

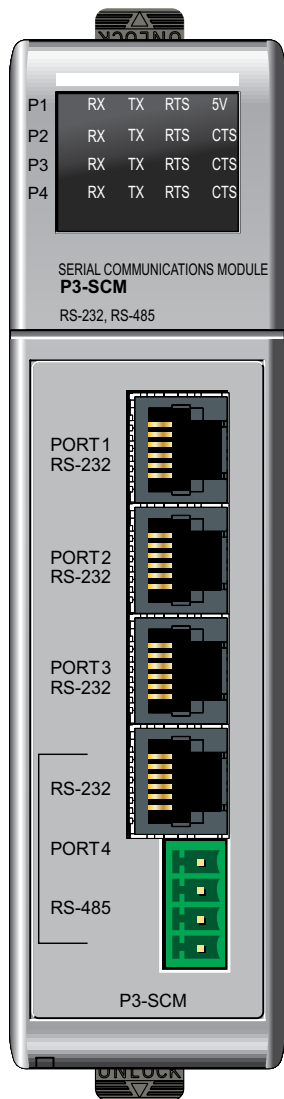
# Specialty Modules

## 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.

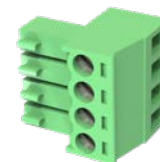


General Specifications	
<b>Module Type</b>	Intelligent
<b>Modules per Base</b>	Base size limited, 11 Max
<b>Modules per Group</b>	11 Max
<b>I/O Points Used</b>	None, mapped directly to tags in CPU
<b>Field Wiring Connector</b>	4 - RJ12, 1 - 4 Position Terminal Block
<b>Operating Temperature</b>	0°C–60°C (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.

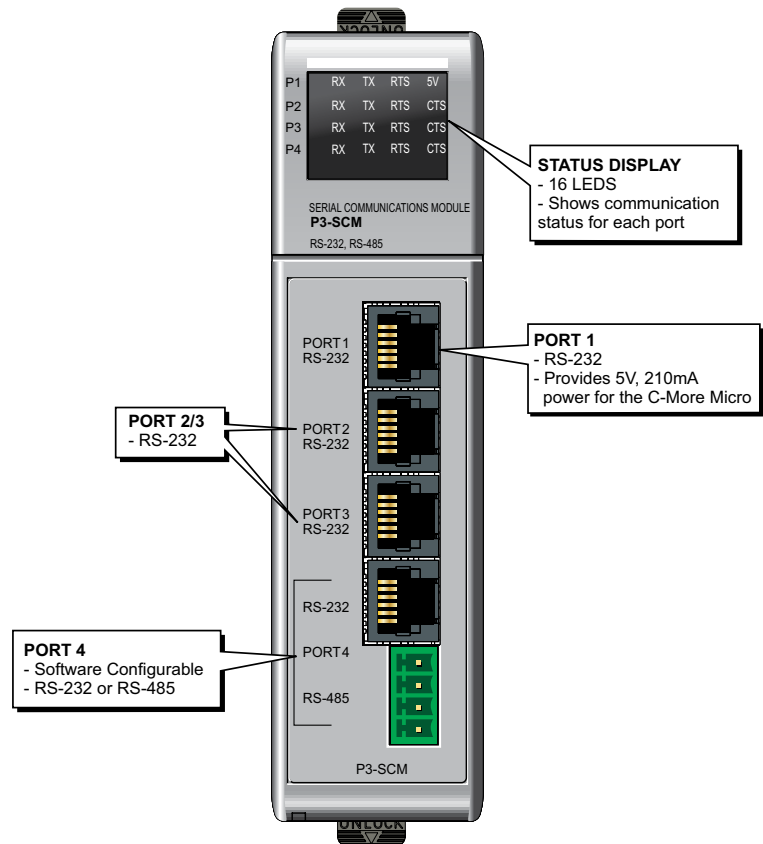
# Specialty Modules

## 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

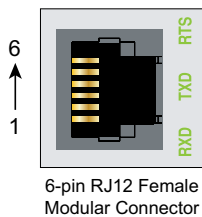
## P3-SCM (cont'd)

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

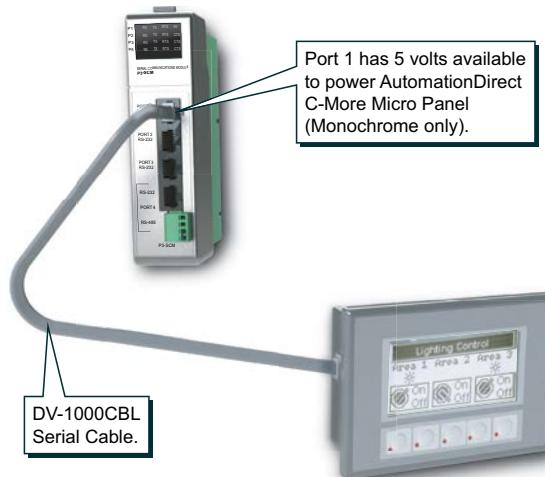
Ports 2, 3 and 4 RS-232 Specifications	
<b>Port Name</b>	<b>RS-232</b>
<b>Description</b>	Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection.
<b>Data Rates</b>	Selectable, 1200, 2400, 4800, 9600, 19200, 33600 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

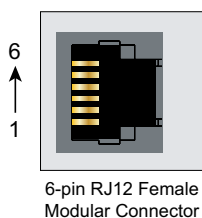
### Port 1



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

# 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	\$197.00
P3-08ND3S	8	Isolated Sinking/Sourcing DC Input	\$99.00
P3-16ND3	16	Sinking/Sourcing DC Input	\$152.00
P3-32ND3	32	Sinking/Sourcing DC Input	\$208.00
P3-64ND3	64	Sinking/Sourcing DC Input	\$260.00
P3-08NAS	8	Isolated AC Input	\$126.00
P3-16NA	16	AC Input	\$159.00

\*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

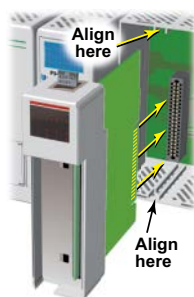
\*ZIPLink required.

## Discrete Output Modules

Productivity3000 Discrete Output Modules			
Part Number	Number of Outputs	Description	Price
P3-08TD1S	8	Isolated Sinking Output	\$135.00
P3-08TD2S	8	Isolated Sourcing Output	\$141.00
P3-16TD1	16	Sinking Output	\$162.00
P3-16TD2	16	Sourcing Output	\$167.00
P3-32TD1*	32	Sinking Output	\$208.00
P3-32TD2*	32	Sourcing Output	\$208.00
P3-64TD1*	*64	Sinking Output	\$280.00
P3-64TD2*	*64	Sourcing Output	\$265.00
P3-08TAS	8	Isolated AC Output	\$177.00
P3-16TA	16	AC Output	\$210.00
P3-08TRS	8	Isolated Relay Output	\$159.00
P3-08TRS-1	8	Isolated Relay Output	\$194.00
P3-16TR	16	Relay Output	\$177.00

\*ZIPLink required.

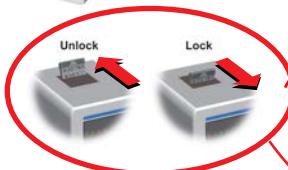
## Module Installation Procedure



**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.

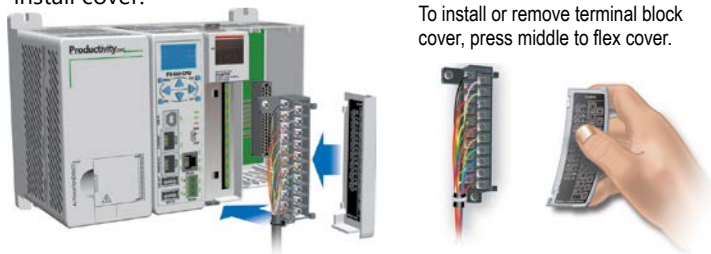
**Step Two:** Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.



**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.