

# Specialty Modules

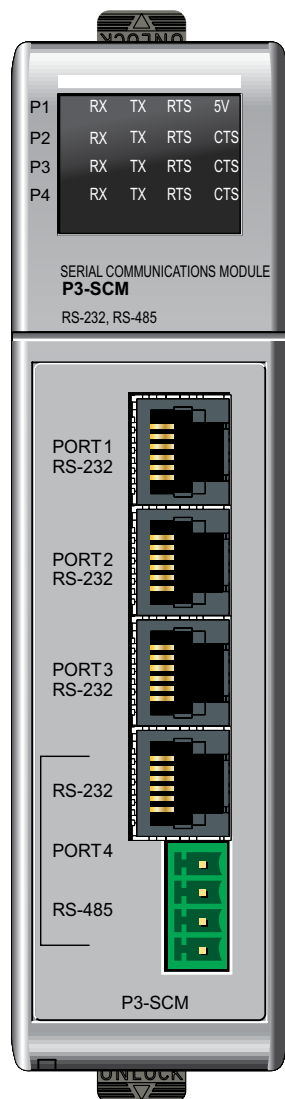
## P3-SCM

\$475.00

### Serial Communications Module

Productivity3000 4-port serial communications module capable of Modbus, ASCII and Custom Communications Protocols. The P3-SCM is also able to power the **C-more** Micro HMI through RS-232 (Port 1 only) for use with the Productivity3000.

P3-SCM contains (4) RS-232 (RJ12) ports half or full duplex, (1) RS-485 port (4-wire terminal block) half duplex, all supporting Modbus RTU Master/Slave, ASCII In/Out and Custom Protocol up to 38.4 K baud rate.

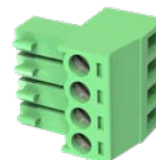


| General Specifications               |                                                                                                                                                    |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Type</b>                   | Intelligent                                                                                                                                        |
| <b>Modules per Base</b>              | Base size limited, 11 Max                                                                                                                          |
| <b>Modules per Group</b>             | 11 Max                                                                                                                                             |
| <b>I/O Points Used</b>               | None, mapped directly to tags in CPU                                                                                                               |
| <b>Field Wiring Connector</b>        | 4 - RJ12, 1 - 4 Position Terminal Block                                                                                                            |
| <b>Operating Temperature</b>         | 0°C– 60°C (32°F–140°F)<br>IEC 60068-2-14 (Test Nb, Thermal Shock)                                                                                  |
| <b>Storage Temperature</b>           | -20°C–70°C (-4°F–158°F)<br>IEC 60068-2-1 (Test Ab, Cold)<br>IEC 60068-2-2 (Test Bb, Dry Heat)<br>IEC 60068-2-14 (Test Na, Thermal Shock)           |
| <b>Humidity</b>                      | 5 to 95% (non-condensing)<br>IEC 60068-2-30 (Test Db, Damp Heat)                                                                                   |
| <b>Environmental Air</b>             | No corrosive gases permitted<br>(EN61131-2 pollution degree 1)                                                                                     |
| <b>Vibration</b>                     | IEC60068-2-6 (Test Fc)                                                                                                                             |
| <b>Shock</b>                         | IEC60068-2-27 (Test Ea)                                                                                                                            |
| <b>Field to Logic Side Isolation</b> | None                                                                                                                                               |
| <b>Insulation Resistance</b>         | No Isolation                                                                                                                                       |
| <b>Noise Immunity</b>                | NEMA ICS3-304<br>IEC 61000-4-2 (ESD)<br>Impulse 1000V @ 1µS pulse<br>IEC 61000-4-4 (FTB)<br>RFI, (145MHz, 440MHz 5W @ 15cm)<br>IEC 61000-4-3 (RFI) |
| <b>Emissions</b>                     | EN61000-6-4 (Conducted and radiated RF emissions)                                                                                                  |
| <b>Module Location</b>               | Any I/O slot in any local, expansion, or remote base in a Productivity3000 system.                                                                 |
| <b>Weight</b>                        | 260g (9.17 oz)                                                                                                                                     |
| <b>Agency Approvals<sup>1</sup></b>  | UL508 file E157382, Canada & USA<br>CE (EN61131-2:2007)                                                                                            |

1. To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page

| Removable Terminal Block Specifications |                                                                                      |
|-----------------------------------------|--------------------------------------------------------------------------------------|
| <b>Number of Positions</b>              | 4 Screw Terminals, 3.5 mm Pitch                                                      |
| <b>Wire Range</b>                       | 16–28 AWG<br>Solid/Stranded Conductor<br>*Use Copper Conductors, 75°C or Equivalent" |
| <b>Screwdriver Size</b>                 | TW-SD-VSL-1 (recommended)                                                            |
| <b>Screw Torque</b>                     | 0.4 N·m                                                                              |

\*Removable Terminal Connector included.



### RS-485 Cable Options

|                    |                                                   |
|--------------------|---------------------------------------------------|
| <b>Recommended</b> | Recommend Q8302-1 (cut to length) or Belden #9841 |
|--------------------|---------------------------------------------------|



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

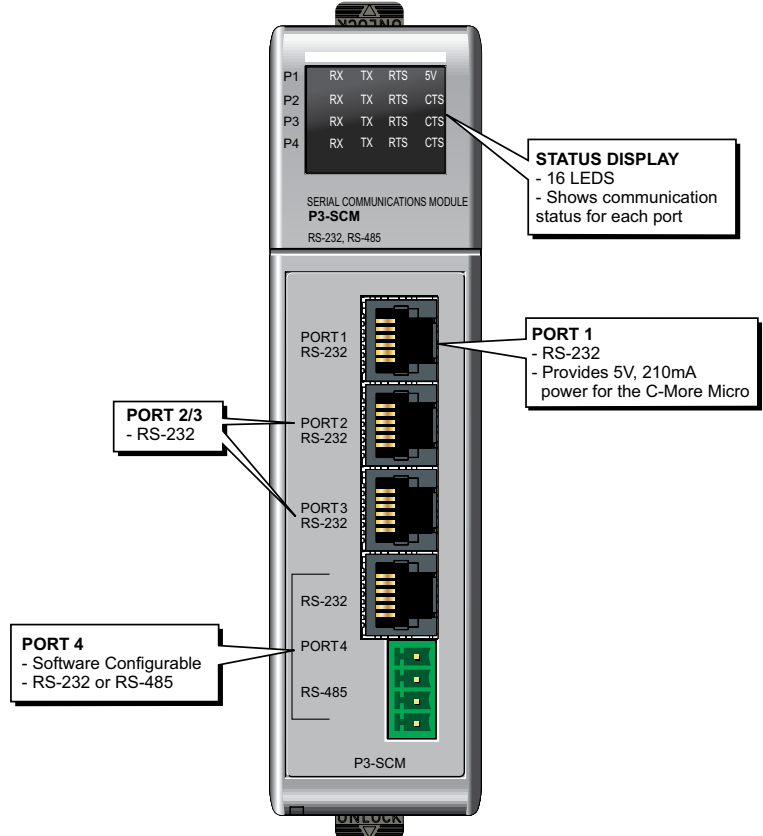
# Specialty Modules

## P3-SCM (cont'd)

| Diagnostic LEDs |        |        |        |        |
|-----------------|--------|--------|--------|--------|
| LED             | Port 1 | Port 2 | Port 3 | Port 4 |
| RXD             | X      | X      | X      | X      |
| TXD             | X      | X      | X      | X      |
| RTS             | X      | X      | X      | X      |
| CTS             |        | X      | X      | X      |
| 5V              | X      |        |        |        |

1. All RS232 & RS485 LEDs reflect the actual electrical level of the signal, there is no direct firmware control of LEDs
2. RS232 LEDs RXD, TXD, RTS & CTS are turned ON when their voltage on the RS232 wire is positive.
  - a - This occurs when the UART I/O signal is low (GND)
  - b - They are turned OFF when the voltage on the RS232 wire is negative
3. RS485 LEDs RXD, TXD, RTS & CTS are turned ON when the UART I/O signal is low (GND)
4. 5V LED is ON when 5V power is good, 5V LED is OFF when 5V is shorted to ground

| Port 4 LED Behavior |                                         |                                         |                                 |                                 |
|---------------------|-----------------------------------------|-----------------------------------------|---------------------------------|---------------------------------|
| Port 4              | RX                                      | TX                                      | RTS                             | CTS                             |
| RS232               | Flickers on RXD activity, OFF when idle | Flickers on TXD activity, OFF when idle | ON when asserted, OFF otherwise | ON when asserted, OFF otherwise |
| RS485               |                                         |                                         |                                 | Always OFF                      |



| P3-SCM Configuration Options                                      |                                                |                                                 |                                           |
|-------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------|-------------------------------------------|
| Configuration Item                                                | Port 1 (RS-232)                                | Ports 2, 3 & 4 (RS-232)                         | Port 4 (when RS-485)                      |
| <b>Protocol Selections</b>                                        | Disabled, Modbus RTU, ASCII/Custom             | Disabled, Modbus RTU, ASCII/Custom              | Disabled, Modbus RTU, ASCII/Custom        |
| <b>Data Rate, baud</b>                                            | 1200,2400,4800, 9600,19200, 33600, & 38400     | 1200,2400,4800,9600,19200, 33600, & 38400       | 1200,2400,4800,9600,19200, 33600, & 38400 |
| <b>Parity</b>                                                     | None, Odd or Even                              | None, Odd or Even                               | None, Odd or Even                         |
| <b>Data Bits<sup>4</sup></b>                                      | 7 or 8 Bit                                     | 7 or 8 Bit                                      | 7 or 8 Bit                                |
| <b>RTS Off Delay Time<sup>1</sup></b>                             | None, or 0–5,000 msec                          | None, or 0–5,000 msec                           | N/A                                       |
| <b>RTS On Delay Time<sup>1</sup></b>                              | None, or 0–5,000 msec                          | None, or 0–5,000 msec                           | N/A                                       |
| <b>Modbus Character Timeout<sup>2</sup></b>                       | None, or 0–10,000 msec                         | None, or 0–10,000 msec                          | None, or 0–10,000 msec                    |
| <b>Communication Timeout (Timeout between query and response)</b> | 100–30,000 msec                                | 100–30,000 msec                                 | 100–30,000 msec                           |
| <b>Response/Request Delay Time</b>                                | N/A                                            | N/A                                             | None, or 1–5,000 msec                     |
| <b>Comm Heartbeat Value<sup>2</sup></b>                           | 2–1,000 sec                                    | 2–1,000 sec                                     | 2–1,000 sec                               |
| <b>Node Address (Station)</b>                                     | 1 to 247                                       | 1 to 247                                        | 1 to 247                                  |
| <b>CTS</b>                                                        | N/A                                            | Ignore, Wait, System Input <sup>3</sup>         | N/A                                       |
| <b>Enable/Disable CTS Wait Timeout</b>                            | N/A                                            | Enable Timeout, Disable Timeout (Never Timeout) | N/A                                       |
| <b>CTS Wait Timeout</b>                                           | N/A                                            | 100–999,900 msec                                | N/A                                       |
| <b>RTS</b>                                                        | On, Off, Assert During Transmit, System Output | On, Off, Assert During Transmit, System Output  | N/A                                       |
| <b>Port 4 RS-485 2-Wire Mode</b>                                  | N/A                                            | N/A                                             | Disable, Enable                           |
| <b>MODBUS Port Security</b>                                       | Read/Write, Read Only                          | Read/Write, Read Only                           | Read/Write, Read Only                     |

1. For "None" selection with Modbus RTU protocol, Modbus.org minimums are used. This minimum is 3.5 character times up to 19, 200 baud rate and 1.75 ms over 19,200 baud rate
2. Only applies to MODBUS messages
3. CTS signal is only provided on Ports 2, 3 & 4
4. 7-bit data is only supported with Odd or Even parity

# Specialty Modules

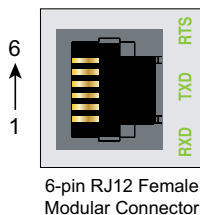
## P3-SCM (cont'd)

| Port 1 RS-232 Specifications           |                                                                                                                                                     |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Port Name</b>                       | <b>RS-232</b>                                                                                                                                       |
| <b>Description</b>                     | 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. |
| <b>Data Rates</b>                      | Selectable, 1200, 2400, 4800, 9600, 19200, 33600 and 38400.                                                                                         |
| <b>+5V Cable Power Source</b>          | 210mA maximum at 5V, $\pm 5\%$ . Reverse polarity and overload protected.                                                                           |
| <b>TXD</b>                             | RS-232 Transmit output                                                                                                                              |
| <b>RXD</b>                             | RS-232 Receive input                                                                                                                                |
| <b>RTS</b>                             | Handshaking output for flow control.                                                                                                                |
| <b>GND</b>                             | Logic ground                                                                                                                                        |
| <b>Maximum Output Load (TXD/RTS)</b>   | 3kV, 1,000pf                                                                                                                                        |
| <b>Minimum Output Voltage Swing</b>    | $\pm 5V$                                                                                                                                            |
| <b>Output Short Circuit Protection</b> | $\pm 15mA$                                                                                                                                          |
| <b>Port Status LED</b>                 | Red LED is illuminated when active for TXD, RXD, RTS                                                                                                |

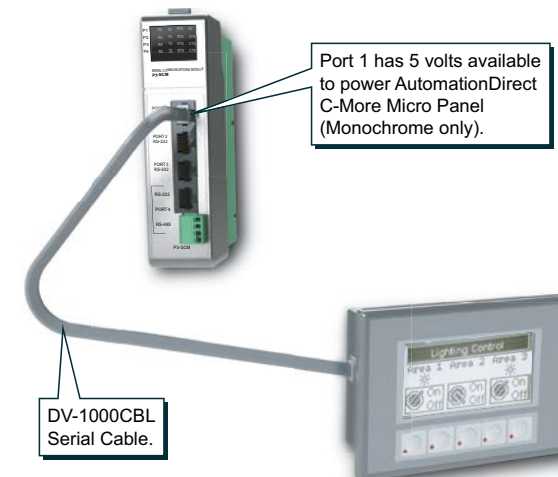
| Ports 2, 3 and 4 RS-232 Specifications |                                                                                                                                                     |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Port Name</b>                       | <b>RS-232</b>                                                                                                                                       |
| <b>Description</b>                     | 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. |
| <b>Data Rates</b>                      | Selectable, 1200, 2400, 4800, 9600, 19200, 33600 and 38400.                                                                                         |
| <b>TXD</b>                             | RS-232 Transmit output                                                                                                                              |
| <b>RXD</b>                             | RS-232 Receive input                                                                                                                                |
| <b>RTS</b>                             | Handshaking output for flow control.                                                                                                                |
| <b>CTS</b>                             | Handshaking input for flow control.                                                                                                                 |
| <b>GND</b>                             | Logic ground                                                                                                                                        |
| <b>Maximum Output Load (TXD/RTS)</b>   | 3kV, 1,000pf                                                                                                                                        |
| <b>Minimum Output Voltage Swing</b>    | $\pm 5V$                                                                                                                                            |
| <b>Output Short Circuit Protection</b> | $\pm 15mA$                                                                                                                                          |
| <b>Port Status LED</b>                 | Red LED is illuminated when active for TXD, RXD, RTS                                                                                                |

| RS-232 Ports 1, 2, 3 and 4             |     |      |          |         |
|----------------------------------------|-----|------|----------|---------|
| Electrical Specifications              | Min | Typ  | Max      | Units   |
| Output ON (3k $\Omega$ , 1000pF Load)  | 5.0 | 5.2  |          | Volts   |
| Output OFF (3k $\Omega$ , 1000pF Load) |     | -5.2 | -5.0     | Volts   |
| Output Short-Circuit Current           |     | 15   |          | mA      |
| Short-Circuit Duration                 |     |      | No Limit | Seconds |
| Output Resistance                      | 300 |      |          | Ohm     |
| Input ON Threshold                     |     | 1.6  | 2.4      | Volts   |
| Input OFF Threshold                    | 0.6 | 1.2  |          | Volts   |
| Input Resistance                       | 3k  | 5k   | 7k       | Ohm     |

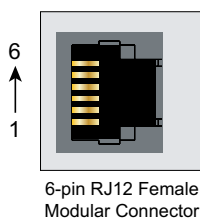
Port 1



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



Ports 2, 3 and 4 (RS-232)



| Pin # | Signal |               |
|-------|--------|---------------|
| 1     | GND    | Logic Ground  |
| 2     | CTS    | RS-232 Input  |
| 3     | RXD    | RS-232 Input  |
| 4     | TXD    | RS-232 Output |
| 5     | RTS    | RS-232 Output |
| 6     | GND    | Logic Ground  |

### Line Specifications for RS-232 Ports

| RS-232 Line Specifications           | Options                                       | Units  |
|--------------------------------------|-----------------------------------------------|--------|
| <b>Data Rate Setting</b>             | 1200, 2400, 4800, 9600, 19200, 33600, & 38400 | baud   |
| <b>Data Rate Error</b>               | $\pm 2$                                       | %      |
| <b>Data Bits Setting<sup>1</sup></b> | 7 or 8                                        | Bits   |
| <b>Stop Bits Setting</b>             | 1                                             | Bits   |
| <b>Parity Setting</b>                | None1, Odd or Even                            | Parity |
| <b>Data Transmission</b>             | Half duplex or Full duplex <sup>2</sup>       | N/A    |
| <b>Network</b>                       | Point-to-Point                                | N/A    |

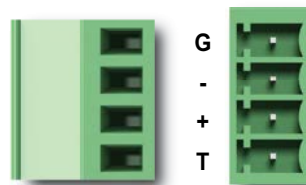
1. 7-bit data are only supported with odd or even parity  
 2. Full duplex is only supported for ASCII/Custom Protocol

# Specialty Modules

## P3-SCM (cont'd)

| Port 4 (RS-485 Configuration)               |                                                                                                                                                                                            |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Port Name</b>                            | RS-485                                                                                                                                                                                     |
| <b>Description</b>                          | 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 |
| <b>Data Rates</b>                           | Selectable, 1200, 2400, 4800, 9600, 19200, 33600 and 38400                                                                                                                                 |
| <b>TXD+/RXD+</b>                            | RS-485 transceiver high                                                                                                                                                                    |
| <b>TXD-/RXD-</b>                            | RS-485 transceiver low                                                                                                                                                                     |
| <b>GND</b>                                  | Logic ground                                                                                                                                                                               |
| <b>Input Impedance</b>                      | 19k $\Omega$                                                                                                                                                                               |
| <b>Maximum load</b>                         | 50 transceivers, 19k $\Omega$ each, 60 $\Omega$ termination (two 120 $\Omega$ resistors at each end)                                                                                       |
| <b>Output Short-Circuit Protection</b>      | $\pm 250$ mA, thermal shut-down protection                                                                                                                                                 |
| <b>Electrostatic Discharge Protection</b>   | $\pm 8$ k $\Omega$ per IEC1000-4-2                                                                                                                                                         |
| <b>Electrical Fast Transient Protection</b> | $\pm 2$ k $\Omega$ per IEC1000-4-4                                                                                                                                                         |
| <b>Minimum Differential Output Voltage</b>  | 1.5 V with 60 $\Omega$ load                                                                                                                                                                |
| <b>Fail safe inputs</b>                     | Logic high input state if inputs are unconnected                                                                                                                                           |
| <b>Maximum Common Mode Voltage</b>          | -7.5 V to 12.5 V.                                                                                                                                                                          |
| <b>Port Status LED</b>                      | Red LED illuminated when active for TXD and RXD                                                                                                                                            |
| <b>Cable Options</b>                        | Recommend Q8302-1 (cut to length) or Belden #9841                                                                                                                                          |

### Port 4 (RS-485)

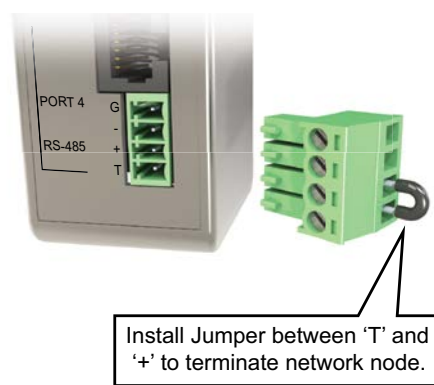


| Pin # | Signal      |
|-------|-------------|
| G     | GND         |
| -     | TXD-/RXD-   |
| +     | TXD+/RXD+   |
| T     | TERMINATION |

| RS-485 Port 4                                                  |      |     |          |         |
|----------------------------------------------------------------|------|-----|----------|---------|
| Electrical Specifications                                      | Min  | Typ | Max      | Units   |
| <b>Driver Differential Output (60<math>\Omega</math> load)</b> | 1.5  |     |          | Volts   |
| <b>Driver Common-Mode Output</b>                               |      |     | 3        | Volts   |
| <b>Driver Short-Circuit Output Current</b>                     |      |     | 250      | mA      |
| <b>Short-Circuit Duration (Thermal Shutdown)</b>               |      |     | No Limit | Seconds |
| <b>Receiver Differential Input Threshold</b>                   | 200  |     |          | mV      |
| <b>Receiver Common-Mode Input</b>                              | -7.5 |     | 12.5     | Volts   |
| <b>Input Resistance</b>                                        | 12k  |     |          | Ohm     |
| <b>Termination Resistance (TB jumper wire 'T' to '+')</b>      |      | 120 |          | Ohm     |
| <b>Cable Length (38400 baud max.)</b>                          |      |     | 1200     | Meters  |

| Line Specifications for RS-485 Port  |                                               |        |
|--------------------------------------|-----------------------------------------------|--------|
| RS-485 Line Specifications           | Options                                       | Units  |
| <b>Data Rate Setting</b>             | 1200, 2400, 4800, 9600, 19200, 33600, & 38400 | Baud   |
| <b>Data Rate Error</b>               | $\pm 2$                                       | %      |
| <b>Data Bits Setting<sup>1</sup></b> | 7 or 8                                        | Bits   |
| <b>Stop Bits Setting</b>             | 1                                             | Bits   |
| <b>Parity Setting</b>                | None, 1, Odd or Even                          | Parity |
| <b>Data Transmission</b>             | Half duplex                                   | N/A    |

1. 7-bit data is only supported with odd or even parity



\* Jumper not included

# I/O Modules

A variety of discrete, analog and specialty I/O modules are available for use in local, expansion, and remote I/O bases. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number P3-FILL).

## Discrete Input Modules

| Productivity3000 Discrete Input Modules |                  |                                    |          |
|-----------------------------------------|------------------|------------------------------------|----------|
| Part Number                             | Number of Inputs | Description                        | Price    |
| P3-16SIM                                | 16               | Input Simulator Module             | \$214.00 |
| P3-08ND3S                               | 8                | Isolated Sinking/Sourcing DC Input | \$109.00 |
| P3-16ND3                                | 16               | Sinking/Sourcing DC Input          | \$162.00 |
| P3-32ND3                                | 32               | Sinking/Sourcing DC Input          | \$218.00 |
| P3-64ND3                                | 64               | Sinking/Sourcing DC Input          | \$284.00 |
| P3-08NAS                                | 8                | Isolated AC Input                  | \$136.00 |
| P3-16NA                                 | 16               | AC Input                           | \$167.00 |

\*ZIPLink required.

## Discrete Output Modules

| Productivity3000 Discrete Output Modules |                   |                          |          |
|------------------------------------------|-------------------|--------------------------|----------|
| Part Number                              | Number of Outputs | Description              | Price    |
| P3-08TD1S                                | 8                 | Isolated Sinking Output  | \$164.00 |
| P3-08TD2S                                | 8                 | Isolated Sourcing Output | \$169.00 |
| P3-16TD1                                 | 16                | Sinking Output           | \$175.00 |
| P3-16TD2                                 | 16                | Sourcing Output          | \$180.00 |
| P3-32TD1*                                | 32                | Sinking Output           | \$228.00 |
| P3-32TD2*                                | 32                | Sourcing Output          | \$218.00 |
| P3-64TD1*                                | *64               | Sinking Output           | \$319.00 |
| P3-64TD2*                                | *64               | Sourcing Output          | \$289.00 |
| P3-08TAS                                 | 8                 | Isolated AC Output       | \$212.00 |
| P3-16TA                                  | 16                | AC Output                | \$225.00 |
| P3-08TRS                                 | 8                 | Isolated Relay Output    | \$187.00 |
| P3-08TRS-1                               | 8                 | Isolated Relay Output    | \$194.00 |
| P3-16TR                                  | 16                | Relay Output             | \$190.00 |

\*ZIPLink required.

## Analog I/O Modules

| Productivity3000 Analog Input Modules |                    |                           |          |
|---------------------------------------|--------------------|---------------------------|----------|
| Part Number                           | Number of Channels | Description               | Price    |
| P3-04ADS                              | 4                  | Isolated Analog Input     | \$724.00 |
| P3-08AD                               | 8                  | Analog Input              | \$393.00 |
| P3-16AD-1                             | 16                 | Analog Input (Current)    | \$535.00 |
| P3-16AD-2                             | 16                 | Analog Input (Voltage)    | \$524.00 |
| P3-08RTD                              | 8                  | Analog RTD Input          | \$581.00 |
| P3-08THM                              | 8                  | Analog Thermocouple Input | \$736.00 |

| Productivity3000 Analog Output Modules |                    |                         |          |
|----------------------------------------|--------------------|-------------------------|----------|
| Part Number                            | Number of Channels | Description             | Price    |
| P3-04DA                                | 4                  | Analog Output           | \$449.00 |
| P3-08DA-1                              | 8                  | Analog Output (Current) | \$779.00 |
| P3-08DA-2                              | 8                  | Analog Output (Voltage) | \$725.00 |
| P3-16DA-1                              | 16                 | Analog Output (Current) | \$929.00 |
| P3-16DA-2                              | 16                 | Analog Output (Voltage) | \$911.00 |

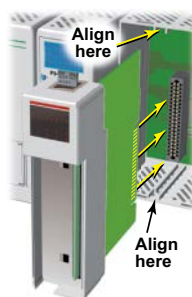
| Productivity3000 Analog Input/Output Modules |                    |                               |          |
|----------------------------------------------|--------------------|-------------------------------|----------|
| Part Number                                  | Number of Channels | Description                   | Price    |
| P3-8AD4DA-1                                  | 8/4                | Analog Input/Output (Current) | \$598.00 |
| P3-8AD4DA-2                                  | 8/4                | Analog Input/Output (Voltage) | \$617.00 |

## Specialty Modules

| Productivity3000 Specialty Modules |                    |                              |          |
|------------------------------------|--------------------|------------------------------|----------|
| Part Number                        | Number of Channels | Description                  | Price    |
| P3-HSI                             | 2                  | High-Speed Pulse Input       | \$563.00 |
| P3-HSO*                            | 2                  | High-Speed Output            | \$587.00 |
| P3-SCM                             | 4 ports            | Serial Communications Module | \$475.00 |

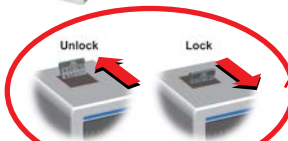
\*ZIPLink required.

## Module Installation Procedure



**WARNING:** DO NOT APPLY FIELD POWER UNTIL THE FOLLOWING STEPS ARE COMPLETED. SEE HOT-SWAPPING PROCEDURE FOR EXCEPTIONS.

**Step One:** Align circuit card with slot and press firmly to seat module into connector.

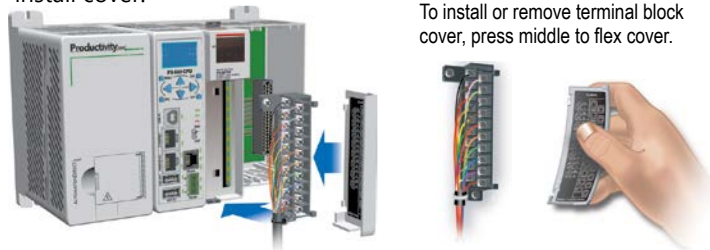


**Step Two:** Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



**Step Three:** Attach field wiring using optional terminal block or ZIPLink wiring system and install cover.

To install or remove terminal block cover, press middle to flex cover.



**WARNING:** EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT CONNECTORS OR OPERATE SWITCHES WHILE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS. DO NOT HOT-SWAP MODULES UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.