

15 Configuring Serial and Parallel Ports

This chapter describes serial and parallel ports. The following topics are covered in this chapter:

- ❑ “Ports Overview” on page 15-1
- ❑ “Configuring Port Operating Characteristics” on page 15-2
- ❑ “Configuring a Terminal for Use as a System Console” on page 15-9
- ❑ “Controlling Access to Serial and Parallel Ports” on page 15-10

For information on serial and parallel port pinouts, see the hardware documentation for your terminal.

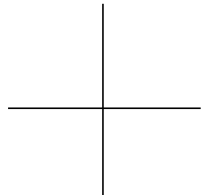
Ports Overview

All NCD Explora and HMX terminals are equipped with at least one serial port and one parallel port.

Serial Ports

You can configure a serial port to:

- ❑ Run serial terminal emulation through the NCD Terminal Emulator. See Chapter 12, *Configuring the NCD Terminal Emulator*.
- ❑ Attach a printer. See the *NCDware System Administrator's Guide for UNIX Systems*.
- ❑ Use the terminal as a console for controlling a host system. See “Configuring a Terminal for Use as a System Console” on page 15-9.
- ❑ Use XRemote, NCD's optional software for running both X clients and non-X applications. See the *NCDware System Administrator's Guide for UNIX Systems*.
- ❑ Use an alternative input device. For information about the input devices you can attach to a serial port, see the *NCDware User's Guide*. For input device configuration parameters, see the *Remote Configuration Parameter Quick Reference* and Chapter 9, *Using Configuration Menus*.



Parallel Port

Parallel ports are Centronics-compatible. You can configure the parallel port for printing or for a floppy drive. “Configuring the Parallel Port” on page 15-8 explains how to configure general parallel-port attributes. For information about configuring the parallel port for a floppy drive or printer, see the *NCDware System Administrator’s Guide for UNIX Systems*.

Configuring Port Operating Characteristics

This section describes how to identify terminal ports and the parameters used for configuring them

Identifying Serial Port Numbers

The Auxiliary Serial Port on all terminals is serial port 1.

For terminals with more than one serial port, the ports are identified in NCDware displays and configuration parameters as follows:

- ☐ The serial port on an ESP board is serial port 2.
- ☐ If a Y cable is attached to an ESP board’s serial port, the A connector is serial port 2 and the B connector is serial port 3.

Specifying Physical Serial Port Attributes

The **serial-interfaces-table** controls physical aspects of serial-line communication (Setup ⇒ Change Setup Parameters ⇒ Serial ⇒ Serial Interfaces Table). The table is saved in NVRAM and changes to the table take effect as soon as they are applied.

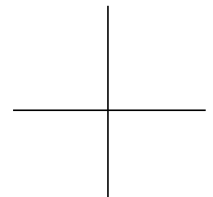


Table 15-1 serial-interfaces-table Parameter

Table Entries	Possible Values	Results
port-number	Range: 1 - 3 (read-only)	The identifying number of the serial port.
mode	Controls the function of the auxiliary serial port, and takes effect at boot time. (The current-mode field specifies the immediate use of the port.)	
	default	terminal
	terminal	The X server uses the serial port for a serial VT320 terminal connection, usually for connection to a modem, to a host system as a system console, or to a terminal multiplexer.
	printer	The X server uses the serial port for an attached printer. This option is the same as “serial-daemon.”
	serial-daemon	The X server uses the serial port for an attached printer. This option is the same as “printer.”
	slip	Configures the port for SLIP.
	console	The X server sends diagnostic messages to the serial port. This option is for the use of NCD Technical Support only.
	input-device	Configures the port to support one of the input devices selected in the xserver-input-extension-device parameter.
	xremote	Configures the port for XRemote. NCD recommends that you do not set the mode choice to “xremote.” The X server automatically changes current-mode to “xremote” when the user enters an xinitremote command.
	ppp	Configures the port for PPP.

Table 15-1 serial-interfaces-table Parameter (Continued)

Table Entries	Possible Values	Results
current-mode	Controls the immediate function of the auxiliary serial port. (The “mode” entry takes precedence at boot time.)	
	default	terminal
	terminal	The X server uses the serial port for serial, VT320 terminal connection, usually for connection to a modem, directly to a host system, or to a terminal multiplexer.
	printer	The X server uses the serial port for an attached printer. This option is the same as “serial-daemon.”
	serial-daemon	The X server uses the serial port for an attached printer. This option is the same as “printer.”
	slip	Configures the port for SLIP.
	console	The X server sends diagnostic messages to the serial port. This mode choice is for the use of NCD Technical Support.
	input-device	Configures the port for one of the input devices selected in the xserver-input-extension-device parameter.
	xremote	Configures the port for XRemote.
	ppp	Configures the port for PPP.
baud-rate	default	9600
	baud-rate	The baud rates for Serial Port 1 are 50, 75, 110, 134.5, 150, 200, 300, 600, 1050, 1200, 1800, 2000, 2400, 4800, 7200, 9600, 14400, 19200, 38400, 57600. Optional serial ports 2 and 3 can operate at the following additional baud rates: 76800, and 115200.
data-bits	default	8
	8	The serial port transmits characters with eight data bits.
	7	The serial port transmits characters with seven data bits.

15-4 Configuring Serial and Parallel Ports

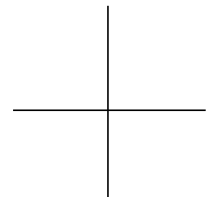


Table 15-1 serial-interfaces-table Parameter (Continued)

Table Entries	Possible Values	Results
stop-bits	default	1
	1	The serial port uses one stop bit per character.
	2	The serial port uses two stop bits per character.
parity	default	none
	none	No parity is generated.
	odd	The serial port requires an odd number of 1s (ones) for each byte.
	even	The serial port requires an even number of 1s (ones) for each byte.
	space	The serial port uses a 0 (zero) for each parity bit.
	mark	The serial port uses a 1 (one) for each parity bit.
handshake	default	none
	none	Flow control is disabled.
	xon/xoff	The terminal sends an XON (^Q) signal when input buffers are available and an XOFF (^S) signal when input buffers are nearly full.
	dtr/dsr	The terminal raises the DTR (Data Terminal Ready) signal when input buffers are available and lowers DTR when input buffers are nearly full. In addition, the DCE (Data Communication Equipment, the device with which the terminal communicates), raises the DSR (Data Set Ready) signal when it can receive data from the terminal. The terminal stops sending data when the DCE lowers the DSR signal.
	rts/cts	The terminal raises the RTS (Ready to Send) signal when input buffers are available and lowers RTS when input buffers are nearly full.

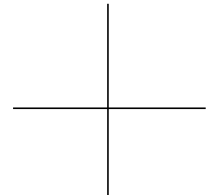


Table 15-1 serial-interfaces-table Parameter (Continued)

Table Entries	Possible Values	Results
hangup	default	none
	none	Neither the Serial daemon nor the NCD Terminal Emulator performs any action when the serial connection is closed by either the host or the X server.
	drop-dtr	Depending on the value assigned to the mode field, either the Serial daemon or the NCD terminal emulator drops the Data Terminal Ready signal on the specified serial port when either the host system or the X server closes the serial connection.
	send-break	Depending on the value assigned to the mode field, either the Serial daemon or the NCD Terminal Emulator sends a three-second break from the specified serial port when either the host system or the X server closes the serial connection.

The default **serial-interfaces-table** is:

```
serial-interfaces-table = {  
  { 1 terminal terminal 9600 8 1 none none none }  
  { 2 terminal terminal 9600 8 1 none none none }  
  { 3 terminal terminal 9600 8 1 none none none }  
}
```

Specifying Serial Port Software Characteristics

The **serial-daemons-table** specifies Serial daemon operating characteristics for each port (Setup ⇒ Change Setup Parameters ⇒ Serial ⇒ Serial Daemons Table).

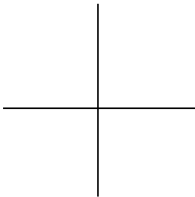


Table 15-2 serial-daemons-table Parameter

Table Entries	Possible Values	Results
port-number	Range: 1- 3 (read-only)	The identifying number of the serial port.
use-serial-protocol	default	false
	false	A protocol for reporting serial status to host printing software is not used.
	true	A protocol for reporting serial status to host printing software is used. This does not work unless hostside printing software has been enabled. (For more information about hostside printing software, contact NCD Technical Support.)
tcp-port	default	Port 1: 87 Port 2: 5962 Port 3: 5963
	<i>integer</i>	TCP/IP port number used by the hosts connecting to the Serial daemon. Range: 1 to 65535.
ncdnet-object-name	default	seriald
	<i>string</i>	The NCDnet object used by hosts connecting to the Serial daemon.
enable-lat-service	default	false
	true	LAT service is enabled for the Serial daemon. Supports VMS print service for the terminal.
	false	LAT service is not enabled for the Serial daemon.
lat-service-name	default	nil
	<i>string</i>	The name of the Serial daemon LAT service.
lat-service-rating	default	50
	<i>integer</i>	The X server uses the specified LAT service rating when advertising LAT service for the terminal's Serial daemon.

The default **serial-daemons-table** is:

```
serial-daemons-table = {
  { 1 false 87 seriald false nil 50 }
  { 2 false 87 seriald false nil 50 }
  { 3 false 87 seriald false nil 50 }
}
```

Configuring the Parallel Port

The **parallel-daemons-table** specifies operating characteristics for the parallel port (Setup ⇒ Change Setup Parameters ⇒ Parallel ⇒ Parallel Daemons Table).

Table 15-3 parallel-daemons-table Parameter

Table Entries	Possible Values	Results
port-number	Range: 1 - 2 (read-only)	The identifying number of the parallel port.
use-parallel-protocol	default	false
	false	A protocol for reporting status to host printing software is not used. This is the recommended setting when a printer is attached to the parallel port.
	true	A protocol for reporting status to host printing software is used. This value does not work unless hostside printing software has been enabled. This is the recommended setting when a floppy drive is attached to the parallel port (For more information about hostside printing software, contact NCD Technical Support.)
tcp-port	default	5964
	<i>integer</i>	TCP/IP port number used by the hosts connecting to the Parallel daemon. Range: 1 - 65535.

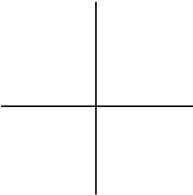


Table 15-3 parallel-daemons-table Parameter

Table Entries	Possible Values	Results
ncdnet-object-name	default	paralleld
	<i>string</i>	The NCDnet object used by hosts connecting to the Parallel daemon.
enable-lat-service	default	false
	true	The terminal enables a LAT service for the Parallel daemon. This LAT service is used to support VMS print service for the terminal.
	false	The terminal does not enable a LAT service for its Parallel daemon to the LAT network.
lat-service-name	default	nil
	<i>string</i>	The name of the Parallel daemon LAT service.
lat-service-rating	default	50
	<i>integer</i>	The X server uses the specified LAT service rating when advertising LAT service for the terminal's Parallel daemon.

The default **parallel-daemons-table** is:

```
parallel-daemons-table = {{ 1 false 5964 paralleld false nil 50 }}
```

Configuring a Terminal for Use as a System Console

By connecting a serial port of an NCD terminal to a host system, you can use the terminal as the system console.

Complete the following steps to configure an NCD terminal to operate as the system console:

1. Connect the terminal to the host using a null-modem cable.
2. Make sure the X server boots from a PCMCIA card. With a local server, the terminal can reboot even if the host system is down.

- 3. Make sure the **config-auto-save-nvram** parameter is set to “true,” so the **serial-interfaces-table** is written to NVRAM.
- 4. Set the **mode** parameter in the **serial-interfaces-table** to “terminal” for the port that you wish to use. Table 15-1 on page 15-3 lists the values for serial port attributes in the **serial-interfaces-table**.

When an NCD terminal is used as the system console, you should make sure security is enforced. Without security, a user on another terminal connected to the host could execute the NCD Terminal Emulator on the console and display its output on the user’s own terminal.

To prevent a user from invoking the **term -ctype** command on a terminal being used as a system console, use **exec-access-control-disabled** and **exec-access-control-list** as described in the *System Administrator’s Guide*.

Controlling Access to Serial and Parallel Ports

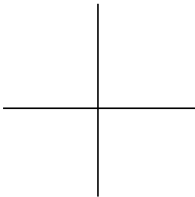
This section describes the parameters that control access to a terminal’s serial and parallel ports from other network hosts. These parameters are not saved in NVRAM.

To restrict access to a terminal’s serial ports or prevent all access from outside the terminal, complete the following steps:

- 1. To establish access control for a terminal’s ports, set the **serial-access-control-enabled** parameter to “true” (Setup ⇒ Change Setup Parameters ⇒ [Serial and Parallel Daemon section] ⇒ Enable Serial and Parallel Access Control).

Table 15-4 serial-access-control-enabled Parameter

Possible Values	Result
default	false
false	New requests for connection to the terminal’s ports are not checked against the list of hosts defined in the serial-access-control-list parameter.
true	Requests to access the terminal’s ports are honored only from hosts listed in the serial-access-control-list parameter.



2. In the **serial-access-control-list** parameter, specify the hosts permitted to access the terminal's ports. You must list all hosts that have access (including other terminals). A separate entry is required for each protocol family (TCP/IP, DECnet, and LAT). For example, a host that has both TCP/IP and DECnet access must have two entries (Setup ⇒ Change Setup Parameters ⇒ Access Control [Serial and Parallel Daemon section] ⇒ Serial and Parallel Access Control List).

Table 15-5 serial-access-control-list Parameter

Table Entries	Possible Values	Result
host	default	(empty list)
	host	Host permitted to access the terminal's serial ports, specified by hostname, IP address, or DECnet address. DECnet host names must have "::" appended to them.
family	default	tcpip
	tcpip	The host can connect to the serial ports via TCP/IP.
	ncdnet	The host can connect to the serial ports via DECnet.
	lat	The host can connect to the serial ports via LAT.

For example:

```
serial-access-control-list = {
    { eagle      tcpip }
    { eagle      lat   }
    { ncdnu23    tcpip }
}
```

In the following example, only local access to the terminal is allowed:

```
serial-access-control-list = {{127.0.0.1 tcpip}}
```

3. To prevent access from all hosts, leave the **serial-access-control-list** table empty:

```
serial-access-control-list = {}
```

