General Specifications
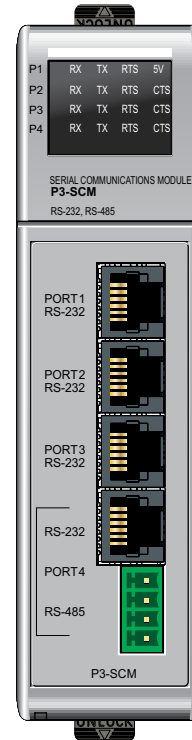
Module Type	Intelligent
Modules per Base	Base size limited, 11 Max
Modules per Group	11 Max
I/O Points Used	None, mapped directly to tags in PAC
Field Wiring Connector	4 - RJ12, 1 - 4 Position Terminal Block
Operating Temperature	0° to 60°C (32° to 140°F)
	IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage 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)
Agency Approvals	UL508 file E157382, Canada & USA
	CE (EN61131-2007)
Module Location	Any slot in any local, expansion or remote base in a Productivity3000 System
Weight	260g (9oz)

Document Name	Edition/Revision	Date
P3-SCM-M	1st Edition/Rev. E	3/1/2019

# AUTOMATIONDIRECT

Productivity3000

P3-SCM

The P3-SCM is a serial communications module capable of Modbus, ASCII, and Custom Communication Protocols and able to power the C-More Micro through RS-232 (Port 1 only) for use with the Productivity3000 Programmable Automation Controller.

Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.automationdirect.com/P3000 for details).
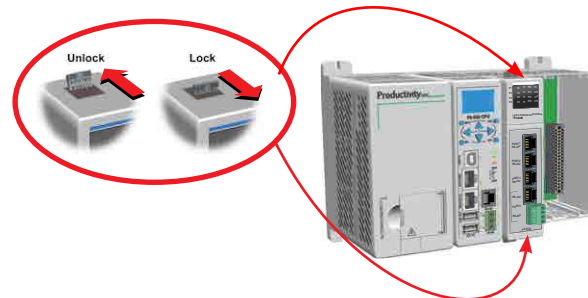
P3-SCM Front Panel
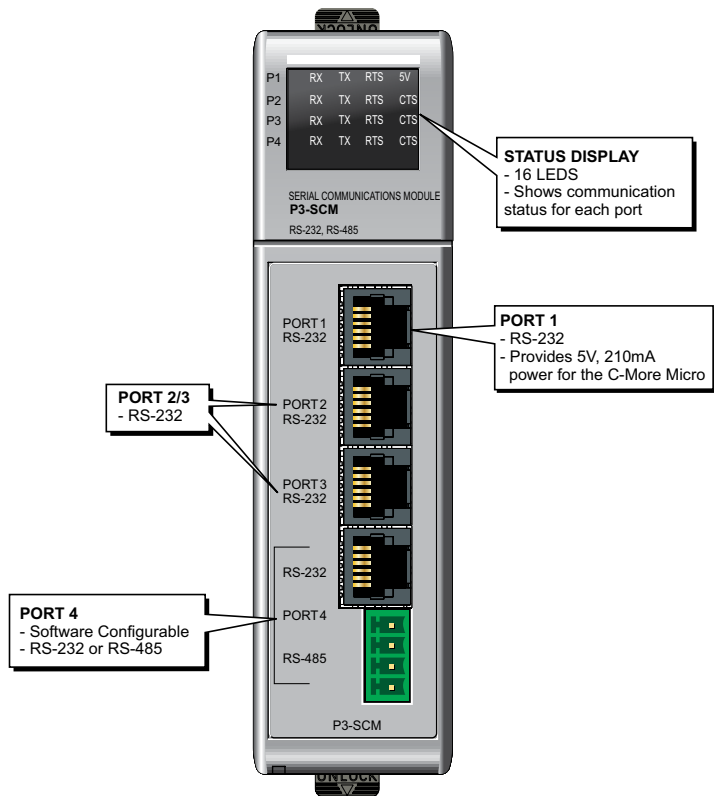
Module Installation Procedure

WARNING: Do not apply field power until the following steps are completed.

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.

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.

P1	RX	TX	RTS	5V
P2	RX	TX	RTS	CTS
P3	RX	TX	RTS	CTS
P4	RX	TX	RTS	CTS

SERIAL COMMUNICATIONS MODULE
P3-SCM
RS-232, RS-485

STATUS DISPLAY
- 16 LEDS
- Shows communication status for each port

PORT1
RS-232

PORT 1
- RS-232
- Provides 5V, 210mA power for the C-More Micro

PORT 2/3
- RS-232

PORT2
RS-232

PORT3
RS-232

RS-232

PORT4

PORT 4
- Software Configurable
- RS-232 or RS-485

RS-485

P3-SCM

P3-SCM Port 1 Powers C-More Micro

Port 1 has 5 volts available to power AutomationDirect C-More Micro Panel (Monochrome only).
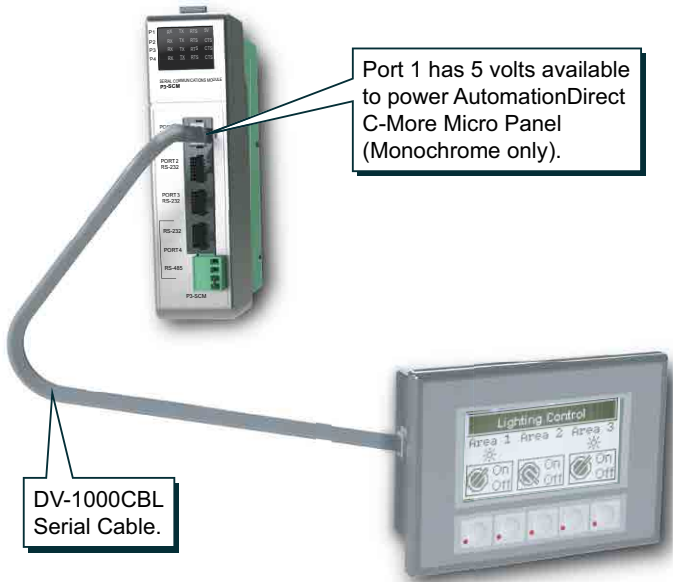
DV-1000CBL Serial Cable.

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	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 are only supported with Odd or Even parity

Port Specifications

RS-232 Ports 1, 2, 3, & 4

Electrical Specifications	Min	Typ	Max	Units
Output ON, Space Condition (3kΩ, 1000pF Load)	5.0	5.2		Volts
Output OFF, Mark Condition (3kΩ, 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	Volt
Input OFF Threshold	0.6	1.2		Volt
Input Resistance	3k	5k	7k	Ohm

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]	
Network	Point-to-Point	

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

Port Specifications

Port 1 RS-232 Configuration

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, +/- 5%. Reverse polarity and over-load 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)	3kΩ, 1,000pf
Minimum Output Voltage Swing	+/-5V
Output Short Circuit Protection	+/-15mA
Port Status LED	Red LED is illuminated when active for TXD, RXD and RTS

Port 2, 3 and 4 (RS-232 Configuration)

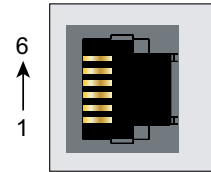| Port Name	RS-232
Description	Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection.
Data Rates	Selectable,1200, 2400, 4800, 9600, 19200, 33600, and 38400.
TXD	RS-232 Transmit output
RXD	RS-232 Receive input
RTS	Handshaking output for flow control.
CTS	Handshaking input for flow control.
GND	Logic ground
Maximum Output Load (TXD/RTS)	3kΩ, 1,000pf
Minimum Output Voltage Swing	+/-5V
Output Short Circuit Protection	+/-15mA
Port Status LED	Red LED is illuminated when active for TXD, RXD and RTS

6
↑
1

6-pin RJ12 Female Modular Connector

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

6
↑
1

6-pin RJ12 Female Modular Connector

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

RS-485 Port 4

Electrical Specifications	Min	Typ	Max	Units
Driver Differential Output (60Ω 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	
Input Resistance	12k			Ohm
Termination Resistance (TB jumper wire 'T' to '+')		120		Ohm
Cable Length (38400 BAUD max.)			1200	Meter

Line Specifications for RS-485 Port 4

RS-485 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	

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

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

* Jumper not included

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, 38400
TXD+/RXD+	RS-485 transceiver high
TXD-/RXD-	RS-485 transceiver low
GND	Logic ground
Input Impedance	19kΩ
Maximum load	50 transceivers, 19KΩ each, 60Ω termination (2 120Ω Resistors @ each end)
Output Short Circuit Protection	+/- 250mA, thermal shut-down protection
Electrostatic Discharge Protection	+/-8KV per IEC1000-4-2
Electrical Fast Transient Protection	+/-2KV per IEC1000-4-4.
Minimum Differential Output Voltage	1.5V with 60Ω load
Fail safe inputs	Logic high input state if inputs are unconnected
Maximum Common Mode Voltage	-7.5V to 12.5V.
Port Status LED	Red LED illuminated when active for TXD and RXD
Cable Options	Recommend L19827-100, L19827-500, L19827-1000 or Belden #9841

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

G
-
+
T

Port 4 LED Behavior

Port 4	RX	TX	RTS	CTS
RS232	1	2	3	3
RS485	1	2	3	4

1 - Flickers on RXD activity, OFF when idle
2 - Flickers on TXD activity, OFF when idle
3 - ON when asserted, OFF otherwise
4 - Always OFF

Removable Terminal Block Specifications

Number of Positions	4 Screw Terminals, 3.5MM 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. PCON-KIT).

RS-485 Cable Options

Recommended	Recommend L19827-100, L19827-500, L19827-1000 or Belden #9841

WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

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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 postive (MARK)
    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 (SPACE)
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

Important Hot-Swap Information

The Productivity3000 PAC supports hot-swap! Individual modules, expansion bases, and entire remote base groups can be taken offline, removed, and replaced while the rest of the PAC system continues controlling your process. Before attempting to use the hot-swap feature, be sure to read the hot-swap topic in the programming software's help file or our online documentation at AutomationDirect.com for details on how to plan your installation for use of this powerful feature.

CPU	Firmware Required	Productivity Suite Required
P3-530	Version 1.1.15.x or later	Version 1.10.x.x or later
P3-550	Version 1.1.15.x or later	