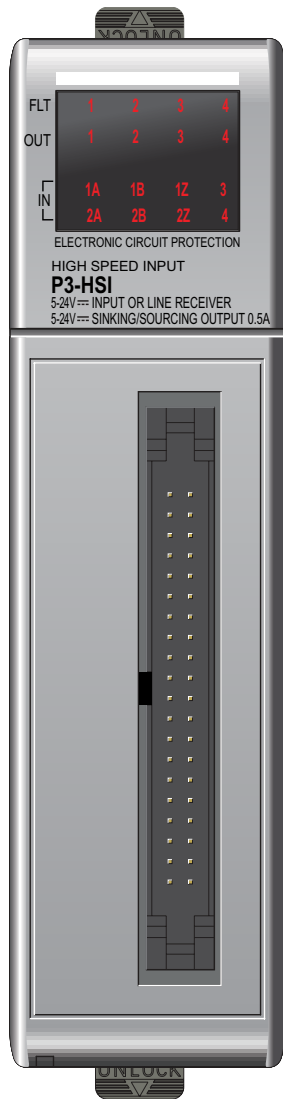


# Specialty Modules

## P3-HSI \$563.00

High-Speed Pulse Input The P3-HSI is a high-speed pulse (1MHz) input module that has both differential and single ended inputs. This module accepts Pulse/Direction and Quadrature signals on each of the two independent input channels. It also provides four general purpose high-speed inputs and four general purpose 5–24 VDC 0.5 amp, outputs.



No terminal block sold for this module; ZIPLink required.

General Specifications	
<b>Module Type</b>	Intelligent
<b>Modules per Base</b>	11 Max
<b>I/O Points Used</b>	None, mapped directly to tags in CPU
<b>Surrounding Air Temperature</b>	0°C–60°C (32°F–140°F)
<b>Storage Temperature</b>	-20°C–70°C (-4°F–158°F)
<b>Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	IEC60068-2-6 (Test Fc)
<b>Shock</b>	IEC60068-2-27 (Test Ea)
<b>Field to Logic Side Isolation</b>	1800VAC applied for 1s
<b>Insulation Resistance</b>	>10MΩ @ 500VDC
<b>Heat Dissipation</b>	5.76 W
<b>Enclosure Type</b>	Open equipment
<b>Emissions</b>	EN61000-6-4 (Conducted and radiated RF emissions)
<b>Module Keying to Backplane</b>	Electronic
<b>Module Location</b>	Any I/O slot in any local, expansion, or remote base in a Productivity3000 system.
<b>Field Wiring</b>	Use ZIPLink wiring system. See Wiring Solutions.
<b>Weight</b>	113.4 g (4oz)
<b>Agency Approvals</b>	UL508 file E157382, Canada & USA CE (EN61131-2*)

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

Power Specifications	
<b>External Power</b>	24VDC +10%/–15%, Class 2
<b>Maximum Voltage</b>	26.4 VDC
<b>Minimum Voltage</b>	20.4 VDC
<b>Current Consumption Excluding Outputs</b>	47mA
<b>Maximum Current Consumption Total of the 4 Status Outputs</b>	2A

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

See Wiring Solutions for part numbers of ZIPLink cables and connection modules required with this I/O module.



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

# Specialty Modules

## P3-HSI (cont'd)

Single Ended (5-24V) Input Specifications	
<b>Status Input</b>	Single ended inputs (8 pts: 1A, 1B, 1Z, 2A, 2B, 2Z, 3IN, 4IN)
<b>Isolation</b>	Each input is isolated from other circuits
<b>Input Volts Range</b>	5-24 VDC
<b>Input Volts Maximum</b>	±34 VDC, limited by protection
<b>Input Impedance</b>	1kΩ min., 5kΩ max.
<b>Inputs Rated Current</b>	5-24 VDC, 16mA 5.2 mA typ. @ 5VDC 22mA max. @ 34VDC
<b>Input Minimum ON Voltage</b>	4.5 VDC
<b>Input Maximum OFF Voltage</b>	2.0 VDC
<b>Input Minimum ON Current</b>	5.0 mA
<b>Input Maximum OFF Current</b>	1.4 mA
<b>OFF to ON Response Time</b>	1A, 1B, 2A, 2B: 0.48 μs 1Z, 2Z, 3IN, 4IN: 6μs
<b>ON to OFF Response Time</b>	1A, 1B, 2A, 2B: 0.48 μs 1Z, 2Z, 3IN, 4IN: 6μs
<b>Max. Input Frequency</b>	1A, 1B, 2A, 2B: 200kHz* 1Z, 2Z, 3IN, 4IN: 200kHz*

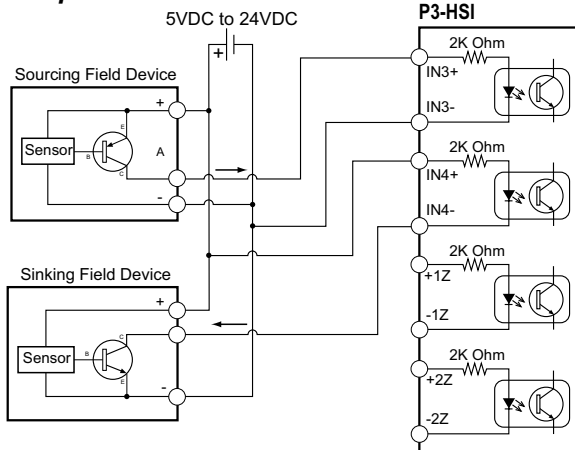
\* Inputs are not limited to this speed but single ended signals are not usually reliable above 200kHz due to cabling capacitance.

Status Output Specifications	
<b>Status Outputs</b>	4 Outputs
<b>Output Signal Type, per Output</b>	Current Sinking   Current Sourcing
<b>Operating Voltage<sup>1</sup></b>	5-24 VDC   5-24 VDC1
<b>Output Volts Maximum</b>	36VDC   26.4 VDC1
<b>Output Current Maximum</b>	500mA   500mA
<b>Overcurrent Protection</b>	Short circuit detect and current limit with automatic retry for each output
<b>Output Self Limiting Current</b>	1.2 to 2.4 amps
<b>Max. Inrush Current</b>	Self limited
<b>Output Voltage Drop</b>	0.7 VDC @ 0.5 A   0.7 VDC @ 0.5 A
<b>Thermal Protection</b>	Independent over-temperature protection each output
<b>Output Voltage Clamp During Inductive Switching</b>	+45VDC   -20VDC
<b>Maximum OFF to ON Response</b>	25ms <sup>2</sup>
<b>Maximum ON to OFF Response</b>	25ms <sup>2</sup>

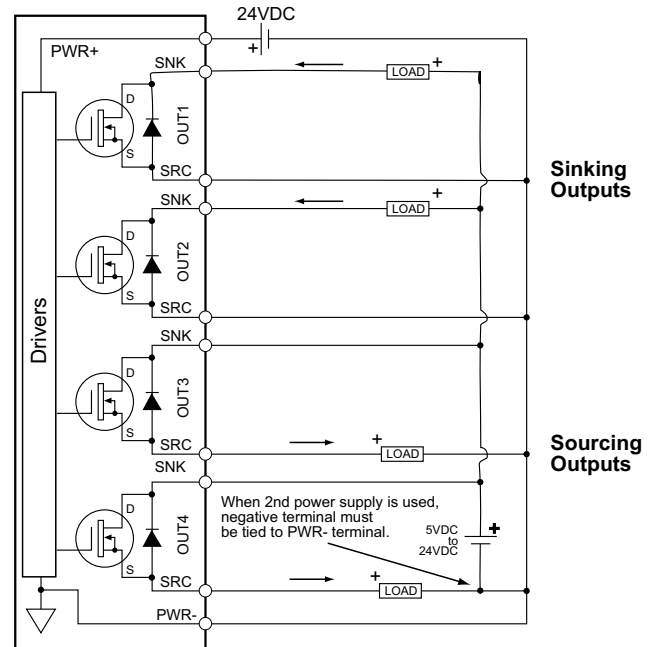
**Notes:**

1. Operating voltage of current sourcing outputs must be no greater than external power.
2. Measured at 5VDC operating voltage, 0.5 A load current.

### Status Inputs



### Status Outputs



Differential (5V) Input Specifications	
<b>Pulse Inputs</b>	Differential inputs (6 pts: 1A, 1B, 1Z, 2A, 2B, 2Z)
<b>Isolation</b>	Each input is isolated from other circuits
<b>Input Signal Type, per Channel Select</b>	Differential
<b>Input Volts</b>	5VDC
<b>Input Volts Maximum</b>	±5.6 VDC, limited by protection
<b>Input Impedance</b>	200Ω min., 500Ω max.
<b>Inputs Rated Current</b>	5VDC, 15mA (8mA typ., 15mA max.)
<b>Input Minimum ON Voltage</b>	3.0 VDC
<b>Input Maximum OFF Voltage</b>	1.0 VDC
<b>Input Minimum ON Current</b>	5.0 mA
<b>Input Maximum OFF Current</b>	2.0 mA
<b>OFF to ON Response Time</b>	1A, 1B, 2A, 2B: 0.48 μs 1Z, 2Z, 3IN, 4IN: 6μs
<b>ON to OFF Response Time</b>	1A, 1B, 2A, 2B: 0.48 μs 1Z, 2Z, 3IN, 4IN: 6μs
<b>Max. Input Frequency</b>	1A, 1B, 2A, 2B: 1MHz 1Z, 2Z, 3IN, 4IN: 300kHz*

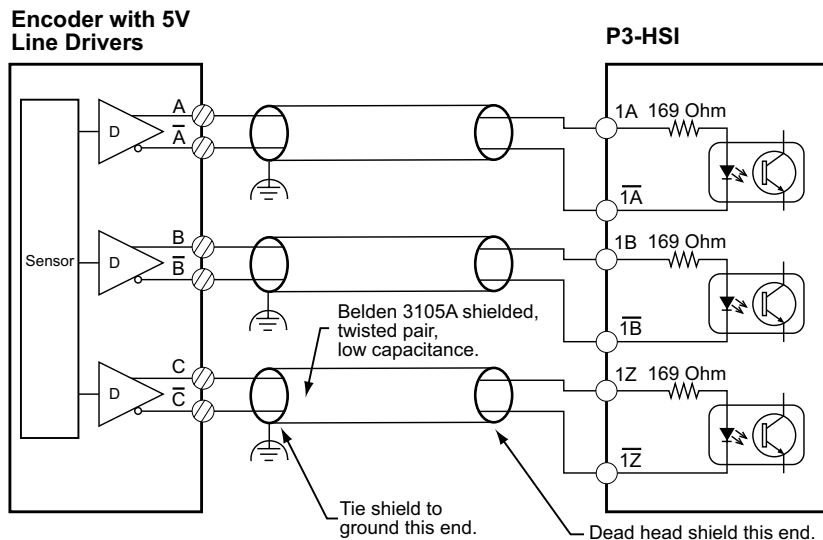
Note: The voltage difference between the input pairs must be between 3-5.6 volts.  
\* The Z pulse input (1Z & 2Z) is capable of capturing a 1 MHz wide pulse for the purpose of resetting an encoder count but a 3 microsecond pause (300kHz) is required between pulses.

# Specialty Modules

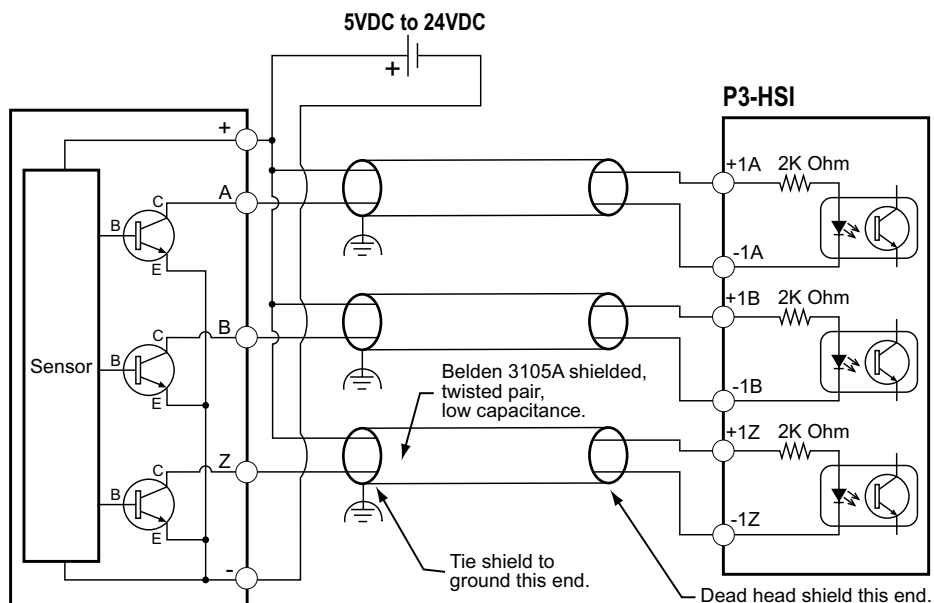
## P3-HSI (cont'd)

### 5V Encoder Inputs

To prevent damage to P3-HSI 5V inputs, do not exceed 6.8 V or 30mA on inputs 1A, 1A̅, 1B, 1B̅, 1Z, 1Z̅, 2A, 2A̅, 2B, 2B̅, 2Z, & 2Z̅.



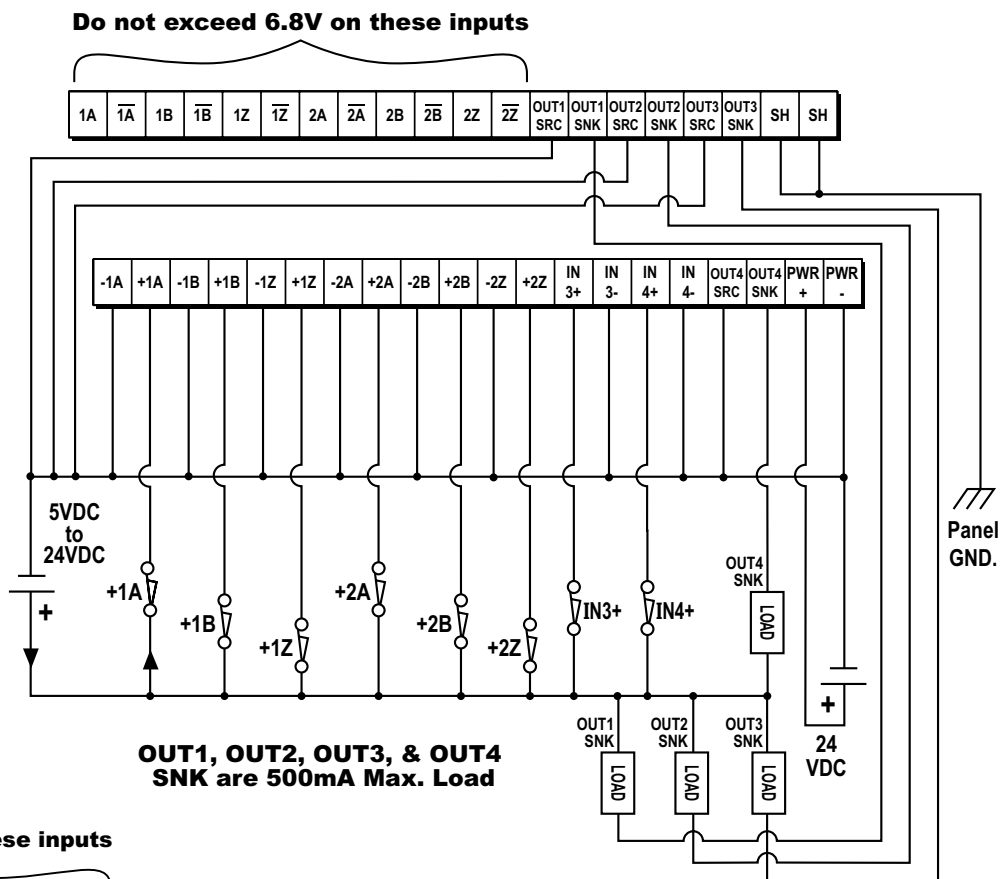
### 24V Encoder Inputs



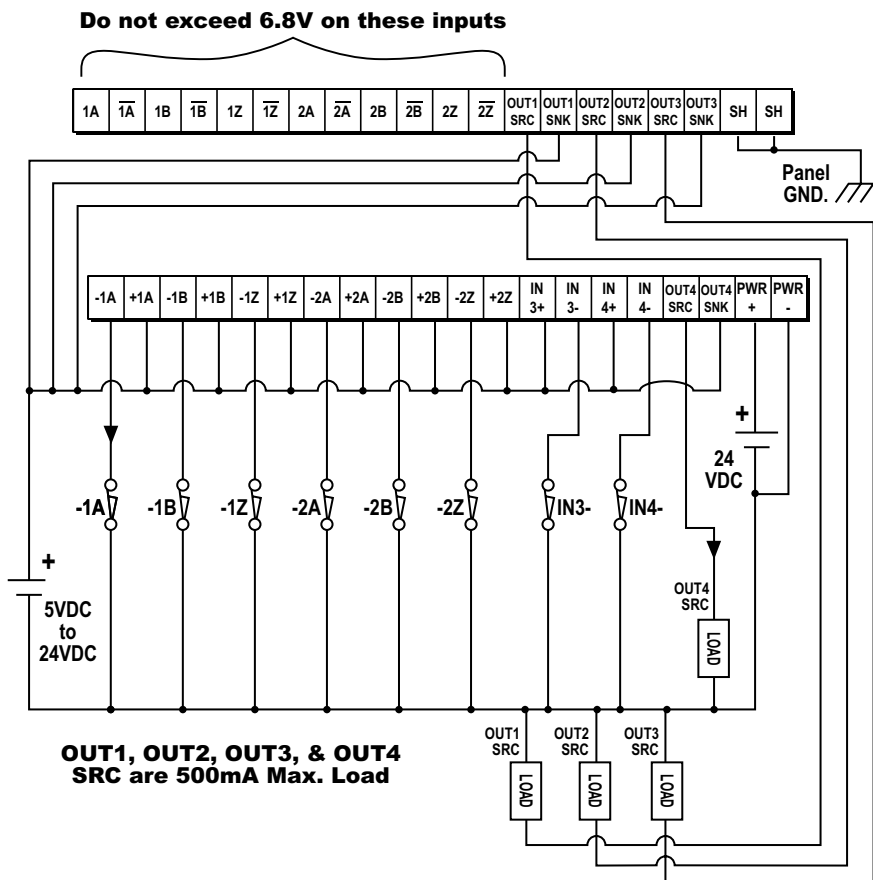
# Specialty Modules

## P3-HSI (cont'd)

### Sinking I/O Wiring Diagram



### Sourcing I/O Wiring Diagram



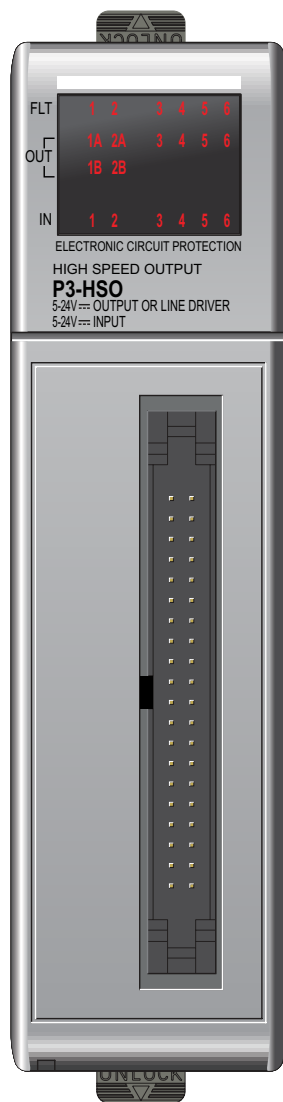
# Specialty Modules

## P3-HSO

\$587.00

### High-Speed Output

The P3-HSO is a high-speed pulse (1MHz) output module that supports Pulse/Direction, Up/Down and Quadrature pulse output on each of the two independent output channels. It has both line driver and open drain outputs. Additionally, it has six general purpose high-speed inputs and four general purpose outputs. Simple move, velocity move, and additional high level instructions make it easy to implement the application's motion profile.



No terminal block sold for this module; ZIPLink required.

General Specifications	
<b>Module Type</b>	Intelligent
<b>Modules per Base</b>	11 Max
<b>I/O Points Used</b>	None, mapped directly to tags in CPU
<b>Surrounding Air Temperature</b>	0°C–60°C (32°F–140°F)
<b>Storage Temperature</b>	-20°C–70°C (-4°F–158°F)
<b>Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	IEC60068-2-6 (Test Fc)
<b>Shock</b>	IEC60068-2-27 (Test Ea)
<b>Field to Logic Side Isolation</b>	1800VAC applied for 1s
<b>Insulation Resistance</b>	>10MΩ @ 500VDC
<b>Heat Dissipation</b>	6.26 W
<b>Enclosure Type</b>	Open equipment
<b>Emissions</b>	EN61000-6-4 (Conducted and radiated RF emissions)
<b>Module Keying to Backplane</b>	Electronic
<b>Module Location</b>	Any I/O slot in any local, expansion, or remote base in a Productivity3000 system.
<b>Field Wiring</b>	Use ZIPLink wiring system. See Wiring Solutions.
<b>Weight</b>	114g (4oz.)
<b>Agency Approvals</b>	UL508 file E157382, Canada & USA CE (EN61131-2*)

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

Power Specifications	
<b>External Power</b>	24VDC +10%/-15%, Class 2
<b>Maximum Voltage</b>	26.4 VDC
<b>Minimum Voltage</b>	20.4 VDC
<b>Current Consumption Excluding Outputs</b>	130mA
<b>Maximum Current Consumption Total of the 4 Status Outputs</b>	2A

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

See Wiring Solutions for part numbers of ZIPLink cables and connection modules required with this I/O module.



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

# Specialty Modules

## P3-HSO (cont'd)

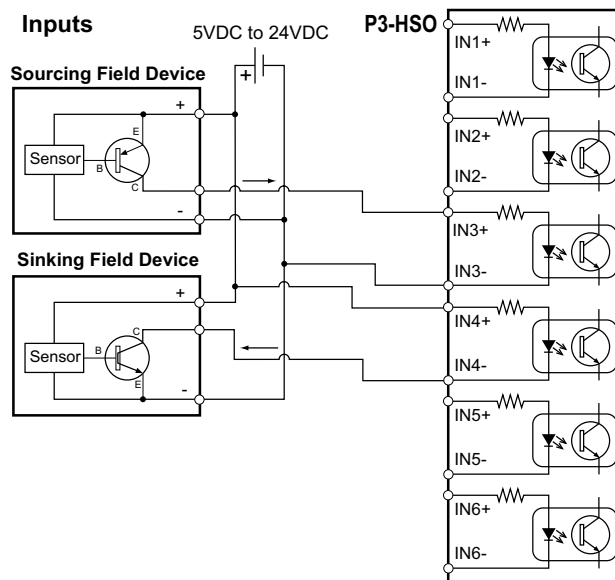
Status Input Specifications	
Status Input	6 inputs
Isolation	Each status input is individually isolated from all other circuits
Input Volts Range	5-24 VDC
Input Volts Maximum	± 34VDC, limited by protection
Input Impedance	1kΩ min., 5kΩ max.
Inputs Rated Current	5-24 VDC, 16mA 5.2 mA typ. @ 5VDC 22mA max. @ 34VDC
Input Minimum ON Voltage	4.5 VDC
Input Maximum OFF Voltage	2.0 VDC
Input Minimum ON Current	5.0 mA
Input Maximum OFF Current	1.4 mA
OFF to ON Response Time	4ms
ON to OFF Response Time	4ms

Status Output Specifications		
Status Outputs	4 Outputs	
Output Signal Type, per Output	Current Sinking	Current Sourcing
Operating Voltage <sup>1</sup>	5-24 VDC	5-24 VDC <sup>1</sup>
Output Volts Maximum	36VDC	26.4 VDC <sup>1</sup>
Output Current Maximum	500mA	500mA
Overcurrent Protection	Short circuit detect, overcurrent shutdown <sup>1</sup>	
Output Self Limiting Current	1.2 to 2.4 amps	
Max. Inrush Current	Self limited	
Output Voltage Drop	0.7 VDC @ 0.5 A	0.7 VDC @ 0.5 A
Thermal Protection	Independent overtemperature protection each output	
Overtemperature Shutdown	155° to 185°C (311° to 365°F)	
Temperature Shutdown Hysteresis	5° to 15°C (41° to 59°F)	
Output Voltage Clamp During Inductive Switching	+45VDC	-20VDC
Maximum OFF to ON Response	25ms <sup>2</sup>	
Maximum ON to OFF Response	25ms <sup>2</sup>	

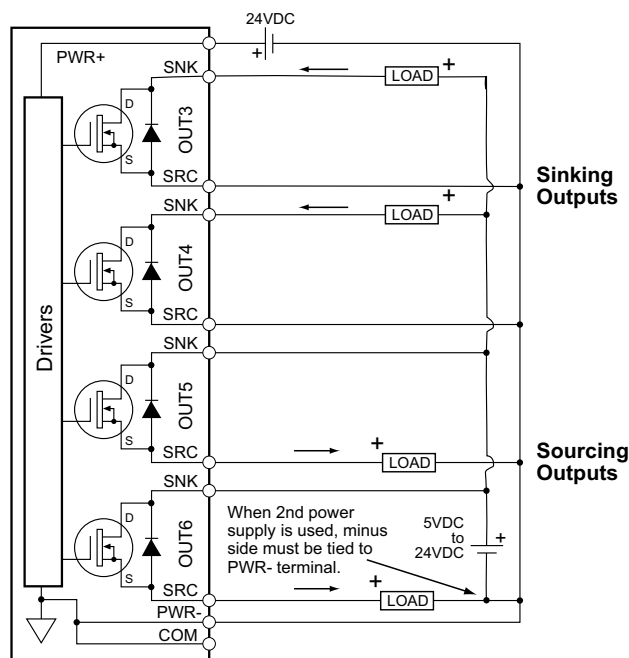
- Notes:
- Any fault shuts off the output. Fault is indicated and output is kept off until a new move start is received.
  - Operating voltage for current sourcing outputs must be less or equal to the external power.
  - Measured at 5VDC operating voltage, 0.5 A load.

Pulse Outputs Specifications		
Pulse Outputs	2 Channels	
Output Pulse Type, per Channel Select	Selectable for pulse & direction, up/down or quadrature	
Output Signal Type, per Channel Select	RS-422 Line Driver Current Sinking and Sourcing	Open Drain FET Outputs Current Sinking
Output Volts	RS-422 levels	24VDC
Output Volts Maximum	5VDC	36VDC
Protection for Overcurrent and Short Circuit to Power	Current limit and Thermal shutdown <sup>2</sup>	Current limit and Thermal shutdown <sup>1</sup>
Protection Short to Ground	Yes	Yes
Overcurrent Trip Level	Output current limit ±200mA max.2	100mA minimum
Maximum Continuous Output Current	±60mA	40mA
Max Switching Frequency, 1m Cable	1MHz	500kHz*
Max Switching Frequency, 10m Cable	1MHz	200kHz*

Status Inputs



Status Outputs



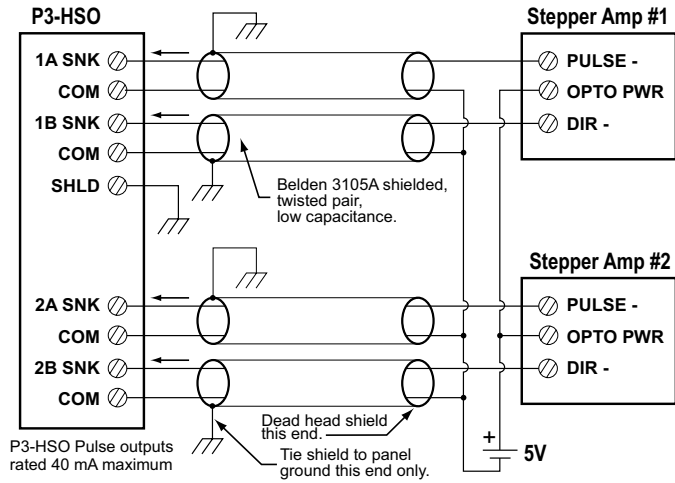
- Notes:
- Any fault shuts off the output. Fault is indicated and output is kept off until a new move start is received.
  - RS-422 thermal faults auto reset after device cool down.

\* Outputs are not limited to these speeds but single ended signals produced by the FETs are not usually reliable above these speeds due to cabling capacitance.

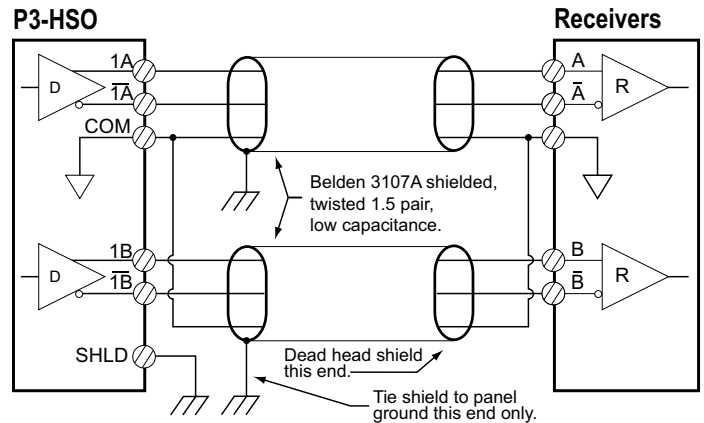
# Specialty Modules

## P3-HSO (cont'd)

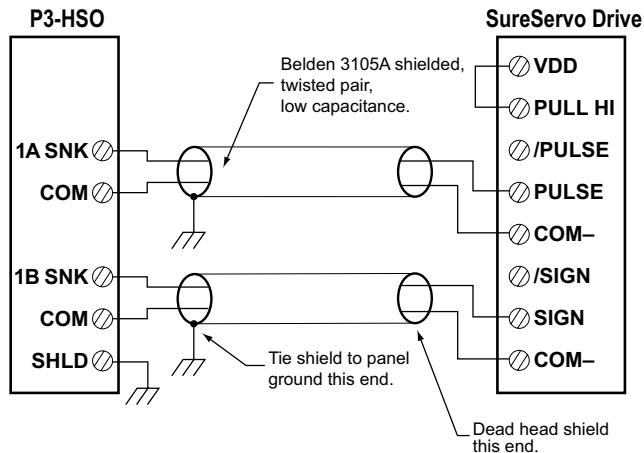
### Sinking Pulse Outputs



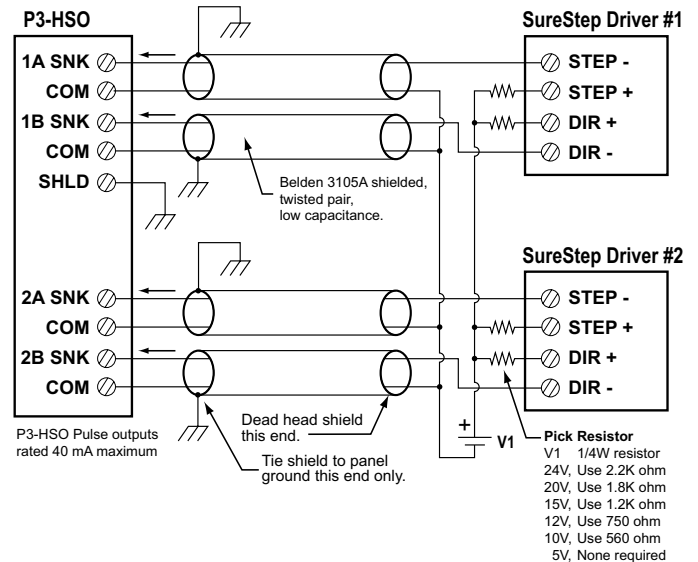
### Line Driver Pulse Outputs



### SureServo Wiring Diagram



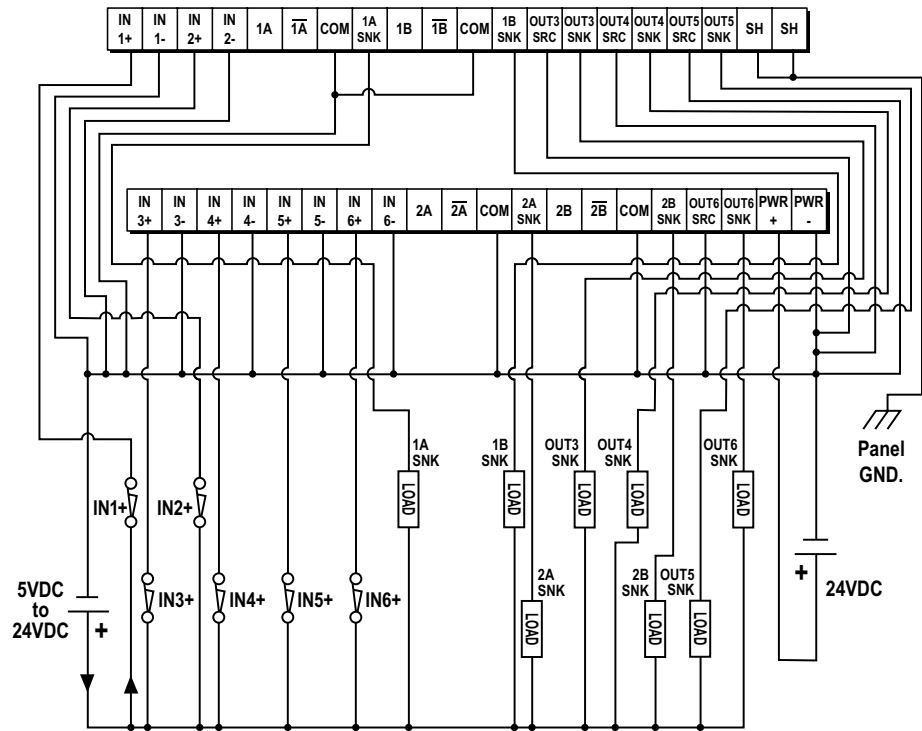
### SureStep Wiring Diagram



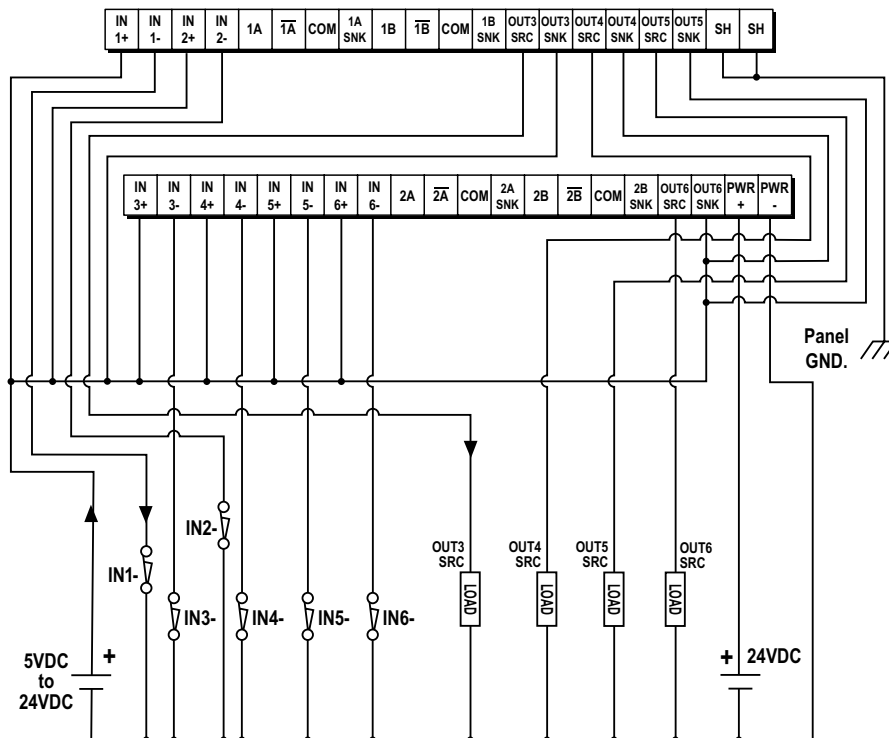
# Specialty Modules

## P3-HSO (cont'd)

### Sinking I/O Wiring Diagram



### Sourcing I/O Wiring Diagram





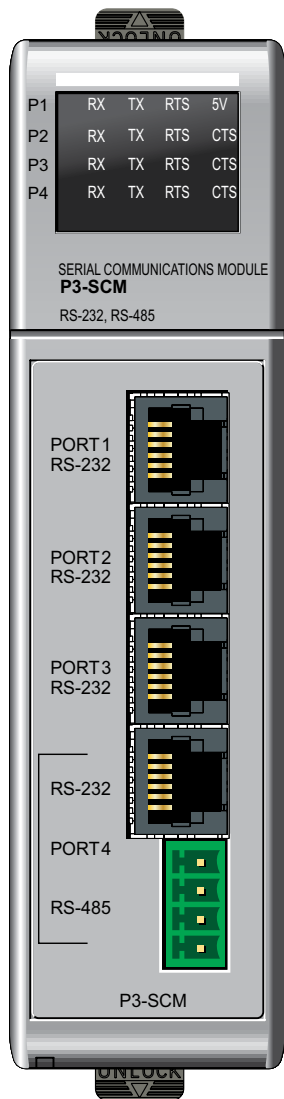
# Specialty Modules

## 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.

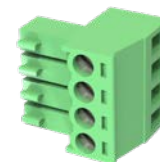


General Specifications	
<b>Module Type</b>	Intelligent
<b>Modules per Base</b>	Base size limited, 11 Max
<b>Modules per Group</b>	11 Max
<b>I/O Points Used</b>	None, mapped directly to tags in CPU
<b>Field Wiring Connector</b>	4 - RJ12, 1 - 4 Position Terminal Block
<b>Operating Temperature</b>	0°C–60°C (32°F–140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
<b>Storage Temperature</b>	-20°C–70°C (-4°F–158°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
<b>Humidity</b>	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
<b>Environmental Air</b>	No corrosive gases permitted (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 IEC 61000-4-2 (ESD) Impulse 1000V @ 1µS pulse IEC 61000-4-4 (FTB) RFI, (145MHz, 440MHz 5W @ 15cm) 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 CE (EN61131-2007)

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 Solid/Stranded Conductor *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.

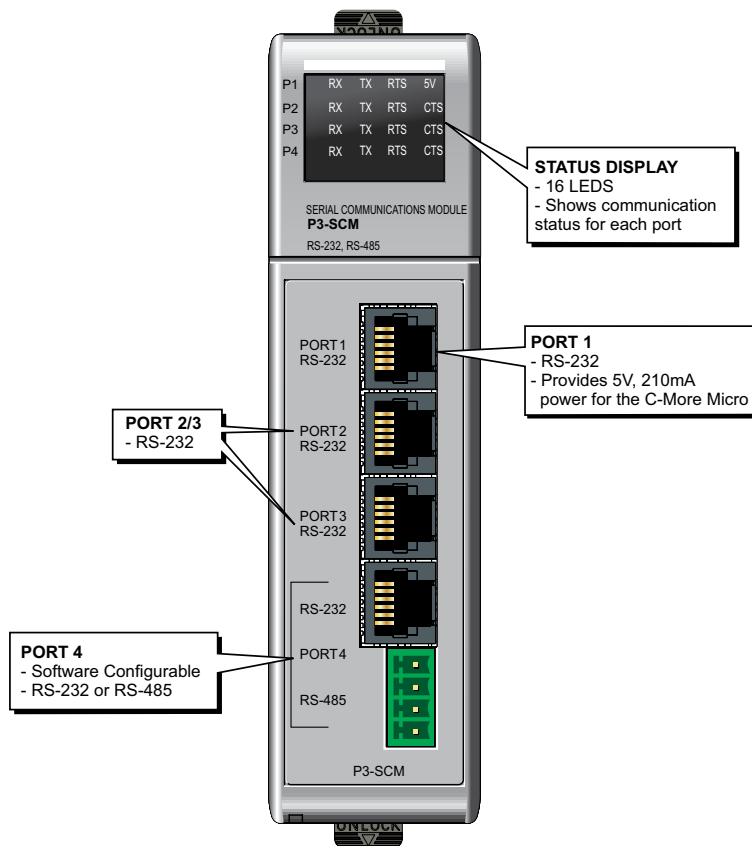
# Specialty Modules

## 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			

- All RS232 & RS485 LEDs reflect the actual electrical level of the signal, there is no direct firmware control of LEDs
- RS232 LEDs RXD, TXD, RTS & CTS are turned ON when their voltage on the RS232 wire is positive.
  - This occurs when the UART I/O signal is low (GND)
  - They are turned OFF when the voltage on the RS232 wire is negative
- RS485 LEDs RXD, TXD, RTS & CTS are turned ON when the UART I/O signal is low (GND)
- 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 Input3	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

- 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
- Only applies to MODBUS messages
- CTS signal is only provided on Ports 2, 3 & 4
- 7-bit data is only supported with Odd or Even parity

# Specialty Modules

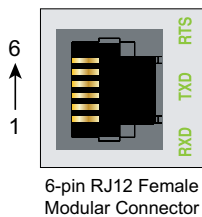
## P3-SCM (cont'd)

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

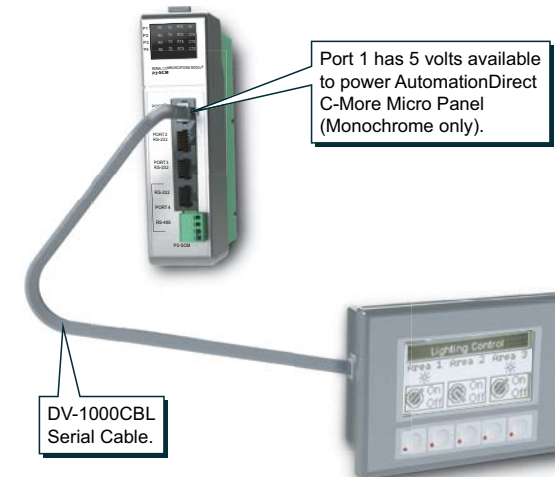
Ports 2, 3 and 4 RS-232 Specifications	
<b>Port Name</b>	<b>RS-232</b>
<b>Description</b>	Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection.
<b>Data Rates</b>	Selectable, 1200, 2400, 4800, 9600, 19200, 33600 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
<b>Output ON (3k<math>\Omega</math>, 1000pF Load)</b>	5.0	5.2		Volts
<b>Output OFF (3k<math>\Omega</math>, 1000pF Load)</b>		-5.2	-5.0	Volts
<b>Output Short-Circuit Current</b>		15		mA
<b>Short-Circuit Duration</b>			No Limit	Seconds
<b>Output Resistance</b>	300			Ohm
<b>Input ON Threshold</b>		1.6	2.4	Volts
<b>Input OFF Threshold</b>	0.6	1.2		Volts
<b>Input Resistance</b>	3k	5k	7k	Ohm

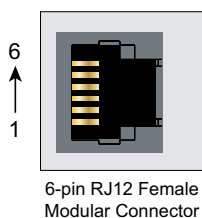
### Port 1



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 Setting1</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 duplex2	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>	19kΩ
<b>Maximum load</b>	50 transceivers, 19kΩ each, 60Ω termination (two 120Ω resistors at each end)
<b>Output Short-Circuit Protection</b>	±250mA, thermal shut-down protection
<b>Electrostatic Discharge Protection</b>	±8kΩ per IEC1000-4-2
<b>Electrical Fast Transient Protection</b>	±2kΩ per IEC1000-4-4
<b>Minimum Differential Output Voltage</b>	1.5 V with 60Ω 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 (60Ω 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>	+/-2	%
<b>Data Bits Setting1</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	N/A

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



Install Jumper between 'T' and '+' to terminate network node.

\* Jumper not included