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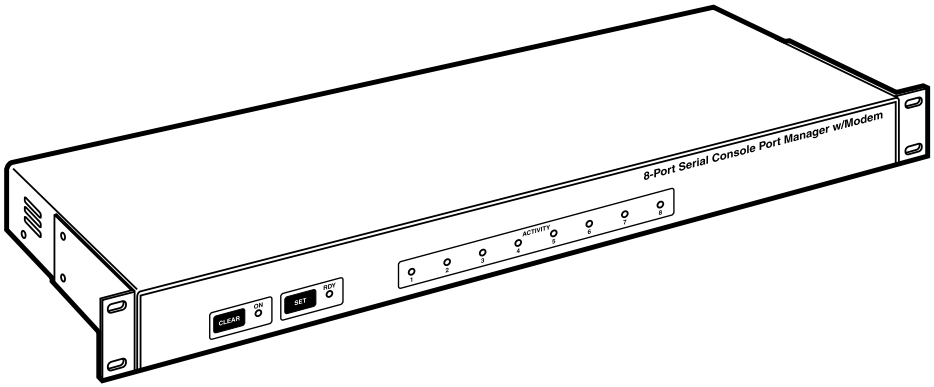
NETWORK SERVICES

JUNE 2003
SW544A-M

8-Port Serial Port Manager with Integral Modem



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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

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WARNING

You might be shocked! Do not attempt to repair or service this device yourself. Only authorized service personnel should service internal components.

WARNING

This device should be operated only with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, consult your local power company.

- **Connect this device only to a properly measured supply. Use the three-wire cord provided with the product.**
- **Maintain reliable earthing of this equipment. Pay particular attention to supply connections when connecting to power strips as opposed to direct connections to the branch circuit.**

Rackmount Installation

1. Enclosed Racks: Enclosed racks must provide adequate ventilation. Make certain that the rack is not overly crowded and remember that each unit in the rack generates its own heat. An enclosed rack should have louvered sides and a fan to circulate cooling air.

   When mounting the unit in an enclosed rack with a ventilation fan at the top of the rack, note that excessive heat generated by devices at the bottom of the rack can be drawn upward and into the ventilation slots of units located at the top. Make certain to provide adequate ventilation for equipment installed at the bottom of the rack.

   The ambient temperature within the rack may be greater than room temperature. Install the product so that the amount of air flow required for safe operation is not compromised. The maximum temperature for the equipment in this environment is 113°F (45°C).

   Do not load the equipment unevenly in the rack.

2. Open Racks: Make certain that the rack frame does not block the ventilation slots on the instrument cover. If the device is installed on sliders, check the unit when seated all the way into the rack to make certain that ventilation slots are not blocked.

Ventilation

Slots in the instrument cover allow ventilation for heat dissipation. To ensure safe, reliable operation, make sure that these openings are not covered or blocked.

Disconnect Power

Immediately disconnect the unit from the outlet and contact Black Box if:

1. The power cord becomes frayed or damaged.
2. Liquid is spilled into the device or if the device is exposed to rain or water.

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1. Specifications

Coding: Asynchronous, 7 or 8 bits ASCII

Parity: Even, odd, or none

Stop Bits: 1 or 2

Data Rate: 300 to 115.2 kbps (standard rates)

Flow Control: X-ON/X-OFF, RTS/CTS, both, or none

Timeout: "No activity" timeout disconnects port; 1, 5, 10, 15, or 30 seconds; 1, 5, 15, 30, or 90 minutes

Memory: Stores parameters and captured data; Non-volatile 32 K SRAM buffer memory per port

Break: Accept break or refuse break

Venting: Side vents are used to dissipate heat generated within the unit; When mounting the unit in an equipment rack, make certain to allow adequate clearance for venting

User Controls: Rear panel: (1) Power switch, (1) 8-position DIP switch, sets default parameters for baud rate, flow control, response format, and command echo; Front panel: (1) Set button, (1) Clear button

Connectors: (7) DB9: (2) System setup ports, (5) RS-232 console ports; (2) RJ-11: (1) phone jack, (1) internal modem port for connection to telco line; (1) IEC-320 inlet for power

Indicators: (10) LEDs: (1) On, (1) Ready, (8) Activity (one for each RS-232 port)

Operating Temperature: 32 to 113°F (0 to 45°C)

Relative Humidity: Up to 90%, noncondensing

Power: 100–240 VAC (switch-selectable), 50/60 Hz, 5 watts

Size: 1.75"H (1U) x 17.2"W x 6.8"D (4.4 x 43.7 x 17.3 cm)

Weight: 6 lb. (2.7 kg)

2. Introduction

2.1 Overview

The 8-Port Serial Port Manager with Integral Modem allows reliable, high-speed connections between PCs, modems, and other devices using dissimilar baud rates, parity, and flow control. It supports communication at speeds up to 115.2 kbps, features full RTS/CTS hardware handshaking, and has a 33.6-kbps internal modem.

Connect up to seven different devices to the Serial Port Manager without selecting a common baud rate or parity. Configure each port individually for specific baud rates, parity, handshaking, and various other parameters and options. Via menus, select communications parameters and enable or disable options.

The Serial Port Manager is ideal for situations that require limited access to important commands. Two security levels allow each port to function as a supervisor port or user port, depending on the password you enter at login. Supervisor ports can change configuration, display status, and connect to any other port; user ports can only connect to the ports provided by their password. Each individual port is assigned its own unique, user-defined password, up to sixteen characters long.

If power to the Serial Port Manager is lost or interrupted, its non-volatile memory retains user-defined parameters and port connections.

Control the Serial Port Manager either by a local PC that communicates with the unit via cable, or remotely via an external modem. Use ProComm® (or another communications program) to send commands to connect ports or display status.

Once you configure the Serial Port Manager to fit your application, save parameters and options to an ASCII text file on your PC. Quickly restore user-selected parameters if the configuration is accidentally altered or deleted. Upload saved parameters to other Serial Port Managers. This allows rapid setup when several units are configured with identical or similar parameters.

2.2 Modem Components

The Serial Port Manager's front panel has two user control buttons and ten LED indicators. See Figure 2-1 and Table 2-1. Numbers 1–10 in Figures 2-1 and 2-2 correspond to the numbers in Table 2-1.

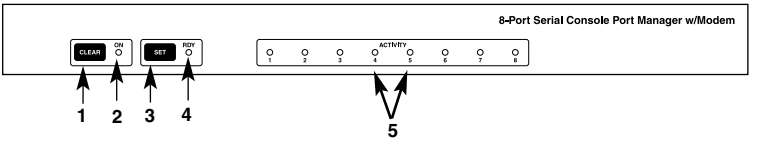

Figure 2-1. Front panel.

The back panel features a power connector and switch, an 8-position DIP switch, an internal modem port, and RS-232 ports. See Figure 2-2 and Table 2-1.

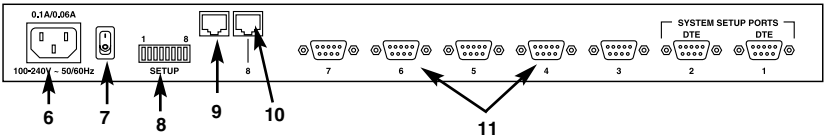

Figure 2-2. Back panel.

Table 2-1. Connectors, indicators, and user controls.

Number	Name	Type	Function
1	CLEAR	Button	This button restarts the Serial Port Manager's operating program without changing user-selected parameter settings or breaking port connections.
2	ON	LED	This indicator lights when AC power is applied.
3	SET	Button	When used with the CLEAR button, this button initializes the Serial Port Manager to defaults specified by the setup switches. To initialize, press and hold both the SET and CLEAR buttons, release only the CLEAR button, then release the SET button.
4	RDY	LED	This LED flashes to indicate that the Serial Port Manager is operational.
5	ACTIVITY	LED	An ACTIVITY indicator lights when the corresponding port is receiving data. There are 8 ACTIVITY LEDs.
6	—	IEC-320 connector	A receptacle for AC power.

NOTES

During initialization, all port LEDs will flash for approximately one-half second.

During initialization, all command-selected parameters will be cleared, and the Serial Port Manager will revert to the default parameters specified by the setup switches.

Table 2-1 (continued). Connectors, indicators, and user controls.

Number	Name	Type	Function
7	—	Switch	Turns power to the Serial Port Manager on or off.
8	SETUP	DIP switch	This bank of eight DIP switches sets default communication parameters and other features.
9	—	RJ-11 connector	This connector attaches to your phone line.
10	—	RJ-11 connector	This internal modem port connects to your telco line. For information about modem configuration, see **Section 5.5.3**.
11	—	DB9 connector	The DB9 ports connect to RS-232 console ports on user devices. For more information, refer to **Section 4.4** (connection instructions), **Appendix A** (interface description), and **Section 5.2** (setup ports).

3. Quick-Start Guide

This chapter provides a brief overview of basic 8-Port Serial Port Manager with Integral Modem capabilities. It also describes the procedures for installing the unit and accessing the Command mode.

NOTE

This chapter demonstrates the Serial Port Manager's basic functions and capabilities.

To take full advantage of the complete range of features provided by the Serial Port Manager, complete the entire Installation and Configuration sections (Chapters 4 and 5) after completing this chapter.

1. Review the safety warnings and cautions listed on pages 5 and 6 and in **Section 4.1**.
2. Connect the Serial Port Manager to an appropriate power source.
3. Press the power switch to the ON position.
4. Use a standard RJ-11 cable to connect your telco outlet to the internal modem port (located on the Serial Port Manager's back panel).

NOTE

After the Serial Port Manager is installed and configured, you can connect additional external modems to its RS-232 ports as described in Section 4.4.

5. Attach a standard null-modem cable from your PC COM port to the port 1 DB9 connector on the Serial Port Manager's back panel. For a description of the port interface, refer to **Appendix A**.

NOTE

When the Serial Port Manager is shipped from the factory, communications parameters are set as follows: 9600 bps, RTS/CTS handshaking, 8 data bits, one stop bit, and no parity. Although you can easily redefine these parameters, for this quick-start guide, we recommend that you configure your communications program (for example, HyperTerminal) to accept the default parameters.

6. Start your communications program and then press **Enter**. The APS> prompt appears, indicating that you've successfully accessed the Serial Port Manager's Command mode.

7. At the APS> prompt, type /H and press **Enter** to display the Help menu (Figure 3-1). This menu provides a basic listing of all Serial Port Manager commands.

```
COMMAND MENU

DISPLAY                                  CONFIGURATION
/S[P]          Port Status               /F        System Parameters
/SD            Port Diagnostics          /P[n]     Port Parameters
/W[P][n]       Port Parameters (Who)     /I        Default & Test
/J             Site ID                   /UF       Upgrade Firmware
/H             Command Menu (Help)       /CP       Copy Port Parameters

CONTROL                                  +-------------------------------+
<Enter>        Enter Command Mode        | P  Show Passwords             |
/X             Exit Command Mode         | n  Port # or Name             |
/C <n> [n]     Connect Local [Remote]    | *  "all"                      |
/D <n| ... |*> Disconnect                | |  "or"                       |
/E <n| ... |*> Erase Buffer              | < > Required Entry            |
/U             Send Parameter File       | [ ] Optional Entry            |
                                         +-------------------------------+

/D, /E, /I Commands: Add /Y to bypass "Sure (Y/N)?"
```

Figure 3-1. The supervisor-level Help menu.

8. Type /S and press **Enter** to display the Port Status screen (Figure 3-2). This screen summarizes conditions at all Serial Port Manager ports.

NOTE

The Port Status screen's various fields are explained in more detail in Section 7.1.

PORT STATUS: Serial Port Manager, Version 2.00, Site ID: (undefined)

PORT	NAME	PASSWORD	STATUS	MODE	BUFFER COUNT
01	(undefined)	(undefined)	Free	Any	0
02	(undefined)	(undefined)	Free	Any	0
03	(undefined)	(undefined)	Free	Any	0
04	(undefined)	(undefined)	Free	Any	0
05	(undefined)	(undefined)	Free	Any	0
06	(undefined)	(undefined)	Free	Any	0
07	(undefined)	(undefined)	Free	Any	0
08	Internal_Modem	(undefined)	Free	Any	0

Enter /H for Command Menu

Figure 3-2. The Port Status screen.

9. The Serial Port Manager performs two different types of port connections: resident and third-party.

   a) Resident connection: Your resident port (for example, port 1) issues a /C command to connect to a second port.

      i. To connect port 1 to port 2, type `/C 2` and press **Enter**. While port 1 is connected, the Serial Port Manager doesn't recognize commands issued at port 1. However, the unit does recognize a resident disconnect sequence issued at port 1 or port 2.

      ii. To issue the resident disconnect sequence (logoff sequence), type `^X` (press **Ctrl** and **X** at the same time).

   b) Third-party connection: Your resident port (for example, port 1) issues a /C command to create a connection between two other ports.

      i. To connect port 2 to port 3, type `/C 2 3` and press **Enter**.

      ii. While ports 2 and 3 are connected, port 1 still recognizes Serial Port Manager commands. Type `/S` and press **Enter** to display the Port Status screen. The STATUS column lists ports 2 and 3 as connected, and port 1 as free.

iii. Issue a third-party disconnect command to disconnect ports 2 and 3. The Serial Port Manager displays the "Are you Sure (y/n)?" prompt. Type `y` and press **Enter** to disconnect.

iv. Type `/S` and press **Enter** to display the Port Status screen. The STATUS column now lists ports 2 and 3 as free.

10. Exit Command Mode: From the APS> prompt, type `/X` and press **Enter**. The Serial Port Manager exits from Command mode.

11. Access Command Mode via Modem: From a PC with a modem and telco line, dial the number for the line that's connected to the Serial Port Manager's internal modem. Once the connection is established, the Serial Port Manager sends the APS> prompt, indicating that you've successfully accessed the Command mode.

    a) Type `/H` and press **Enter** to display the Help menu. If desired, you may also want to repeat the Port Connection/Disconnection examples described in step 9 on the previous page.

    b) When you finish communicating with the Serial Port Manager, type `/X` and press **Enter** to exit the Command mode and terminate the modem connection.

This completes the 8-Port Serial Port Manager with Integral Modem's basic quick-start guide. Proceed to **Chapters 4** and **5** for complete installation and configuration procedures.

4. Hardware Installation

4.1. Connecting AC Power to the Serial Port Manager

CAUTION

Operate this device only with the type of power source indicated on the instrument nameplate. If you are not aware of the type of power service available, please contact your local power company.

The Serial Port Manager autosenses for 100–240 VAC power. Plug the supplied power cable into the receptacle on the back panel, then connect the power cable to a grounded AC outlet.

4.2 Configure the 8-Position DIP Switch

The 8-position DIP switch selects default settings for the Serial Port Manager's RS-232 ports. The switch is located on the back panel, as shown in Figure 2-1.

When the Serial Port Manager is shipped from the factory, the switches are configured for 9600 baud, 8 bits—no parity, RTS/ CTS handshaking, verbose command response, and command echo on (all switches ON). These settings are compatible with most applications. If the default settings are not compatible with your application, change the switch settings as described in this section.

NOTES

Configure the DIP switches to match the parameters your control device uses when communicating with the Serial Port Manager. This ensures access to command functions, even if the Serial Port Manager is reset to default parameters.

If the switch configuration is changed, new parameters don't take effect until the Serial Port Manager is reinitialized (as described in Section 4.3).

You can select operating parameters (baud rate, parity, etc.) for each port using the /P command as described in Section 5.5.3. The /P command can select different parameters for each Serial Port Manager port.

When the Serial Port Manager is initialized, parameters will return to settings specified by the DIP switches.

4.2.1 Default Baud Rate (SW1, SW2, SW3)

DIP-switch positions 1 through 3 select the default baud rate for RS-232 ports 1 through 7. The default baud rate must match the rate your control device will use when communicating with the Serial Port Manager.

NOTES

If the control device communicates via an external modem connected to one of the RS-232 ports, select a default baud rate that's compatible with the external modem.

The /P command also selects a different operating baud rate for each port.

DIP-switches 1 through 3 don't set the default baud rate for port 8 (the internal modem port). The default baud rate for port 8 is 9600 bps. The operating baud rate for port 8 is also set via the /P command.

Table 4-1. Baud-rate settings.

Switch Position			Default Baud Rate (bps)
1	2	3	
ON	ON	ON	9600*
OFF	ON	ON	300
ON	OFF	ON	1200
OFF	OFF	ON	2400
ON	ON	OFF	19,200
OFF	ON	OFF	38,400
ON	OFF	OFF	57,600
OFF	OFF	OFF	115,200

*Factory setting.

4.2.2 Default Handshake (SW4, SW5)

DIP-switch positions 4 and 5 select the default handshake format for RS-232 ports 1 through 7. The default handshake format must match the format your control device uses when communicating with the Serial Port Manager. Switches 4 and 5 select RTS/CTS (hardware), X-ON/X-OFF, both, or none.

NOTES

If the control device communicates with the Serial Port Manager via an external modem connected to one of the RS-232 ports, select a default handshaking format that is compatible with the external modem.

The /P command also selects a different handshake format for each port.

Switch positions 4 and 5 don't select the default handshake format for port 8 (the internal modem port). The default handshake format for port 8 is RTS/CTS. The operating handshake format for port 8 is also set via the /P command.

Table 4-2. Handshake settings.

Switch Position		Default Handshake
4	5	
ON	ON	RTS/CTS*
OFF	ON	X-ON/X-OFF
ON	OFF	Both
OFF	OFF	None

*Factory setting.

4.2.3 Default Response Message Format (SW6)

When commands are invoked, the Serial Port Manager responds with either verbose or terse (abbreviated) messages. Response messages are summarized in **Section 11.2**. After installation, the /P command also sets the response format to "none" (Quiet mode). When Quiet mode is selected, the Serial Port Manager does not send response messages.

NOTE

The /P command is also used to select a different Response Message format for each port.

Switch 6	Default Response Message Type
ON	Verbose (English text)*
OFF	Terse (abbreviated/numeric)

*Factory setting.

4.2.4 Default Command Echo (SW7)

Switch 7 enables or disables the Command Echo. When enabled, characters sent to the Serial Port Manager are echoed back to the control device.

NOTE

The /P command also selectively enables or disables the Command Echo at each individual port.

NOTE

DIP-switch position 8 is not currently used.

4.3 Initialize the Serial Port Manager to Default Settings

If you change DIP-switch settings, new parameters don't take effect until the Serial Port Manager initializes.

CAUTION

After initialization, the Serial Port Manager reverts to the parameters specified by the DIP switches. Any command-selected parameters are lost.

1. Simultaneously press the **SET** and **CLEAR** buttons on the Serial Port Manager's front panel.

2. Release the **CLEAR** button. Wait for the Port LEDs to flash, then release the **SET** button.

4.4 Connecting Devices to the Serial Port Manager

Serial Port Manager RS-232 ports 1 through 7 are standard DB9 connectors, configured as DTE ports, and are similar to a standard serial port on a PC.

1. Access the Serial Port Manager's Command mode.

2. Determine which RS-232 port will be used for connection to the new device.

3. Type `/S` and press **Enter** to display the Port Status screen. Check the Buffer Count column, which lists the amount of data stored in the buffer for each port.

   a) If the Port Status screen shows data stored in the buffer for the desired port, type `/E` *xx* (where *xx* is the desired port number) and press **Enter** to clear the buffer.

   b) Cleared data cannot be recovered.

4. Use an appropriate DB9 cable to connect the RS-232 serial port on the device to the selected DB9 port on the Serial Port Manager.

   a) External Modems and other DCE Devices: Use a standard serial-modem cable.

   b) PCs and other DTE Devices: Use a standard null-modem cable.

5. Select communication parameters for the port as described in **Chapter 5**.

5. Configuration

5.1 Accessing the Serial Port Manager Command Mode

When the Serial Port Manager's Command mode is active, you can invoke commands to select parameters and connect or disconnect ports.

NOTE

Command mode can't be accessed from a Buffer mode port, Passive mode port, or any port that's currently connected to another Serial Port Manager port.

Supervisor-level commands can't be accessed at any Serial Port Manager port where the supervisor level is disabled.

1. Start your communications program (for example, HyperTerminal or ProComm). Make certain the Serial Port Manager and the communications program are set for the same parameters (for example, baud rate, parity, etc.).

2. Access the Command mode.

   a) Local Access: To access the Command mode from a local PC that is connected to the 8-Port Serial Port Manager via cable, press **Enter**.

      i. There must be no other characters preceding **Enter**. If you have already hit other keys, press **Enter** twice.

      ii. If the supervisor password is defined, the password prompt appears. Type in your supervisor or port password and press **Enter**. The APS> prompt appears.

   b) Modem Access: To access the Command mode via modem, proceed as follows:

      i. Dial the number for the Serial Port Manager's internal modem, or, if present, for an external modem connected to one of the Serial Port Manager's RS-232 ports.

      ii. If you defined the supervisor password, a prompt displays. Type in your supervisor or port password and press **Enter**. If the supervisor password is not defined, just press **Enter**. The APS> prompt appears.

5.2 System Setup Ports

Ports 1 and 2 are designated as system setup ports. These ports always permit password-protected access to supervisor-level command functions, even when the unit is reinitialized to default parameters.

To ensure that access to command functions is always available, ports 1 and 2 can't be configured as Buffer mode or Passive mode ports (Buffer and Passive mode ports are not able to access the Command mode.) In addition, ports 1 and 2 always permit password-protected access to supervisor-level commands; the Supervisor mode can't be disabled at these two ports.

5.3 Password Functions

The Serial Port Manager features two different types of passwords: the supervisor password and the port (user) passwords. The supervisor password allows system administrators to invoke unit configuration commands; the port passwords allow users to access specific ports in order to create connections between permitted ports or view port configuration parameters.

5.3.1 The Supervisor Password

The supervisor password allows access to higher-level Serial Port Manager configuration commands. Administrators use these commands to select communication parameters, assign port access rights, and perform other system management tasks.

After the supervisor password is defined (via the System Parameters menu), the Serial Port Manager displays a password prompt whenever you attempt to access the Command mode. If the correct supervisor password is entered, the Serial Port Manager Command mode then starts up in Supervisor mode. Supervisor-level commands are summarized in **Section 11.3**.

NOTES

If the supervisor password is not defined, then supervisor-level commands are available to all ports, and port access and configuration functions are not password protected.

If you want to restrict user ports from changing Serial Port Manager configuration parameters or connecting to restricted ports, define the supervisor password.

When the supervisor password is defined, the Serial Port Manager displays a password prompt when you attempt to access the Command mode. Any RS-232 port that has not been assigned a port password can only be accessed using the supervisor password.

When defining a supervisor password, record the password for future use. If you forget or lose your supervisor password, you won't be able to access supervisor-level commands. In this case, the only way to access the supervisor mode is to reinitialize the Serial Port Manager to default values as described in Section 4.2.

Normally, you can enter the supervisor password at any port to gain access to supervisor-level commands. If you want to completely deny a port's access to supervisor mode (even with the supervisor password), use the Port Parameters menus (/P) to disable the Supervisor mode at ports 3 through 8. The Supervisor mode can't be disabled at system setup ports 1 and 2.

NOTE

If the unit is reset to default parameters, all ports revert to the default state (where supervisor-level commands are available to all ports, without password protection).

5.3.2 The Port Passwords

The port passwords (or user passwords) allow system administrators to restrict access to a specific group of ports. When the Serial Port Manager Command mode is accessed with a port password, you can connect only to the RS-232 ports to which they have been granted access, and review configuration parameters for those ports. Port passwords do not grant access to Serial Port Manager configuration commands.

The Configuration menus (/P) for each RS-232 port allow a port password to be assigned to each individual port. To allow a port password to grant access to a group of Serial Port Manager ports, the same port password is assigned to each port in the group.

For example, if the port password "test" is assigned to ports 3, 4, and 5, then when "test" is entered at the password prompt, you can connect only to ports 3, 4, and 5 and can view parameters for ports 3, 4, and 5 only.

If desired, all Serial Port Manager ports can function as both a supervisor port and a user port, depending on which password you enter at the login prompt. However, if you want to prevent a port from being able to access the Supervisor mode at all (even with the supervisor password), disable the Supervisor mode at the RS-232 ports using the Port Configuration menus as described in **Section 5.5**.

NOTE

The Supervisor mode can't be disabled at ports 1 and 2; these ports are designated as setup ports and are always allowed password-protected access to supervisor-level commands.

When port passwords are defined, the Serial Port Manager doesn't allow you to select a port password that's already been used as the supervisor password.

5.4 Defining the Site ID and Supervisor Password

Before configuring individual ports, define the site ID and supervisor password. The site ID indicates the location or name of the Serial Port Manager; the supervisor password restricts access to sensitive command functions. The site ID and supervisor password are defined via the System Parameters menu (/F).

NOTES

The site ID can't include double quotes.

The supervisor password can't include an asterisk, forward slash, spaces, or double quotes.

Both the site ID and supervisor password are cleared if the Serial Port Manager is initialized to default settings.

The Serial Port Manager does not allow you to select a supervisor password that is the same as an existing port password.

The System Parameters menu is only available in Supervisor mode.

1. Access the Command mode. Type `/F` and press **Enter** to display the System Parameters menu.

2. Site ID message: (Up to 32 characters; Default = undefined). Type `1` and press **Enter**. A prompt appears. Type in the desired text and press **Enter**. The site ID is listed on the Port Status and Port Diagnostic screens.

3. Supervisor password: (Up to 16 characters; Default = undefined.) Type 2 and press **Enter**. A prompt appears. Type in the desired password, then press **Enter**. The Serial Port Manager prompts you to re-key the password to confirm spelling and capitalization. Type in the password a second time, and then press **Enter**.

NOTES

The supervisor password is case sensitive. Note the exact password entered, including the case of each letter.

Write down your supervisor password. If the password is lost or forgotten, you won't be able to access supervisor-level commands unless you initialize the Serial Port Manager and clear all parameters as described in Section 4.3.

5.5 Port Configuration

5.5.1 Configuration Conventions

When responding to prompts, invoking commands, and selecting items from the Port Configuration menus, note the following:

- To select an item from a Port Configuration menu, type in the number for the item and press **Enter**.
- To clear an item in a Port Configuration menu, enter the number for the desired item and press **Enter**. When the prompt appears, press **Space** and then press **Enter**.
- When defining the port name, don't use the forward slash character (/), double quotes (""), the asterisk character (*), or blank spaces.
- Port names can't begin with a number.
- Refer to the instructions in each screen for additional functions available under that screen.
- To exit a menu or prompt without changing its current value, press **Esc**.
- Passwords and port names are case sensitive. When defining passwords and port names, note the exact text, including the case of each character.
- If you configure the Serial Port Manager via modem, communication parameters do not change until after you exit from Command mode and disconnect from the Serial Port Manager.

5.5.2 Port Modes

The Serial Port Manager offers four different port operation modes: Any-to-Any mode, Passive mode, Buffer mode, and Modem mode.

- Any-to-Any mode: Allows communication between connected ports. Any-to-Any mode ports can be connected to other Any-to-Any mode, Passive mode, Buffer mode, or Modem mode ports by accessing Command mode and invoking the /C command (see **Section 8.1.1**). The Any-to-Any mode is available for all Serial Port Manager ports *except* port 8 (the external modem port).

- Passive mode: Allows communication between connected ports, but does not allow access to Command mode. Connect Passive mode ports by accessing Command mode from a free Any-to-Any or Modem mode port and invoking the /C command (see **Section 8.1.1**). The Passive mode is not available for ports 1, 2, or 8.

- Buffer mode: Allows collection and storage of data received from connected devices. Retrieve collected data by accessing Command mode from a free Any-to-Any or Modem mode port and issuing the /C command. Note that the Buffer mode also allows pass-through communication with the connected device. The Buffer mode is not available for ports 1, 2, or 8.

- Modem mode: A port configured for the Modem mode performs all functions normally available in Any-to-Any mode, but the Modem mode also allows definition of a hang-up string, reset string, and initialization string. Any Serial Port Manager RS-232 port can be configured for the Modem mode, and port 8 (the external modem port) is always configured for Modem mode.

For more information on port modes, refer to **Chapter 8**.

5.5.3 RS-232 Port Configuration Menus

The Port Configuration menus select options for each of the Serial Port Manager RS-232 ports. Parameters selected via these menus stay in effect until the unit is initialized or the /P command is used to reconfigure the port. After initialization, parameters revert to the defaults specified by the switches.

To select port parameters, proceed as follows:

1. Access the Command mode. If the password prompt displays, type in your supervisor-level password.

2. Type /P, followed by the number of the port to be configured, and press **Enter**. For example, to configure port 2, type /P 2 and press **Enter**. The Port Configuration menu appears (see Figure 5-1).

```
PORT PARAMETERS #02

1.   Port Name:           (undefined)
2.   Password:            (undefined)
3.   Baud Rate:           9600
4.   Bits/Parity:         8–None
5.   Stop Bits:           1
6.   Handshake Mode:      RTS/CTS
7.   Port Mode:           Any-to-Any
8.   Supervisor Mode:     Permit
9.   Logoff Character:    ^X
10.  Sequence Disconnect: One Character
11.  Timeout Disconnect:  Off
12.  Response Type:       Verbose
13.  Command Echo:        On
14.  Accept Break:        Yes

Enter: "<" Previous Port,
       ">" Next Port,
       <ESC> Exit  …
```

Figure 5-1. Port Configuration menu (port 2 shown).

a) If the /P command is entered without the port number (for example, when you type /P and press **Enter**), the Configuration menu for your resident port displays.

b) The /P command is only available in the Supervisor mode.

The Port Configuration menu offers the following options:

1. Port Name: (Up to 16 characters.) Assigns a name to the port. (Defaults: ports 1 through 7 = undefined; port 8 = internal modem.)

2. Password: (Up to 16 characters.) Defines the port password for this port. Identical port passwords are generally assigned to several ports. When this password is entered at the login prompt, you then have access to all ports that share this password. (Default = undefined.)

NOTES

The port password is not displayed by the Port Parameters menu. When the port password is defined, the field for this item will read "defined." To display port passwords, invoke the /SP or /WP commands as described in Chapter 7.

The Serial Port Manager does not allow you to define a port password that is the same as the existing supervisor password.

3. Baud Rate: Selects the baud rate for the port. Can be set to any standard rate from 300 bps to 115.2 kbps. (Default = Selected by DIP switches 1, 2, and 3.)

4. Bits/Parity: (Default = 8–none.)

5. Stop Bits: (Default = 1.)

6. Handshake Mode: Selects the handshake format for this port: X-ON/X-OFF, RTS/CTS (hardware), both, or none. (Default = RTS/CTS.)

7. Port Mode: Defines the operation mode for this port. (Default: ports 1 through 7 = Any-to-Any mode; port 8 = Modem mode.)

NOTES

Ports 1 and 2 cannot be configured for Passive mode or Buffer mode.

Port 8 is always configured for Modem mode. Port 8 cannot be set to Any-to-Any mode, Buffer mode, or Passive mode.

When Any-to-Any, Passive, or Buffer mode is selected, the Serial Port Manager displays the DTR output prompt as shown in Figure 5-2. The DTR output prompt does not display when you select Modem mode.

74. DTR Output: Determines how DTR reacts when this port disconnects. DTR can be held low, held high, or pulsed for 0.5 seconds and then held high. In the default state, DTR pulses for 0.5 seconds and then remains high. For more information on hardware lines, refer to **Appendix A**. (Default = Pulse.)

When Port mode (item 7 in Figure 5-1) is set to Modem mode, the menu includes additional prompts that define the following:

71. Reset String: If necessary, this prompt re-defines the modem reset string, which is sent prior to the initialization string. (Up to 48 characters, default = ATZ.)

72. Initialization String: Defines a command string sent to initialize a modem to settings required by your application. (Up to 48 characters; defaults: port 1 through 7 = AT& C1$ D2S0=1; port 8 = ATM0& C1$ D2S0=1.)

73. Hang-Up String: Although the Serial Port Manager pulses the DTR line to hang up an attached modem, the hang-up string is often useful for controlling modems that do not use the DTR line. (Up to 48 characters; default = undefined.)

NOTES

When communicating with the Serial Port Manager via modem, communication parameters don't change until you exit from Command mode and disconnect the modem.

For a list of basic AT® commands for the Serial Port Manager's internal modem, please refer to Section 6.2.

8. Supervisor Mode: Permits or denies access to Supervisor mode. When enabled (permit) and the valid supervisor password is entered, the port allows access to supervisor-level commands. When disabled (deny), the port may not enter Supervisor mode even when the supervisor password is entered. (Default = Permit.)

NOTE

The Supervisor mode cannot be disabled at ports 1 or 2.

9. Logoff Character: Defines the logoff character for this port. The logoff character determines the command(s) or character(s) that must be issued at this port in order to disconnect from a second port (resident disconnect). (Default = **^X ([Ctrl] plus [X])**.)

NOTE

When redefining the logoff character, select a character that does not normally occur in your data. This prevents the Serial Port Manager from accidentally disconnecting ports in the middle of a data transfer. For example, if the logoff character is defined as "s," then the ports disconnect whenever the letter s is detected.

10. Sequence Disconnect: Enables/disables and configures the resident disconnect command. This prompt offers the option to either disable the sequence disconnect or select a one-character format or a three-character format. (Default = One Character.)

NOTE

When a resident connection is initiated, the Serial Port Manager sends a message that lists the connected ports and displays the one- or three-character command required to disconnect.

The one-character disconnect sequence is intended for situations where the destination port does not receive the disconnect command. When the three-character format is selected, the disconnect sequence passes through to the destination port before breaking the connection.

When the one-character format is selected, resident connections are terminated by entering the selected logoff character only. You don't have to press Enter before and after the logoff character when the one-character format is selected.

When the three-character format is selected, the resident disconnect sequence uses the format [Enter] *LLL* [Enter], where *L* is the selected logoff character.

11. Timeout Disconnect: Enables and selects the timeout period for this port. If enabled and the port does not receive or transmit data for the specified timeout period, the port will disconnect. In Any-to-Any mode, Passive mode, or Buffer mode, the default setting is OFF. When the port is set for Modem mode, the default setting is 15 minutes.

NOTES

The timeout disconnect also applies to non-connected ports that are left in Command mode. If no additional data activity is detected, an unconnected port exits from Command mode when the timeout disconnect value expires.

When connected ports time out and are disconnected, both ports also exit from Command mode.

12. Response Type: Selects the type of messages that this port sends in response to commands. Select verbose (English text), terse (numeric/abbreviation), or Quiet mode (no response). (Default = verbose).

13. Command Echo: Enables or disables the command echo for this port. (Default = On).

14. Accept Break: Determines whether the port accepts breaks received from the attached device and passes them along to a connected port. When enabled, breaks received at this port are passed to any port that this port is connected to, and they're sent along to the device connected to the other port. When disabled, breaks are refused at this port, and hence, not sent to the other port. (Default = Yes.)

5.6 Copying Parameters to All Ports

The /CP command (Copy Port Parameters) selects similar parameters for all Serial Port Manager RS-232 ports.

When the /CP command is invoked, the Serial Port Manager displays a menu that allows you to select port communication parameters, then copy them to all Serial Port Manager RS-232 ports. The Copy Port Parameters menu sets all parameters for all RS-232 ports, or defines only a select group of parameters and then copies them to all ports.

NOTES

The /CP command is only available in Supervisor mode.

The Copy Port Parameters menu does not display the port password. This field reads either undefined or defined, depending upon whether or not the port password is specified.

The /CP command does not set ports 1 and 2 to Passive mode or Buffer mode (Port mode, item 7 in Figure 5-2).

The /CP command does not disable the Supervisor mode at ports 1 and 2 (Supervisor mode, item 8 in Figure 5-2).

The /CP command does not change the port mode at port 8 (internal modem port).

```
COPY PORT PARAMETERS

1. Port Name:              (undefined)
2. Password:
3. Baud Rate:
4. Bits/Parity:
5. Stop Bits:
6. Handshake Mode:
7. Port Mode:
   74. DTR Output:
8. Supervisor Mode:
9. Logoff Character:
10. Sequence Disconnect:
11. Timeout Disconnect:
12. Response Type:
13. Command Echo:
14. Accept Break:

(Note: Ports 1 & 2 will NOT have restricted values changed.)
Enter: Parameter # <CR> to define parameter value to copy to all ports.
<CR> to remove all values set,
X<CR> tp exit WITHOUT copy,
<ESC> to copy to all ports and exit …
```

Figure 5-2. The Copy Port Parameters menu.

To select common parameters for all Serial Port Manager RS-232 ports:

1. Access the Serial Port Manager Command mode. If the password prompt displays, type in your supervisor-level password.

2. At the command prompt, type `/CP` and press **Enter**. The menu shown in Figure 5-2 displays.

3. Selecting Parameters: To copy parameters, type in the number for the desired parameter, press **Enter**, and then follow the instructions in the submenu.

NOTE

You don't have to define all port parameters. For example, use the /CP command to select only the baud rate for all ports.

NOTE

The /CP command copies the parameters currently displayed by the Copy Port Parameters menu. Although the port password is not displayed, the selected password is copied if the field for this item reads defined.

4. Clear Menu: After defining several parameters, if you want to clear the /CP menu and start again, type - (dash) and press **Enter**. The menu will be reset.

5. Exit Without Copy: To exit from the Copy Parameters menu without copying selected parameters to all RS-232 ports, type X and then press **Enter**. The Serial Port Manager exits from the Copy Parameters menu and returns to the command prompt.

6. Copy Parameters: When you finish selecting parameters, press **Esc** to copy the selected parameters to all Serial Port Manager RS-232 ports and exit from the Copy Port Parameters menu. The Serial Port Manager displays a "Sure?" prompt before copying parameters to other ports.

5.7 Save User-Selected Parameters

Although this step is optional, we strongly recommend that you save all user-defined parameters to an ASCII file. This allows quick recovery if port parameters are accidentally deleted or reconfigured. **Chapter 9** describes the procedure for saving configuration parameters to an ASCII file.

6. The Internal Modem

NOTE

Although port 8 is the internal modem port, any Serial Port Manager port can also be configured for connection to an external modem.

6.1 Communicating with the Internal Modem

To communicate with the Serial Port Manager's internal modem, proceed as follows:

1. Access the Serial Port Manager's Command mode as described in **Section 5.1**.

NOTES

If you log on to the Serial Port Manager using a port password (rather than the supervisor password), you can only connect to port 8 if your password allows access to that port. The supervisor password always allows access to port 8.

To access the internal modem's Command mode from a remote location, first dial into an external modem installed at one of the other RS-232 ports, then proceed as described below. The internal modem's Command mode can't be accessed via a remote connection to the internal modem.

2. When the APS> prompt appears, type `/C 8` and press **Enter** to connect to the internal modem port (port 8).

3. When the connection is established, the Serial Port Manager responds with a message that reads:

```
Connected: 08
```

and lists the port name and currently selected disconnect command.

6.2 Common AT Commands

This section lists some of the most commonly used AT commands for the Serial Port Manager's internal modem. For a complete listing of all available AT Commands and S-Registers, access the modem Command mode and display the modem Help screen using the $H *n* command.

NOTES

Type commands in either upper or lower case. Do not use a combination of upper- and lower-case characters.

Use the Backspace key to delete errors.

All commands begin with the AT prefix and are invoked by pressing Enter (Carriage Return). The only exceptions are the A/ command (Repeat Previous Command) and +++ (Exit to On-Line Command Mode).

The maximum command length is 40 characters. This does not include the AT prefix, carriage returns, or spaces.

Default settings are marked with an asterisk (*).

Command	Function/Options
$H *n*	Help screen. $H1 Help screen #1. $H2 Help screen #2. $H3 Help screen #3.
Z	Reset modem. All configuration parameters are reset to default values.
,	Pause. Creates pause during dialing. The duration of the pause is determined by Register S6.
/	Pause for 125 milliseconds.
:	Continuous redial.
;	Return to Command mode after dialing.
!	Causes modem to flash on-hook.
@	Quiet Mode. Causes modem to wait for ringback, followed by five seconds of silence before processing the next command.

Command	Function/Options
&D *n*	Data Terminal Ready (DTR) signal. &D0 Ignore DTR. &D1 Modem returns to Command mode. * &D2 Normal DTR. &D3 DTR drop causes modem to reset to default parameters.
E *n*	Set modem command mode echo. E0 Disable echoing of Command mode characters. * E1 Enable echoing of Command mode characters.
&W *n*	Save modem parameters. &W0 Instructs modem to save current parameters in nonvolatile RAM. The modem loads these parameters for future sessions instead of reading factory ROM defaults (unless the &F command is issued). * &W1 Instructs modem to not save parameters to RAM.
+++ AT	In-band escape sequence. Places modem in Command mode while still remaining on-line. Type +++ followed by AT. Enter up to ten command characters.
&Q *n*	Reliable, compressed, and LAP-M result codes. * &Q0 Enable reliable/compressed/LAP-M result codes. &Q1 Disable reliable/compressed/LAP-M result codes (standard AT result codes).
L *n*	Display parameters. L0 Display stored phone numbers. L5 Display all current operating parameters. L6 Display all current S-Register values. L7 Display additional parameters. L8 Display current on-line diagnostics. L9 Display signal strength information. L10 Display signal to noise ratio information. L11 Display noise information.
#L *n*	Select detection phase. #L0 Negotiates V.42 mode (MNP® or LAP-M). #L1 Enables MNP and disables LAP-M. #L2 Enables LAP-M and disables MNP. #L3 Disables detection phase, goes directly to LAP-M.

Command	Function/Options
&E *n*	Error correction/flow control.
	&E0 No error correction.
	* &E1 V.42 auto-reliable mode.
	&E2 V.42 reliable mode.
	&E3 No modem-initiated flow control.
	* &E4 CTS/RTS modem-initiated flow control.
	&E5 X-ON/X-OFF modem-initiated flow control.
	* &E6 Disable X-ON/X-OFF pass-through.
	&E7 Enable X-ON/X-OFF pass-through.
	&E8 Disable Enq/Ack pacing.
	&E9 Enable Enq/Ack pacing.
	* &E10 Disable normal mode flow control.
	&E11 Enable normal mode flow control.
	&E12 Disable pacing.
	* &E13 Enable pacing.
	&E14 Disable data compression.
	* &E15 Enable data compression.

7. The Status Screens

The Serial Port Manager Status screens display the connection status and communication parameters for its RS-232 ports. There are three different types of status screens: the Port Status screen (/S), the Port Diagnostics screen (/SD), and the Port Parameters screen (/W).

7.1 The Port Status Screen (/S)

The Port Status screen lists the general status of the Serial Port Manager's RS-232 ports. To display the Port Status screen, access the Command mode, type `/S`, and press **Enter**. The screen appears (see Figure 7-1).

Although both supervisors and users display the Port Status screen, the screen appears slightly different, depending upon whether the Command mode was accessed with the supervisor password or a port password. When a port password (User mode) is entered at login, the Port Status screen displays the status of only those ports that share the same port password entered at login.

When the Supervisor mode is active, the Port Status screen either displays or suppresses port passwords.

When the /S command is invoked, the password column will say either "defined" or "undefined," depending upon whether or not the password for each port is specified. To display the Port Status screen with port passwords included, type `/SP` and then press **Enter**.

NOTE

The /SP command option is not available in User mode.

```
PORT STATUS:   Serial Port Manager Version 2.00          Site ID: (undefined)

PORT  | NAME           | PASSWORD    | STATUS | MODE  | BUFFER COUNT
──────────────────────────────────────────────────────────────────────
01    | (undefined)    | (undefined) | Free   | Any   |      0
02    | (undefined)    | (undefined) | Free   | Any   |      0
03    | (undefined)    | (undefined) | Free   | Any   |      0
04    | (undefined)    | (undefined) | Free   | Any   |      0
05    | (undefined)    | (undefined) | Free   | Any   |      0
06    | (undefined)    | (undefined) | Free   | Any   |      0
07    | (undefined)    | (undefined) | Free   | Any   |      0
08    | Internal_Modem | (undefined) | Free   | Modem |      0

Enter /H for Command Menu
```

Figure 7-1. The Port Status screen.

As shown in Figure 7-1, the Port Status screen lists the following items:

- Port: The port number.
- Name: The user-defined name for each port.
- Password: The user-defined password for each port.

NOTE

Actual passwords are not displayed; column options include either "undefined" or "defined." To display port passwords, type `/SP` and press Enter (Supervisor mode only).

- Status: The connect status of each port. When the port is connected, this column lists the number of the other Serial Port Manager port connected to this port.
- Mode: The user-selected port mode. Options include Any (Any-to-Any), Modem, Passive, or Buffer, depending on the configuration selected for the port.
- Buffer Count: Lists the amount of data (in bytes) stored in the buffer for this port.

7.2 The Port Diagnostics Screen (/SD)

The Port Diagnostics screen provides more detailed information about each port. To display the Port Diagnostics screen, access the Command mode, type `/SD`, and press **Enter**. The screen appears as shown in Figure 7-2.

```
PORT DIAGNOSTICS: Serial Port Manager Version 2.00     Site ID: (undefined)

PORT  | NAME             | STATUS  | BAUD | COM | HS  | MODE  | BUF | CTS
------------------------------------------------------------------------
01    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | H
02    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
03    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
04    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
05    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
06    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
07    | (undefined)      |  Free   | 9600 | 8N1 | RTS | Any   | 0   | L
08    | Internal_Modem   |  Free   | 9600 | 8N1 | RTS | Modem | 0   | L

Enter /H for Command Menu
```

Figure 7-2. The Port Diagnostics screen.

Like the Port Status screen, the Port Diagnostics screen is also available to both supervisors and users. It looks slightly different depending upon whether the Command mode is accessed with the supervisor password or a port password (User mode).

In User mode, the Port Diagnostics screen displays only the status of those ports that share the same port password that was entered at login. Ports protected by other passwords do not display.

As shown in Figure 7-2, the Port Diagnostics screen lists the following items:

- Port: The port number. If this column contains a plus sign (+), the port can access the Supervisor mode if the appropriate supervisor password is entered at login.
- Name: The user-defined name for each port.

- Status: The connect status for each port. When the port is connected, this column lists the number of the other port that is connected to this port. If this column contains an asterisk, the port has accessed the Command mode.
- Baud: The baud rate selected for each port.
- COM: The data bits, parity, and stop bits selected for each port. For example, 8N1 indicates eight data bits, no parity, and one stop bit.
- HS: The handshaking (flow control) mode for each port.
- Mode: The user-selected port mode. Options include Any (Any-to-Any), Modem, Passive, or Buffer, depending on the configuration selected for each port.
- BUF: Lists the amount of data (in bytes) currently stored in the buffer for this port.
- CTS: The high/low status of the CTS line at the RS-232 interface.

7.3 The Port Parameters Screen (/W)

The /W command displays more detailed information about an individual Serial Port Manager port. Rather than listing connection information for all ports like the Port Status screens, the Port Parameters screen lists all defined parameters for a specific port.

```
PORT PARAMETERS #03

1.    Port Name:              (undefined)
2.    Password:               (undefined)
3.    Baud Rate:              9600
4.    Bits/Parity:            8–None
5.    Stop Bits:              1
6.    Handshake Mode:         RTS/CTS
7.    Port Mode:              Any-to-Any
      74. DTR Output:         Pulse
8.    Supervisor Mode:        Permit
9.    Logoff Character:       ^X
10.   Sequence Disconnect:    One Character
11.   Timeout Disconnect:     Off
12.   Response Type:          Verbose
13.   Command Echo:           On
14.   Accept Break:           Yes

Enter: "<" Previous Port,
       ">" Next Port,
       <ESC> Exit  …
```

Figure 7-3. The Port Parameters screen.

The /W command is available in both Supervisor mode and User mode.

NOTE

When you log in with a port (user) password, the Serial Port Manager displays information about your resident port only.

If the Supervisor mode is active, the Port Parameters screen either displays or suppresses port passwords.

Normally, when /W is invoked, the password field will say either "defined" or "undefined," depending upon whether or not the port's password has been specified. To display the Port Parameters screen with the port password, type `/WP`, the desired port number, and then press **Enter**.

NOTE

The /WP command option is not available in User mode.

The /W command uses the following format:

`/W[P]` *xx* [**Enter**]

where *xx* is the desired port number, and P is the command option to display port passwords.

NOTE

When this option is included (for example, /WP 5), the Port Parameters screen will display the port password, if defined (Supervisor mode only).

8. Operation

8.1 Any-to-Any Mode

Any-to-Any mode ports can be connected to other Any-to-Any, Passive, Buffer, or Modem mode ports by accessing the Command mode and issuing the /C command. All ports can be configured for Any-to-Any mode.

8.1.1 Port Connection and Disconnection

The Serial Port Manager provides communication between devices without requiring that both devices use the same communication parameters. This allows you to connect devices that use dissimilar baud rates, parity, handshake, etc. The Serial Port Manager converts data rates and other parameters, eliminating the need to select common parameters for all connected devices.

Connecting Ports

Two different types of connections can be made between Serial Port Manager ports: resident connections and third-party connections.

- Resident connections: Your resident port issues a /C command to connect to a second port. For example, port 4 issues the /C command to connect to port 5.
- Third-party connections (Supervisor mode only): Your resident port issues a /C command to create a connection between two other ports. For example, port 1 is your resident port, and port 1 issues a command to connect port 2 to port 3.

NOTES

Third-party connections can be initiated only from a port with supervisor-level command capability.

If a port accesses command mode using the port password (User mode), then that port can connect only to other ports that share the same port password.

To connect ports:

1. Access the Command mode as described in **Section 5.1**. If the password prompt displays, enter your supervisor password or port password.
2. Invoke the /C command to connect the desired ports.

a) Resident connect: To connect your resident port to another port, type `/C xx` and press **Enter** (*xx* is the number or name of the port you want to connect). The Serial Port Manager displays the numbers of the connected ports, along with the command sequence required to disconnect the two ports.

Example: To connect your resident port to port 8, type `/C 8` and press **Enter**.

b) Third-party connect (Supervisor mode only): To connect any two ports (other than your resident port), type `/C xx XX` and press **Enter**. (*xx* and *XX* are two port names or numbers.) The Serial Port Manager displays the numbers of the two connected ports.

Example: To connect port 5 to port 6, invoke the following command at a port with supervisor-level command capability: type `/C 5 6` and press **Enter**.

When the /C command specifies the port name, you only need to enter enough letters to differentiate the desired port from other ports. Type an asterisk (*) to represent the remaining characters in the port name. For example, to connect your resident port to a port named SALES, invoke the connect command as /C S*, providing no other port names begin with the letter S.

Disconnecting Ports

There are three different methods for disconnecting ports: the resident disconnect, the third-party disconnect, and the no activity timeout. Providing the timeout feature is enabled, a no activity timeout disconnects resident ports or third-party ports.

NOTE

When Any-to-Any mode, Buffer mode, or Passive mode is selected, Option 74 in the Port Parameters menu determines how the DTR signal reacts when the port disconnects. The DTR signal can either be held low, held high, or pulsed and then held high.

1. Resident disconnect: Disconnects your resident port from another port. For example, if you are communicating via port 3, and port 3 is connected to port 4, a resident disconnect is used to disassociate the two ports. The Serial Port Manager offers two different resident disconnect command formats: the one-character format and the three-character format (for more information, refer to **Section 5.5.3**):

a) One character (default): When the one-character disconnect sequence is selected, simply enter the selected logoff character once. (Default = **^X ([Ctrl] plus [X])**.)

NOTE

You don't have to enter a carriage return before or after the logoff character.

b) Three characters: Uses the format [**Enter**] *LLL* [**Enter**], where *L* is the selected logoff character. For example, if the logoff character is defined as **+**, then the three-character disconnect sequence would be [**Enter**] +++ [**Enter**].

If the default resident disconnect sequence is not compatible with your application, redefine both the command format and logoff character via the Port Configuration menus, as described in **Section 5.5**.

2. Third-party disconnect (Supervisor mode only): The /D command is issued from your resident port to disconnect two third-party ports. For example, if your resident port is port 1, a third-party disconnect is used to disconnect port 3 from port 4.

   a) The /D command uses the format: */D xx XX* [**Enter**], where *xx* and *XX* are the numbers of the ports that you want to disconnect.

   b) The /D (Disconnect) command can only be invoked by a port with access to supervisor-level commands.

   c) The /D command specifies both connected ports, or either of the two ports. For example, if port 1 is your resident port, use any of the following commands to disconnect port 3 from port 4:

   `/D 3 4` [**Enter**]

   or

   `/D 3` [**Enter**]

   or

   `/D 4` [**Enter**]

3. No activity timeout: If the timeout feature is enabled at either connected port, the no activity timeout disconnects resident ports or third-party ports.

   a) RS-232 Ports: To configure the timeout feature for the RS-232 ports, invoke the /P command to display the Port Configuration menu for the desired port as described in **Section 5.5.3**. Option 11 enables and defines the timeout feature.

   b) When the timeout feature is enabled, the port automatically disconnects if no data is received for the defined timeout period.

NOTES

When connected ports time out, both ports exit Command mode after disconnecting.

When an unconnected port is left in Command mode and no additional data activity is detected, the port automatically exits Command mode when its defined timeout value elapses.

8.1.2 Defining Hunt Groups

A hunt group creates a situation where the Serial Port Manager scans a group of ports and connects to the first available port in the group. Hunt groups are created by assigning identical or similar names to two or more ports. Use Any-to-Any, Passive, Buffer, or Modem mode ports to define hunt groups.

1. Access the Command mode. If the password prompt displays, enter the supervisor password.

2. Invoke the /P command to access the Port Configuration menu for the desired port(s) as described in **Section 5.5.3**. For example, to configure port 4, type `/P 4` and press **Enter**.

3. From the Port Configuration menu, select item 1 to define the port name.

4. Repeat steps 2 and 3 above to assign identical names to the other ports in the hunt group. For example, a series of ports in a group could all be named SERVER.

5. To connect to the next available port in the hunt group, invoke the /C command using the port name to specify the desired group. For example, type `/C SERVER` and press **Enter**.

6. Your port connects to the first available port in the group. If all ports are presently connected, the Serial Port Manager responds with the BUSY message.

7. You need to enter only enough letters of the port name to differentiate the hunt group ports from other ports. Type an asterisk (*) to represent the remaining characters in the port name. For example, to connect your resident port to the first available port in a group of ports named SALES1, SALES2, and SALES3, invoke the connect command by typing `/C S*` and pressing **Enter** (providing no other port names begin with the letter S).

Hunt group port names must be unique. Otherwise, ports with similar names will also be included in the hunt group.

Hunt Group Example 1:

1. Ports 1 and 2 are configured as modem mode ports, and external modems are installed at both ports. Port 1 is named MODEM1 and port 2 is named MODEM2.

2. Your resident port is port 4. To connect to the first available external modem, access the Command mode, then type `/C MODEM*` and press **Enter**.

Hunt Group Example 2:

1. Ports 3, 4, and 5 are any-to-any mode ports. All three ports are named SERVER.

2. Your resident port is port 1. To connect port 2 to the first available server, access the Command mode, type `/C 2 SERVER` and press **Enter**.

8.2 Passive Mode

Passive mode ports function the same as Any-to-Any mode ports, but do not allow access to Command mode. A Passive mode port communicates with other ports, but does not enter Command mode. Therefore, it can't invoke commands to redefine port parameters, display status, etc.

Passive mode ports can be connected by accessing the Command mode from a free Any-to-Any mode or Modem mode port. Then invoke the third-party connect or resident connect command as described in **Section 8.1.1**. Passive mode ports do not buffer data except during baud rate conversion.

NOTES

A Passive mode port can't access the Command mode.

To ensure supervisor access to important command functions, the Passive mode is not available to ports 1 and 2 (setup ports).

Port 8 (internal modem port) can't be configured as a Passive mode port.

8.3 Buffer Mode

Ports configured as Buffer mode ports collect data from the connected device and store it in the Serial Port Manager's statically allocated memory. Each Serial Port Manager port features a fixed-length, fixed-position data buffer.

The Buffer mode allows collection of data from various devices without the requirement that all devices use the same communication parameters (for example, baud rate, parity, etc.).

NOTES

Buffer mode ports can't access the Command mode.

To ensure supervisor access to important command functions, the Buffer mode isn't available to ports 1 and 2 (setup ports).

Port 8 (the internal modem port) can't be configured as a Buffer mode port.

8.3.1 Reading Data from Buffer Mode Ports

To retrieve data from Buffer mode ports, first determine which port buffers contain data. To check port buffers for stored data, access the Command mode, type /S, and press **Enter** to display the Port Status screen.

To retrieve data from buffer memory, go to a free Any-to-Any or Modem mode port, access the Command mode (supervisor level), and issue the /C command using the following format:

/C *xx* [**Enter**]

xx is the number or name of the port buffer to be read.

If the port's buffer is empty, the Serial Port Manager sends a message that reads

```
Connected xx, Buffer Empty
```

where *xx* is the port number. If the buffer contains data, the Serial Port Manager displays a prompt that offers four options:

- Next screen: To scroll through data one screen at a time, press the space bar. Each time you press the space bar, the next full screen of data is sent.
- Scroll all: To send all data without pausing, press **1**.
- Skip/connect: To connect to the buffer port without sending stored data, press **2**.
- Erase/connect: To connect to the buffer port and erase stored data, press **3**.

NOTE

Buffered data is erased immediately and is not sent.

NOTE

All four of these options also allow pass-through communication with the device connected to the Buffer mode port.

To clear data from the buffer, use the erase/connect option, or go to a free Any-to-Any or Modem mode port with supervisor-level command capability. Issue the /E (Erase Buffer) command using the following format:

/E *xx* [**Enter**]

where *xx* is the number or name of the port buffer to clear.

8.3.2 Port Buffers

The Status screen lists the amount of buffer memory currently used by each port. The Serial Port Manager uses buffer memory in two different ways, depending on the user-selected port mode.

- Any-to-Any, Passive, and Modem mode ports: When two ports are communicating at dissimilar baud rates, the buffer memory prevents data overflow at the slower port.
- Buffer mode ports: Stores data received from connected devices. Issue a connect command (/C) from an any-to-any mode or modem mode port to retrieve data.

If the status screen indicates an accumulation of data, use the /E (Erase Buffer) command to clear the buffer.

8.4 Modem Mode

In addition to allowing data transfer, the Modem mode also provides additional functions specifically related to modem communication. A Modem mode port performs all functions normally available in Any-to-Any mode. The Modem mode is available to all Serial Port Manager RS-232 ports. In addition to allowing configuration of the Serial Port Manager's internal modem, the Modem mode also simplifies the process of connecting an external modem to ports 1 through 7.

NOTE

Port 8 (the internal modem port) is always configured for the Modem mode. Port 8 can't be configured as an Any-to-Any mode, Buffer mode, or Passive mode port.

When you select the Modem mode, the Port Configuration menu (command /P) displays three additional prompts which let you redefine the modem reset string, initialization string, and hang-up string. When you select the Modem mode for a port with supervisor-level command access, define the supervisor password. This will discourage unauthorized access to higher-command functions.

When a call is received, the Serial Port Manager prompts the caller to enter a password. The Serial Port Manager allows three attempts to enter a valid password. If the correct password is not entered in three attempts, or if the user does not respond to the password prompt within 30 seconds, the modem disconnects. The password is defined and enabled by invoking the /P command as described in **Section 5.5.3**.

NOTES

When a Modem mode port exits Command mode, or the DCD line is lost while the Command mode is active, the Serial Port Manager pulses the DTR line to the modem. The Serial Port Manager then sends the user-defined modem command strings to make certain the modem is properly disconnected and reinitialized.

All Serial Port Manager RS-232 ports use the internal modem and also external modem(s) installed at another RS-232 port, providing that the port password allows access to the desired modem port. To call out, invoke the /C command to connect to the port, then access the modem as you normally would.

9. Saving and Restoring Configuration Parameters

After the Serial Port Manager is properly configured, parameters can be downloaded and saved as an ASCII text file. Later, if the configuration is accidentally altered, the file with the saved parameters can be uploaded to automatically reconfigure the Serial Port Manager without manually assigning each parameter.

Saved parameters can also be uploaded to other Serial Port Managers. This allows for rapid setup when several units will be configured with the same parameters.

Perform the Save Parameters procedure from any communications program (for example, HyperTerminal, ProComm, Crosstalk®, etc.) that allows downloading of ASCII files.

9.1 Sending Parameters to a File

1. Start your communications program and access the Serial Port Manager Command mode. If the password prompt displays, enter the supervisor password.

2. When the Serial Port Manager command prompt appears, type `/U` and press **Enter**. The Serial Port Manager prompts you to configure your communications program to receive an ASCII download.

   a) Set your communications program to receive an ASCII format download, then specify a name for a file that will receive the saved parameters (for example, SPM.PAR).

   b) Disable the line wrap function for your terminal emulation program. This prevents command lines from being broken in two during transmission.

3. When the communications program is ready to receive the file, return to the Serial Port Manager's Save Parameter File menu. Press **Enter** to proceed with the download. Serial Port Manager parameters are saved on your hard drive in the file specified in the step above.

4. The Serial Port Manager sends a series of ASCII command lines that specify the currently selected Serial Port Manager parameters. The last line of the file ends with a /G-00 command. When the download is complete, press **Enter** to return to the APS> prompt.

9.2 Restoring Saved Parameters

This section describes the procedure for using your communications program to send stored parameters to the Serial Port Manager.

1. Start your communications program and access the Serial Port Manager Command mode. If the password prompt displays, enter the supervisor password.

2. Configure your communications program to upload an ASCII text file.

3. Upload the ASCII text file with the saved Serial Port Manager parameters. If necessary, type in the file name and directory path.

4. Your communications program sends the specified ASCII text file to the Serial Port Manager. When the communications program finishes the upload, terminate the Upload mode.

NOTE

If the Serial Port Manager detects an error in the parameters file, it responds with the Invalid Parameter message. If an error message is received, carefully check the contents of the parameters file, correct the problem, and then repeat the upload procedure.

5. If the parameter upload procedure is successful, the Serial Port Manager sends a confirmation message, then returns to the APS> prompt. Type `/S` and press **Enter**. The Serial Port Manager Status screen displays. Check the Status screen to make certain the Serial Port Manager has been configured with the saved parameters.

10. Upgrading Serial Port Manager Firmware

When new, improved versions of the Serial Port Manager operating firmware become available, use the /UF (Upgrade Firmware) function to update the Serial Port Manager to the new firmware version.

Upload updates to the Serial Port Manager via setup ports 1 and 2, or via the internal modem port (port 8). To install a firmware update, follow these steps.

NOTE

All other ports are disabled during the firmware upgrade procedure.

1. Obtain the update file. Firmware modifications can be downloaded via an FTP site. Place the diskette in your diskette drive and/or copy the file to your hard drive.

2. Access the Serial Port Manager Command mode. If the password prompt is displayed, type the supervisor password. The upgrade firmware feature is only available in Supervisor mode.

3. When the Serial Port Manager prompt appears, type `/UF` and then press **Enter**. The Serial Port Manager displays a screen that offers the following options:

   a) Continue the upload and keep the current parameters: To proceed with the upgrade while retaining current, user-defined parameters, type `1` and press **Enter**. All parameter settings are restored when the upgrade is complete.

   b) Continue the upload and default system: To proceed with the upgrade and reset parameters to default settings, type `2` and press **Enter**. When the upgrade is complete, all parameters are set to default values.

NOTE

If the firmware upgrade is performed via modem, modem port parameters will not default until after you hang up and disconnect from the unit.

   c) Abort upload: To cancel the upgrade and return to the command prompt, type `3` and press **Enter**.

4. Use your communication program's (for example, HyperTerminal's) upload function to transfer the upgrade firmware to the Serial Port Manager. Select ASCII file format, then specify the filename and directory location where the firmware upgrade file resides.

NOTE

The upload function times out after one minute of inactivity. If the function times out, type `1` and press Enter to continue, or press Esc to abort.

5. If the upload is successful, the Serial Port Manager prompts you to continue the upgrade or abort.

   a) Upgrade: To continue with the upgrade, type `1` and press **Enter**. The Serial Port Manager erases the previous firmware, moves new firmware from data flash to program flash memory, calculates and store the new checksum, and reboots. Do not attempt to reconnect to the Serial Port Manager until the RDY indicator blinks to indicate that the process is complete.

   b) Abort: To abort the procedure, type `2` and press **Enter**.

6. Incomplete upload: If the upload is interrupted, times-out, or if the file is corrupted during transfer, the Serial Port Manager displays a screen that asks for user confirmation before proceeding. To proceed, type `1` and press **Enter**, then return to step 4 above.

7. Emergency recovery: In the rare event that the Serial Port Manager operating system becomes corrupted during installation, front-panel indicators blink five times and the unit automatically switches to emergency recovery mode. Please contact Black Box Technical Support at 724-746-5500 for further instructions.

11. Command Reference Guide

11.1 Command Conventions

The commands described in this section conform to the following conventions:

- Slash character: Most Serial Port Manager commands begin with the slash character (/).
- Apply command to all ports: When the asterisk character is entered as the argument of the /D command (disconnect port) or the /E command (erase buffer), the command applies to all ports. For example, to erase all port buffers, type `/E *` and press **Enter**.
- Port name wild card: Instead of entering the entire port name, simply enter the first character(s) of the name followed by an asterisk (*). For example, a port named SERVER can be specified as S*.

NOTE

This command also applies to any other port name that begins with the letter S.

- Suppress Sure? prompt: When the /D (disconnect port), /E (erase buffer), or /I (default and test unit) commands are invoked, the /Y option can be included in the command line to override the "Are you Sure (y/n)?" prompt. For example, to disconnect Port 8 without displaying the "Sure?" prompt, type `/D/Y 8` and press **Enter**.
- Enter key: All commands are invoked by pressing **Enter**.
- Command mode: Serial Port Manager ports only recognize commands when the Command mode is activated. Access the Command mode from a free Any-to-Any or Modem mode port (see **Section 5.1**.)
- Connected ports: When two ports are connected, most Serial Port Manager commands are not recognized by either of the connected ports. The only exception is the resident disconnect sequence (Default = **^X ([Ctrl] plus [X]**).)
- Configuration menus: To exit from a configuration menu, press **Esc**.

11.2 Command Response

When commands are sent to the Serial Port Manager, it responds with either verbose (English Text) or terse messages (numeric/abbreviated). The default message type for all ports is set to either terse or verbose using DIP-switch-position 6.

After the Serial Port Manager is installed and configured, the port configuration command (/P) specifies an individual response format for each port. In addition to the terse and verbose response modes, the port configuration commands also select the Quiet mode. When the Quiet mode is selected, the port does not send messages in response to commands.

Table 11-1 summarizes the various response messages for both the terse and verbose modes.

Terse	Verbose
0	RAM Test Passed
1	Connected*
2	Busy
3	Disconnected
4	Invalid Command
5	Are You Sure (Y/ N)?
6	Invalid Parameter
7	Invalid Syntax
8	Invalid Access
9	Enter Site ID:
A	Aborted
B	Enter Password:
C	Invalid Password
D	RAM Test Failed at*
E	Inactivity Timeout, Disconnected
F	Data in Buffer from Previous Connection... Re-Enter Logoff Sequence to Purge Buffer
G	Asleep

*These verbose response messages include additional information not provided by terse response messages.

11.3 Command Summary

		Command Availability	
Function	**Command Syntax**	**Supervisor**	**User**
Enter Command Mode	[**Enter**]	X	X
Exit Command Mode	/X [**Enter**]	X	X
Help Menu	/H [**Enter**]	X	X
Display Site ID	/J [**Enter**]	X	X
Display Port Status	/S[P] [**Enter**]	X	X
Display Port Diagnostics	/SD [**Enter**]	X	X
Display Port Parameters (Who)	/W[P] [*x*] [**Enter**]	X	X
Set System Parameters	/F [**Enter**]	X	
Set RS-232 Port Parameters	/P [*x*] [**Enter**]	X	
Copy RS-232 Port Parameters	/CP [**Enter**]	X	
Connect	/C <*x*> [*x*] [**Enter**]	X	X
Resident Disconnect	^X	X	X
Third-Party Disconnect	/D[/Y] <*x*> [*x*] [**Enter**] /D[/Y]* [**Enter**]	X X	
Erase Buffer	/E[/Y] <*x*> [*x*] [**Enter**] /E[/Y]* [**Enter**]	X	
Default and Test	/I[/Y] [**Enter**]	X	
Save Parameters	/U [**Enter**]	X	
Upgrade Firmware	/UF [**Enter**]	X	

1. Supervisor mode displays parameters for all ports; User mode only displays parameters for ports allowed by port password.
2. To display port passwords, include the P option (Supervisor mode only).
3. A port with user command capability can only view its own parameters. A user port can't view parameters for other ports.
4. A user port can't perform a third-party connect.
5. Resident disconnect: Disconnects your resident port from another port.

NOTE

The resident disconnect sequence can be redefined via the Port Configuration menus.

6. Third-party disconnect: Disconnects two or more nonresident ports. Must be issued from a third port with supervisor-command capability.

11.4 Command Set

This section provides more detailed information on all Serial Port Manager commands.

ENTER COMMAND MODE

To set parameters or connect ports, first access the Command mode as described in **Section 5.1**. When the Command mode is inactive (port asleep), the port responds only when you press the **Enter** key without any characters preceding it. If the supervisor password is defined, the Serial Port Manager requires a password before allowing access to Command mode.

Availability: Supervisor/User

Format: [**Enter**] (Press [**Enter**] twice if other characters have already been typed.)

Response: The Port Status screen appears, followed by the APS> prompt.

RESIDENT DISCONNECT SEQUENCE

The resident disconnect sequence disconnects your resident port from another port. For example, if you are communicating via port 3, and port 3 is connected to port 4, the resident disconnect sequence disconnects port 3 from port 4. Although the default resident disconnect sequence is **^X** ([**Ctrl**] and [**X**]), the command format and logoff character is also redefined via the Port Configuration menus as described in **Section 5.5.3**.

NOTE

A three-character disconnect command is also selected.

Availability: Supervisor/User

Format: ^X

Response:

Verbose: The Serial Port Manager sends the Disconnected message, followed by the Port Status screen.

Terse: 3

CONNECT

Establishes a bi-directional connection between two ports. For more information and command line examples, refer to **Section 8.1**. There are two different types of port connections:

- Resident connect: If the /C command specifies one port name or number, your resident port will be connected to the specified port.
- Third-party connect: If the /C command specifies two port names or numbers, the Serial Port Manager connects the two ports indicated. A third-party connect command is issued from a third port with supervisor-command capability. User ports cannot initiate a third-party connect.

NOTE

Ports with user-command capability only connect to ports that share the same port password.

Ports with supervisor-command capability are allowed to connect to all other ports.

Availability: Supervisor/User

Format: `/C <x> [x]` [**Enter**]

where *x* is the number or name of the port(s) to be connected.

Response:

Verbose: Connected *xx* (where *xx* is the number or name of the port[s] to be connected), when a resident connection is initiated, the Serial Port Manager also displays the currently selected resident disconnect sequence for your port.

Terse: 1

COPY RS-232 PORT PARAMETERS

Allows quick setup when all Serial Port Manager RS-232 ports are configured with the same or similar parameters. When the /CP command is invoked, the Serial Port Manager displays a menu used to select common port parameters, which can then be copied to all Serial Port Manager RS-232 ports.

NOTE

The copy command does not change restricted parameters at ports 1, 2, and 8. For more information, please refer to Section 5.6.

Availability: Supervisor only

Format: /CP [**Enter**]

Response: Displays Copy Parameters menu.

THIRD-PARTY DISCONNECT

Invoke the /D command at your resident port to disconnect two other ports. The /D command can't disconnect your resident port. To disconnect your resident port, issue the resident disconnect sequence or wait for the timeout period to elapse (if enabled).

Availability: Supervisor only

Format: /D[/Y] <*x*> [*x*] [**Enter**]

where:

/Y (optional) suppresses the "Sure?" prompt.

x is the number or name of the port(s) to be disconnected.

To disconnect all ports, enter an asterisk.

Response:

Verbose: "Are you Sure (y/n)?". If "y," the Serial Port Manager responds with "Disconnected."

Terse: 5. If "y," the Serial Port Manager responds with "3."

(The terse commands are numeric responses to specific commands as opposed to verbal responses. The Serial Port Manager will respond with a different number depending on the command issued.)

Example: To disconnect port 2 from port 3 without the "Sure?" prompt, access the Command mode from a third port with "All" command capability. Type one of the following commands:

`/D/Y 2` [**Enter**] or `/D/Y 3` [**Enter**]

ERASE BUFFER

Erases data from the buffer for a specified port or several ports.

NOTE

Erased data cannot be recovered.

Availability: Supervisor only

Format: `/E[/Y] <x> [x]` [**Enter**]

where:

x is the number or name of the port buffer(s) to be cleared.

To erase buffers for all ports, enter an asterisk.

`/Y` (optional) suppresses the "Sure? (Y/N)" prompt.

Response:

Verbose: "Are You Sure (y/n)." If "y," the Serial Port Manager responds with "OK."

Terse: 5. If "y," the Serial Port Manager responds with "0."

(The terse commands are numeric responses to specific commands as opposed to verbal responses. The Serial Port Manager will respond with a different number depending on the command issued.)

Example: To clear the buffer for port 3, access the Command mode from a port with "All" command capability. Type `/E 3` and press **Enter**.

SET SYSTEM PARAMETERS

Displays a menu that defines the site ID message and supervisor password. When the supervisor password is defined, the Serial Port Manager displays a password prompt before allowing access to Command mode. For more information, refer to **Section 5.4**.

NOTE

Record your supervisor password for future reference. If the supervisor password is lost or forgotten, you can't access supervisor-level commands.

Availability: Supervisor only

Format: `/F` [**Enter**]

Response: Displays System Parameters menu.

HELP

Displays a Help screen. This screen lists all Serial Port Manager commands and a brief description of each command.

Availability: Supervisor/User

Format: `/H` [**Enter**]

Response: Displays Help screen.

NOTE

The user-level Help screen does not include supervisor-level commands.

DEFAULT AND TEST

Tests internal memory and initializes the Serial Port Manager with the default parameters specified by the DIP switches.

CAUTION

When this command is invoked, the Serial Port Manager reverts to the parameters specified by the DIP switches. Command selected parameters are lost.

Availability: Supervisor only

Format: `/I[/Y]` [**Enter**]

where `/Y` is a command option used to suppress the "Sure?" prompt.

Response:

Verbose: "Are You Sure (y/n)". If "y," memory test and initialization begins.

Terse: 5. If "y," memory test and initialization begins.

(The terse commands are numeric responses to specific commands as opposed to verbal responses. The Serial Port Manager will respond with a different number depending on the command issued.)

DISPLAY SITE ID

Displays the user-defined site ID message.

Availability: Supervisor/User

Format: /J [**Enter**]

Response: Displays site ID message.

SET RS-232 PORT PARAMETERS

Displays a menu that allows you to select options and parameters for the selected port. **Section 5.5.3** describes the procedure for defining port parameters.

Availability: Supervisor only

Format: /P [*x*] [**Enter**]

where *x* is the number or name of the port to be configured. If the port number or name is not specified, the Serial Port Manager displays the Configuration menu for your resident port.

Response: The Port Parameters menu displays.

DISPLAY PORT STATUS

Displays the Port Status screen, which lists current conditions and parameters for all ports. Normally, the Port Status screen does not display port passwords. The password column options include defined or undefined (depending upon whether or not the password for each port is specified). When the Supervisor mode is active, the /SP command offers the option to either display or suppress port passwords. In User mode, the /S command only displays information for the ports that share the same password entered at login. For more information on the Port Status screen, refer to **Section 7.1**.

Availability: Supervisor/User

Format: /S[P] [**Enter**]

When the P option is included (for example, /SP), the Port Status screen lists the password for each port, if defined (Supervisor mode only).

Response: Displays Port Status screen.

DISPLAY PORT DIAGNOSTICS

Provides more detailed information regarding the operational status of each port. In User mode, this screen displays parameters only for the ports allowed by the port password entered at login. For more information on the Port Diagnostics screen, refer to **Section 7.2**.

Availability: Supervisor/User

Format: /SD [**Enter**]

Response: Displays Port Diagnostics screen.

SAVE PARAMETERS

Sends Serial Port Manager configuration parameters to an ASCII text file as described in **Chapter 9**.

Availability: Supervisor only

Format: /U [**Enter**]

Response: The Serial Port Manager sends a series of command lines.

UPGRADE FIRMWARE

When new versions of the Serial Port Manager operating firmware become available, this command updates the existing firmware as described in **Chapter 10**.

NOTE

This command functions only at the internal modem port (port 8) and at setup ports 1 and 2.

Availability: Supervisor only

Format: /UF [**Enter**]

Response: The Serial Port Manager displays a menu that offers the options to retain existing Serial Port Manager parameters, default parameters, or abort the upgrade procedure.

DISPLAY PORT PARAMETERS (WHO)

Displays configuration of an individual port, but does not allow you to change parameters. Ports with user-level command capability can't display parameters for other ports. Normally, the port parameters screen doesn't include the port password.

NOTE

When the Supervisor mode is active, the /WP option can be used to display the password for the target port.

For more information, refer to **Section 7.3**.

Availability: Supervisor/User

Format: `/W[P] [x]` [**Enter**]

where:

- `P` When the P option is included (for example, `/WP 5`), the Port Parameters screen lists the password for the port, if defined (Supervisor mode only).
- `x` Port number or name. If the *x* argument is omitted, parameters for your resident port display.

Response: Displays port parameters.

Example: To display parameters for a port named SERVER, access the Command mode from a port with supervisor-level command capability. Type `/W SERVER` and press **Enter**.

EXIT COMMAND MODE

Exits Command mode. When issued at the net port (which is a port that may be tied to a serial terminal server and an established telnet session), this command also ends the telnet session.

NOTE

Exiting from Command mode will not terminate port connections.

- Any-to-any mode: Exits Command mode.
- Modem mode: Disconnects and resets the modem. A hang-up message is sent, the hardware line to modem drops for 500 ms, and the modem reset string is sent.

Availability: Supervisor/User

Format: /X [**Enter**]

Response: Disconnected.

Appendix A. RS-232 Port Interface

DCD and DTR hardware lines function as follows:

When connected:

1) If either port is set for Modem mode, the DTR output at either port reflects the DCD input at the other end.

2) If neither port is set for Modem mode, DTR output is held high (active).

When not connected:

1) If the port is set for Modem mode, upon disconnect DTR output pulses for 0.5 seconds and then is held high.

2) If the port is not set for Modem mode, DTR output is controlled by the DTR output option (Parameters menu, option 74). Upon disconnect, option 74 allows DTR output to be held low, held high, or pulsed for 0.5 seconds and then held high.

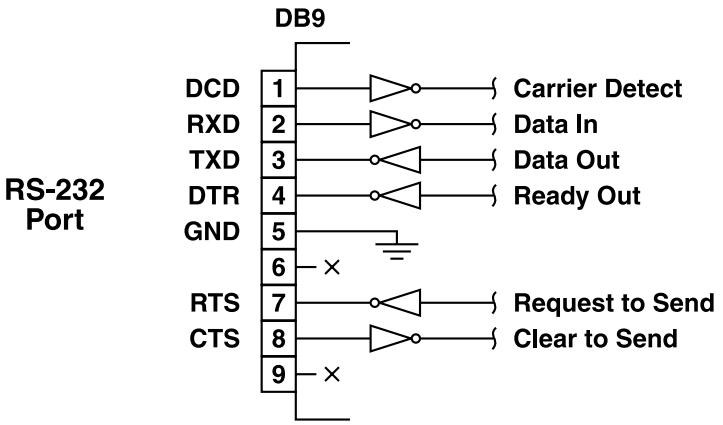

Figure A-1. RS-232 port interface.

Appendix B. Troubleshooting

B.1 Calling Black Box

If you determine that your 8-Port Serial Port Manager with Integral Modem is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

B.2 Shipping and Packaging

If you need to transport or ship your 8-Port Serial Port Manager with Integral Modem:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Serial Port Manager for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.