2	N/A
Screw Torque	2.5 lb·in (0.28 N·m)	N/A

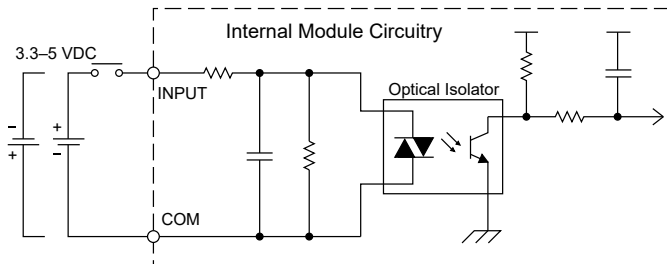
\* Recommended screwdriver TW-SD-MSL-1

# P2-16ND-TTL Sinking/Sourcing Input (continued)

## Wiring Diagrams



### Equivalent Input Circuit



## P2-32ND3-1 24VDC Sinking/Sourcing Input

The P2-32ND3-1 DC Input Module provides thirty-two sinking/sourcing 12–24 VDC inputs for use with the Productivity® 2000 system.



### Input Specifications

Inputs per Module	32 (Sink/Source)
Voltage Rating	12–24 VDC
Input Voltage Range	10.2–26.4 VDC
Peak Voltage	30VDC
Input Current	3.5 mA @ 12VDC 7.5 mA @ 24VDC
Maximum Input Current @ Temp	10mA @ 26.4 VDC
ON Voltage Level*	> 9.5 VDC
OFF Voltage Level	< 7VDC
Maximum ON Current	2mA
Maximum OFF Current	1.6 mA
OFF to ON Response	2ms max., 1ms typical
ON to OFF Response	
Status Indicators	Logic Side (32 points)
Commons	4 Isolated (8 points/common)

### Connector Specifications

Connector Type	IDC style header with latch, Omron XG4A-4034
Number of Pins	40
Pitch	0.1 in. (2.54 mm)



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

No terminal block sold for this module; ZIPLink required. See Chapter 5 for part numbers of ZIPLink cables and connection modules required with this module.



## P2-32ND3-1 24VDC Sinking/Sourcing Input (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1500VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	3W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Weight	104g (3.7 oz)
Agency Approvals** (See note below)	UL 61010-2-201 file E139594, Canada & USA CE (EMC: EN61131-2 and, SAFETY: EN61010-2-201 *)

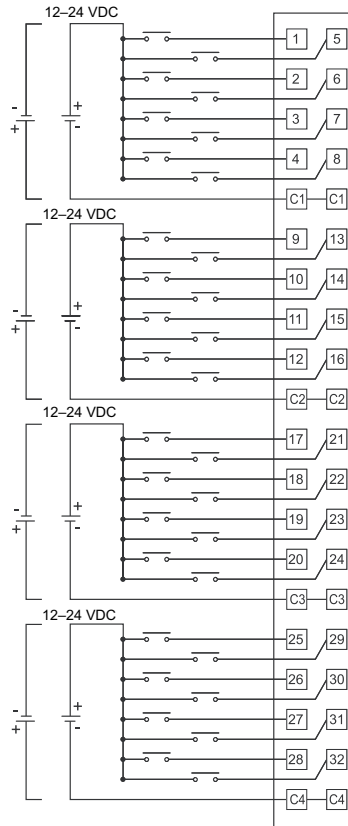
\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

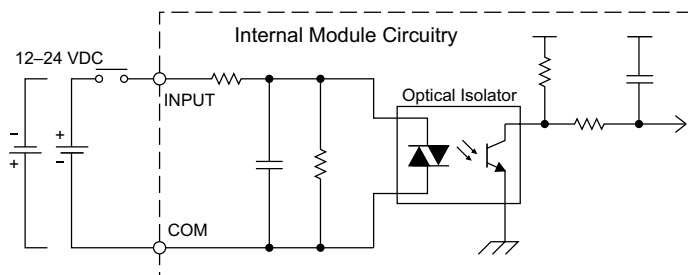
NOTE: P2-32ND3-1 is UL/CUL compliant only when used with ZIPLink module ZL-RTB40 or ZL-RTB40-1.

# P2-32ND3-1 24VDC Sinking/Sourcing Input (continued)

## Wiring Diagrams

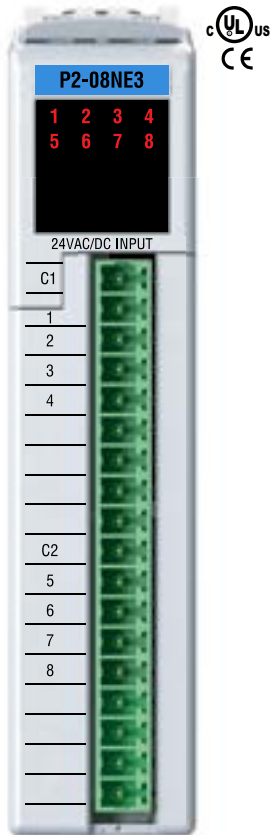


### Equivalent Input Circuit



## P2-08NE3 AC/DC Sinking/Sourcing Input

The P2-08NE3 AC/DC Input Module provides eight 24V AC or DC sinking/sourcing inputs.



Input Specifications	
Inputs per Module	8 (Sinking/Sourcing)
Voltage Range	24V AC/DC
Input Voltage Range	20.4–27.6 VAC/VDC
Peak Voltage	27.6 VAC/ 30VDC
AC Frequency	47–63 Hz
Input Current (Typical)	3.4 mA @ 24 VAC/VDC
Maximum Input Current @ Temp	5.0 mA @ 27.6 VAC/VDC
ON Voltage Level	>12VDC, >9VAC
OFF Voltage Level	<10.5 VDC, <9VAC
Minimum ON Current	2.5 mA
Maximum OFF Current	0.5 mA
OFF to ON Response	DC: 6ms > max AC: 10ms
ON to OFF Response	DC: 10ms > max AC: 20ms
Status Indicators	Logic Side (8 points)
Commons	2 Isolated (4 points/common)

Terminal blocks  
sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1





## P2-08NE3 AC/DC Sinking/Sourcing Input, (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	325mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Removable terminal block (not included). Use <b>ZIPLink</b> wiring system or optional terminal block. See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

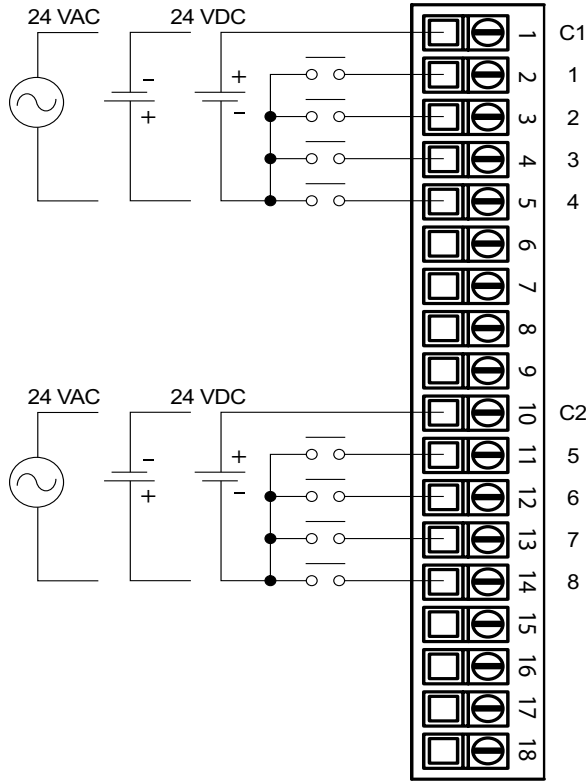
\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

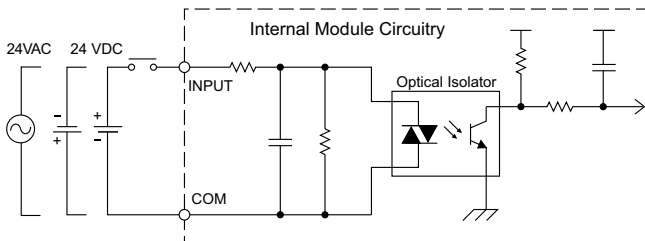
\* Recommended screwdriver TW-SD-MSL-1

# P2-08NE3 AC/DC Sinking/Sourcing Input (continued)

## Wiring Diagrams

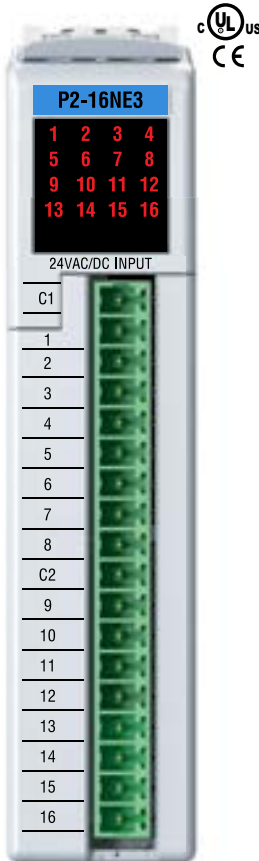


### Equivalent Input Circuit



## P2-16NE3 AC/DC Sinking/Sourcing Input

The P2-16NE3 AC/DC Input Module provides sixteen 24V AC/DC sinking or sourcing inputs with four isolated commons.



Terminal blocks  
sold separately

### Input Specifications

Inputs per Module	16 (Sinking/Sourcing)
Operating Voltage Range	24V AC/DC
Input Voltage Range	20.4–27.6 VAC/VDC
Peak Voltage Range	27.6 VAC/ 30VDC
AC Frequency	47– 63 Hz
Input Current (typical)	3.4 mA @ 24 VAC/VDC
Maximum Input Current	5.0 mA @ 27.6 VAC/VDC
ON Voltage Level	>12VDC, >9VAC
OFF Voltage Level	<10.5VDC, <9VAC
Minimum ON Current	2.5 mA
Maximum OFF Current	0.5 mA
OFF to ON Response	DC: 6ms >max; AC: 10ms
ON to OFF Response	DC:10ms >max; AC: 20ms
Status Indicators	Logic Side (16 Points)
Commons per Module	2 (8 points/common) isolated

### Removable Terminal Block Specifications

Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



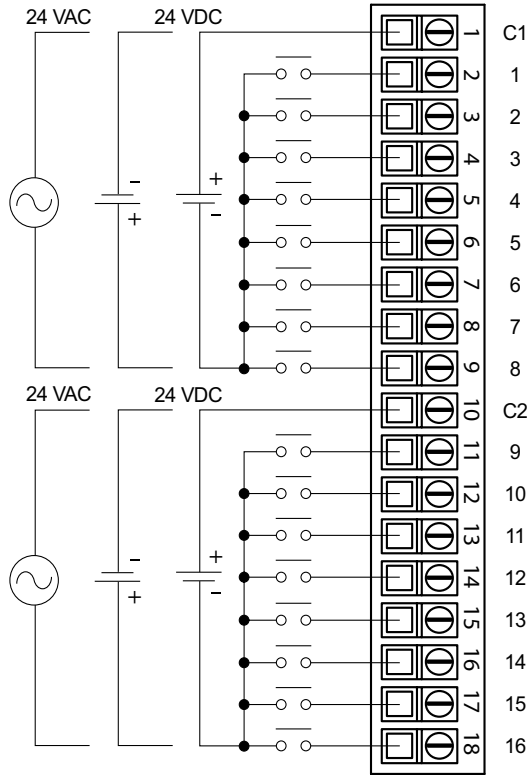
## P2-16NE3 AC/DC Sinking/Sourcing Input (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	400mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use <b>ZIP</b> Link wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL 508 file E139594, Canada & USA CE (EN61131-2*)

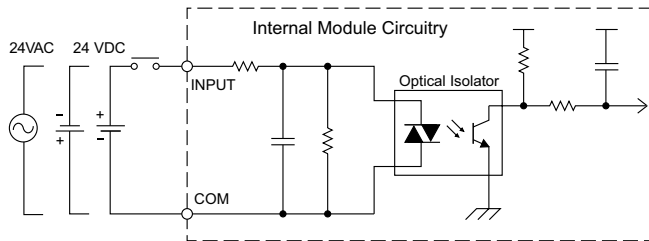
\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

# P2-16NE3 AC/DC Sinking/Sourcing Input (continued)

## Wiring Diagrams



### Equivalent Input Circuit



# P2-32NE3 AC/DC Sinking/Sourcing Input

The P2-32NE3 AC/DC Input Module provides thirty-two 24V AC or DC sinking/sourcing inputs.



Input Specifications	
Inputs per Module	32 (Sinking/Sourcing)
Operating Voltage Range (Tolerance)	24 VAC/VDC
Input Voltage Range	20.4–27.6 VAC/VDC
Peak Voltage Range	27.6 VAC/VDC
AC Frequency	47–63 Hz
Input Current	Typ 3.4 mA @ 24 VAC/VDC
Maximum Input Current @ Temp	5.0mA @ 27.6 VAC/VDC
ON Voltage Level	>12 VDC, >9 VAC
OFF Voltage Level	<10.5 VDC, <9 VAC
Minimum ON Current	2.5 mA
Maximum OFF Current	0.5 mA
OFF to ON Response	DC: 10ms > max AC: 20ms
ON to OFF Response	DC: 20ms > max AC: 40ms
Status Indicators	Logic Side (32 Points)
Commons per Module	4 Isolated (8 points/common)

Connector Specifications	
Connector Type	IDC style header with latch, Omron XG4A-4034
Number of Pins	40
Pitch	0.1 in. (2.54 mm)



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

No terminal block sold for this module; ZIPLink required. See Chapter 5 for part numbers of ZIPLink cables and connection modules required with this module.



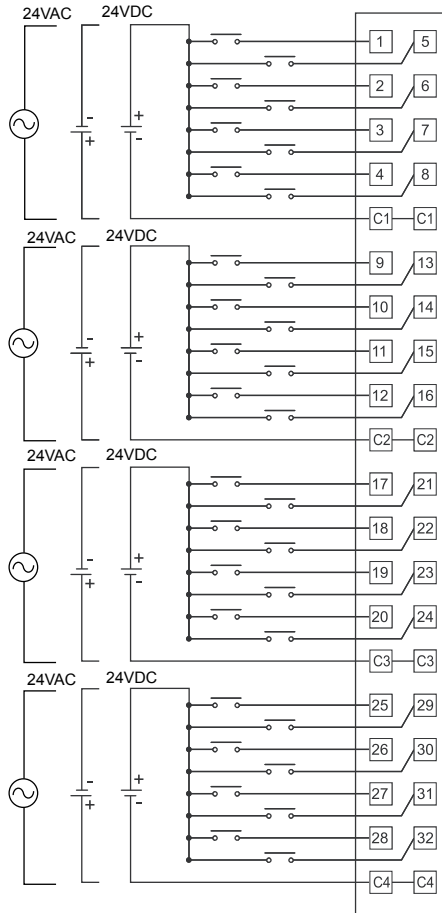
## P2-32NE3 AC/DC Sinking/Sourcing Input (continued)

General Specifications	
Surrounding Air Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1500VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	3W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system. See "Wiring Options" in Chapter 5.
Weight	104g (3.7 oz)
Agency Approvals	UL 508 file E139594, Canada & USA CE (EN61131-2*)

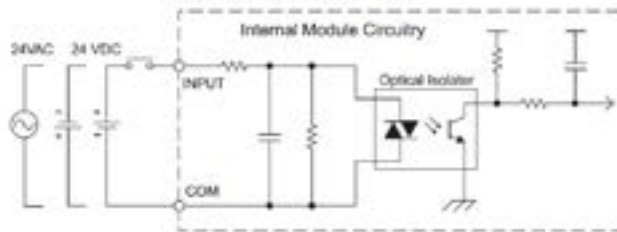
\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

# P2-32NE3 AC/DC Sinking/Sourcing Input (continued)

## Wiring Diagrams



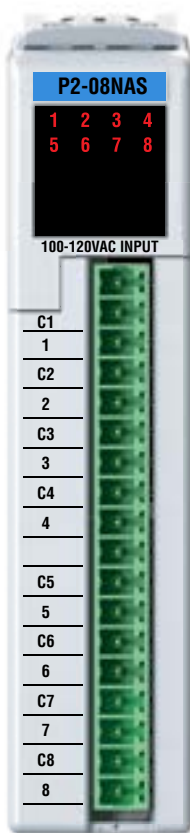
### Equivalent Input Circuit





# P2-08NAS Isolated AC Input

The P2-08NAS AC Isolated Input Module provides eight 100–120 VAC isolated inputs for use with the Productivity® 2000 system.



Terminal blocks sold separately

Input Specifications	
Inputs per Module	8
Rated Voltage	100–120 VAC
Operating Voltage Range	80–144 VAC
AC Frequency	47–63 Hz
Input Current	8.5 mA @ 100VAC (50Hz) 10mA @ 100VAC (60Hz)
Maximum Input Current	13mA @ 60°C (144VAC)
Input Impedance	12kΩ (50Hz), 12kΩ (60Hz)
ON Voltage Level	> 70VAC
OFF Voltage Level	< 20VAC
Minimum ON Current	5mA
Maximum OFF Current	2mA
OFF to ON Response	< 10ms
ON to OFF Response	< 25ms
Status Indicators	Logic side (8 points)
Commons	8 Isolated (1 point/common)

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-08NAS Isolated AC Input, (continued)

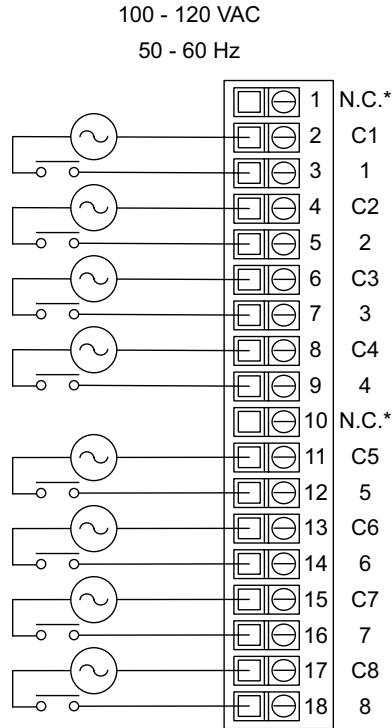
General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	600mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIP</b> Link wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	85g (2.9 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EMC: EN61131-2*, SAFETY: EN61010-2-201)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

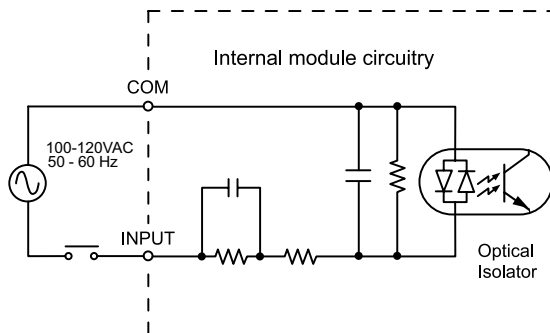
\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

# P2-08NAS Isolated AC Input, (continued)

## Wiring Diagrams

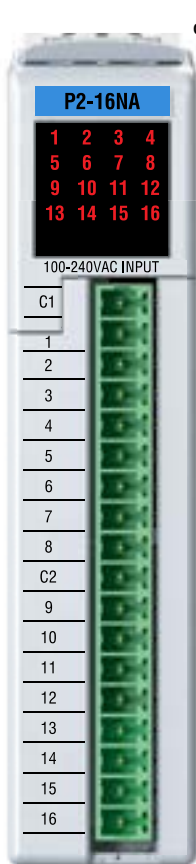


\*N.C. = No Connection



## P2-16NA AC Input

The P2-16NA AC Input Module provides eight 100–240 VAC isolated inputs.



Input Specifications		
Inputs per Module	16	
Operating Voltage Range (Tolerance)	CE	100–240 VAC (±20%)
	UL	100–240 VAC (±20%)
AC Frequency	47–63 Hz	
Input Current (Typical)	8.5 mA @ 100VAC (50Hz) 10mA @ 100VAC (60Hz) 17mA @ 240VAC (50Hz) 20mA @ 240VAC (60Hz)	
Maximum Input Current @ Temp	26mA @ 60°C (288VAC)	
Input Impedance	15kΩ (50Hz), 12kΩ (60Hz)	
ON Voltage Level	>70VAC	
OFF Voltage Level	<20VAC	
Minimum ON Current	5mA	
Maximum OFF Current	2mA	
OFF to ON Response	<10ms	
ON to OFF Response	<25ms	
Status Indicators	Logic side (16 points)	
Commons	2 Isolated for 120V 2 Non-Isolated for 240V (external jumper required)	

Terminal blocks sold separately



We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5.

If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

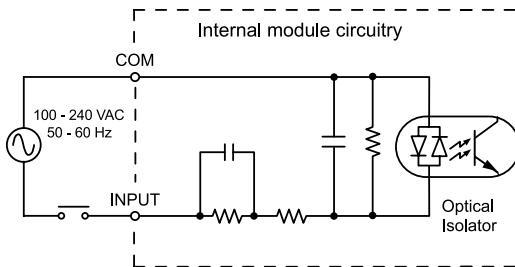
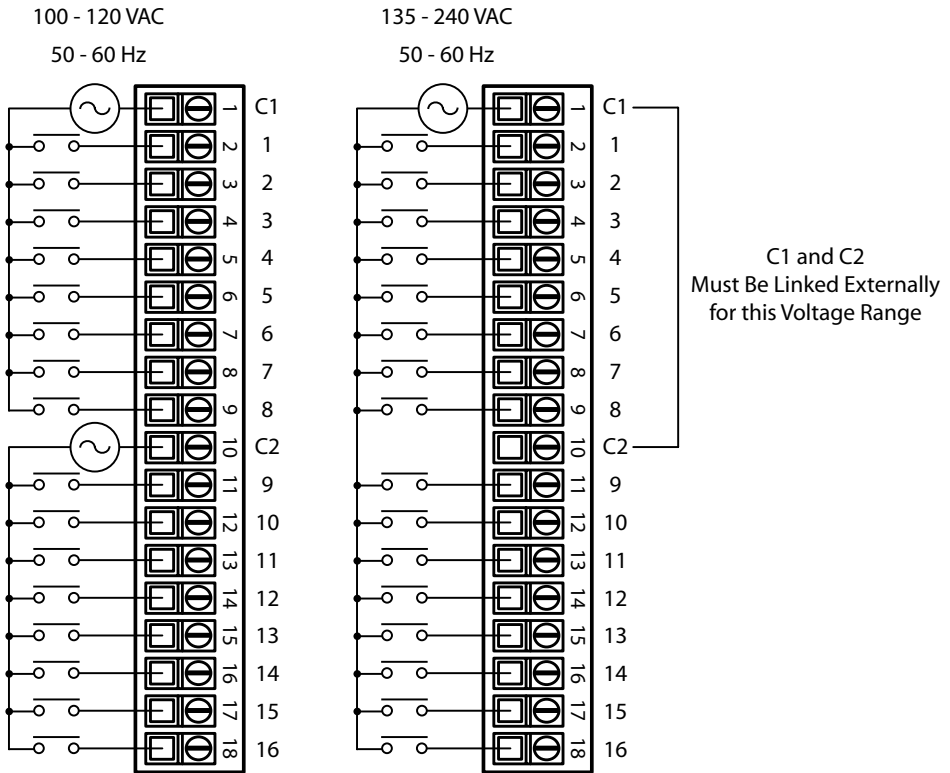
## P2-16NA AC Input (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	600mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use <b>ZIP</b> Link wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

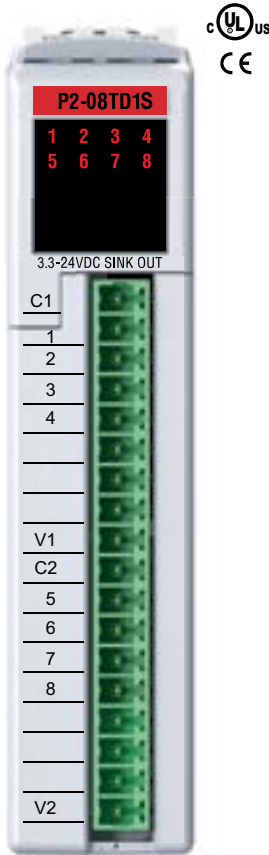
# P2-16NA AC Input (continued)

## Wiring Diagrams



# P2-08TD1S Isolated Sinking DC Output

The P2-08TD1S DC Output Module provides eight outputs, isolated four per common, that sink up to 2A per output from loads powered from 3.3–24 VDC supplies.



Terminal blocks sold separately

Output Specifications	
Outputs per Module	8 sinking
Output Type	N-channel MOSFET, open drain
Rated Voltage	3.3–24 VDC
Operating Voltage Range	2.8–30 VDC
Maximum Output Current	2A per point
Minimum Load Current	0.4 mA
Maximum Leakage Current	0.3 mA @ 30VDC
On Voltage Drop	0.2 VDC @ 2A
Maximum Inrush Current	4A for 40ms, 6A for 10ms
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Status Indicators	Logic Side (8 points)
Commons	2 Isolated (4 points / common)
Fuses	None
External Power Supply Required	12–24 VDC (-15% / +20%) @ 12mA

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-08TD1S Isolated Sinking DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1800mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18 Position, removable terminal block
Weight	98g (3.5 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EMC: EN61131-2*, SAFETY: EN61010-2-201)

*\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.*

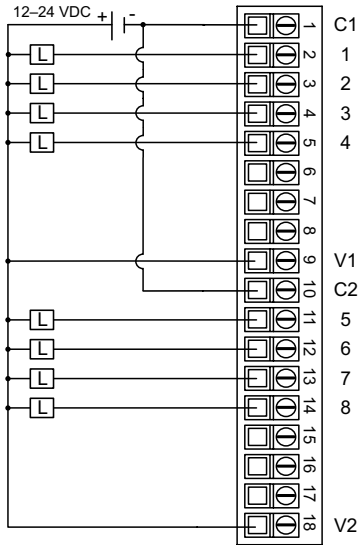
*\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.*



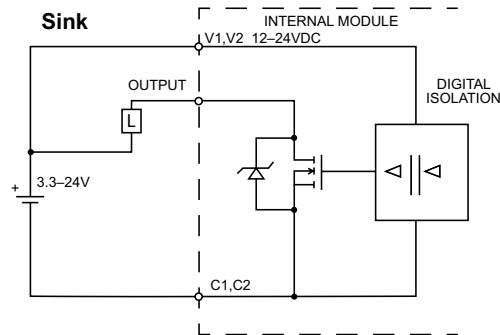
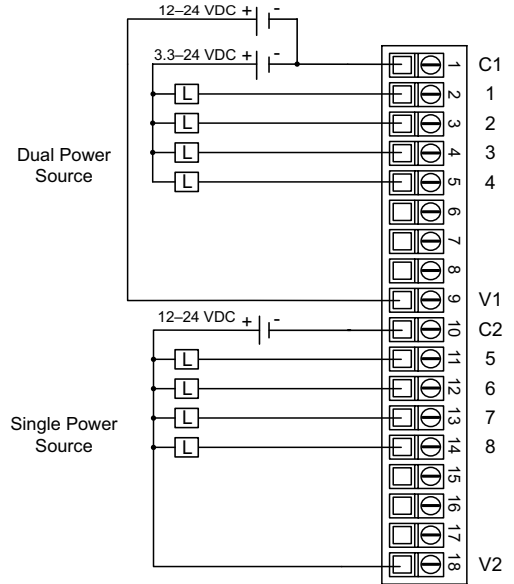
# P2-08TD1S Isolated Sinking DC Output (continued)

## Wiring Diagrams

Single Power Source

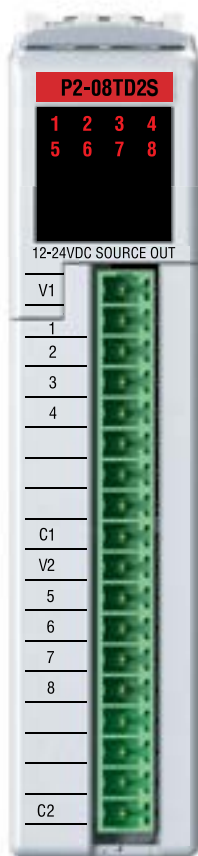


Single or Dual Power Source



# P2-08TD2S Isolated Sourcing DC Output

The P2-08TD2S DC Output Module provides eight outputs, isolated four per common, that source up to 2A per output from 12–24 VDC supplies.



Output Specifications	
Outputs per Module	8 sourcing
Output Type	P-channel MOSFET, open source
Rated Voltage	12–24 VDC
Operating Voltage Range	10.2–30 VDC
Maximum Output Current	2A per point
Minimum Load Current	0.4 mA
Maximum Leakage Current	0.3 mA @ 30VDC
On Voltage Drop	0.2 VDC @ 2A
Maximum Inrush Current	4A for 40ms, 6A for 10ms
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Status Indicators	Logic Side (8 points)
Commons	2 Isolated (4 points / common)
Fuses	None
External Power Supply Required	12–24 VDC (-15% / +20%) @ 12mA

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks  
sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-08TD2S Isolated Sourcing DC Output (continued)

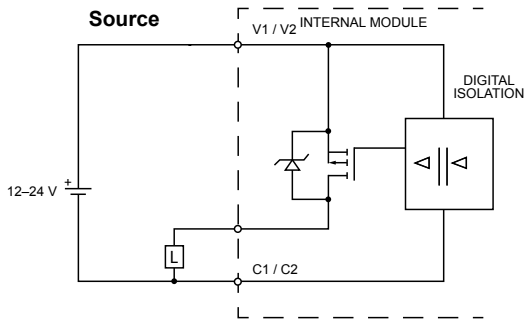
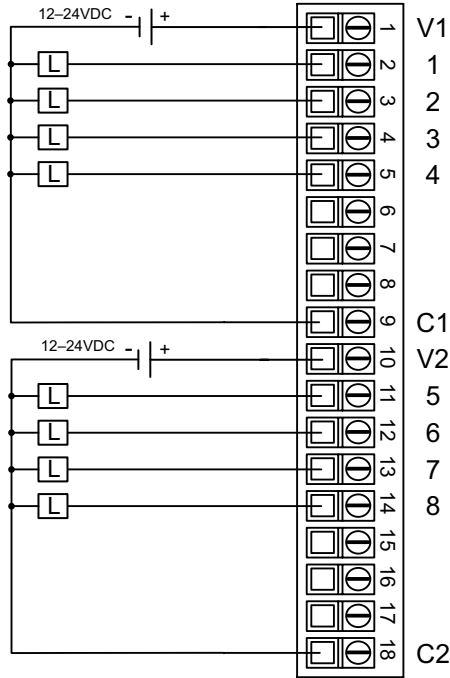
General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	2600mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	98g (3.5 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EMC: EN61131-2*, SAFETY: EN61010-2-201)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

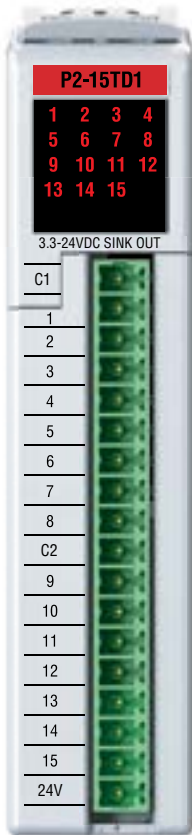
# P2-08TD2S Isolated Sourcing Output (continued)

## Wiring Diagrams



## P2-15TD1 Sinking DC Output

The P2-15TD1 DC Output Module provides fifteen outputs that sink up to 1A per output from loads powered from 3.3–24 VDC supplies for use with the Productivity® 2000 system.



Output Specifications	
Outputs per Module	15 sinking
Output Type	N-channel MOSFET, open drain
Rated Voltage	3.3–24 VDC
Operating Voltage Range	2.8–30 VDC
Maximum Output Current	1A per point / 8A per common
Minimum Load Current	1mA
Maximum Leakage Current	0.3 mA @ 30VDC
On Voltage Drop	0.18 VDC @ 1A
Maximum Inrush Current	4A for 40ms, 6A for 10ms
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Status Indicators	Logic Side (15 points)
Commons	2 (non-isolated)
Fuses	None
External Power Supply Required	12–24 VDC (-15% / +20%) @ 22mA

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N·m)	N/A

Terminal blocks sold separately

\* Recommended screwdriver TW-SD-MSL-1



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-15TD1 Sinking DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1800mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	100g (3.5 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EMC: EN61131-2*, SAFETY: EN61010-2-201)

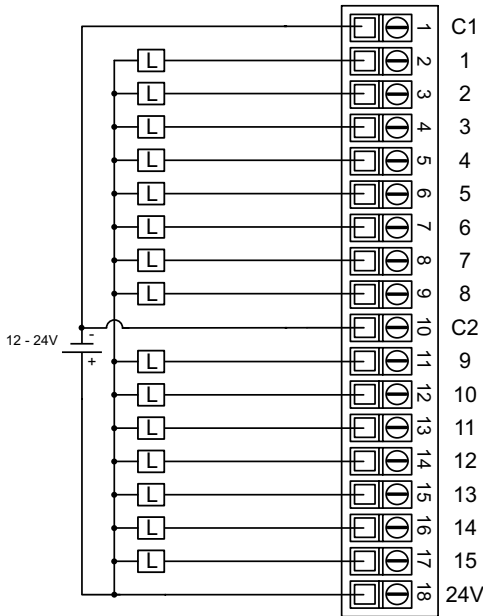
\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

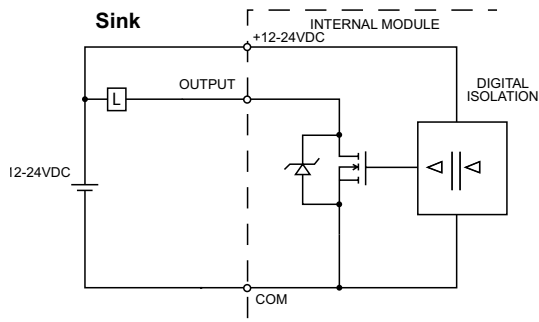
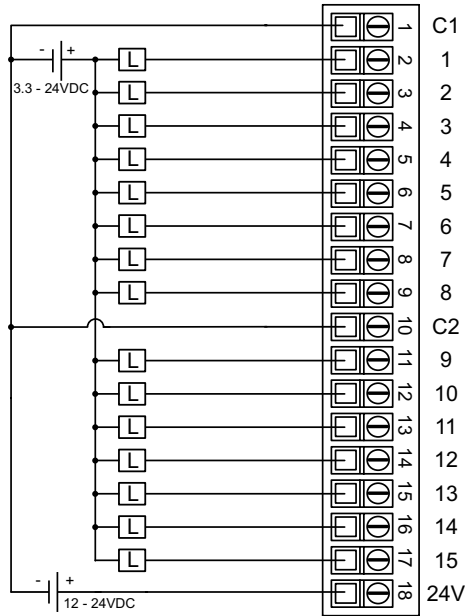
# P2-15TD1 Sinking DC Output (continued)

## Wiring Diagrams

Single Power Source

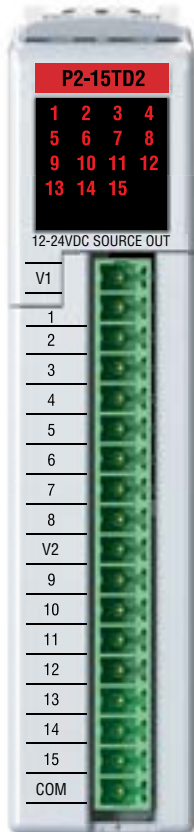


Dual Power Source



## P2-15TD2 Sourcing DC Output

The P2-15TD2 DC Output Module provides fifteen 12–24 VDC outputs that source up to 1A per output from supplies for use with the Productivity® 2000 system.



Output Specifications	
Outputs per Module	15 sourcing
Output Type	P-channel MOSFET, open source
Rated Voltage	12–24 VDC
Operating Voltage Range	10.2–28.8 VDC
Maximum Output Current	1A per point / 8A per common
Minimum Load Current	1mA
Maximum Leakage Current	0.3 mA @ 30VDC
On Voltage Drop	0.18 VDC @ 1A
Maximum Inrush Current	4A for 40ms, 6A for 10ms
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Status Indicators	Logic Side (15 points)
Commons	1
Fuses	None
External Power Supply Required	12–24 VDC (-15% / +20%) @ 22mA

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.





## P2-15TD2 Sourcing DC Output (continued)

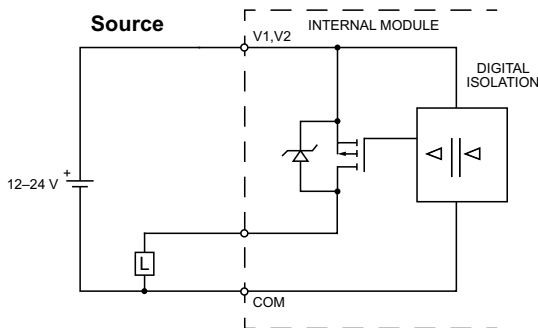
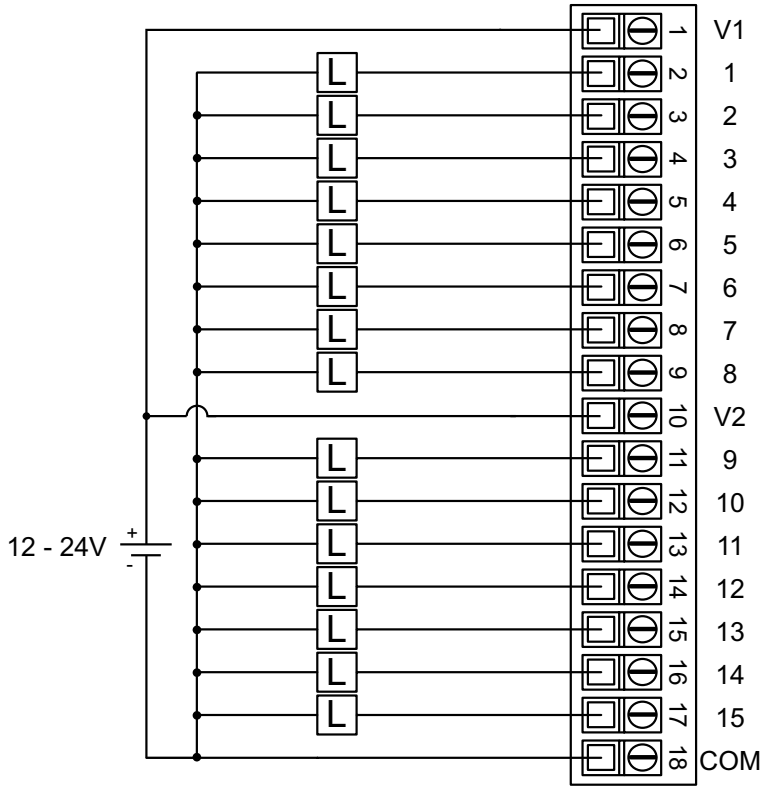
General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	2600mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position, removable terminal block
Weight	100g (3.5 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EN61131-2*)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

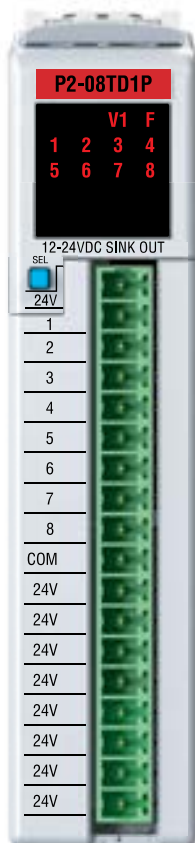
# P2-15TD2 Sourcing DC Output (continued)

## Wiring Diagrams



## P2-08TD1P Sinking Protected DC Output

The P2-08TD1P Output Module provides eight 12–24 VDC sinking outputs with short-circuit and overload protection.



### Output Specifications

Outputs per Module	8 sinking, protected
Rated Voltage	12–24 VDC
Operating Voltage Range (Tolerance)	10.2–26.4 VDC
Maximum Output Current	0.25 A continuous
On Voltage Drop	0.5 VDC
Maximum Inrush Current	Self-limited
OFF to ON Response	0.5 ms
ON to OFF Response	0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max. >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	135µA 10.2–26.4 VDC
Over-temperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (8 points)
External 24V Error Indicator	Logic Side (1 points)
Fault Condition Indicator	Logic Side (8 points)
Commons	1
Fuses	None
External DC Power Required	24VDC @ 30mA

### Removable Terminal Block Specifications

Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N·m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1



## P2-08TD1P Sinking Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1.8 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any Productivity®2000 system.
Field Wiring	Use <b>ZIP</b> Link wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	97.6 g (3.4 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

\* Meets EMC and Safety requirements.

LED Status		
Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	"V1" LED is ON	Apply external 24VDC
Open Load (Note 1)	"F" LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power

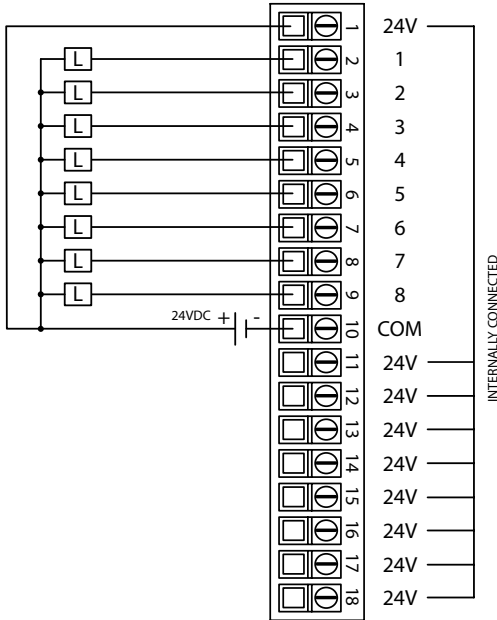
Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

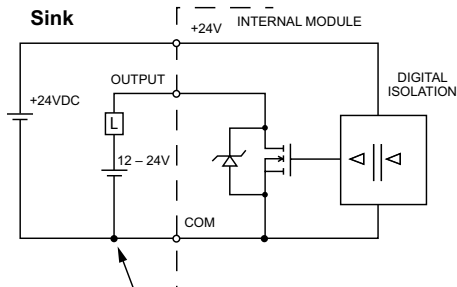
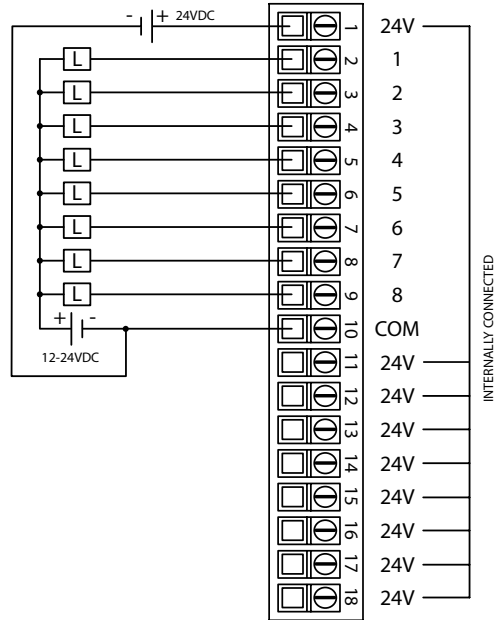
# P2-08TD1P Sinking Protected DC Output (continued)

## Wiring Diagrams

SINGLE POWER SOURCE



DUAL POWER SOURCE

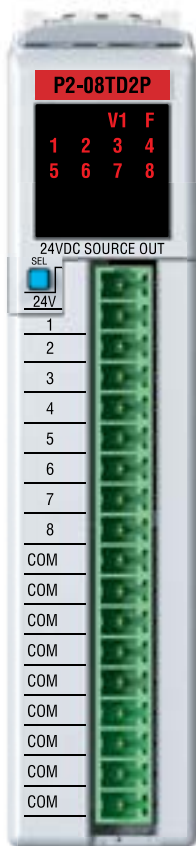


COMs of both Power Supplies are connected.

**NOTE:** If two separate power supplies are used to supply module control logic and output, grounds from both power supplies must be connected. For testing outputs, see note in P2-USER-M manual under P2-08TD1P wiring.

# P2-08TD2P Sourcing Protected DC Output

The P2-08TD2P DC Output Module provides eight 24VDC sourcing outputs with short circuit and overload protection.



## Output Specifications

Outputs per Module	8 sourcing, protected
Voltage Rating	24VDC
Operating Voltage Range	21.6–26.4 VDC
Maximum Output Current	0.25 A
On Voltage Drop	0.7 VDC
Maximum Inrush Current	Self-limited
OFF to ON Response	0.5 ms
ON to OFF Response	0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max. >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	160µA @ 21.6–26.4 VDC
Over Temperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (8 points)
External 24V Error Indicator	Logic Side (1 points)
Fault Condition Indicator	Logic Side (8 points)
Commons	9 (non-isolated)
Fuses	None
External DC Power Required	24VDC @ 30mA

## LED Status

Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	V1 LED is ON	Apply external 24VDC
Open Load (Note 1)	F LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power

Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

Terminal blocks  
sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-08TD2P Sourcing Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1.8 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	97.4 g (3.4 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2)*

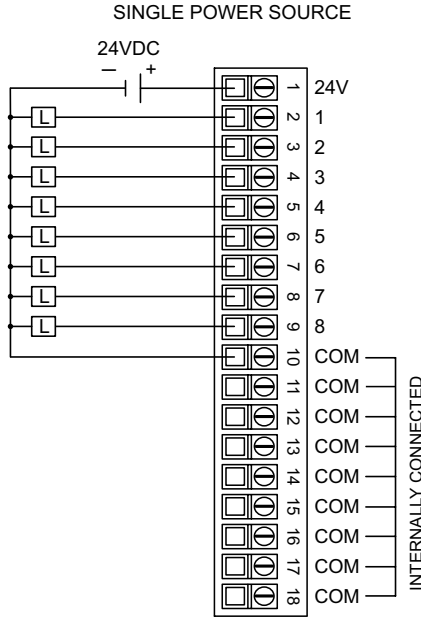
\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

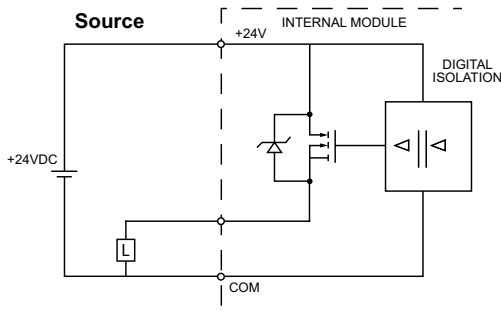
\* Recommended screwdriver TW-SD-MSL-1

# P2-08TD2P Sourcing Protected Output (continued)

## Wiring Diagrams



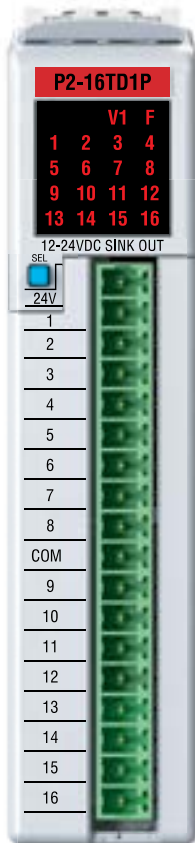
**NOTE:** For testing purposes, to check the output point without a load attached, use DMM in current mode with a 1K $\Omega$  resistor in series with DMM lead; or use DMM in voltage mode with 1K $\Omega$  in parallel with DMM lead.





# P2-16TD1P Sinking Protected DC Output

The P2-16TD1P DC Output Module provides sixteen 12–24 VDC sinking outputs with short-circuit and overload protection.



Output Specifications	
Outputs per Module	16 sinking, protected
Voltage Rating	12–24 VDC
Operating Voltage Range	10.2–26.4 VDC
Maximum Output Current	0.25 A continuous
On Voltage Drop	0.5 VDC
Maximum Inrush Current	Self-limited
OFF to ON Response	0.5 ms
ON to OFF Response	0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max. >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	135µA @ 10.2–26.4 VDC
Over Temperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (16 points)
External 24V Error Indicator	Logic Side (1 points)
Fault Condition Indicator	Logic Side (16 points)
Commons	1
Fuses	None
External DC Power Required	24VDC @ 55mA

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-16TD1P Sinking Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1.8 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	97.4 g (3.4 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

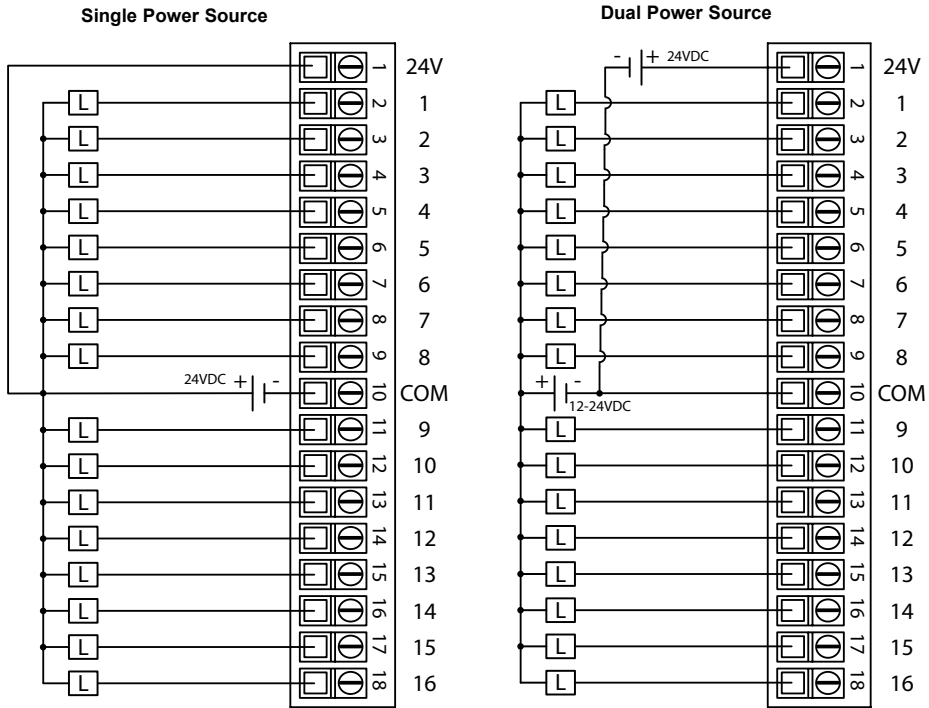
LED Status		
Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	"V1" LED is ON	Apply external 24VDC
Open Load (Note 1)	"F" LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power

Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

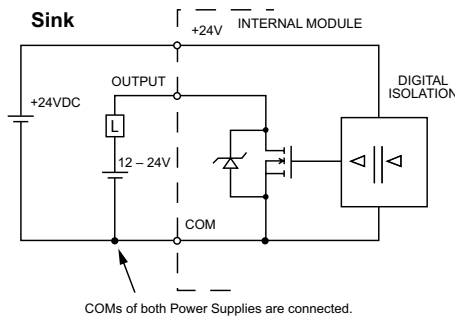
Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

# P2-16TD1P Sinking Protected DC Output (continued)

## Wiring Diagrams



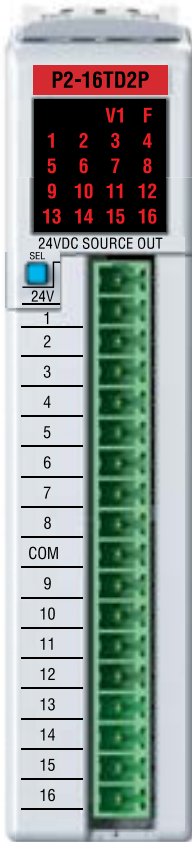
**NOTE:** For testing purposes, to check the output point without a load attached, use DMM in current mode with a 1kΩ resistor in series with DMM lead; or use DMM in voltage mode with 1kΩ in parallel with DMM lead.



**NOTE:** If two separate power supplies are used to supply module control logic and output, common from both power supplies must be connected. For testing outputs, see note in P2-USER-M manual under P2-16TD1P wiring.

# P2-16TD2P Sourcing Protected DC Output

The P2-16TD2P DC Output Module provides sixteen 24VDC sourcing outputs with short-circuit and overload protection.



Output Specifications	
Outputs per Module	16 sourcing
Voltage Rating	24VDC
Operating Voltage Range	21.6–26.4 VDC
Maximum Output Current	0.25 A continuous
On Voltage Drop	0.7 VDC
Maximum Inrush Current	Self-limited
OFF to ON Response	0.5 ms
ON to OFF Response	0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max. >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	160µA @ 21.6–26.4 VDC
Overtemperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (16 points)
External 24V Error Indicator	Logic Side (1 point)
Fault Condition Indicator	Logic Side (16 points)
Commons	1
Fuses	None
External DC Power Required	24VDC @ 60mA

LED Status		
Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	V1 LED is ON	Apply external 24VDC
Open Load (Note 1)	F LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power

Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

Terminal blocks sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-16TD2P Sourcing Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	2.6 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	97.0 g (3.4 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

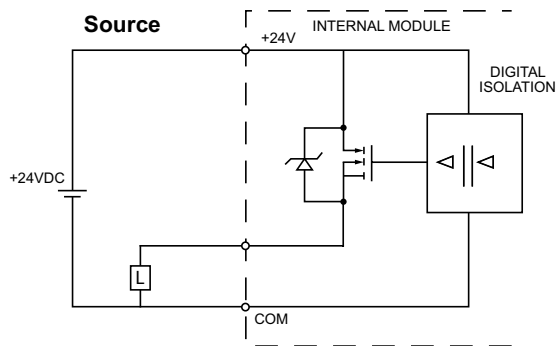
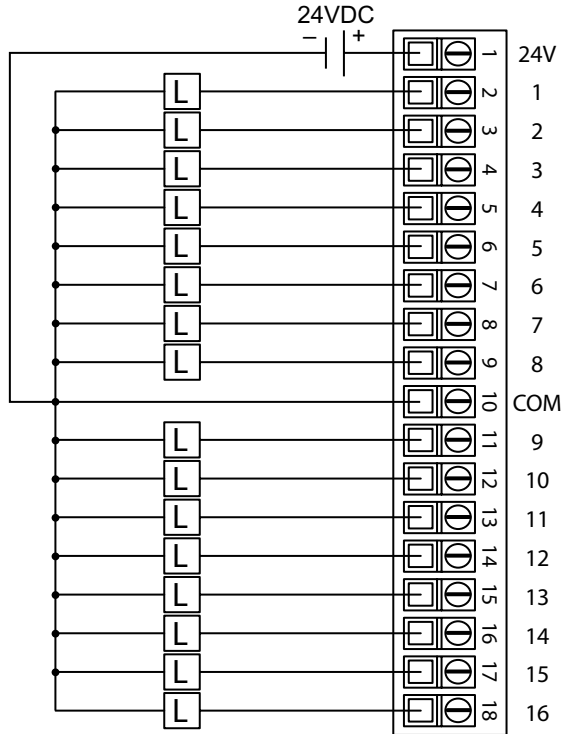
\* Meets EMC and Safety requirements. See the Declaration of Conformity for details.

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N·m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

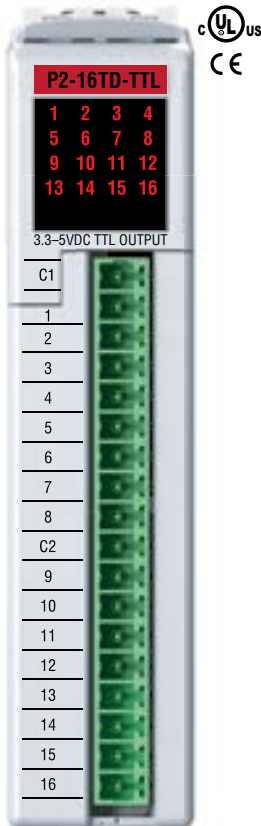
# P2-16TD2P Sourcing Protected DC Output (continued)

## Wiring Diagrams



## P2-16TD-TTL Sourcing DC Output

The P2-16TD-TTL Output Module provides sixteen TTL-level sourcing outputs for use with Productivity2000 system.



### Output Specifications

Outputs per Module	16 sourcing
Output Type	TTL Driver
Voltage Rating	5V
Operating Voltage Range	5V $\pm$ 2%
Minimum Output Current	0 $\mu$ A
Maximum Output Current	20mA per point or 100mA total
On Voltage Drop	0.2 V @ Max Load
Maximum Leakage Current	$\pm$ 1 $\mu$ A
OFF to ON Response	$\leq$ 0.5 ms
ON to OFF Response	$\leq$ 0.5 ms
Status Indicators	Logic Side (16 points)
Commons	2 isolated (8 point/common)
Fuses	None
External Power Supply Required	None

Terminal blocks  
sold separately



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5.  
If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-16TD-TTL Sourcing Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	1750VAC applied for 5 second 420VDC applied for 1 minute
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1420mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See Wiring Solutions.
Connector Type (Sold separately)	18 Position Removable Terminal Block
Weight	104g (3.66 oz)
Agency Approvals**	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

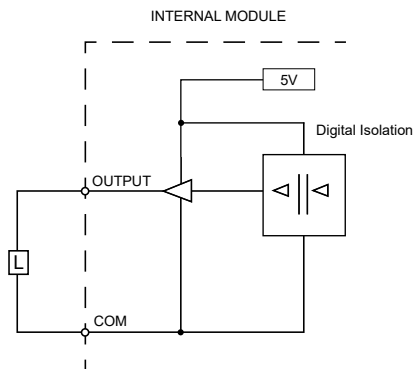
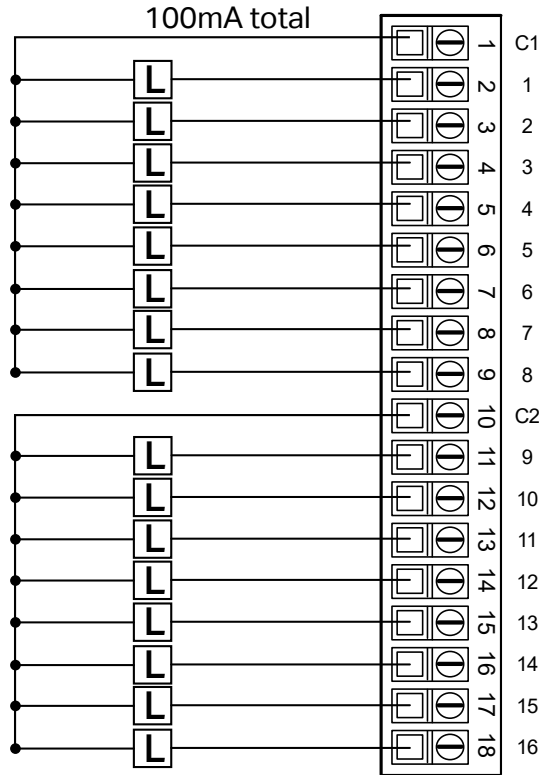
Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	N/A
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N·m)	N/A

\* Recommended screwdriver P/N TW-SD-MSL-1.



# P2-16TD-TTL Sourcing Protected DC Output (continued)

## Wiring Diagrams



## P2-32TD1P Sinking Protected DC Output

The P2-32TD1P DC Output Module provides thirty-two 12–24 VDC sinking outputs with short circuit and overload protection for use with Productivity® 2000 system.



Output Specifications	
Outputs per Module	32 sinking, protected
Voltage Rating	12–24 VDC
Operating Voltage Range	10.2–28.8 VDC
Maximum Output Current	0.2 A/pt, 1.6 A per Common1 @ 60°C, 0.5 A/pt, 2A per Common1 @ 40°C
Maximum Inrush Current	Self-limited
On Voltage Drop	0.5 VDC @ 0.1 A
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max., >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	135µA @ 10.2–26.4 VDC
Over Temperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (16 points x 2)
External 24V Error Indicator	Logic Side (1 point)
Fault Condition Indicator	Logic Side (16 points x 2)
Commons	4 (non-isolated)
Recommended External Fuse	None
External DC Power Required	24VDC (-15% / +20%) @ 80mA

Note (1) Connect all Commons: C1, C2, C3, C4, V1, V2, V3, and V4.

Connector Specifications	
Connector Type	IDC style header with latch, Omron XG4A-4034
Number of Pins	40 point
Pitch	0.1 in (2.54 mm)



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5.



## P2-32TD1P Sinking Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	4.0 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (Sold separately). See "Wiring Options" in Chapter 5.
Weight	105g (3.7 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EN61131-2*, Safety EN61010-2-201)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

LED Status		
Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	V1 LED is ON	Apply external 24 VDC
Open Load (Note 1)	"F" LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power
LED Page Shifting		
The "A" LED is ON when the LED states correspond to outputs/faults 1–16. The "B" LED is ON for outputs / faults 17–32.		

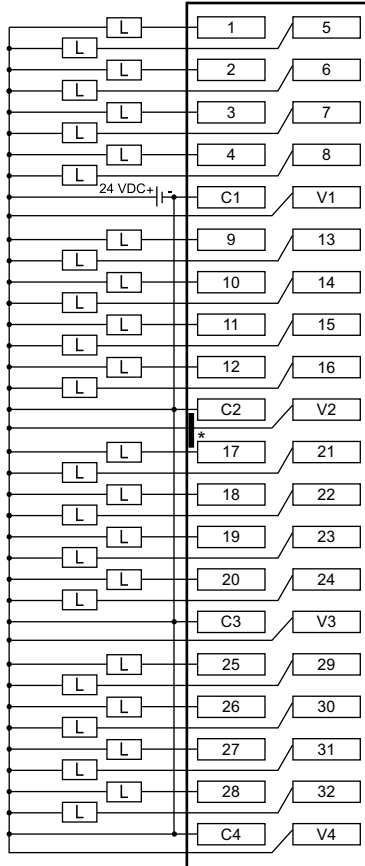
Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

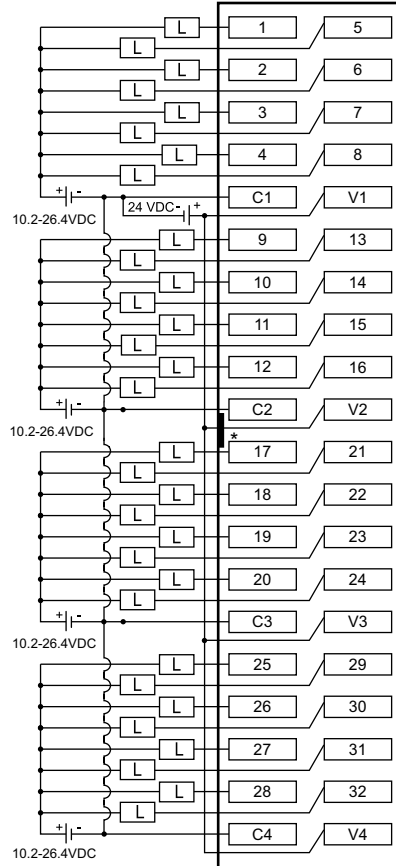
# P2-32TD1P Sinking Protected DC Output (continued)

## Wiring Diagrams

Single Power Source



Dual Power Source



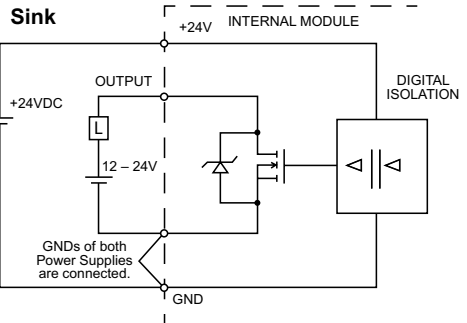
\* Denotes key location of all associated ZIPLink cables.



**NOTE 1:** If two separate power supplies are used to supply module control logic and output, grounds from both power supplies must be connected.

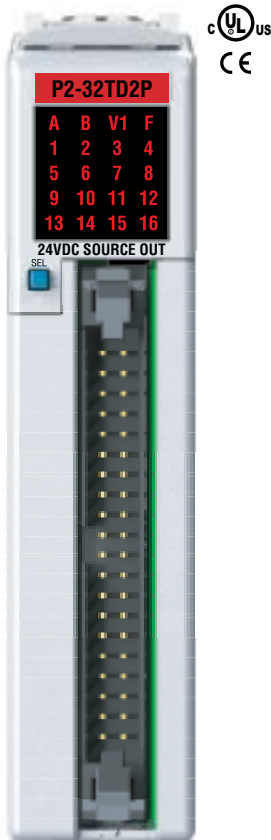


**NOTE 2:** For testing purposes, to check the output point without a load attached, use DMM in current mode with a 1kΩ resistor in series with DMM lead; or use DMM in voltage mode with 1kΩ in parallel with DMM lead.



## P2-32TD2P Sourcing Protected DC Output

The P2-32TD2P DC Output Module provides thirty-two 24VDC sourcing outputs with short circuit and overload protection for use with the Productivity® 2000 system.



### Output Specifications

Outputs per Module	32 sourcing, protected
Voltage Rating	24VDC
Operating Voltage Range	20.4–28.8 VDC
Maximum Output Current	0.2 A/pt, 1.6 A per common1 @ 60°C, 0.5 A/pt, 2A per common1 @ 40°C
Maximum Inrush Current	Self-limited
On Voltage Drop	0.5 VDC @ 0.1 A
OFF to ON Response	≤0.5 ms
ON to OFF Response	≤0.5 ms
Overcurrent Trip	0.6 A min., 1.2 A max., >50ms duration
Minimum Load Current to Avoid Open Load Fault Detection	113µA
Maximum Leakage Current	160µA @ 21.6–26.4 VDC
Over-temperature Shutdown	Independent to each output
Load Resistance to Avoid Open Load Fault Detection	<58kΩ
Status Indicators	Logic Side (16 points x 2)
External 24V Error Indicator	Logic Side (1 point)
Fault Condition Indicator	Logic Side (16 points x 2)
Commons	4 (non-isolated)
Recommended External Fuse	None
External DC Power Required	24VDC (-15%/+20%) @ 80mA

Note (1) Connect all Commons: COM and 24V points.

### Connector Specifications

Connector Type	IDC style header with latch, Omron XG4A-4034
Number of Pins	40 point
Pitch	0.1 in (2.54 mm)



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5.



## P2-32TD2P Sourcing Protected DC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	4.0 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any local or remote base in a Productivity@2000 system.
Field Wiring	Use ZIPLink wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Weight	105g (3.7 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EN61131-2*, Safety EN61010-2-201)

\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

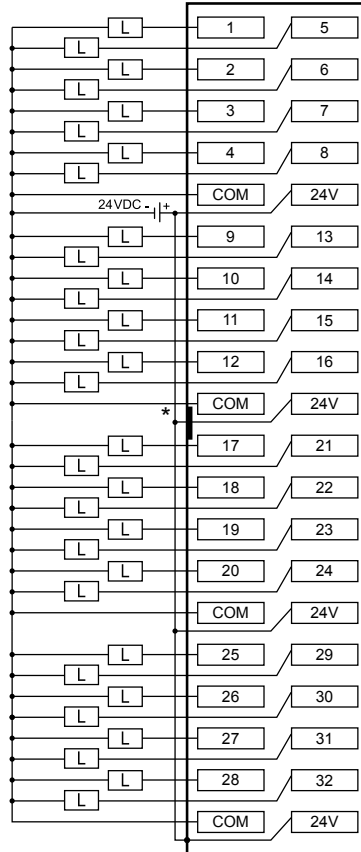
LED Status		
Fault Condition	Fault Status Indication	Operation to Reset Fault
Missing External 24VDC	V1 LED is ON	Apply external 24VDC
Open Load (Note 1)	"F" LED is ON (Note 2)	Connect the load
Over Temperature or Over Load Current		Turn the output OFF or cycle power
LED Page Shifting		
The "A" LED is ON when the LED states correspond to outputs/faults 1–16. The "B" LED is ON for outputs / faults 17–32.		

Note 1: Open Load Fault is always enabled, but is only valid when output is OFF. If Open Load Fault happens while output is ON, fault will not appear until you turn OFF output.

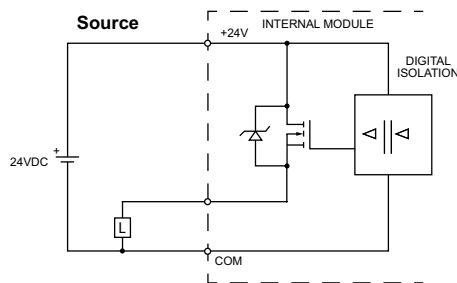
Note 2: The SEL button cycles between the output status and fault status. If the "F" LED is OFF the numbered LEDs are showing output status. If the "F" LED is ON the numbered LEDs are showing fault status of each output. The "V1" LED is independent of fault or output display.

# P2-32TD2P Sourcing Protected DC Output (continued)

## Wiring Diagrams

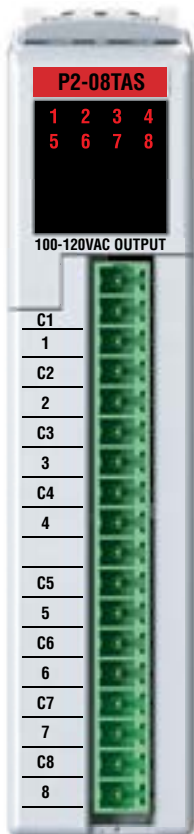


\* Denotes key location of all associated ZIPLink cables.



# P2-08TAS Isolated AC Output

The P2-08TAS AC Output Module provides eight 100–120 VAC isolated outputs for use with the Productivity® 2000 system.



Terminal blocks sold separately

## Output Specifications

Outputs per Module	8
Input Voltage Rating	100–120 VAC
Operating Voltage Range	85–132 VAC
AC Frequency	47–63 Hz
Maximum Output Current	1A / point @ 40°C 0.7 A / point @ 60°C
Minimum Load	10mA
Maximum Leakage Current	4mA @ 144VDC
On Voltage Drop	1.5 VAC @ > 50mA 4.0 VAC @ < 50mA
Maximum Inrush Current	3A for 10ms
OFF to ON Response	1ms + 1/2 cycle
ON to OFF Response	1ms + 1/2 cycle
Status Indicators	Logic Side (8 points)
Commons	8 Isolated (1 point / common)
Recommended External Fuse	1.6 A Max. (AutomationDirect P/N S5001-6-R)

## Removable Terminal Block Specifications

Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.





## P2-08TAS Isolated AC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1500mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity@2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5..
Connector Type (Sold separately)	18-position removable terminal block
Weight	85g (2.9 oz)
Agency Approvals**	UL 61010-2-201 file E139594, Canada & USA CE (EN61131-2*, Safety EN61010-2-201)

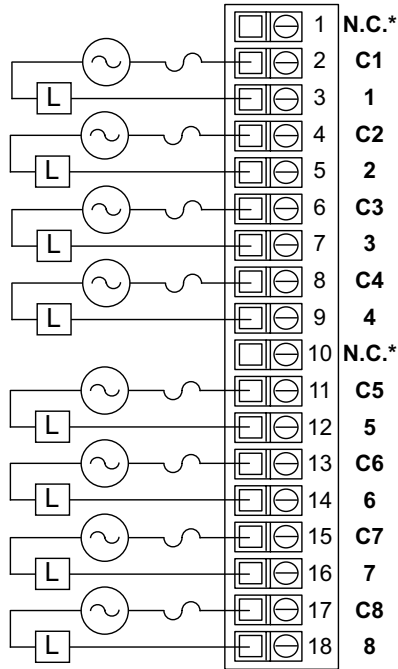
\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

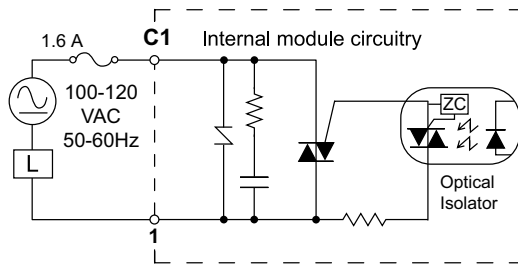
# P2-08TAS AC Output (continued)

## Wiring Diagrams

100 - 120 VAC  
50 - 60 Hz

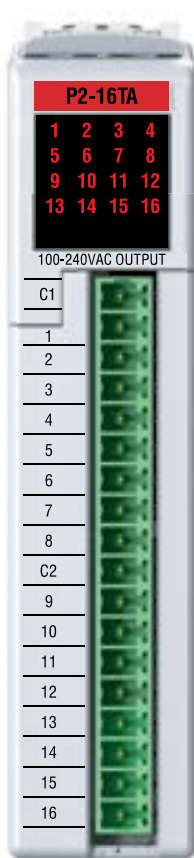


\*N.C. = No Connection



# P2-16TA AC Output

The P2-16TA AC Output Module provides sixteen 100-240 VAC outputs.



Terminal blocks sold separately

Output Specifications	
Outputs per Module	16
Voltage Rating	100–240 VAC
Operating Voltage Range (Tolerance)	(CE) 100–240 VAC (-15% / +10%)
	(UL) 100–240 VAC (-20% / +20%)
AC Frequency	47–63 Hz
Maximum Output Current @ Temp	0.5 A / point , 4A / common @ 55°C 0.3 A / point , 2.4 A / common @ 60°C
Minimum Load	10mA
Maximum Leakage Current	4mA @ 264VAC
On Voltage Drop	1.5 VAC @ >50mA 4.0 VAC @ <50mA
Maximum Inrush Current	10A for 10ms
OFF to ON Response	1ms + 1/2 cycle
ON to OFF Response	1ms + 1/2 cycle
Status Indicators	Logic Side (16 points)
Commons	2 Isolated Commons for 120V 2 Non-Isolated Commons for 240V (external jumper required)
Recommended External Fuse	6.3 A Max (Automation Direct P/N S5006-3-R)

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-16TA AC Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	1.9 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any local base in a Productivity®2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5
Connector Type (Sold separately)	18-position removable terminal block
Weight	90g (3.2 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

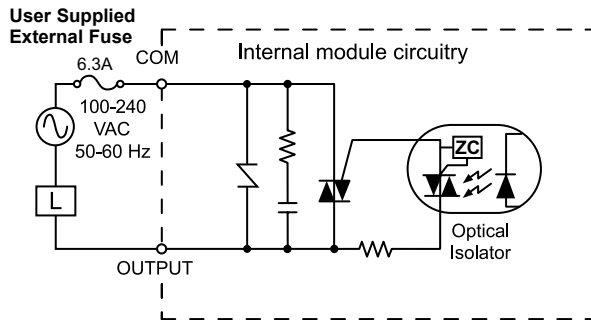
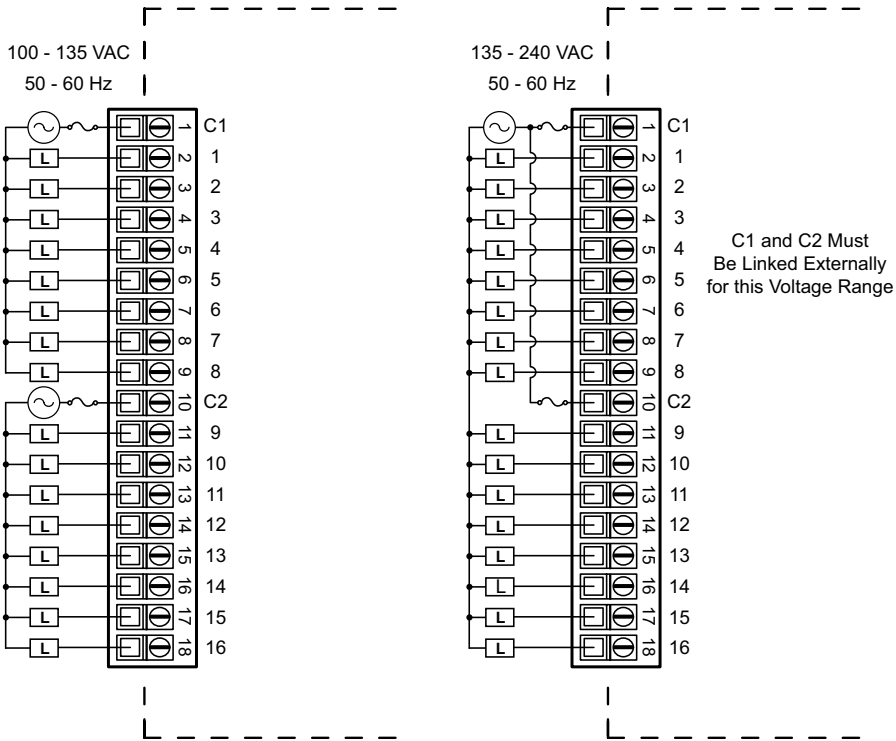
\* Meets EMC and Safety requirements. See the D.O.C. for details.

# P2-16TA AC Output (continued)

## Wiring Diagrams

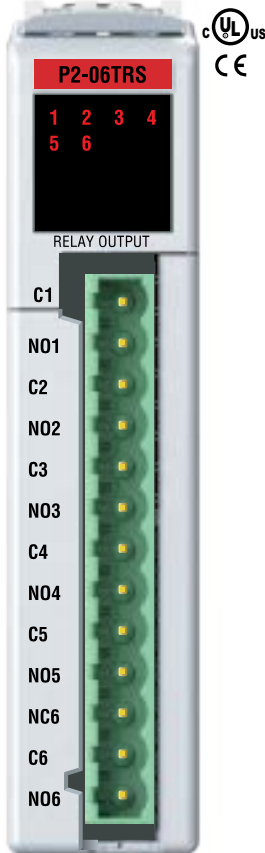
Single Power Source

Dual Power Source



## P2-06TRS Isolated Relay Output

The P2-06TRS high-current isolated relay output module provides six, 7A surge-protected relay outputs for extended life. The module offers both normally open and normally closed relay contacts. For use with the Productivity2000 system.



Terminal blocks sold separately

ZIPLink connectors are not compatible with this module. P2-RTB13 or P2-RTB13-1 removable terminal blocks must be ordered separately.

Output Specifications	
<b>Outputs per Module</b>	6
<b>Rated Voltage</b>	100-240 VAC / 30VDC
<b>Operating Voltage Range</b>	5-30 VDC 5-264 VAC
<b>Output type</b>	5 Relays, FORM A (SPST) 1 Relays, FORM C (SPDT)
<b>AC Frequency</b>	47-63 Hz
<b>Maximum Output Current @ Temp</b>	7A / point @ 40°C, 6A/point at 60°C for both AC and DC
<b>Minimum Load Current</b>	5mA @ 5VDC
<b>Maximum Inrush Current</b>	10A for 10ms
<b>OFF to ON Response</b>	10ms
<b>ON to OFF Response</b>	10ms
<b>Status Indicators</b>	Logic Side (6 points)
<b>Commons</b>	6 Isolated (1 point / common)
<b>Protected Circuit</b>	12A Max Not built-in to module - install protection elements such as external fuse.

Removable Terminal Block Specifications		
Part Number	P2-RTB13	P2-RTB13-1
<b>Number of positions</b>	13 Screw terminals, 5.08 mm terminal block plug	13 Push release terminals, 5.08 mm terminal block plug
<b>Wire Range</b>	24-12 AWG (0.25-4mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 3/8 in (9-10 mm) strip length	
<b>Conductors</b>	USE COPPER CONDUCTORS, 75°C or equivalent.	
<b>Screw Driver Width</b>	0.13 in. (3.5 mm) maximum*	N/A
<b>Screw Size</b>	M2.5	N/A
<b>Screw Torque</b>	4.4 lb-in (0.5 N·m)	N/A

\* Recommended screwdriver TW-SD-MSL-1



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

## P2-06TRS Isolated Relay Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meter, max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	3000VAC applied for 5 seconds 1100VAC applied for 1 minute
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	3W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use removable terminal block (not included). See Wiring Solutions.
Connector Type (Sold separately)	13-position removable terminal block
Weight	148g (5.2 oz)
Agency Approvals***	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA* CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)**

\* Per UL61010-2-201 mixed voltage use is restricted:  
Mixed use of 24VDC and 120VAC is allowed.  
Mixed use of 120VAC and 240VAC is allowed.  
Mixed use of 24VDC and 240VAC is not permitted.

\*\*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

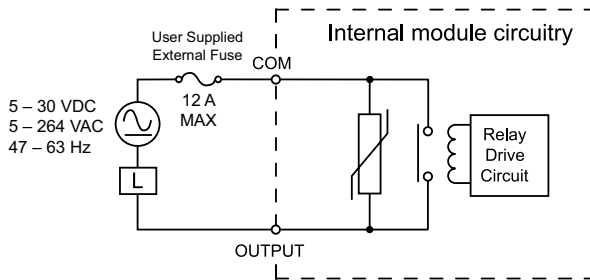
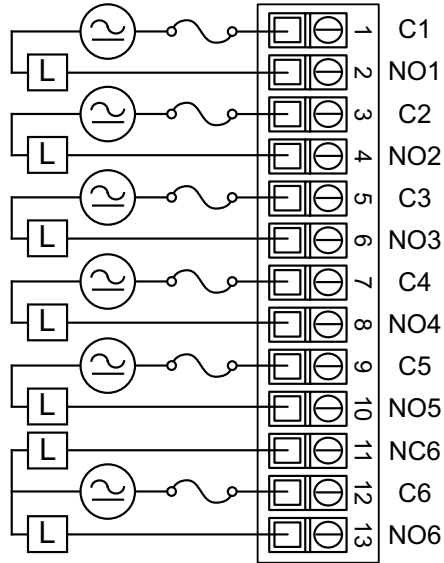
\*\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

Typical Relay Life	
Voltage & Type of Load	Operations at 4A Load Current
30VDC Resistive	100,000
30VDC Solenoid	100,000
120VAC Resistive	100,000
120VAC Solenoid	100,000

# P2-06TRS Isolated Relay Output (continued)

## Wiring Diagrams

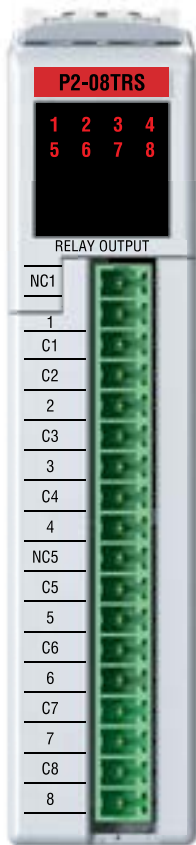
5 - 30 VDC  
5 - 264 VAC  
47 - 63 Hz





# P2-08TRS Isolated Relay Output

The P2-08TRS Isolated Relay Output Module provides eight, 4A surge protected outputs for extended relay life. Module offers both normally open and normally closed relay contacts.



Output Specifications		
Outputs per Module	8	
Operating Voltage Range (Tolerance)	(CE)	6.25–24 VDC (-15% / + 20%) 6–120 VAC (-15% / + 10%)
	(UL)	120VAC / 30VDC, 4A / point
Output type	6 Relays, FORM A (SPST) 2 Relays, FORM C (SPDT)	
AC Frequency	47–63 Hz	
Maximum Output Current @ Temp	4A / point @ 60°C for both AC and DC 2A / point if used with <b>ZIPLink</b> Cable	
Minimum Load Current	5mA @ 5VDC	
Maximum Inrush Current	4A for 10ms	
OFF to ON Response	≤10ms	
ON to OFF Response	≤10ms	
Status Indicators	Logic Side (8 points)	
Commons	8 Isolated (1 point / common)	
External Fuses (user supplied)	6.3 A Max	

Removable Terminal Block Specifications		
Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-08TRS Isolated Relay Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	3W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity® 2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	157g (5.54 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

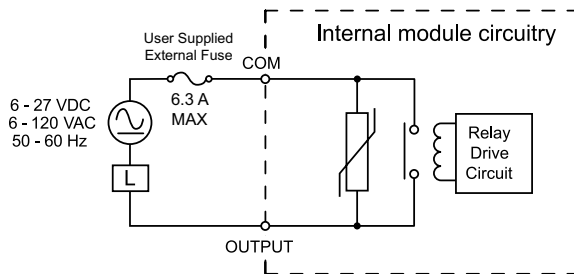
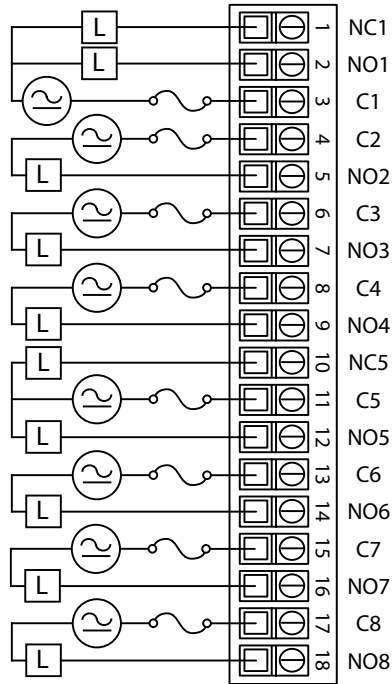
\* Meets EMC and Safety requirements. See the D.O.C. for details.

Typical Relay Life	
Voltage & Type of Load	Operations at 4A Load Current
30VDC Resistive	100,000
30VDC Solenoid	100,000
120VAC Resistive	100,000
120VAC Solenoid	100,000

# P2-08TRS Isolated Relay Output (continued)

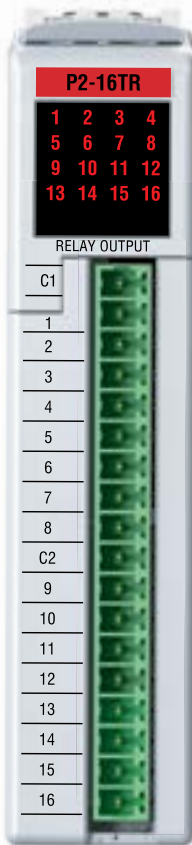
## Wiring Diagrams

6 - 27 VDC  
 6 - 120 VAC  
 50 - 60 Hz



# P2-16TR Relay Output

The P2-16TR Relay Output Module provides sixteen 1.0 amp surge protected outputs with two isolated commons.



### Output Specifications

Outputs per Module	16	
Operating Voltage Range	(CE)	6.25–24 VDC (-15%/+20%) 6–240 VAC (-15%/+10%)
	(UL)	6–27 VDC (-15%/+10%) 6–240 VAC (-10%/+10%)
Output Type	Relay, form A (SPST)	
AC Frequency	47–63 Hz	
Maximum Output Current @ Temp	1A / point, 8A / common @ 60°C for both AC and DC	
Minimum Load Current	5mA @ 5VDC	
Maximum Inrush Current	4A for 10ms	
OFF to ON Response	≤10ms	
ON to OFF Response	≤10ms	
Status Indicators	Logic side (16 points)	
Commons	2 isolated (8 point / common)	
External Fuses (user supplied)	8A Max	

### Removable Terminal Block Specifications

Part Number	P2-RTB	P2-RTB-1
Number of positions	18 screw terminals	18 push release terminals
Wire Range	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 1/4 in (6–7 mm) strip length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid/stranded conductor 3/64 in (1.2 mm) insulation max. 19/64 in (7–8 mm) strip length
Conductors	USE COPPER CONDUCTORS, 75°C or equivalent.	
Screw Driver Width	0.1 in. (2.5 mm) maximum	NA
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

\* Recommended screwdriver TW-SD-MSL-1

Terminal blocks sold separately

We recommend using pre-wired ZIPLink cables and connection modules. See Chapter 5. If you wish to hand-wire your module, removable terminal blocks are sold separately. Order part number P2-RTB or P2-RTB-1.



## P2-16TR Relay Output (continued)

General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	2.73 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity®2000 system.
Field Wiring	Use <b>ZIPLink</b> wiring system or removable terminal block (not included). See "Wiring Options" in Chapter 5.
Connector Type (Sold separately)	18-position removable terminal block
Weight	188g (6.64 oz)
Agency Approvals	UL508 file E139594, Canada & USA CE (EN61131-2*)

\* Meets EMC and Safety requirements. See the D.O.C. for details.

Typical Relay Life	
Voltage & Type of Load	Operations at 1A load current
30VDC Resistive	100,000
30VDC Solenoid	100,000
120VAC Resistive	100,000
120VAC Solenoid	100,000
240VAC Resistive	100,000
240VAC Solenoid	100,000

# P2-16TR Relay Output (continued)

## Wiring Diagrams

