

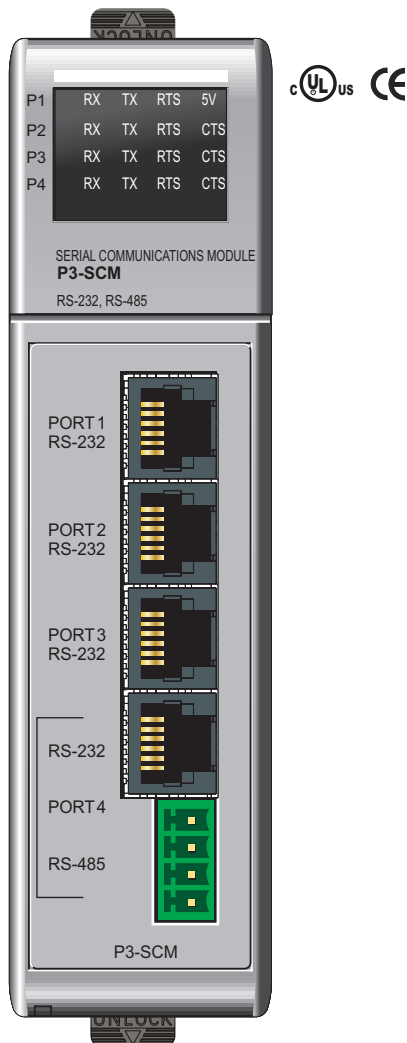
Specialty Modules

P3-SCM

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

Module Type	Intelligent
Modules per Base	Base size limited, 11 Max
Modules per Group	11 Max
I/O Points Used	None, mapped directly to tags in CPU
Field Wiring Connector	4 - RJ12, 1 - 4 Position Terminal Block
Operating Temperature	0° to 60°C (32° to 140°F) IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-20° to 70°C (-4° to 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)
Humidity	5 to 95% (non-condensing) IEC 60068-2-30 (Test Db, Damp Heat)
Environmental Air	No corrosive gases permitted (EN61131-2 pollution degree 1)
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	None
Insulation Resistance	No Isolation
Noise Immunity	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)
Emissions	EN61000-6-4 (Conducted and radiated RF emissions)
Module Location	Any I/O slot in any local, expansion, or remote base in a Productivity3000 System.
Weight	260g (9.17 oz)
Agency Approvals ¹	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

Number of Positions	4 Screw Terminals, 3.5 mm Pitch
Wire Range	16-28 AWG Solid/Stranded Conductor "Use Copper Conductors, 75°C or Equivalent"
Screwdriver Size	TW-SD-VSL-1 (recommended)
Screw Torque	0.4 N·m

Removable Terminal Connector included.
Spare connectors available
(part no. P3-RS485CON-1).



RS-485 Cable Options

Recommended	Recommend L19827-100, L19827-500, L19827-1000 or Belden #9841
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CPU	Firmware Required	Productivity Suite Required
P3-530	Version 1.1.15.x or later	Version 1.10.x.x or later
P3-550		

Specialty Modules

P3-SCM (cont'd)

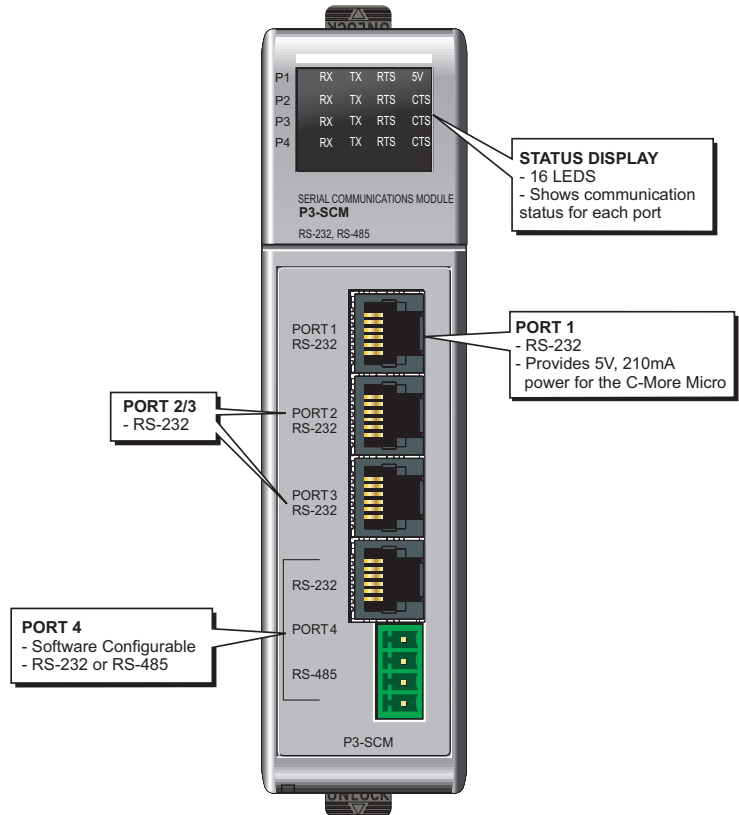
Diagnostic LEDs

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

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 and 38400.
+5V Cable Power Source	210mA maximum at 5V, $\pm 5\%$. Reverse polarity and overload protected.
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS	Handshaking output for flow control.
GND	Logic ground
Maximum Output Load (TXD/RTS)	3k Ω , 1,000pf
Minimum Output Voltage Swing	$\pm 5V$
Output Short Circuit Protection	$\pm 15mA$
Port Status LED	Red LED is illuminated when active for TXD, RXD, RTS

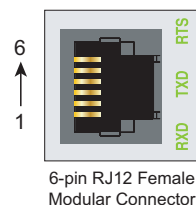
Ports 2, 3 and 4 RS-232 Specifications

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 and 38400.
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS	Handshaking output for flow control.
CTS	Handshaking input for flow control.
GND	Logic ground
Maximum Output Load (TXD/RTS)	3k Ω , 1,000pf
Minimum Output Voltage Swing	$\pm 5V$
Output Short Circuit Protection	$\pm 15mA$
Port Status LED	Red LED is illuminated when active for TXD, RXD, RTS

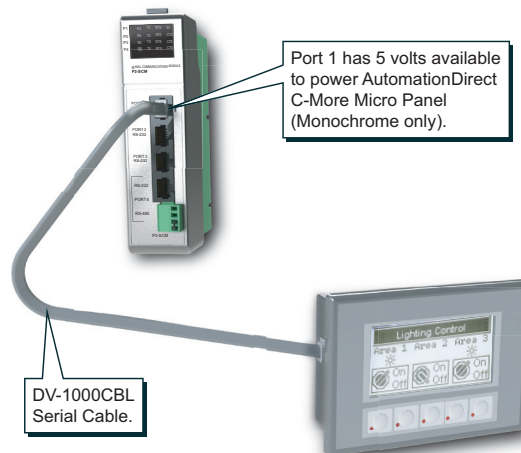
RS-232 Ports 1, 2, 3 and 4

Electrical Specifications	Min	Typ	Max	Units
Output ON (3k Ω , 1000pF Load)	5.0	5.2		Volts
Output OFF (3k Ω , 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

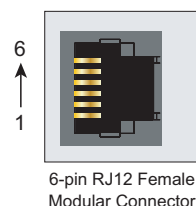
Port 1



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
Data Rate Setting	1200,2400,4800,9600,19200,33600, & 38400	baud
Data Rate Error	± 2	%
Data Bits Setting ¹	7 or 8	Bits
Stop Bits Setting	1	Bits
Parity Setting	None ¹ , Odd or Even	Parity
Data Transmission	Half duplex or Full duplex ²	N/A
Network	Point-to-Point	N/A

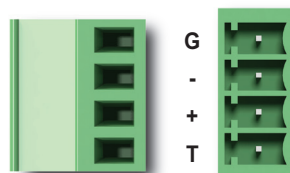
1. 7-bit data are only supported with odd or even parity
 2. Full duplex is only supported for ASCII/Custom Protocol

Specialty Modules

P3-SCM (cont'd)

Port 4 (RS-485 Configuration)	
Port Name	RS-485
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 and 38400
TXD+/RXD+	RS-485 transceiver high
TXD-/RXD-	RS-485 transceiver low
GND	Logic ground
Input Impedance	19k Ω
Maximum load	50 transceivers, 19k Ω each, 60 Ω termination (two 120 Ω resistors at each end)
Output Short-Circuit Protection	± 250 mA, thermal shut-down protection
Electrostatic Discharge Protection	± 8 kV per IEC1000-4-2
Electrical Fast Transient Protection	± 2 kV per IEC1000-4-4
Minimum Differential Output Voltage	1.5 V with 60 Ω 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	Red LED illuminated when active for TXD and RXD
Cable Options	Recommend L19827-100, L19827-500, L19827-1000 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
Driver Differential Output (60 Ω load)	1.5			Volts
Driver Common-Mode Output			3	Volts
Driver Short-Circuit Output Current			250	mA
Short-Circuit Duration (Thermal Shutdown)			No Limit	Seconds
Receiver Differential Input Threshold	200			mV
Receiver Common-Mode Input	-7.5		12.5	Volts
Input Resistance	12k			Ohm
Termination Resistance (TB jumper wire 'T' to '+')		120		Ohm
Cable Length (38400 baud max.)			1200	Meters

Line Specifications for RS-485 Port		
RS-485 Line Specifications	Options	Units
Data Rate Setting	1200,2400,4800,9600,19200, 33600, & 38400	baud
Data Rate Error	$\pm 1-2$	%
Data Bits Setting ¹	7 or 8	Bits
Stop Bits Setting	1	Bits
Parity Setting	None ¹ , Odd or Even	Parity
Data Transmission	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	
P3-08ND3S	8	Isolated Sinking/Sourcing DC Input	
P3-16ND3	16	Sinking/Sourcing DC Input	
P3-32ND3*	32	Sinking/Sourcing DC Input	
P3-64ND3*	64	Sinking/Sourcing DC Input	
P3-08NAS	8	Isolated AC Input	
P3-16NA	16	AC Input	

* ZIPLink required.

Analog I/O Modules

Productivity3000 Analog Input Modules			
Part Number	Number of Channels	Description	Price
P3-04ADS	4	Isolated Analog Input	
P3-08AD	8	Analog Input	
P3-16AD-1	16	Analog Input (Current)	
P3-16AD-2	16	Analog Input (Voltage)	
P3-08RTD	8	Analog RTD Input	
P3-08THM	8	Analog Thermocouple Input	

Productivity3000 Analog Output Modules			
Part Number	Number of Channels	Description	Price
P3-04DA	4	Analog Output	
P3-08DA-1	8	Analog Output (Current)	
P3-08DA-2	8	Analog Output (Voltage)	
P3-06DAS-1	6	Isolated Analog Output (Current)	
P3-06DAS-2	6	Isolated Analog Output (Voltage)	
P3-16DA-1	16	Analog Output (Current)	
P3-16DA-2	16	Analog Output (Voltage)	

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

Specialty Modules

Productivity3000 Specialty Modules			
Part Number	Number of Channels	Description	Price
P3-HSI*	2	High-Speed Input	
P3-HSO*	2	High-Speed Output	
P3-SCM	4 ports	Serial Communications Module	

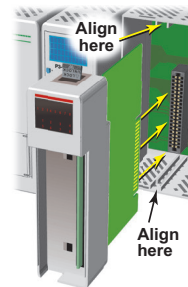
* ZIPLink required.

Discrete Output Modules

Productivity3000 Discrete Output Modules			
Part Number	Number of Outputs	Description	Price
P3-08TD1S	8	Isolated Sinking Output	
P3-08TD2S	8	Isolated Sourcing Output	
P3-16TD1	16	Sinking Output	
P3-16TD2	16	Sourcing Output	
P3-32TD1*	32	Sinking Output	
P3-32TD2*	32	Sourcing Output	
P3-64TD1*	64	Sinking Output	
P3-64TD2*	64	Sourcing Output	
P3-08TAS	8	Isolated AC Output	
P3-16TA	16	AC Output	
P3-08TRS	8	Isolated Relay Output	
P3-16TR	16	Relay Output	
P3-08TRS-1	8	Isolated Relay Output	
P3-16TD3P*	16	Sinking/Sourcing Protected Output	

* ZIPLink required.

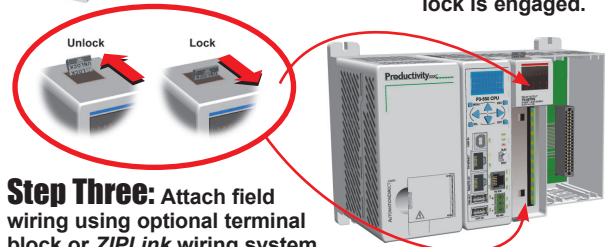
Module Installation Procedure



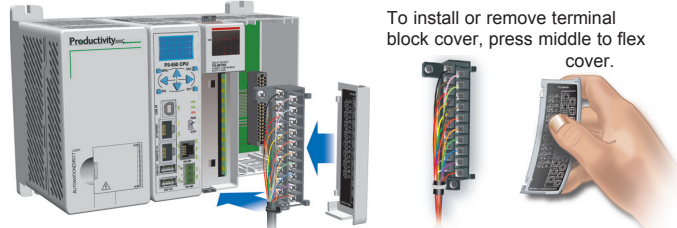
WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

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.



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.