SPE4

Serial Port Expander

Description

The SPE4 which has been a best seller for over a decade.

The SPE4 is available in two versions. The SPE4-3D has five RS-422/485 serial ports. The SPE4-3S has four RS-232 ports and one RS-422 serial port.

The SPE4-3D is a drop-in replacement for the SPE4-1D and the SPE4-2D. The SPE4-3S is a drop-in replacement for the SPE4-1S and the SPE4-2S.

The SPE4 now has several new features previously unavailable:

- The termination and bias of the serial ports is now configurable (-3D only).
- The backplane interface is now 16-bits wide.
- Module configuration can be written to EEPROM "on-the-fly".
- Firmware is now downloadable to FLASH instead of requiring an EEPROM change.

"The serial ports support 17 separate modes including all of the Square D and Modicon serial protocols."

Applications

Modbus Port Expander

- Connect up to 4 Modbus master devices to a network of Modbus slaves
- Or use Auto-scan to gather data from Modbus Slaves and write it to the PLC

Modbus DCS to POWERLOGIC

- Connect a Modbus DCS to POWERLOGIC equipment
- Converts Modbus to POWERLOGIC protocol
- Connect up to 128 POWERLOGIC devices to a single SPE4
- Or mix POWERLOGIC and Modbus slave devices on the same RS-485 network

Serial Protocol Converter

- Devices with different protocols can communicate with each other on separate serial ports

PLC Programming Access Point

- Plug a PC into an SPE4-3D serial port and program Modicon and SY/MAX PLCs over the same connection.
  - The NR&D SC902 Smart Cable will connect an SPE4-3D serial port to a PC COM: port or Port 0 of the SPE4-3S to a PC COM: port.
  - The NR&D RS3 RS-232 cable will connect ports 1-4 of an SPE4-3S to a PC COM: port.

Register Rack Interface

- Gather data from Powerlogic and Modbus devices
- Present the data over the backplane to the PLC
- Works in local and remote SY/MAX racks
- 16-bit backplane preserves analog data

Radio Master

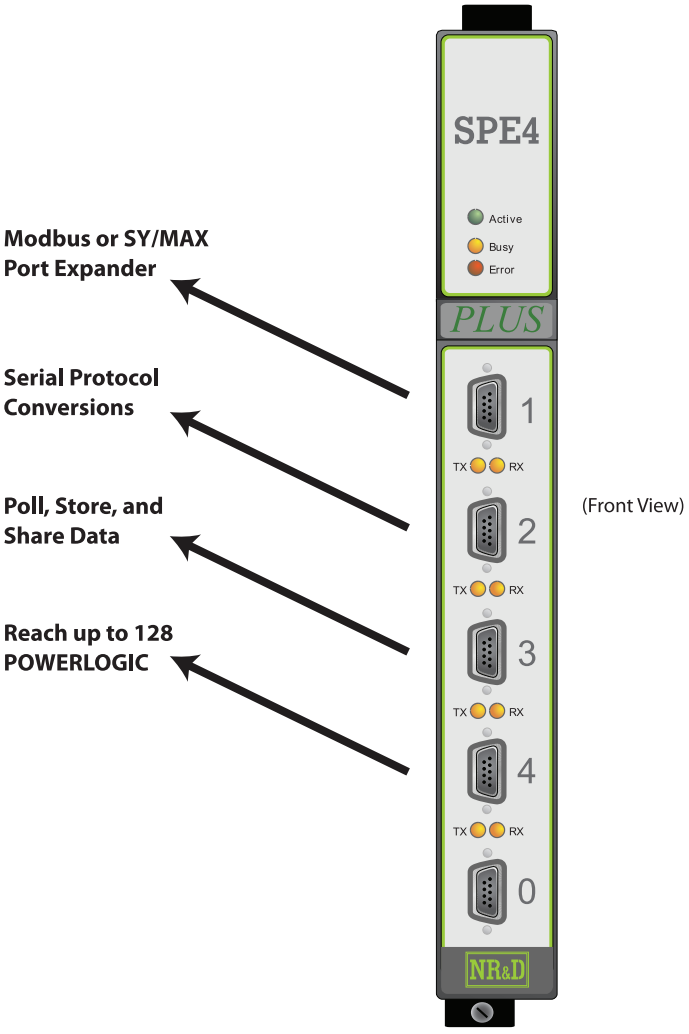
- Control radio networks
- Mix Modbus devices onto RNIM radio networks

Data Concentrator

- Store data in the 2,048 mailbox registers accessible through any port
- Auto-scan devices on the serial ports with register reads and writes
- Allows slave devices to share data with no PLC intervention

SY/MAX Port Expander

- Add ports to a SY/MAX processor
- Add additional operator interfaces
- Connect to SY/NET through a NIM
- Set ports to act as an RNIM or a PNIM
- Give SY/MAX processor Modbus capability
- Move important data to the PLC through the backplane



(Front View)

"... program Modicon and SY/MAX PLCs over the same connection."

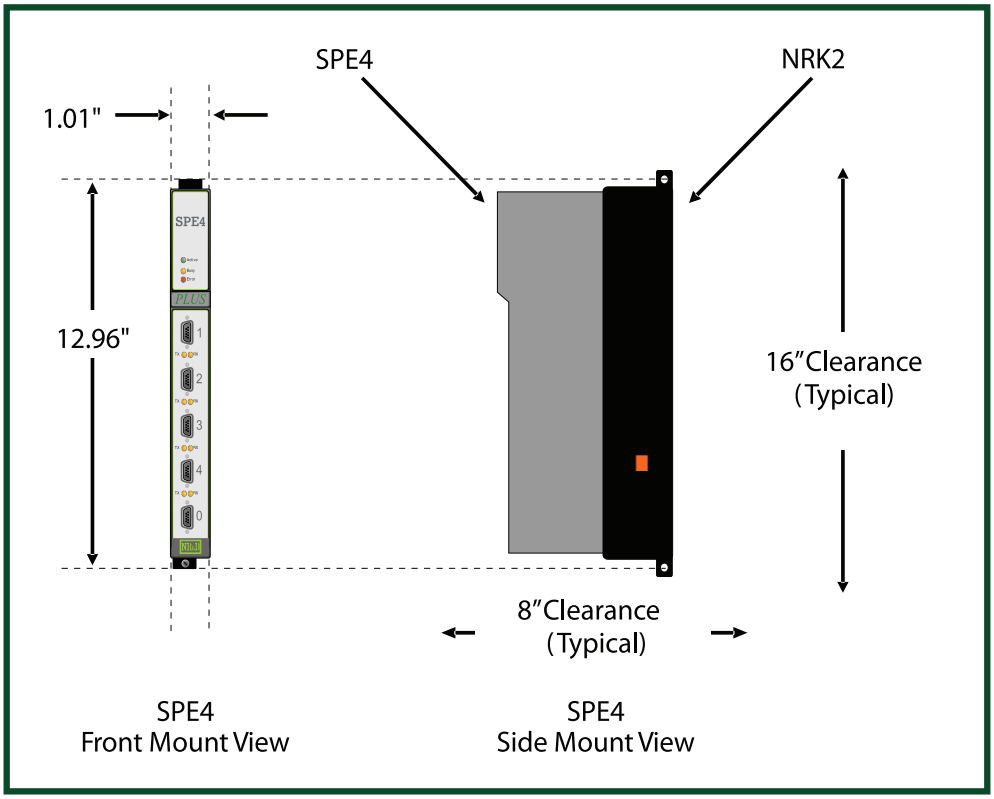
The serial ports support 17 separate modes including all of the Square D and Modicon serial protocols. Some modes allow devices with different protocols to exist on the same physical media. Each port can be independently configured. Each serial port has an auto-scan table of 48 entries.
On the SPE4-3D ports 1-4 support 4-wire RS-422 point-to-point or 2-wire or 4-wire RS-485 multidrop.

On the SPE4-3S ports 1-4 support point-to-point RS-232. On both models port 0 supports 4-wire RS-422 point-to-point and provides +5 VDC power for a converter.

The SPE4 is in the form factor of a SY/MAX rack module. When used in a SY/MAX rack it has a register interface to the PLC but can also be used as a stand-alone solution by including a Niobrara NRK2 single slot rack.

The configuration of the SPE4 is stored in registers available from any port. The configuration can be changed "on-the-fly" without rebooting the module.

The configuration registers are stored in capacitor-backed RAM. For long-term module storage the configuration can be written to EEPROM "on-the-fly".



Panel Layout for SPE4 Installations using NRK2 Power Supply

Niobrara Research & Development Corporation
www.niobrara.com

Ordering Information

The SPE4 is available as:

- **SPE4-3D** with 4 RS-422/RS-485 ports and 1 RS-422
- **SPE4-3S** with 4 RS-232 ports and 1 RS-422 port, rack addressable

SPE4-3D Accessories

- **SC902** RS-232⇔RS-422 Converter cable for configuring the SPE4 and upgrading its firmware.
- **NRK2** Single slot rack with built in power supply for stand alone installations.
- **DC1** RS-422 cable for connecting the SPE4 to a SY/MAX PLC or NIM.

SPE4-3S Accessories

- **SC902** RS-232óRS-422 Converter cable for configuring the SPE4-3S through Port 0
- **RS3** RS-232 cable for configuring the SPE4-3S through Ports 1-4. Also used for upgrading firmware
- **NRK2** Single slot rack with built in power supply for stand alone installations.
- **DC1** RS-422 cable for connecting the SPE4-3S Port 0 to a SY/MAX PLC or NIM.

Specifications

Warranty / Manual	The SPE4 is furnished with a user manual on cd and carries a one year warranty from the date of shipment. During the warranty period, free firmware upgrades are available. See Niobrara's Standard Terms and Conditions of Sale for additional warranty information.
Dimensions	Standard SY/MAX register module. 1.5" wide by 13" tall by 6.5" deep. Approximately four pounds net. Rugged welded steel enclosure with baked on finish. All serial connectors and indicators are on the front. The SY/MAX bus card edge connector is on the back.
Power Requirements	From SY/MAX bus or NRK2: 5 VDC, 1.5 A
Serial Port 0	RS-422 SY/MAX compatible. Same pinout as SY/MAX processor. Slide-lock posts. 50 to 14,400 baud. Even, odd, or no parity. 1 or 2 stop bits. 7 or 8 data bits. Provides +5VDC.
SPE4-3D Serial Ports 1-4	SY/MAX compatible pin-out. Four RS-422/RS-485 serial ports. 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 14,400 or 19,200 baud; 7 or 8 data bits; odd, even or no parity; 1 or 2 stop bits. Selectable checksum (BCC or CRC) supported in some modes. SY/MAX compatible DB9 female connectors with slide-lock posts. When used in RS-485 mode, ports are 2- and 4-wire compatible. RTS/CTS Handshaking enabled. Configurable Bias and Termination.
SPE4-3S Serial Ports 1-4	PC COM port compatible pin-out. Four RS-232 serial ports. 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 14,400 or 19,200 baud; 7 or 8 data bits; odd, even or no parity; 1 or 2 stop bits. Selectable checksum (BCC or CRC) supported in some modes. PC COM port compatible DB9 male connectors with threaded nuts. RTS/CTS Handshaking enabled.
Serial Port Modes	Any serial port can independently operate in any of the following modes: SY/MAX, Net-to-Net, Peripheral, PLogic, IDEC, Modbus Host (RTU - Master and Slave), Modbus Gate (RTU - master and slave), Modbus ASCII, Gateway, Transparent, Share, Chevron, or Dual Slave. Ports 1-4 can also be configured for PNIM, RNIM Master, RNIM Slave, or Multidrop. Auto-scan or auto-transfer on all ports.
Mailbox Registers	2048 processor equivalent registers addressed 1 through 2048. Any number of these may be rack addressed as needed for user applications. Any rack addressed register can be a PLC input or a PLC output as required by the application.
Module Configuration	Module configuration is stored in registers in capacitor-backed RAM and can be changed "on the fly". For long-term storage, configuration can be stored to EEPROM "on the fly".
Indicators	Transmit and Receive LEDs for ports 1-4. Active, Error, and Busy LEDs for the Module. Eleven total indicators.
Operating Conditions	0 to 50 degrees C operating temperature; -40 to 80 degrees C storage. Humidity up to 90% noncondensing. Pressure altitude -200 to +10,000 feet MSL.
Buttons & Switches	Clear button erases RAM and restores module configuration from EEPROM, FLASH, or Factory Defaults. Download switch allows for module firmware download.

"... surprisingly easy to configure."

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