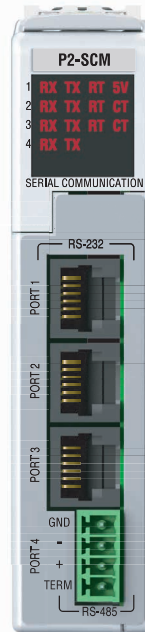# General Specifications

Module Type	Intelligent
Modules per Base	15 maximum*
I/O Points Used	None, mapped directly to tags in CPU
Field Wiring Connector	3 - RJ12, 1–4 Position Terminal Block
Operating Temperature	0º to 60ºC (32º to 140ºF)
Storage Temperature	-20º to 70ºC (-4º to 158ºF)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters max
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC 60068-2-6 (Test Fc)
Shock	IEC 60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	None
Insulation Resistance	No isolation
Module Location	Any slot in any base in a Productivity2000 System
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA
	CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

*For complete system limits, please refer to the "Hardware and Communication Limits" table in the Productivity Suite Help file, "Automation Hardware Configuration" topic (P050)
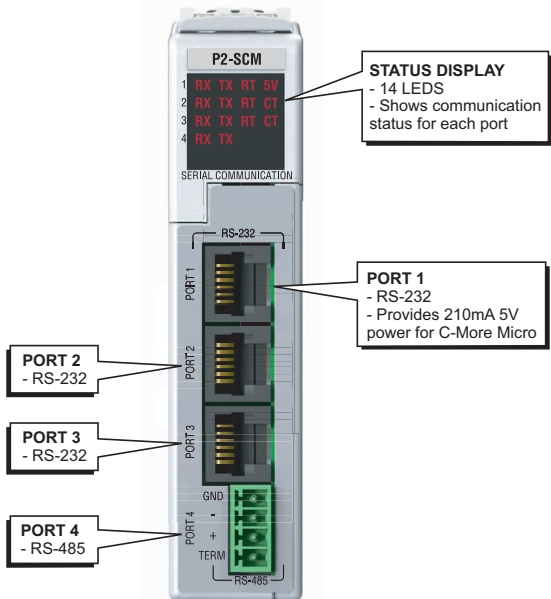**Meets EMC and Safety requirements. See the D.O.C. for details.

P2-SCM Serial Communications

The P2-SCM Serial Communications Module provides three RS-232 ports and one RS-485 port for Modbus master/slave networking or to serial devices using ASCII or custom communication protocols. Port 1 Powers a C-More Micro when using an RJ-12 connector.

Document Name	Edition/Revision	Date
P2-SCM-DS	3rd Edition	1/24/2025

P2-SCM Front Panel

P2-SCM

1 RX TX RT 5V
2 RX TX RT CT
3 RX TX RT CT
4 RX TX

SERIAL COMMUNICATION

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

RS-232

PORT 1

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

PORT 2

PORT 2
- RS-232

PORT 3

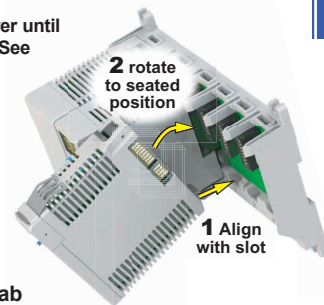**PORT 3**
- RS-232

PORT 4

GND
-
+
TERM

RS-485

PORT 4
- RS-485

Module Installation

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

Step One: Align module catch with base slot and rotate module into connector.

2 rotate to seated position

1 Align with slot

Step Two: Pull top locking tab toward module face. Click indicates lock is engaged.

Locked   Unlocked
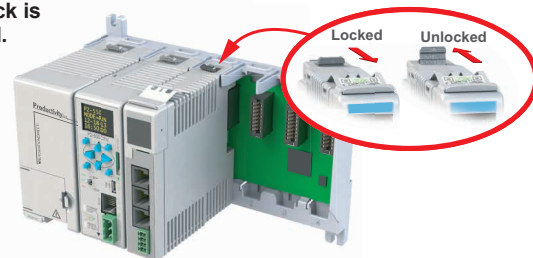
WARNING: Explosion hazard – Do not connect or disconnect connectors or operate switches while circuit is live unless the area is known to be non-hazardous. Do not hot-swap modules unless the area is known to be non-hazardous.

P2-SCM Configuration Options

Configuration Item	Port 1 (RS-232)	Ports 2 & 3 (RS-232)	Port 4 (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 bits	7 or 8 bits	7 or 8 bits
RTS Off Delay Time[1]	None, or 0–5,000 ms	None, or 0–5,000 ms	N/A
RTS On Delay Time[1]	None, or 0–5,000 ms	None, or 0–5,000 ms	N/A
Modbus Character Timeout[2]	None, or 0–10,000 ms	None, or 0–10,000 ms	None, or 0-10,000 ms
Communication Timeout (Timeout between query and response)	500-10,500 ms	500–10,500 ms	500–10,500 ms
Response/Request Delay Time	N/A	N/A	None, or 1–5,000 ms
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	1–9999 tenths of seconds	1–9999 tenths of seconds	N/A
RTS	On, Off, Assert During Transmit, System Output	On, Off, Assert During Transmit, System Output	N/A
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 1.75ms over 19,200 baud rate
2. Only applies to Modbus messages
3. CTS signal is only provided on Ports 2 & 3
4. 7-bit data are only supported with Odd or Even parity

Port Specifications

RS-232 Ports 1, 2 & 3

Electrical Specifications	Min	Typ	Max	Units
Output ON, Space Condition (3kΩ, 1000pF Load)	5.0	5.2	N/A	Volts
Output OFF, Mark Condition (3kΩ, 1000pF Load)	N/A	-5.2	-5.0	Volts
Output Short-Circuit Current		15	N/A	mA
Short-Circuit Duration		N/A	No Limit	Seconds
Output Resistance	300		N/A	Ohm
Input ON Threshold	N/A	1.6	2.4	Volt
Input OFF Threshold	0.6	1.2	N/A	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	N/A
Network	Point-to-Point	

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

RS-485 Port 4

Electrical Specifications	Min	Typ	Max	Units
Driver Differential Output (54Ω Load)	1.5		N/A	Volts
Driver Common-Mode Output			3	Volts
Driver Short-Circuit Output Current	N/A		250	mA
Short-Circuit Duration (Thermal Shutdown)		N/A	No Limit	Seconds
Receiver Differential Input Threshold	200		N/A	mV
Receiver Common-Mode Input	-7		12	Volt
Input Resistance	12k			Ohm
Termination Resistance (TB Jumper wire 'T' to '+')	N/A	120	N/A	Ohm
Data Rate	1200		38400	Baud
Data Rate Error	N/A	N/A	±2	%
Cable Length (38400 baud maximum)			1200	Meter

Line Specifications for RS-485 Port

RS-485 Line Specifications	Options	Units
Data Rate Setting	1200, 2400, 4800, 9600, 19200, 33600, 38400	Baud
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 are only supported with odd or even parity

Port 1

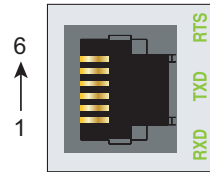| Port Type	RS-232
Description	Non-isolated RS-232 DTE port connects the CPU as a Modbus/ASCII master or slave to a peripheral device. Includes ESD and built-in surge protection.
Data Rates	Selectable, 1200, 2400, 4800, 9600, 19200, 33600, and 38400
+5V Cable Power Source	210mA maximum at 5V, ±5%. Reverse polarity and overload protected
TXD	RS-232 Transmit output
RX	RS-232 Receive input
RTS	Handshaking output for modem 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
Cable Options	EA-MG-PGM-CBL D2-DSCBL USB-RS232-1 with D2-DSCBL FA-CABKIT FA-ISOCON for converting RS-232 to isolated RS-485

Port 2 and 3 (RS-232 Configuration)

Port Type	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
RX	RS-232 Receive input
RTS	Handshaking output for modem 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
Cable Options	D2-DSCBL USB-RS232-1 with D2-DSCBL FA-CABKIT FA-ISOCON for converting RS-232 to isolated RS-485

6-pin RJ12 Female Modular Connector

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

6-pin RJ12 Female Modular Connector

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

Port 4 (RS-485 Configuration)

Port Type	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, 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
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	1.5 V with 60Ω 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-XXX from AutomationDirect.com

G
-
+
T
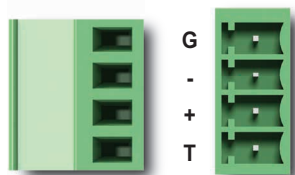
RS-485

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

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	
CTS		X	X	
5V	X			

1 - All RS232 & RS485 LED's reflect the actual electrical level of the signal, there is no direct firmware control of LED's

2 - RS232 LED's 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 LED's RXD & TXD 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

Removable Terminal Block Specs (Port 4)

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"
Screw Driver Size	TW-SD-VSL-1 (Recommended)
Screw Torque	0.4 N·m

Cable Options

Recommended	L19827-100, Belden #9841 or Equivalent

Caution: *If possible, remove field power prior to proceeding. If not, then **EXTREME** care **MUST** be taken to prevent damage to the module, or even personal injury due to a short circuit from the live terminal block.*

Important Hot-Swap Information

The Productivity2000 System supports hot-swap! Individual modules can be taken offline, removed, and replaced while the rest of the 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.