



## RealPort Installation

for the following operating systems:

Microsoft Windows Server 2003, Microsoft Windows 2000, Microsoft Windows XP,  
Microsoft Windows NT 4.0, Microsoft Windows 9x/Me,  
SCO OpenServer, SCO UNIXWare,  
LINUX, Solaris, AIX, and  
HP-UX

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## Introduction to RealPort

RealPort software can be installed on one or more host servers to provide local serial port functionality. RealPort can be used to provide standard system COM or TTY interfaces to control baud rate, parity, stop bits, and flow control of local serial ports. Any system utility or user application that works with a locally attached serial port should work with a Digi RealPort port.

## Device Support

Digi's RealPort software works with all the Digi Device and Terminal Servers, PortServer products, and many EtherLite products.

## About This Guide

### Purpose

Use this guide to install and configure RealPort on a variety of operating systems.

### Audience

This guide is intended for the person responsible for installing and configuring RealPort. This person should have experience configuring network devices and be familiar with networking concepts.

Following are the conventions used in this document:

### Conventions: Special Fonts

A special font (typewriter face) is used for any input you need to enter. Examples appear after descriptive text as in the the following text:

```
set config
```

### Conventions: Square Brackets

Optional parameters are displayed within square brackets.

```
set config [dhcp=on]
```

Note: The square brackets themselves are not actually part of the command, and should not be entered.

### Conventions: Italics

Variables are displayed in italics.

```
set config ip=ip-address
```

Note: Substitute an appropriate IP address for *ip-address* in the above command.

**Conventions: Vertical Bar**

A vertical bar character (|) is used to denote a choice (logical "or").

```
set flow=on|off
```

Note: The above command would be entered as either:

```
set flow=on or set flow=off
```

**About RealPort**

RealPort software can be installed on one or more host servers to provide local serial port functionality. RealPort can be used to provide standard system COM or TTY interfaces to control baud rate, parity, stop bits, and flow control of local serial ports. Any system utility or user application that works with a locally attached serial port should work with a Digi RealPort port.

Digi's RealPort software works with the TS Family (including the Digi One family and Digi PortServer TS family), Digi Flex, Digi Connect, and Digi EtherLite products. However, Encrypted RealPort does not work with EtherLite, Digi Flex, or older PortServer products.

**Requirements**

- The RealPort driver requires between one and two MB of memory on the Microsoft Windows Server 2003/2000/XP system.
- The Windows Server 2003/2000/XP RealPort driver requires a 10-pin RJ-45 cable to connect devices to PortServer ports. This requirement does not apply to Etherlite units.

**Limitations**

Only TAPI-compliant applications or those written to COM 32 API (application programming interface) standards can use intelligent ports, which means only these applications can use RealPort ports.

**Key Concept: About Port Mapping Offsets**

The number of local ports on the Windows Server 2003/2000/XP host offsets the port number on the Digi device. For example, if you have two local COM ports, Port 1 of the Digi device is seen by the RealPort service as COM 3. Once the RealPort driver has been installed, you can modify the COM port numbering scheme.

**Configuring the Digi Device**

To configure the Digi device for RealPort, you must do the following:

- Configure the device with an IP address.
- Configure ports for RealPort.

**Configuring Etherlite**

To configure Etherlite for RealPort, you must configure an IP address for the device. Use dgipserv from the CD or from the Digi Technical Support site <http://www.digi.com/support/>.

**Master Setup Process**

Use this topic to identify all the tasks required to complete RealPort setup.

*Procedure*

1. Configure the Digi device for RealPort.
2. Install (or download) and configure the RealPort driver.
  - You may download the driver or install it from a CD. Some product CDs may have a script or wizard to perform these steps for you.
3. Configure peripherals on RealPort ports. See the following:
  - "Configuring a Printer" on page 17
  - "Configuring a Modem" on page 17

## **Upgrading the RealPort Driver**

Use this procedure to upgrade the RealPort driver. It is assumed that you have already downloaded the driver files or installed them from a CD. Some product CDs may have a script or wizard to perform these steps for you. Use this procedure to upgrade a Digi RealPort device driver that is installed in your system. Digi drivers may be delivered on a CD-ROM or downloaded from the Digi Support Web (<http://support.digi.com>).

**Note:** Digi drivers for Microsoft Windows Server 2003/2000/XP may be either signed or unsigned.

### **Upgrade RealPort**

There are two CDs that ship with the RealPort driver and depending on your product, you will receive one or the other. The Software and Documentation CD has the set up wizard, select Cancel and click Software. The Access Resource CD asks for your Operating System, Hardware, and Software. Select RealPort.

1. Select Install RealPort driver.
2. Select Update Digi RealPort Software.
3. Follow the wizard.
4. Click Finish to complete the wizard.

### **Remove RealPort**

1. From the CD, cancel the set up wizard and select Software.
2. Select Install RealPort driver.
3. Select Remove an Existing Device.
4. Follow the wizard.
5. Click Finish to complete the wizard.

## **Accessing and Changing the RealPort Configuration**

Use these procedures to access and/or change the RealPort configuration. Configuration changes might include adding or removing Digi terminal server devices, adding or removing ports, or changing port attributes.

*Procedure*

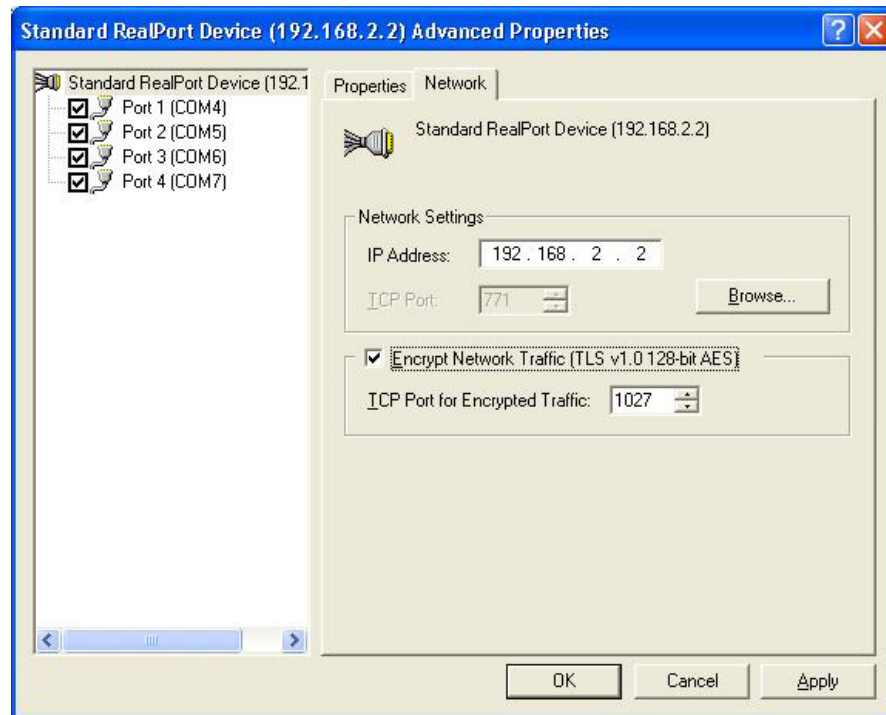
1. Right click My Computer.
2. Choose Properties > Hardware > Device Manager.

3. Locate Multi-port Serial Adapters and expand the list if necessary.
4. Choose the Digi terminal server device, right click and then choose Properties > Advanced.
5. Use the Digi device's Properties utility and the online help for aid in making configuration changes.

## Encrypted RealPort

Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended. To implement Encrypted RealPort use the following procedure:

1. From the Start Menu, click Settings > Control Panel > Administrative Tools > Computer Management > System Tools > Device Manager > Multi-port Serial Adapters
2. Select your device, click the Advanced tab, click Properties and click the Network tab.



3. Enable the Encrypt Network Traffic box.

**Note:** The TCP port for encrypted traffic default setting is 1027. This must agree with the device TCP port setting which can be configured through the web interface by entering the IP address in URL address bar. Under Network > Network Services Settings > Select Enable Encrypted RealPort and verify the port number as 1027. (The Encrypted RealPort TCP port number must match the device port number.) Click Apply - you do not need to reboot.

4. Click Ok and Apply.



## Configuring a Printer

Use this procedure to configure a printer on a Microsoft Windows Server 2003/2000/XP system that is running RealPort. Using the Classic Start menu. To change to the Classic Start menu, right-click the Start button and choose Properties > Classic Start menu.

### *Procedure*

1. From the Start menu, choose Settings > Printers and Faxes > Add Printer.
2. From the Add Printer Wizard, choose Next > select Local printer attached to this computer and uncheck the box Automatically detect and install my Plug and Play printer.
3. Choose Use the following port and scroll to the port to be assigned the printer > Next.
4. From the Install Printer Software screen, choose the printer attached to the RealPort port > Next.
5. Accept the default name or enter a name for the printer > choose whether to make it the default printer or not > Next.
6. Choose Yes to print a test page > Next > Finish. The system does not need to be rebooted.

## Configuring a Modem

Use this procedure to configure a modem on a Digi terminal server port using the Classic Start menu. To change to the Classic Start menu, right-click the Start button and choose Properties > Classic Start menu.

### *Procedure*

1. From the Start Menu, choose Settings > Control Panel > Phone and Modem Options.
2. Choose the Modem tab and then Add. From the Install New Modem screen choose to have Windows detect the modem or to select the modem from a list.
3. If the Windows Server 2003/2000/XP system does not autodetect the proper modem, select the correct modem.
4. Follow the Windows Server 2003/2000/XP prompts to install and set up the modem on a Digi port.

## Starting and Stopping the RealPort Service

Use this procedure to start or stop the RealPort service on Microsoft Windows Server 2003/2000/XP.

### *Procedure*

1. Right-click on My Computer, choose Properties > Hardware tab > Device Manager.

Expand the Multi-port Serial Adapters list if necessary and select the terminal server.

2. Right-click and choose Disable to stop the service or Enable to start the RealPort service.

## Upgrading Etherlite Firmware

Use this procedure to upgrade the firmware on a Digi RealPort EtherLite module.

### *Procedure*

1. Download the latest firmware upgrade, the DglPserv utility, and the Verlog utility from the Digi website at <http://support.digi.com>.
2. Create and name a folder and extract the compressed files to the folder.
3. Execute the DglPserv utility.
4. Choose Update Firmware > Next > and browse to the location of the extracted firmware files.
5. Choose the appropriate \*.bin file  
where \* represents the EtherLite firmware part number.
6. Follow the prompts by entering the EtherLite's MAC address and it's current IP settings.
7. Recycle the power, allowing 10 seconds before reseating the power, and choose Finish. The message "Transfer complete!" will appear confirming a successful upgrade to the firmware. You do not need to reboot your system.

**Note:** To verify the firmware update, use the Digi Verlog utility. It will list the EtherLite model, the new firmware version, and other related information.

## Removing the Driver

Use this procedure to remove RealPort from your system.

### *Procedure*

1. Right-click My Computer > choose Properties > Hardware.
2. Choose Device Manager > select Digi EtherLite > right-click > select Uninstall.

## Troubleshooting RealPort in Windows:

### **None of the Ports work:**

1. Make sure the RealPort driver available on our web site at [www.digi.com](http://www.digi.com).
2. Make sure the Digi Device/Terminal Server is running the latest firmware version available on our website at [www.digi.com](http://www.digi.com).
3. To verify the Digi Device/Terminal Server is configured properly, from a command prompt (or Start > Run), type:

```
telnet [IP_of_digi_unit] 20xx
```

Where 20xx would be replaced by 2000+[**Port Number**]. For example, to connect to port #1, type:

```
telnet [IP_of_digi_unit] 2001
```

By inserting the loopback plug shipped with the Digi Device/Terminal Server into the port, you will be able to view any data being typed. Removing the loopback plug will not display any data typed.

If the loopback test fails, the Digi Device/Terminal Server is not configured properly.

If the loopback test works, the Digi Device/Terminal Server is configured properly.

4. If you haven't already verified the RealPort host can reach the Digi Device/Terminal Server above, please do so now by typing the following from a command prompt (or Start > Run):

```
telnet [IP_of_digi_unit] 771
```

You should get a blank window with a cursor. If you do not, then RealPort cannot connect to the Digi Device/Terminal Server because the socket it uses to communicate (771) is in use, being blocked or fire walled.

**Note:** You will not be able type anything in this window, but you may see two line "||" that repeat. This is nothing to be concerned with. It is the drivers built in keepalive.

5. If you still cannot communicate after verifying the RealPort host can reach the Digi Device/Terminal Server, try reinstalling the driver. If this does not resolve the problem, please contact Digi Technical Support.

#### **Some of the Ports do not work:**

1. Check for active processes that maybe running on that port by logging into the Digi Device/Terminal Server via Telnet. At the root prompt, type:

```
#> who
```

If there appears to be a process on the port, try killing it with the following command:

```
#> kill tty=#
```

**Note:** Rebooting the unit can also clear the process.

2. Test the non-working port with Hyperterminal: Choose Start > Accessories > Communications > Hyperterminal.
3. Type in a name, and choose an icon. It really doesn't matter what you choose for a name or icon. Choose OK when finished.
4. In the "Connect To" dialog box go to the connect using drop down list and choose the com port you wish to test. Choose OK when finished.
5. For testing with the loopback the defaults port settings are fine. Choose OK.
6. Insert the loopback plug, which ships with the Digi Device/Terminal Server,into whichever port you decided to test. You should see a blinking cursor on the main Hyperterminal screen. If you get a "Unable to open comX" message, this means the port is already open, make sure all applications that might be accessing the port are closed, or their services have been stopped (faxing applications, RAS, Citrix MetaFrame, etc.).

7. Type Hello! on the Hyperterminal screen. These characters should appear as you type them.

If the loopback test does not pass, please contact Digi International Technical Support at (952) 912-3456.

8. Test your serial device on a standard COM port (i.e. COM1/COM2)

If the loopback test passed and the serial device works on a standard COM port (i.e. COM1/COM2), verify the following:

- a. Cabling:

<http://support.digi.com/support/techsupport/common/cables/async/pscableindex.html>

- b. Check Advanced Serial Settings: The RealPort driver supports an additional set of advanced features, each of which can be enabled or disabled from the Advanced properties of the Digi Device driver.

**Note:** For more information on what these specific settings can be found in the Release Notes. Read through them to determine if any of these options should be enabled.

If you have not resolved your problem at this point, please write down how far you were able to get in the above procedure (and the results) to describe your problem.



**About RealPort**

RealPort software can be installed on one or more host servers to provide local serial port functionality. RealPort can be used to provide standard system COM, AIO or TTY interfaces to control baud rate, parity, stop bits, and flow control of local serial ports. Any system utility or user application that works with a locally attached serial port should work with a Digi RealPort port.

Digi's RealPort software works with all the Digi One RealPort, Digi Connect, PortServer and EtherLite products.

**Requirements**

- The RealPort driver for Microsoft Windows NT requires between one and two MB of memory on the Windows NT system.
- The Windows NT RealPort driver requires a 10-pin RJ-45 cable to connect devices to Digi One RealPort or PortServer ports.

**Limitations**

- Version 1.0.2 of the RealPort driver is the only version that supports Windows NT systems. You can access this driver at the Digi Web site: [www.digi.com](http://www.digi.com).
- Only TAPI-compliant applications or those written to COM 32 API (application programming interface) standards can use intelligent ports, which means only these applications can use RealPort ports.

**Key Concept: About Port Mapping Offsets**

The number of local ports on the Windows NT host offsets the port number on the Digi device. For example, if you have two local COM ports, Port 1 of the Digi device is seen by the RealPort service as COM 3.

**Configuring the Digi Device**

To configure the Digi device for RealPort, you must do the following:

- Configure the device with an IP address.
- Configure ports for RealPort.

**Configuring Etherlite**

To configure Etherlite for RealPort, you must configure an IP address for the device. The recommend way to do this is during Windows NT RealPort driver installation.

**Setup Process**

Use this topic to identify all the tasks required to complete RealPort setup.

#### *Procedure*

1. Install (or download) and configure the RealPort driver.
  - You may download the driver or install it from a CD. Some product CDs may have a script or wizard to perform these steps for you.
2. Configure the Digi device for RealPort. (This step is accomplished during driver installation for Etherlite units.)
3. Reboot the system to make RealPort ports available to the operating system.
4. Configure peripherals on the RealPort ports. See the following:
  - "Configuring a Printer" on page 25
  - "Configuring a Modem" on page 26

### **Install RealPort on Microsoft Windows NT4**

Use this procedure to install the RealPort driver. It is assumed that you have already downloaded the driver files or installed them from a CD. Some product CDs may have a script or wizard to perform these steps for you.

1. Click Start, click Settings, and then click Control Panel.
2. Double-click Network and then click the Services tab.
3. Click Add and then click Have Disk.
4. Type the path to the RealPort files and click OK, or click Browse and locate the files.
5. Select Digi RealPort Service and click OK.
6. Follow the prompts on the screen to finish installing RealPort.

### **Update RealPort on Microsoft Windows NT4**

1. Click Start, click Settings, and then click Control Panel.
2. Double-click Network and then click the Services tab.
3. In the Network Services list, select Digi RealPort Service and click Remove
4. In the following Warning dialog, click Yes to confirm the permanent component removal.
5. Click Close to close the Network dialog and then click Yes to restart your computer.
6. When the computer has restarted, click Start, click Settings, and then click Control Panel.
7. Double-click Network and then click the Services tab.
8. Click Add and then click Have Disk.
9. Type the path to the RealPort files and click OK
10. Select Digi RealPort Service and click OK
11. Follow the prompt on the screen to finish updating RealPort.

## Accessing and Changing the RealPort Configuration

Use these procedures to access and/or change the RealPort configuration. Configuration changes might include adding or subtracting Digi devices, adding or subtracting ports, or changing port attributes.

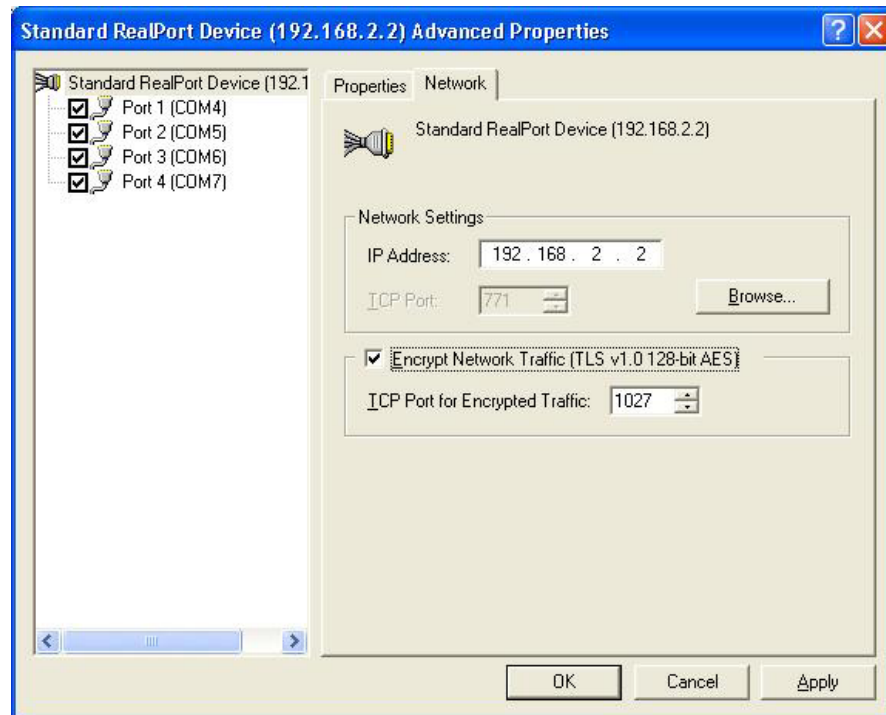
### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Network > Services.
2. Choose the Digi RealPort Service and then Properties.
3. Choose a Digi device and then Properties.
4. When the RealPort Properties page appears, use the help text to guide you through configuration procedures.

## Encrypted RealPort

Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended. To implement Encrypted RealPort use the following procedure:

1. From the Start Menu, click Settings > Control Panel > Administrative Tools > Computer Management > System Tools > Device Manager > Multi-port Serial Adapters
2. Select your device, click the Advanced tab, click Properties and click the Network tab.



3. Enable the Encrypt Network Traffic box.



**Note:** The TCP port for encrypted traffic default setting is 1027. This must agree with the device TCP port setting which can be configured through the web interface by entering the IP address in URL address bar. Under Network > Network Services Settings > Select Enable Encrypted RealPort and verify the port number as 1027. (The Encrypted RealPort TCP port number must match the device port number.) Click Apply - you do not need to reboot.

4. Click Ok and Apply.

## Configuring a Printer

Use this procedure to configure a printer on a Microsoft Windows NT system that is running RealPort.

**Note:** This procedure requires you to restart the computer. Therefore, print this topic to avoid having to relocate it when the system restarts.

### *Procedure*

1. From the Start menu, choose Settings > Printers > Add Printer.
2. From the Add Printer Wizard, choose My Computer > Next.
3. From the list of available ports, choose LPT1 (temporarily, until RealPort ports are added) and then Next.
4. Use the Add Printer Wizard to install and configure a printer driver.

Do not print a test page.

5. When the new printer is displayed in the Printers menu, choose the new printer and then File > Properties.
6. Choose the Ports tab and then Add Port... > Local Port > New Port.
7. Type in a Digi port name followed by a colon (example: COM18 :) and then choose OK.
8. When the Ports list appears, choose the new Digi port and then Add.
9. Choose the Digi port in the COM Port field and then OK.
10. When you are prompted to reboot your system, choose Don't Restart Now.
11. Choose the Digi port and then Settings.
12. Set the Baud Rate, Data Bits, Parity, Stop Bits, and Flow Control to match your printer configuration.

**Note:** Changing the baud rate of a serial printer requires deleting the printer device and then re-adding the device with a different baud rate. If you plan to use the RealPort service with serial printers, you have to reboot the system after device installation or after renaming ports to see the new ports listed in the Print Spooler's list of available ports for printing. If you experience problems printing to a serial printer, navigate to the device's Device Properties dialog in the Device Manager, enable "Complete Write Requests Immediately," and try printing again.

13. Choose OK and then exit the printer configuration.
14. Reboot your system and then return to the Printer menu.
15. Choose the printer and then File > Properties > Ports.
16. Choose the Digi port from the list and then OK.

## Configuring a Modem

Use this procedure to configure a modem on a Digi port on a Microsoft Windows NT system.

### *Procedure*

1. From the Start Menu, choose Settings > Control Panel > Modems.
2. Choose Add > Next (which will autodetect the modem). If the Windows NT system does not autodetect the proper modem, select the modem.
3. Follow the Windows NT 4.0 prompts to install and set up the modem on a Digi port.

## Starting and Stopping the RealPort Service

Use this procedure to start or stop RealPort service on Microsoft Windows NT.

### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Devices > Digi RealPort.
2. Choose Stop or Start.

## Upgrading Etherlite Firmware

Use this procedure to upgrade the firmware on a Digi RealPort EtherLite module.

### *Procedure*

1. Download the latest firmware upgrade from the Digi website at [support.digi.com](http://support.digi.com).
2. Create and name a folder, for example *ELupgrade*, and extract the compressed firmware upgrade files to the folder.
3. Locate and execute the DgIPserv utility. The utility was installed with the RealPort driver and can be found in the default directory location at `c:\WINNT\system32`.
4. Choose Update Firmware > Next and browse to the location of the extracted firmware files.
5. Change the Files of type from EtherLite Firmware \*.prm to EtherLite Firmware \*.bin and choose the appropriate \*.bin file where \* represents the EtherLite firmware part number.
6. Follow the prompts by entering the EtherLite's MAC address and its current IP settings.
7. Recycle the power and choose Finish. A message will appear confirming a successful upgrade to the firmware.
8. Reboot your system.

Note: To verify the firmware update, use the Digi Verlog.exe utility found on the Digi website. It will list the EtherLite model, its firmware version, and related information.

### Removing the Driver

Use this procedure to remove RealPort from your system.

#### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Network > Services.
2. Choose Digi RealPort Service and then Remove.
3. Follow the prompts to complete removal.

### Troubleshooting RealPort in Windows:

#### **If none of the ports work:**

1. Make sure the RealPort driver available on our web site at [www.digi.com](http://www.digi.com).
2. Make sure the Digi device is running the latest firmware version available on our website at [www.digi.com](http://www.digi.com).
3. To verify the Digi device is configured properly, from a command prompt (or Start > Run), type:

```
telnet [IP_of_digi_unit] 20xx
```

Where 20xx would be replaced by 2000+[Port Number]. For example, to connect to port #1, type:

```
telnet [IP_of_digi_unit] 2001
```

By inserting the loopback plug shipped with the Digi device into the port, you will be able to view any data being typed. Removing the loopback plug will not display any data typed.

If the loopback test fails, the Digi device is not configured properly.

If the loopback test works, the Digi device is configured properly.

4. If you haven't already verified the RealPort host can reach the Digi device above, please do so now by typing the following from a command prompt (or Start > Run):

```
telnet [IP_of_digi_unit] 771
```

You should get a blank window with a cursor. If you do not, then RealPort cannot connect to the Digi device because the socket it uses to communicate (771) is in use, being blocked or fire walled.

**Note:** You will not be able type anything in this window, but you may see two line "||" that repeat. This is nothing to be concerned with. It is the drivers built in keepalive.

5. If you still cannot communicate after verifying the RealPort host can reach the Digi device, try reinstalling the driver. If this does not resolve the problem, please contact Digi Technical Support.

#### **If some of the ports do not work:**

1. Check for active processes that maybe running on that port by logging into the Digi device via Telnet. At the root prompt, type:

```
#> who
```

If there appears to be a process on the port, try killing it with the following

command:

```
#> kill tty=#
```

**Note:** Rebooting the unit can also clear the process.

2. Test the non-working port with Hyperterminal: Choose Start > Accessories > Communications > Hyperterminal.
3. Type in a name, and choose an icon. It really doesn't matter what you choose for a name or icon. Choose OK when finished.
4. In the "Connect To" dialog box go to the connect using drop down list and choose the com port you wish to test. Choose OK when finished.
5. For testing with the loopback the defaults port settings are fine. Choose OK.
6. Insert the loopback plug, which ships with the Digi device, into whichever port you decided to test. You should see a blinking cursor on the main Hyperterminal screen. If you get a "Unable to open comX" message, this means the port is already open, make sure all applications that might be accessing the port are closed, or their services have been stopped (faxing applications, RAS, Citrix MetaFrame, etc.).
7. Type Hello! on the Hyperterminal screen. These characters should appear as you type them.

If the loopback test does not pass, please contact Digi International Technical Support at (952) 912-3456.

8. Test your serial device on a standard COM port (i.e. COM1/COM2)

If the loopback test passed and the serial device works on a standard COM port (i.e. COM1/COM2), verify the following:

- a. Cabling: <http://support.digi.com/support/techsupport/common/cables/async/pscableindex.html>
- b. Check Advanced Serial Settings: The RealPort driver supports an additional set of advanced features, each of which can be enabled or disabled from the Advanced properties of the Digi device driver.

**Note:** For more information on what these specific settings can be found in the Release Notes. Read through them to determine if any of these options should be enabled.

If you have not resolved your problem at this point, please write down how far you were able to get in the above procedure (and the results) to describe your problem.



**About RealPort**

RealPort software can be installed on one or more host servers to provide local serial port functionality. RealPort can be used to provide standard system COM, AIO or TTY interfaces to control baud rate, parity, stop bits, and flow control of local serial ports. Any system utility or user application that works with a locally attached serial port should work with a Digi RealPort port.

Digi's RealPort software works with all the Digi device server products.

**Requirements**

- The RealPort driver for Microsoft Windows 9x/Me requires between one and two MB of memory on the Windows 9x/Me system.
- The Windows 9x/Me RealPort driver requires a 10-pin RJ-45 cable to connect devices to Digi One RealPort or PortServer ports.

**Limitations**

Only TAPI-compliant applications or those written to COM 32 API (application programming interface) standards can use intelligent ports, which means only these applications can use RealPort ports.

**Key Concept: About Port Mapping Offsets**

The number of local ports on the Windows 9x/Me host offsets the port number on the Digi device. For example, if you have two local COM ports, Port 1 of the Digi device is seen by the RealPort service as COM 3.

**Configuring the Digi Device**

To configure the Digi device for RealPort, you must do the following:

- Configure the device with an IP address.
- Configure ports for RealPort.

**Configuring Etherlite**

To configure Etherlite for RealPort, you must configure an IP address for the device. The recommend way to do this is during Windows 9x/Me RealPort driver installation. This method is described in the following discussions:

- "Installing the Driver: CD" on page 31
- "Upgrade RealPort on Microsoft Windows 98 or Microsoft Windows Me." on page 32

**Setup Process**

Use this topic to identify all the tasks required to complete RealPort setup.

#### *Procedure*

1. Install (or download) and configure the RealPort driver.
  - You may download the driver or install it from a CD. Some product CDs may have a script or wizard to perform these steps for you.
2. Configure the Digi device for RealPort. (This step is accomplished during driver installation for Etherlite units.)
3. Reboot the system to make RealPort ports available to the operating system.
4. Configure peripherals on the RealPort ports. See the following:
  - "Configuring a Printer" on page 33
  - "Configuring a Modem" on page 34

#### **Installing the Driver: Download or Integration Kit**

Use this procedure when to install the Windows 9x/Me RealPort driver after you download it from the Digi web site.

1. From the Start menu, choose Settings > Control Panel > Network > Services.
2. Choose Add > Have Disk....
3. Type in the path to where the RealPort files are stored and then choose OK.
4. Choose Digi RealPort Service and then OK.

The files are installed and the configuration wizard is started.

5. If you are using an Etherlite unit that has not been assigned IP settings, do the following to assign the settings:
6. Press the DgIPServ button.
7. Use the wizard and the associated help text to assign IP settings to the Etherlite unit.
8. When you finish, return to the Add Digi RealPort wizard.
9. Use the Add Digi RealPort wizard and the associated help text to configure the RealPort driver with the IP address and TCP port number used by the Digi device.
10. Follow the prompts to complete configuration of the RealPort driver.

#### **Installing the Driver: CD**

Use this procedure to install the Windows 9x/Me RealPort driver from the Digi CD. This procedure assumes that you have already started the Digi CD front-end menu program. Navigate the CD front-end to your RealPort installation.

1. Click the Run Add New Hardware button at the bottom of the instructions.
2. Click Next > Next. The wizard searches for devices and asks if the device you want to install is listed below.
3. Click "No, the device isn't in the list" then click Next.

4. Click "No, I want to select the device from a list" then click Next.
5. Scroll down and select Other devices and click Next.
6. Click Have Disk.
7. Click Control-V when prompted for the path and click OK.  
 Note: If the name does not appear in the path, enter  
 D:/drivers/windows/win9x/realport where D = the CD ROM drive.
8. Select your device from the list that appears and click Next.
9. Click Finish to complete the configuration.  
 If you are using an Etherlite unit that has not been assigned an IP address, do the following to assign an address:
10. Press the DgIPServ button.
11. Use the wizard and the associated help text to assign an IP address to the Etherlite unit.
12. When you finish, return to the Add Digi RealPort wizard.
13. Use the Add Digi RealPort wizard and the associated help text to configure the RealPort driver with the IP address and TCP port number used by the Digi device. For Etherlite units, this is the IP address assigned in the previous step.
14. Follow the prompts to complete configuration of the RealPort driver.

### **Upgrade RealPort on Microsoft Windows 98 or Microsoft Windows Me.**

Use this procedure to upgrade the RealPort driver. It is assumed that you have already downloaded the driver files or installed them from a CD. Some product CDs may have a script or wizard to perform these steps for you.

1. Click Start > Settings > Control Panel.
2. Double-click System > Device Manager tab.
3. Double-click Multi-port Serial Adapters > double-click the device you would like to update.
4. On the Driver tab, click Update Driver to start the Update Device Driver Wizard and click Next.
5. Click Search for a better driver than the one your device is using now (Recommended) and click Next.
6. Clear all check boxes, then select the Select a location check box.
7. Type the path to the RealPort files and click OK, or click Browse and locate the files.
8. Click One of the other drivers and click View List
9. In the list, select the driver you are updating, click OK, click Next > Next.
10. Click OK to confirm the Add New Digi Hardware dialog, click Finish to close the Update Device Driver Wizard and then click Close to close the Device Properties dialog.



11. Repeat steps 3 to 10 for each device you would like to update.
12. Close the Device Manager and restart your computer to let the changes take effect.

## Accessing and Changing the RealPort Configuration

Use these procedures to access and/or change the RealPort configuration. Configuration changes might include adding or subtracting Digi devices, adding or subtracting ports, or changing port attributes.

### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Network > Services.
2. Choose the Digi RealPort Service and then Properties.
3. Choose a Digi device and then Properties.
4. When the RealPort Properties page appears, use the help text to guide you through configuration procedures.

## Configuring a Printer

Use this procedure to configure a printer on a Microsoft Windows NT system that is running RealPort.

**Note:** This procedure requires you to restart the computer. Therefore, print this topic to avoid having to relocate it when the system restarts.

### *Procedure*

1. From the Start menu, choose Settings > Printers > Add Printer.
2. From the Add Printer Wizard, choose My Computer > Next.
3. From the list of available ports, choose LPT1 (temporarily, until RealPort ports are added) and then Next.
4. Use the Add Printer Wizard to install and configure a printer driver.  
Do not print a test page.
5. When the new printer is displayed in the Printers menu, choose the new printer and then File > Properties.
6. Choose the Ports tab and then Add Port... > Local Port > New Port.
7. Type in a Digi port name followed by a colon (example: COM18 :) and then choose OK.
8. When the Ports list appears, choose the new Digi port and then Add.
9. Choose the Digi port in the COM Port field and then OK.
10. When you are prompted to reboot your system, choose Don't Restart Now.
11. Choose the Digi port and then Settings.
12. Set the Baud Rate, Data Bits, Parity, Stop Bits, and Flow Control to match your printer configuration.
13. Choose OK and then exit the printer configuration.
14. Reboot your system and then return to the Printer menu.

15. Choose the printer and then File > Properties > Ports.
16. Choose the Digi port from the list and then OK.

### **Configuring a Modem**

Use this procedure to configure a modem on a Digi port on a Microsoft Windows NT system.

#### *Procedure*

1. From the Start Menu, choose Settings > Control Panel > Modems.
2. Choose Add > Next (which will autodetect the modem). If the Windows 9x/Me system does not autodetect the proper modem, select the modem.
3. Follow the Windows 9x/Me prompts to install and set up the modem on a Digi port.

### **Starting and Stopping the RealPort Service**

Use this procedure to start or stop RealPort service on Microsoft Windows 9x/Me.

#### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Devices > Digi RealPort.
2. Choose Stop or Start.

### **Upgrading Etherlite Firmware**

Use this procedure to upgrade the firmware on a Digi RealPort EtherLite module.

#### *Procedure*

1. Download the latest firmware upgrade from the Digi website at [support.digi.com](http://support.digi.com).
2. Create and name a folder, for example *ELUpgrade*, and extract the compressed firmware upgrade files to the folder.
3. Locate and execute the DgIPserv utility. The utility was installed with the RealPort driver and can be found in the default directory location at `c:\WINNT\system32`.
4. Choose Update Firmware > Next and browse to the location of the extracted firmware files.
5. Change the Files of type from EtherLite Firmware \*.prm to EtherLite Firmware \*.bin and choose the appropriate \*.bin file where \* represents the EtherLite firmware part number.
6. Follow the prompts by entering the EtherLite's MAC address and its current IP settings.
7. Recycle the power and choose Finish. A message will appear confirming a successful upgrade to the firmware.
8. Reboot your system.

**Note:** To verify the firmware update, use the Digi Verlog.exe utility found on the Digi website. It will list the EtherLite model, its firmware version, and related information.

### Removing the Driver

Use this procedure to remove RealPort from your system.

#### *Procedure*

1. From the Start menu, choose Settings > Control Panel > Network > Services.
2. Choose Digi RealPort Service and then Remove.
3. Follow the prompts to complete removal.

### Troubleshooting RealPort in Windows:

#### **If none of the ports work:**

1. Make sure the RealPort driver available on our web site at [www.digi.com](http://www.digi.com).
2. Make sure the Digi device is running the latest firmware version available on our website at [www.digi.com](http://www.digi.com).
3. To verify the Digi device is configured properly, from a command prompt (or Start > Run), type:

```
telnet [IP_of_digi_unit] 20xx
```

Where 20xx would be replaced by 2000+[**Port Number**]. For example, to connect to port #1, type:

```
telnet [IP_of_digi_unit] 2001
```

By inserting the loopback plug shipped with the Digi device into the port, you will be able to view any data being typed. Removing the loopback plug will not display any data typed.

If the loopback test fails, the Digi device is not configured properly.

If the loopback test works, the Digi device is configured properly.

4. If you haven't already verified the RealPort host can reach the Digi device above, please do so now by typing the following from a command prompt (or Start > Run):

```
telnet [IP_of_digi_unit] 771
```

You should get a blank window with a cursor. If you do not, then RealPort cannot connect to the Digi device because the socket it uses to communicate (771) is in use, being blocked or fire walled.

**Note:** You will not be able type anything in this window, but you may see two line "||" that repeat. This is nothing to be concerned with. It is the drivers built in keepalive.

5. If you still cannot communicate after verifying the RealPort host can reach the Digi device, try reinstalling the driver. If this does not resolve the problem, please contact Digi Technical Support.

**If some of the ports do not work:**

1. Check for active processes that maybe running on that port by logging into the Digi device via Telnet. At the root prompt, type:

```
#> who
```

If there appears to be a process on the port, try killing it with the following command:

```
#> kill tty=#
```

**Note:** Rebooting the unit can also clear the process.

2. Test the non-working port with Hyperterminal: Choose Start > Accessories > Communications > Hyperterminal.
3. Type in a name, and choose an icon. It really doesn't matter what you choose for a name or icon. Choose OK when finished.
4. In the "Connect To" dialog box go to the connect using drop down list and choose the com port you wish to test. Choose OK when finished.
5. For testing with the loopback the defaults port settings are fine. Choose OK.
6. Insert the loopback plug, which ships with the Digi device, into whichever port you decided to test. You should see a blinking cursor on the main Hyperterminal screen. If you get an "Unable to open comX" message, this means the port is already open, make sure all applications that might be accessing the port are closed, or their services have been stopped (faxing applications, RAS, Citrix MetaFrame, etc.).
7. Type Hello! on the Hyperterminal screen. These characters should appear as you type them.

If the loopback test does not pass, please contact Digi International Technical Support at (952) 912-3456.

8. Test your serial device on a standard COM port (i.e. COM1/COM2)

If the loopback test passed and the serial device works on a standard COM port (i.e. COM1/COM2), verify the following:

a. Cabling:

<http://support.digi.com/support/techsupport/common/cables/async/pscableindex.html>

b. Check Advanced Serial Settings: The RealPort driver supports an additional set of advanced features, each of which can be enabled or disabled from the Advanced properties of the Digi device driver.

**Note:** For more information on what these specific settings can be found in the Release Notes. Read through them to determine if any of these options should be enabled.

If you have not resolved your problem at this point, please write down how far you were able to get in the above procedure (and the results) to describe your problem.



**Requirements and Considerations**

Read this section before beginning the RealPort driver installation.

- The SCO OpenServer RealPort driver is compatible with SCO OpenServer System 5.0.4, 5.0.5, 5.0.6., and 5.0.7. The SCO OpenServer RealPort driver is not compatible with SCO UnixWare.
- Installing the RealPort software on a SCO OpenServer host where RealPort has already been installed necessitates the removal of the existing RealPort driver. During the removal of the previous driver, the user is prompted to save the old configuration.
- During a new installation of the driver, the system prompts the user to approximate the number of Digi devices that might be configured with RealPort. It is best to configure extra Digi devices during the initial RealPort configuration. By doing this, additional Digi devices can be connected later without relinking and rebooting the system.
- The Digi RealPort driver for SCO OpenServer is an installable device driver. The software development system is not required to create a new kernel.
- Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. SCO OpenServer supports Encrypted RealPort but EtherLite, Digi Flex, and older PortServer products do not.
- The RealPort package includes software developed by the OpenSSL project for use in the OpenSSL toolkit (<http://www.openssl.org>)
  - The OpenSSL software requires an external random number generator on the system. If you want to use the encrypted layer in the driver you must install PRNGD (Psuedo Random Number Generator Daemon)
  - The PRNGD package for Open Server is available at:  
<ftp://ftp2.caldera.com/pub/skunkware/osr5/vols/prngd-0.9.23-VOLS.tar>  
PRNGD is a third party software package and not supported by Digi Tech Support.

**Information to Gather**

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.

- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

## Configure the Digi Device

Use these procedures to configure a Digi device from the Digi One, Digi Connect, PortServer, and Digi Flex families for use with Digi RealPort drivers.

### Procedure Overview

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.

Note: The RealPort TCP port number is set to 771 as the default. If you have trouble with your configuration after following the steps listed below, check to verify that the RealPort TCP port number has not been changed and is set to 771. To ensure this setting is correct, use `set config realport=771`.

3. Set the device type to `rp` for all ports that will be using RealPort.
4. Reboot unit for settings to take effect.

### Access the Root Prompt

1. Connect a terminal cable to any port on the device (and the terminal).
2. Configure the terminal for VT-100 Emulation, 9600 baud, 8 data bits, 1 stop bits, and no parity.
3. Plug in the power supply to the Digi device (most devices will power up but the larger devices have a power switch).
4. Press Enter or Return on the keyboard.
5. Enter `root` at the login prompt.
6. Enter `dbps` (the default password).

### Set the IP Address

1. Set IP address with the `setconfig` command:

```
set config ip= [ipaddress]
```

2. Set any relevant `setconfig` parameters such as name server or gateway.

### Set Device Type

The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```

### Reboot Unit

Reboot the device for settings to take effect:

```
boot action=reset
```

## Setting Altpin

If you are using an 8-pin RJ-45 cable connecting a Digi serial port to a modem or printer, altpin must be set on the PortServer devices in order to get DCD signal functionality. Altpin **cannot** be set in the device driver. To enable altpin on the Digi device, do the following:

Telnet to the Digi device by using the following command:

```
telnet ipaddress
```

an example is: telnet 155.204.23.56

3. From the prompt, enter the following command:

```
set flow altpin=on range=port
```

where port is the number or numbers of the ports

## Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

### Procedure

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

### Assigning an IP Address

EtherLite IP addresses may be set by either of two methods:

- dgipserv, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

### Using dgipserv to Assign an IP Address

The dgipserv Digi utility is used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on dgipserv, consult the man pages.

### Procedure

1. Enter the command:

```
dgipserv
```

2. Enter the following command to store an IP address in your Digi device:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device as in the following example.

```
dgipserv -store 10:e0:f7:15:20:8g 192.168.2.2
```

## Master Setup Process

Use this process to install and configure the SCO OpenServer RealPort driver.



1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See "Information to Gather" on page 38.
3. Install the RealPort driver. "Installing the Driver: Download or Integration Kit" on page 41 or "Installing the Driver: CD" on page 42.
4. Configure the PortServer for RealPort. See "Configure the Digi Device" on page 39, or "Configuring EtherLite for RealPort" on page 40.

#### Installing the Driver: Download or Integration Kit

1. Download the appropriate driver package file.
2. Copy the downloaded package file to a directory on the SCO OpenServer system.
3. Log in as root on the SCO OpenServer system.
4. Change to the directory into which you copied the package file.
5. Enter the following command:

```
custom -i -p misc:drp -F `pwd`/file_name
```

6. where *file\_name* is the name of the downloaded driver package.
7. Follow the prompts.

**Note:** In order to prevent having to reboot your system (and potentially losing all previous settings) make an estimate of devices to accommodate future additions. If you underestimate the number of devices to add, the system will prompt you to verify that you want to add more devices and you must reboot for the devices to function. Estimating a high number will prevent you from having to reboot.

**Note:** You will be prompted with the following to install Encrypted RealPort:

Would you like this RealPort session to be encrypted?

NOTE: Not all RealPort products support encrypted RealPort sessions.

Please check your RealPort product's firmware release notes or product literature before selecting "always".

If in doubt, select "never".

(always/never) : (never): always

The following device will be configured,

```
0      10.1.3.68      16      aa      secure (always)
```

Is this correct (y to add or x to abort) ? y

8. Confirm your configuration.
9. Reboot the system when the installation is complete.

The RealPort package includes software developed by the OpenSSL project for use in the OpenSSL toolkit (<http://www.openssl.org>)

— The OpenSSL software requires an external random number generator on the system. If you want to use the encrypted layer in the driver you must install PRNGD (Pseudo Random Number Generator Daemon)

- The PRNGD package for Open Server is available at:  
<ftp://ftp2.caldera.com/pub/skunkware/osr5/vols/prngd-0.9.23-VOLS.tar>  
PRNGD is a third party software package and not supported by Digi Tech Support.

### Installing the Driver: CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

## Uninstalling RealPort

The Digi device driver software can be removed from the kernel by using custom. The Development Kit is not required, although the link kit must be installed.

1. Log onto the console as super-user (root) and enter this command:

```
custom -i -p misc:drp -F `pwd`/file_name
```

2. Choose Software > Remove from the menu that appears.
3. Choose Digi RealPort.
4. Exit custom.
5. Enter the following command to shut the system down and boot the new kernel:

```
shutdown -y -g0
```

## Adding a Digi Device with drpadmin

Use this procedure to create RealPort devices and start the RealPort daemons.

### Procedure

1. Enter this command at a root prompt:

```
/usr/bin/drpadmin
```

2. Answer the prompts as appropriate.

Prompt	Action
Select an option	Choose add.
Enter the host name or IP address for this Digi device	If an IP address is used, make sure it is unique and does not conflict with any other network device. If a name is entered, the name must be registered in /etc/hosts or with an accessible nameserver.
Enter the number of ports on the Digi device	Enter the number of ports for this Digi device. The installation will prompt to confirm this number. If PORTS/Xem (EBI) modules will be attached to a PortServer II module, include these ports.

Enter TTY device ID letter(s)	Enter one or two letters. These letters will be used to create the RealPort device names.
Would you like this RealPort session to be encrypted?	If you want the session encrypted enter always. The session will always remain encrypted. If unable to create an encrypted session it will fail to work. If you do not want the session encrypted enter never. The session will never use encryption. Check your documentation to verify if your Digi device supports Encrypted RealPort.
Enter WAN speed if the connection between the Digi device and HP-UX system includes a WAN link slower than 1 MB	Enter the WAN speed if this is the case. Otherwise, choose Enter to continue.
Confirm the configuration	Enter <code>y</code> to proceed or <code>n</code> to reenter the information.
Select an option	Enter <code>a</code> to add another Digi device. Enter <code>s</code> to show configured Digi devices. Enter <code>q</code> to exit drpadmin.

### RealPort Devices

The RealPort installation creates four different devices for each port in the `/dev` directory.

- Standard device
- Modem device
- Standard transparent print device
- Modem transparent print device

### Device Name Format

The devices are named according to the following conventions:

Syntax	Description
a-z/aa-zz	The Digi device letter ID. Single or double characters can be used.
01-64	The port number on the individual Digi device.
lowercase letter	At the end of a device name indicates a standard device.
uppercase letter	At the end of a device name indicates a modem device.

Here are examples of the devices for the first port of a Digi device with the identification letter "a":

Device	Path/Name Example
Standard Device	<code>/dev/ttya01</code>
Modem Device	<code>/dev/ttyA01</code>
Standard Transparent Print Device	<code>/dev/prA01</code>
Modem Transparent Print Device	<code>/dev/prA01</code>

### Standard Device

**Example:** /dev/ttya01

A standard Digi device uses a lowercase identification letter in their names. The default handshake method is XON/XOFF. Data Carrier Detect (DCD) need not be present to open the device.

Once a connection is established and DCD becomes active, standard devices behave in the same way as modem devices--subsequent loss of the Data Carrier Detect signal will cause active processes on the port to be killed and the user will be automatically logged off.

### Modem Device

**Example:** /dev/ttyA01

Digi modem devices use an uppercase identification letter in their names. They are sometimes referred to as "dial-in" devices.

Modem devices are traditional Unix ports with modem control. They require Data Carrier Detect to be high before they will operate. RTS/CTS handshaking is enabled by default. When used with a modem, the ports will wait for carrier before sending out the login: prompt

When used with a terminal or other device, it is usually wise to wire the Digi DCD signal to the terminal's Data Terminal Ready (DTR) line. When the terminal is turned on, the system outputs a login prompt. When the terminal is turned off, any associated jobs are killed, and the user is logged out.

### Transparent Print Devices

**Examples:** /dev/prA01 and /dev/prA01

The transparent print devices can be used with auxiliary printer ports on terminals. Output directed to a pr device goes out the auxiliary port of a terminal while you continue to use the terminal normally.

Use pra01 if the terminal device is ttya01 (standard device); use prA01 if the terminal device is ttyA01 (modem device).

## Configuring a Device for a Terminal

Use this procedure to configure a Digi serial device for a terminal. See your operating system documentation for more information on configuring a serial device for a terminal.

### Procedure

1. Connect a serial cable between the port and terminal.
2. Edit the /etc/inittab file on the SCO OpenServer system. Change the device to the proper speed, data bits, stop bits and parity bit. Do this by editing the letter or number at the end of the line for the port (the default is m, which corresponds with 9600 8,1,N). See /etc/gettydefs for /etc/inittab letter and number definitions.
3. Enable the port for login by entering this command at a prompt:

```
enable device
```

where *device* is the name of the Digi device.

## Configuring a Device for a Printer

Use this procedure to configure a Digi serial device for a printer. Consult your operating system documentation for more information on configuring a serial device for a printer.

Note: If you are using an 8-pin RJ-45 cable connecting a Digi serial port to a modem or printer, altpin must be set on the PortServer devices in order to get DCD signal functionality. Altpin **cannot** be set in the device driver. For information on how to set altpin, see "Setting Altpin" on page 40

### Procedure

1. Connect a proper cable between the port and printer.

Enter the following command at a root prompt to set up a print spooler:

```
scoadmin printer
```

Note: See your SCO OpenServer documentation for information on scoadmin.

2. Reboot the system or enter the ditty command manually for the new settings to take effect.

## Configuring a Device for a Modem

Use these procedures to configure a Digi serial device for a Dial-in/Dial-out modem connection. This scenario requires familiarity with both the modem and the operating system. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

Note: If you are using an 8-pin RJ-45 cable connecting a Digi serial port to a modem or printer, altpin must be set on the PortServer devices in order to get DCD signal functionality. Altpin **cannot** be set in the device driver. For information on how to set altpin, see "Setting Altpin" on page 40

### Procedure: Configuring the UNIX Device

1. Connect a serial cable between the port and modem.
2. Power the modem on.
3. Edit the /etc/inittab file on the SCO OpenServer server. Change the upper-case device to the letter o by editing the letter or number at the end of the line for the device. See /etc/gettydefs for inittab letter and number definitions.
4. Disable the modem control and non modem control devices for the port by entering:

```
disable modem-control-device  
disable non-modem-control-device
```

where *modem-control-device* is the name of the modem control device for the port and *non-modem-control-device* is the name of the non modem control device for the port.

5. Edit the file `/usr/lib/uucp/Devices`. Add a Direct line for the device like this:

```
Direct ttyh1a - 38400 direct device
```

The "D" in Direct must be the first character on the line.

#### **Procedure: Configuring Modems for Dial-in**

1. Comment out any ACU lines relating to this device until dial-in is working properly.

Note: Some applications may require an ACU entry in the Devices file. If an application requires an entry, refer to the modem manual or to the modem manufacturer for the correct modem initialization string, and to the SCO OpenServer Administration handbook for guidance on setting up an appropriate ACU entry that uses this initialization string.

2. Connect to the modem. At a root prompt, enter this command

```
cu -l /dev/device -s 38400
```

where *device* is the name of the non modem control device for the port.

3. Set the modem to answer after the first ring with this command:

```
ats0=1
```

4. Enter the following command to train the modem to the port speed:

```
at&w
```

5. Enter any other desired modem commands.

6. Disconnect from the modem by entering a tilde and a period:

```
~.
```

7. Configure flow control on the port. Hardware flow control is typical and can be configured by inserting this command at the end of the file `/etc/rc.d/8/userdef`:

```
ditty rtspace ctspace -ixon device
```

Note: The ditty command is not supported for EtherLite devices. Use standard operating system tools (scoadmin or stty) to set device options for EtherLite devices.

8. To add dial-in capability, enter this command at a root prompt:

```
enable device
```

an example is: `enable ttyA01`

In SCO OpenServer, the uppercase device name is for dial-in, the lowercase name is for dial-out and modem configuration.

## **Adding or Removing Digi Devices**

The new Digi RealPort driver allows a user to add or remove Digi devices on their systems without having to relink or reboot the kernel each time a device is added or removed. This feature is achieved with the *drpadmin* utility.

During the driver package installation, the user is prompted to reserve additional devices to accommodate future additions. No other information is requested at that time. If the user, however, underestimates the number of Digi devices and needs to add more devices at a later date, the

drpadmin utility allows the user to add devices as needed. These new *unreserved* devices require the kernel be relinked. The drpadmin utility relinks the unreserved devices automatically, but the user must perform a system reboot to load the new kernel.

## Deleting a Digi Device with drpadmin

Use this procedure to delete a Digi device.

### Procedure

1. Enter this command at a root prompt:

```
/usr/bin/drpadmin
```

2. Enter `s` to show all installed Digi devices.
3. Note the number of the Digi devices to delete.
4. Choose Enter to make the options prompt reappear.
5. Enter `d` (delete).

Note: `r` = reset - this kills the daemon and then restarts it.  
`s` = show - displays the host name, IP address, and other information

6. Enter the Digi device number to delete.
7. Enter `y` to confirm the deletion.

## Transparent Printer Setup

### About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.

## Configuring Transparent Printers

Use this procedure to set up transparent printers on terminals.

Note: This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

## Procedure

At the command prompt, enter:

```
ditty -n ttyname [options]
```

where *ttyname* is the name of the terminal device and options are selected from the list below..

Option	Description
maxcps <i>n</i>	Limits the maximum printer port character-per-second data rate. <i>n</i> should be set to the minimum character rate the printer can sustain in typical use.
maxchar <i>n</i>	Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.
bufsize <i>n</i>	This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.
onstr "s"	<p>Defines the terminal escape sequence to direct subsequent data to the transparent printer.</p> <p>s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.</p> <p>For example, the sequence "&lt;Esc&gt;[5i" would be entered as: "\033[5i".</p>
offstr "s"	<p>Defines the terminal escape sequence to stop directing data to the printer.</p> <p>s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.</p> <p>For example, the sequence "&lt;Esc&gt;[4i" would be entered as: "\033[4i".</p>
term <i>t</i>	<p>Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: adm31, ansi, dg200, dg210, hz1500, mc5, vt100, vt220, vt320, vt420, wang2x36, wyse30, wyse50, wyse60 or wyse75.</p> <p>If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the mc5/mc4 attributes found there.</p>



### Setup Examples for Transparent Printing

Use the ditty program to set up your terminal for transparent printing.

The following command configures the transparent print options for a DEC VT100 terminal connected to /dev/ttya01 (note that the printer will be called /dev/prn01). maxcps, maxchar and bufsize are left to defaults.

```
ditty term vt100 /dev/ttya01
```

The following example uses onstr and offstr arguments (this sets the terminal to use ANSI Standard). Again maxcps, maxchar, and bufsize are defaults. Enter on a single command line:

```
ditty onstr \033[5i offstr \033[4i /dev/ttya01
```

This example command sets the transparent print option for a WYSE30 terminal, with maxcps of 75, a maxchar of 100, and a printer buffer size, bufsize, of 1000. Enter on a single command line:

```
ditty term wyse30 maxcps 75 maxchar 100 bufsize 1000 /dev/ttya01
```

## Setting TTY Options

RealPort UNIX device driver packages include the ditty command, which is a superset of stty, and may be used to set and display the device options for Digi RealPort devices.

The general command format is:

```
ditty [-a] [-n ttyname] [option(s)] [ttyname]
```

With no options, ditty displays all Digi special driver settings, modem signals, and all standard parameters displayed by stty(1) for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to stty(1) for interpretation.

ditty commands may be executed from the command line or placed in a startup script to be run whenever the system is booted.

Option	Description
-a	Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by stty -a.
-n <i>ttyname</i>	Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.
<i>ttyname</i>	Set and display options for the specified TTY device. Replace <i>ttyname</i> with the TTY pathname (such as /dev/ttya01s, /dev/term/a01 or /dev/dty/a001s, depending on your operating system). This option may be used on a modem control line when no carrier is present.

The following options specify transient actions to be performed immediately:

<b>Option</b>	<b>Action</b>
break	Send a 250 MS break signal out on the TTY line.
flush	Immediately flush (discard) TTY input and output.
flushin	Flush TTY input only.
flushout	Flush TTY output only.

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will use the default values the next time it is opened..

<b>Option</b>	<b>Actions</b>
stopout	Stop output exactly as if an XOFF character were received.
startout	Restart stopped output exactly as if an XON character were received.
stopin	Activate flow control to stop input.
startin	Release flow control to resume stopped input.
[-]dtr	Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
[-]rts	Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

<b>Sticky</b>	<b>Description</b>
[-]fastbaud	Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See "fastbaud Data Rate Mapping" on page 52.
[-]rtspc	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
[-]ctspc	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
[-]dsrpc	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
[-]dcdpc	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
[-]dtrpc	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
[-]forcedcd	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.

<b>Sticky</b>	<b>Description</b>
<code>startc c</code>	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
<code>stopc c</code>	Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astartc c</code>	Sets auxiliary XON flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astopc c</code>	Sets auxiliary XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>[-]aixon</code>	Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.
<code>maxcps n</code>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.
<code>maxchar n</code>	Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
<code>bufsize n</code>	Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the <code>maxcps</code> rate selected above. Default is 100 characters.
<code>onstr "s"</code>	Defines the terminal escape sequence to direct subsequent data to the transparent printer. <p><code>s</code> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <code>xxx</code> may be given as <code>\xxx</code>.</p> <p>For example, the sequence &lt;Esc&gt;[5i would be entered as:  <code>"\033 [5i"</code>.</p>

Sticky	Description
offstr "s"	<p>Defines the terminal escape sequence to stop directing data to the printer.</p> <p>s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.</p> <p>For example, the sequence &lt;Esc&gt;[5i would be entered as: "\033[5i".</p>
term t	<p>Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.</p>

#### fastbaud Data Rate Mapping

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

## Troubleshooting RealPort in SCO OpenServer 5:

If none of the ports work:

**Check the Status of the RealPort Daemon:**

From the UNIX root prompt, type:

```
ps -ef | grep drpd
```

You should see an entry for each Digi device similar to the following, please verify the respective IP address.

```
%-q 1027 199.86.5.1
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the

particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (**ping nodename**)

To restart the daemon type the following from the UNIX root prompt:

```
# drpadmin
```

Select 'r' to reset, followed by the item number for the entry to reset.

**If some of the ports do not work:**

**Check serial signal activity:**

Check the serial signals by typing "display port range=[port\_number]" from the Device root prompt. For a graphical utility to display port signals, please download and install DPA Remote:

<http://ftp.digi.com/support/utilities/ts/>

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the UNIX root prompt can clear the port:

```
# ditty startin startout flush ttyx##
```

If this command does not work, a reboot of the UNIX server may be required to clear the port from an overflow condition.

**Kill any active processes:**

To kill any active processes, which may be stuck on the UNIX host, please issue the following commands from the root prompt:

```
# fuser -k /dev/ttyx##
```

Where ttyx## represents the actual tty id.

**Requirements and Considerations**

Read this section before beginning the RealPort driver installation.

- "SVR4" in this section refers to versions of Unix System V Release 4 including SCO UnixWare.
- Installing the RealPort software on an SVR4 Unix host where a RealPort driver prior to version 4.0 has already been installed will delete the existing RealPort configuration. You will have to re-enter the configuration. Installing over an installation of RealPort version 4.0 or later will retain the existing configuration.
- Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended.

**Information to Gather**

Before you install RealPort, determine the following

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

**Configuring EtherLite for RealPort**

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

**Assigning an IP Address**

EtherLite IP addresses may be set by either of two methods:

- `dgipserv`, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

## Using dgipserv to Assign an IP Address

The dgipserv utility configures the IP address, subnet mask, and gateway . For more information on dgipserv consult the man pages.

**Note:** dgipserv works with firmware version 7.9 or later.

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the *MAC\_address* and the IP address are the addresses of the Digi device. An example of this command is:

```
dgipserv -store 10:e0:f7:15:20:8g 192.168.2.2
```

## Master Setup Process

Use this process to install and configure the SCO UnixWare RealPort driver.

1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See "Information to Gather" on page 54.
3. Install the RealPort driver. See one of the following:
  - "Installing the Driver (Including Encrypted RealPort): CD" on page 55
  - "Installing the Driver: Downloaded Using pkgadd" on page 56.
4. Add a device. See "Adding a Digi Device" on page 57
5. Configure the Digi device for RealPort. See one of the following:
  - "Configuring the Digi Device for RealPort" on page 57
  - "Configuring EtherLite for RealPort" on page 54.

## Installing the Driver (Including Encrypted RealPort): CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

1. Choose an operating system.
2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.

Note: Follow the prompts. You will be prompted with the following to install Encrypted RealPort:

Would you like this RealPort session to be encrypted?

NOTE: Not all RealPort products support encrypted RealPort sessions.

Please check your RealPort product's firmware release notes or product literature before selecting "always".

If in doubt, select "never".

(always/never) : (never): always

The following device will be configured,

```
0      10.1.3.68      16      aa      secure (always)
```

Is this correct (y to add or x to abort) ? y

5. Confirm your configuration.
6. Reboot your system if necessary.

### Installing the Driver: Downloaded Using pkgadd

Use this procedure to install a downloaded driver.

1. Download the appropriate driver file(s).
2. Log in as root on the UNIX system.
3. Enter this command at a root prompt:
 

```
pkgadd -d /path/filename
```

 where *path/filename* are the path to the driver file and the name of the driver file.
4. Follow the system prompts to install the driver.

### Installing the Driver: Downloaded Using SCO Admin

1. Download the driver from the Digi web site.
2. Log into the system as root.
3. Format a diskette.
4. Access the root prompt.
5. Copy the driver to the formatted diskette.
6. Insert the newly-created driver diskette.
7. Do one of the following:
  - In the window environment, select <SCO Admin>
  - At the root prompt, type `scoadmin`.
8. Double-click the Software Management folder in the System Administration window.
9. Double-click <Application Installer>.
10. Choose <Disk\_A> from the Install from: menu.
11. Choose <Update View>.
12. Choose the Digi driver to install.
13. Choose <Install>.



14. Follow the system prompts to install the driver.

### Adding a Digi Device

1. Log in at root prompt
2. Enter:  
`ncxa_config`
3. From the configuration menu select Add a unit.
4. Select Save Configuration, Install, and Quit.

### Configuring the Digi Device for RealPort

Use this procedure to configure the Digi device for use with Digi RealPort drivers.

Note: See the appropriate Command Reference or Configuration and Administration Guide for more information on the commands that follow.

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.
4. For all ports that will be using RealPort, set the device type to rp. The following example configures port for RealPort:

```
set ports range=1 dev=rp
```

### Uninstalling RealPort

Use this procedure to uninstall the RealPort driver.

Note: The `pkgrm` utility will remove all RealPort files, including the configuration file, `/etc/realport.conf`. To reinstall the RealPort driver you will need to re-enter the configuration or restore `realport.conf` from a backup.

Note: To stop RealPort devices temporarily, use `realport_stop` and then `realport_start` to restart them. To remove the RealPort driver from the kernel temporarily, use `realport_uninstall` and then `realport_install` to re-install the driver in the kernel. In both cases the configuration information will be retained. For more information on `realport_stop`, `realport_start`, `realport_uninstall`, and `realport_install`, consult the UNIX man pages.

1. Enter the following command at a root prompt:

```
pkgrm ncxa
```

2. Follow the subsequent prompts.

You should receive a message reporting a successful removal. If any problem or error occurs during the execution of the `pkgrm` command, reboot the system and try repeating the command.

### General SCO UnixWare Device Configuration

Use this information to configure serial ports, which includes configuring port direction (incoming and outgoing), transmission speed, and other port attributes.

1. Start the SCO Serial Manager by entering this command at a SCO UnixWare command prompt:  
`scoadmin serial`
2. Choose View and change the selection from Ports to Boards.
3. Choose the ncxa daemon for Digi RealPort.
4. Choose View and change from Boards to Ports. The ports will be listed.
5. Configure the ports as needed. Use the SCO UnixWare online help for additional information.
6. Exit the SCO Serial Manager.

Note: There is a bug in the SCO UnixWare Serial Manager that causes it to incorrectly set the "o" and "P" ttymon flags for a RealPort modem port. If the port does not work for logins, you may need to remove these flags. Use the `realport_pm_flags` program to list all non-console ttymon port monitor flags and change them appropriately.

## General SVR4 Device Configuration

This topic describes how to configure serial ports, which includes configuring port direction (incoming and outgoing), transmission speed, and other port attributes.

### Enabling Login on a Port

1. At a UNIX command prompt, enter the following command:

```
sysadm
```

2. Choose Ports > Quick Terminal > Add.
3. Follow the remaining sysadm prompts.
4. Repeat these steps for every port to be enabled.
5. Exit sysadm.

### Modifying Port Settings

1. At a UNIX command prompt, enter the following command:

```
sysadm
```

2. Choose Ports > Ports Services > Modify.
3. Follow the remaining sysadm prompts.
4. Change the port parameters as needed.
5. Repeat these steps for every port.
6. Exit sysadm.

## Configuring a Device for a Terminal

Use this information to configure serial ports, which includes configuring port direction (incoming and outgoing), transmission speed, and other port attributes.

1. Start the SCO Serial Manager by entering this command at a SCO UnixWare command prompt:

```
scoadmin serial
```

2. Choose View and change the selection from Ports to Boards.
3. Choose the ncxa daemon for Digi RealPort.
4. Choose View and change from Boards to Ports. The ports will be listed.
5. Configure the ports as needed. Use the SCO UnixWare online help for additional information.
6. Exit the SCO Serial Manager.

Note: There is a bug in the SCO UnixWare Serial Manager that causes it to incorrectly set the "o" and "P" ttymon flags for a RealPort modem port. If the port does not work for logins, you may need to remove these flags. Use the `realport_pm_flags` program to list all non-console ttymon port monitor flags and change them appropriately.

## Configuring a Device for a Modem

Use this procedure to configure a RealPort device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

The Digi device should be properly installed, configured and functioning before proceeding.

1. Connect a proper cable between the port and modem.
2. Disable both the modem and non-modem control ports. This can be done through `sysadm`. SCO UnixWare users can enable and disable ports through `scoadmin>Hardware>Serial Manager`.
3. Modify the file `/usr/lib/uucp/Devices`. Create an entry that looks like this:

```
Direct term/a01m,M - 38400 direct_modem
```

The device `ttya01m` used here is just an example.

Comment out any ACU lines relating to this device until dial-in is working properly.

An ACU line is necessary for correct operation of the modem in dial-out applications. Refer to the modem manual or to the modem manufacturer for the correct modem initialization string to use for your modem. Refer to the SCO UnixWare Administration handbook for guidance on setting up an appropriate ACU entry that uses this initialization string.

4. Connect to the modem by entering this command at a Unix root prompt:

```
cu -l /dev/term/a01m -s 38400
```

It may be necessary to use `a01s` instead:

```
cu -l /dev/term/a01s -s 38400
```

5. Train the modem to the port speed with this at command:

```
at&w
```

6. Depending on the modem, it may be necessary to enable auto-answer with this at command:

```
ats0=1&w
```

7. Disconnect from the modem by entering tilde-period.  
~.
8. Enable and configure the port using the SCO Serial Manager, `scoadmin`.

## Configuring a Device for a Printer

Use this procedure to configure a RealPort device for a printer. See your operating system documentation for more information on configuring a serial device for a printer and configuring an lp device.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

If you are using a printer attached to a terminal on a RealPort, use the corresponding RealPort transparent print device. For example, if your terminal is on `/dev/term/a01s` then the attached printer would be on `/dev/pra01s`.

1. Connect a proper cable between the port and printer.
2. Insert either of following commands at the end of the file `/etc/rc2.d/S99printer`:

```
cat < /dev/term/a01s > /dev/null &
```

or

```
sleep 999999 < /dev/term/a01s &
```

These commands force the specified port to stay open, thus preserving any "non-sticky" options. This example uses the port `/dev/term/a01s`. Substitute your port name in the command.

The file `S99printer` is just an example. This file may need to be created. An "S99" file with a different name may be used instead.

3. Insert any other necessary ditty commands at the end of the file `/etc/rc2.d/S99printer`. The command `ditty` can be used to change the settings of a port. For additional information on `ditty`, see "Setting TTY Options" on page 61.

For example, the following command will set the port `a01s` to a speed of 38400, disable software flow control, and enable hardware flow control on the port:

```
ditty 38400 -ixon -ixany -ixoff ctspace a01s
```

**Note:** The Data Carrier Detect (DCD) signal needs to be active (high) on the port for the port to function properly for a printer. The `ditty forcedcd` option can be used to accomplish this when the DCD signal is not made active through cabling.

4. If you are configuring a transparent print device, add ditty commands to set the transparent print parameters. See "Transparent Printer Setup" on page 64, for more information.
5. For the ditty command to take effect immediately, enter the command manually at a system root prompt, or reboot the system.
6. Configure the device as a printer by running `scoadmin printer`.
7. The printer should be ready for use. To print a file, use the command

```
lp -d printer_name file_to_print
```

where *printer\_name* is replaced with the name given to the printer in `sysadm` or `scoadmin`, and *file\_to\_print* is replaced with the name of the file to print.

## Setting TTY Options

### Introduction

RealPort UNIX device driver packages include a command, `ditty`, which is a superset of `stty`, and may be used to set and display the device options for Digi RealPort devices. Commands may be executed from the command line or placed in a startup script to be run whenever the system is booted. Any unrecognized options are passed to `stty` for interpretation.

### Syntax

The following is the `ditty` command format:

```
ditty [-a] [{-n ttyname / ttyname}] [option]
```

### Descriptions

`ditty` (without additional fields)

Displays all Digi special driver settings and all standard settings for all TTYs

`-a`

Displays all unique Digi option settings and standard TTY settings reported by `stty -a`

`{-n tyyname / tyyname}`

Alternate ways of displaying and displays options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.

## Options

Option	Description
aixon   -aixon	aixon enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received. -aixon disables this feature. When the system reboots, this parameter reverts to the default setting.
astart c	Sets the auxiliary XON flow control character. The character may be a decimal, octal, or hexadecimal number. When the system reboots, this parameter reverts to the default setting.
astop c	Sets the auxiliary XOFF flow control character. The character may be a decimal, octal, or hexadecimal number. When the system reboots, this parameter reverts to the default setting.
break	Send a 250 MS break signal out on the TTY line.
bufsize n	Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the maxcps rate selected above. Default is 100 characters.
clear	Clears the tbusy flag in the channel structure to free a port. ?? What does this mean and HTML says applies to Xem and Cx, and then only to Unixware, openserver and solaris. What gives??
ctspace   -ctspace	ctspace enables CTS hardware input flow control. -ctspace disables it. When the system reboots, this parameter reverts to the default setting.
dcdpace   -dcdpace	dcdpace enables DCD hardware output flow control, and -dcdpace disables it. When the system reboots, this parameter reverts to the default setting.
dsrpace   -dsrpace	dsrpace enables DSR hardware output flow control, and -dsrpace disables it. When the system reboots, this parameter reverts to the default setting.
dtr   -dtr	dtr raises the DTR modem control line, and -dtr lowers it. These options work only when DTR hardware flow control is <u>not</u> configured. When the device is closed, this parameter reverts to the default setting.
dtrpace   -dtrpace	dtrpace enables DTR hardware input flow control, and -dtrpace disables it. When the system reboots, this parameter reverts to the default setting.
fastbaud   -fastbaud	???? When the system reboots, this parameter reverts to the default setting.
forcedcd   -forcedcd	forcedcd raises the DCD signal, and -forcedcd lowers it. When the system reboots, this parameter reverts to the default setting.
flush	Immediately discards input and output to and from the device.
flushin	Immediately discards input to the device
flushout	Immediately discards device output

Option	Description
maxchar <i>n</i>	Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters. When the system reboots, this parameter reverts to the default setting.
maxcps <i>n</i>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS. When the system reboots, this parameter reverts to the default setting.
offstr "s"	Defines the terminal escape sequence to stop directing data to the printer. s is a string of ASCII characters, enclosed in quotation marks, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx. For example, the sequence <Esc>[5i would be entered as: "\033[5i". When the system reboots, this parameter reverts to the default setting.
onstr "s"	Defines the terminal escape sequence to direct subsequent data to the transparent printer. s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx. For example, the sequence <Esc>[5i would be entered as: "\033[5i". When the system reboots, this parameter reverts to the default setting.
rts   -rts	rts raises the RTS modem control line, and -rts lowers it. These options work only when RTS hardware flow control is <u>not</u> configured. When the device is closed, this parameter reverts to the default setting.
rtspace   -rtspace	rtspace drops RTS to enable RTS input flow control. -rtspace raises RTS to resume input. When the system reboots, this parameter reverts to the default setting.
start c	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal). When the system reboots, this parameter reverts to the default setting.
startin	Enables input to begin again after it has been stopped by the stopin option. When the device is closed, this parameter reverts to the default setting.
startout	Enables output to begin again after it has been stopped by the stopout option. When the device is closed, this parameter reverts to the default setting.

Option	Description
stop c	Sets the XOFF flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". When the system reboots, this parameter reverts to the default setting.
stopin	Stops input to the device. When the device is closed, this parameter reverts to the default setting.
stopout	Stops output from the device. When the device is closed, this parameter reverts to the default setting.
term t	Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there. When the system reboots, this parameter reverts to the default setting.

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

### Transparent Printer Setup

#### About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.



## Configuring Transparent Printers

Use this procedure to set up transparent printers on terminals.

**Note:** This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

### *Procedure*

At the command prompt, enter:

```
ditty -n ttyname [options]
```

where *ttyname* is the name of the terminal device and options are selected from the list below.

**Note:** Depending on your operating system, the ditty program may be named differently. See "Setting TTY Options" on page 61, for the correct command line format for your operating system.

- |                     |  |
|---------------------|--|
| maxcps<br><i>n</i>  | Limits the maximum printer port character-per-second data rate. <i>n</i> should be set to the minimum character rate the printer can sustain in typical use.   |
| maxchar<br><i>n</i> | Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.   |
| bufsize <i>n</i>    | This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.  |
| onstr " <i>s</i> "  | <p>Defines the terminal escape sequence to direct subsequent data to the transparent printer.</p> <p><i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code>.</p> <p>For example, the sequence "&lt;Esc&gt;[5i" would be entered as: <code>"\033[5i"</code>.</p> |
| offstr " <i>s</i> " | <p>Defines the terminal escape sequence to stop directing data to the printer.</p> <p><i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code>.</p> <p>For example, the sequence "&lt;Esc&gt;[4i" would be entered as: <code>"\033[4i"</code>.</p>                |

term *t*      Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: adm31, ansi, dg200, dg210, hz1500, mc5, vt100, vt220, vt320, vt420, wang2x36, wyse30, wyse50, wyse60 or wyse75.

If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the mc5/mc4 attributes found there.

## Troubleshooting RealPort in SCO UnixWare 7:

**If none of the Ports work:**

**Check the Status of the RealPort Daemon:**

From the UNIX root prompt, type:

```
ps -ef | grep ncxd
```

You should see an entry for each Digi device similar to the following, please verify the respective IP address.

```
root 2254 1 TS 80 0 Dec 13 ? 0:00/usr/sbin/ncxd /dev/ncxa/net1
192.168.2.2
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (**ping nodename**)

To restart the daemon type the following from the UNIX root prompt:

```
# ps -ef | grep ncxd
# kill -9 (PID)
```

Where PID equals the process identification number returned from the ps – ef command.

```
# /etc/idrc.d/ncxa
```

**If some of the ports work:**

**Check serial signal activity:**

Check the serial signals by typing “display port range=[port\_number]” from the Device root prompt. For a graphical utility to display port signals, please download and install DPA Remote:

<http://ftp.digi.com/support/utilities/ts/>

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the UNIX root prompt can clear the port:

```
# ditty startin startout flush ttyx##
```

If this command does not work, a reboot of the UNIX server may be required to clear the port from an overflow condition.

**Kill any active processes:**

To kill any active processes, which may be stuck on the UNIX host, please issue the following commands from the root prompt:

```
# fuser -k /dev/ttyx##
```

Where ttyx## represents the actual tty id.

## Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- To determine if a particular version of the Linux RealPort driver supports a particular version of Linux, check the release notes for that driver.
- RealPort utilities are located in `/usr/bin/dgrp`.
- Once the RealPort driver is installed, man pages are available for a number of the utilities associated with the package, including:

<code>ditty-rp</code>	which sets and displays RealPort TTY device options
<code>dgrp_cfg_node</code>	a tool used to add and remove Digi devices from the RealPort driver
<code>drpd</code>	the Digi RealPort network daemon
<code>dgrp.o</code>	the RealPort driver module. These are placed in <code>/usr/bin/dgrp</code> . The actual man page entry associated with the <code>drpd.o</code> module is <code>dgrp</code> .
<code>dgrp_gui</code>	the Digi RealPort Manager for x-windows

## Information to Gather

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

## Configuring the Digi Device for RealPort

Use this procedure to configure the Digi device for use with Digi RealPort drivers.

**Note:** See the appropriate Command Reference or Configuration and Administration Guide for information on how to perform the steps below.

### *Procedure*

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.

4. For all ports that will be using RealPort, set the device type to rp. The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```

## Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

### *Procedure*

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

### **Assigning an IP Address**

EtherLite IP addresses may be set by either of two methods:

- dgipserv, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

### **Using dgipserv to Assign an IP Address**

The dgipserv utility is used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on dgipserv consult the man pages.

### *Procedure*

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device. An example of this command is:

```
dgipserv -store 10:e0:f7:15:20:8g 192.168.2.2
```

## Master Setup Process

Use this process to install and configure the Linux RealPort driver.

1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See "Information to Gather" on page 68.
3. Install the RealPort driver. See Installing the Driver: Introduction, below.
4. Configure the PortServer for RealPort. See:
  - "Configuring the Digi Device for RealPort" on page 68
  - "Configuring EtherLite for RealPort" on page 69
5. Add and configure your Digi device in Linux. There are two methods for doing this. See:

- "Managing a Digi Device with Digi RealPort Manager" on page 78
- "Managing a Digi Device with dgrp\_cfg\_node" on page 81

**Note:** Digi RealPort Manager uses a graphical interface, while dgrp\_cfg\_node is command line-based.

6. Configure your ports for operation. See "Device Configuration Overview" on page 84.

## Installing the Driver: Introduction

Digi Supports four distribution methods for the RealPort device driver package.

### CD Method

Use this procedure to install a Digi driver from the Digi CD front end menu. This procedure assumes that you have accessed the Digi RealPort CD and that the front end menu appears on your screen. see "Installing the Driver (Including Encrypted RealPort): CD" on page 70.

### Digi Connect CD

Follow the instructions for the RPM method or TGZ method if your LINUX distribution does not support RPM installation

### RPM Method

This method uses a source RPM package. The source RPM method depends on rpm tools. If your Linux distribution does not support RPM packages, or if your system does not have the RPM tools installed, you must either locate and install the RPM manipulation tools or use the TGZ method. To install with this method, see "Installing the Driver: RPM Methods" on page 71.

**Note:** Digi does not support the distribution of the RealPort software via binary RPMs.

### TGZ Method

This method uses a compressed archive of the source. The TGZ method, while relatively simple, does not have the advantage of the common package management operations of RPM-based packages. It does, however, have the advantage that far more systems will support the TGZ method "out-of-the-box". To install with this method, see "Installing the Driver: TGZ Method" on page 75.

## Installing the Driver (Including Encrypted RealPort): CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

### *Procedure*

1. Choose an operating system.

2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.
5. Follow the prompts.

Note: You will be prompted with the following to install Encrypted RealPort:

Would you like this RealPort session to be encrypted?

NOTE: Not all RealPort products support encrypted RealPort sessions.

Please check your RealPort product's firmware release notes or product literature before selecting "always".

If in doubt, select "never".

(always/never) : (never): always

The following device will be configured,

```
0      10.1.3.68      16      aa      secure (always)
```

Is this correct (y to add or x to abort) ? y

6. Confirm your configuration.
7. Reboot your system if necessary.

## Installing the Driver: RPM Methods

Use one of the following procedures to install the Linux RealPort driver.

**Note:** The procedures in this topic should be used only in Linux environments that support the installation and building of packages from an RPM repository. The procedures require that the following RPM directories exist and are used by RPM on your Linux system.

- /usr/src/redhat/BUILD
- /usr/src/redhat/RPMS
- /usr/src/redhat/RPMS
- /usr/src/redhat/SOURCES
- /usr/src/redhat/SPECS
- /usr/src/redhat/SRPMS

## Installation Methods

There are two methods of installing with RPM:

Method	Description
Standard Installation Procedure	This method is still automated but there is user control at every step.
Custom Installation Procedure	This method is intended for use by users who wish to customize the installation (for example, to change the destination directories of certain tools). This method is the most complex and should be used only if necessary.

Both methods are discussed in detail on the pages that follow.

## Package Version and Revision

Certain commands used in the following procedures need to be entered with the correct package version and revision number.

**Note:** To determine package version and revision numbers, use this command:

```
rpm -qp filename
```

### Example:

If the package version of the Linux driver is 1.0 and the revision is 2, then:

For this command variable:	This value would be used:
version	1.0
revision	2

For this command:	This would be entered:
<code>rpm -ivv realport-version revision.src.rpm</code>	<code>rpm -ivv realport-1.0-2.src.rpm</code>

## Standard Installation Procedure

Use this procedure to install the RealPort Linux driver. See Package Version and Revision, above, for important information on entering commands in this procedure.

1. Download the source RPM package. The RPM package can be found on Digi's web site, [www.digi.com](http://www.digi.com), or Digi's ftp site, [ftp.digi.com/support/drivers/linux](ftp://ftp.digi.com/support/drivers/linux). For consistency, you might consider downloading the source RPM to the directory `/usr/src/redhat/SRPMS`.
2. Install the source code in the SOURCES directory used by RPM (`/usr/src/redhat/SOURCES`) with this command:

```
rpm -ivv realport-version-revision.src.rpm
```

This command also copies the specification file (`/usr/src/redhat/SPECS/realport-v.v.spec`) to the SPECS directory.



## LINUX OS Versions

OS Version	Commands
Red Hat	<pre># rpmbuild --rebuild --define DISTRO=REDHAT_XX (package) # rpm -ivv /usr/src/redhat/RPMS/i386/dgrp-#. #-#.i386.rpm # insmod dgrp</pre>
SuSE 8.x	<pre># rpm --rebuild (package) # rpm -i /usr/src/packages/RPMS/i586/dgrp-#. #-#.i586.rpm # insmod dgrp</pre>
SuSE 9.x	<pre># rpmbuild --rebuild (package) # rpm -i /usr/src/packages/RPMS/i586/dgrp-#. #-#.i586.rpm # insmod dgrp</pre>
Mandrake	<pre># rpmbuild --rebuild (package) # rpm -i /usr/src/RPM/RPMS/i586/dgrp-#. #-#.i586.rpm # insmod dgrp</pre>
Debian	<pre># rpmbuild --rebuild (package) # cd /usr/src/rpm/RPMS/i386 # alien -d dgrp-#. #-#.i386.rpm # dpkg -i dgrp_#. #-#_i386.deb # insmod dgrp</pre>

3. Create an RPM specific to your platform by executing the following commands:

```
cd /usr/src/redhat/SPECS
rpmbuild --rebuild --define DISTRO=REDHAT_XX (package)
rpm -ivv /usr/src/redhat/RPMS/i386/dgrp-#. #-#.i386.rpm
insmod dgrp
```

(RPM example is Red Hat. Use the previous table for the correct command)

4. Install the RPM which was just created by the previous step using the following commands.

```
cd /usr/src/redhat/RPMS/arch
rpm -ivv realport-version-revision.arch.rpm
```

The *arch* value should be replaced with a string representing your architecture, such as i386 or alpha. This value is system dependent, and is chosen by your system when the RPM is built.

**Note:** To install the RealPort driver on another system of the same architecture and Linux version, copy the following binary to the same location on the other system and execute the rpm command in this step:

```
/usr/src/redhat/RPMS/arch/realport-version-revision.arch.rpm
```

5. Use the following commands to verify that all files are installed correctly:

```
cd /usr/src/redhat/SPECS
rpm -bl realport-version.spec
```

## Custom Installation Procedure

**Important:** This custom installation procedure is reserved for those users that need to change a portion of the installation procedure or its contents in their specific environment. Reasons might include a need to change the directory where files are installed, or to modify the source code.

**Modifications to the source package may cause Digi to refuse support for that package in that environment.**

See "Package Version and Revision" on page 72, for important information on entering commands in this procedure.

1. Download the RPM package. The RPM package can be found on Digi's web site, [www.digi.com](http://www.digi.com), or Digi's ftp site, [ftp.digi.com/support/drivers/linux](ftp://ftp.digi.com/support/drivers/linux). For consistency, you might consider downloading the source RPM to the directory `/usr/src/redhat/SRPMS`.
2. Install the source code in the SOURCES directory used by RPM (`/usr/src/redhat/SOURCES`) with this command:

```
rpm -ivv realport-version-revision.src.rpm
```

This command also copies the specification file (`/usr/src/redhat/SPECS/realport-version.spec`) to the SPECS directory.

3. Use the RPM tools to open the source archive:

```
cd /usr/src/redhat/SPECS
rpm -bp realport-version.spec
```

The `-bp` option specifies that only the preparation section (`%prep`) of the specification file should be executed. This might result in the source files being uncompressed, removed from the archive, and placed in the following directory:

```
/usr/src/redhat/BUILD/realport-version
```

4. Make desired modifications to the source files and/or the specification file. The source files are found in the directory

```
/usr/src/redhat/BUILD/realport-version
```

The specification file is named:

```
/usr/src/redhat/SPECS/realport-version.spec
```

**Important:** You should save the original version of any file that you change, plus the final version of the files after you make and test your changes. These backup copies should be placed somewhere other than in the `/usr/src/redhat` tree.

**Important:** If you change the final location of any of the files in the package, you must also update the `%file` list in the specification file. Otherwise, you will get a message that the installation was incomplete, because some files were not found.

**Recommended:** It is recommended that you document your changes in the `%description` section of the specification file.

5. The easiest method for building and installing the modified package is to first replace the Digi TGZ archive with a new one including your changes. Replace the archive by doing the following:
  - a. Change to the appropriate directory:

```
cd /usr/src/redhat/BUILD
```
  - b. Create a compressed archive of the source files: (note that the following command should be entered on a single line)

```
tar -cvzf ../SOURCES/realport-version.tgz realport-version/*
```

Once the TGZ file has been replaced, you can proceed with step 3 of the "Standard Installation Procedure" on page 72.

## Installing the Driver: TGZ Method

The following procedure can be used in any Linux environment. It is the only choice available for environments which do not support RPM.

### Package Version and Revision

Certain commands used in the following procedure need to be entered with the correct package version and revision number.

**Note:** Refer to release notes for version and revision (release) numbers.

For this command:	This would be entered:
<code>tar -xvzf realport-version revision.tgz</code>	<code>tar -xvzf realport-1.0-2.tgz</code>

### Procedure

1. Download the Linux RealPort TGZ file. This file can be found on Digi's web site, [www.digi.com](http://www.digi.com), or Digi's ftp site, [ftp.digi.com/support/drivers/linux](ftp://ftp.digi.com/support/drivers/linux).
2. Choose a directory (such as `/usr/src`) where the source tree will reside, and unpack the compressed archive file there. For example:

```
cd /usr/src
tar -xvzf realport-version-revision.tgz
```

This will create a subdirectory called `realport-version` containing all of the RealPort source files.

3. Change directory to the root of the source directory tree.

```
cd /usr/src/realport-version
```

4. Create Makefile script

```
./configure
```

**Note:** Occasionally, a Linux Vendor will ship a kernel that simply cannot be autodetected to add the various changes that might be required for that specific kernel.

Because of this, there is an option that can be used for both the srpm and tgz to tell the driver package exactly what distribution you have. Currently, the recognized options are for:

Red Hat 7.2 - REDHAT\_72,  
Red Hat 7.3 - REDHAT\_73,  
Red Hat 8 - REDHAT\_8,  
Red Hat 9 - REDHAT\_9,  
Red Hat Fedora - FEDORA,  
Red Hat AS 2.1 - REDHAT\_AS\_21,  
Red Hat AS 3 - REDHAT\_AS\_3 / REDHAT\_ES\_3 / REDHAT\_WS\_3

For example, to tell the srpm that you have Red Hat 9, run this command instead:

```
* rpmbuild --rebuild --define DISTRO=REDHAT_9 DRIVER_PACKAGE_NAME.srpm
```

To tell the tgz that you have Red Hat AS 3, run this during the "configure" phase:

```
* ./configure DISTRO=REDHAT_AS_3
```

Examine the Makefile and make modifications as required by your system

environment. Common items to check would include destinations directories, naming conventions, and compiler details.

5. When satisfied with the state of the Makefile and other source files, compile the driver and its support tools by entering this command:

```
make all
```

6. Install the package components with:

```
make install
```

7. Register your module with the system initialization scripts by entering:

```
make postinstall
```

**Recommended:** Do not delete the source tree since the makefiles are necessary for the uninstall procedure.

## Uninstalling the Driver

Use one of the following methods to uninstall the Linux driver.

### Uninstalling with RPM

**Note:** The procedures in this topic should be used only in Linux environments which support the installation and building of packages from an RPM repository. The procedures require that the following RPM directories exist and are used by RPM on your Linux system:

- /usr/src/redhat/BUILD
- /usr/src/redhat/RPMS
- /usr/src/redhat/SOURCES
- /usr/src/redhat/SPECS
- /usr/src/redhat/SRPMS

#### *Procedure*

1. Use the `dgrp_cfg_node` command with the `uninit` option for each PortServer. This will kill each PortServer daemon and erase all information of that PortServer from the system.

```
dgrp_cfg_node uninit ID
```

where `ID` specifies the ID of the PortServer to unconfigure.

2. Enter this command to remove the driver package:

```
rpm -e -vv realport
```

### Uninstalling from a TGZ Archive

**Important:** If you have deleted the source repository created when you installed this driver package, then there is no automated mechanism to remove the package files.

1. Access a command prompt at the root on your Linux system.
2. Change directories to the root of the source tree

```
cd /usr/src/realport-version
```

Substitute your driver version numbers for *version* in the previous command. For example, if the driver version is 1.0, the command would be:

```
cd /usr/src/realport-1.0
```

3. Enter these two make commands:

```
make preuninstall
make uninstall
```

## RealPort Devices

When installed, the Linux RealPort driver creates three different devices for each physical port of each Digi device: a standard TTY device, a callout device, and a transparent print device.

### Device Naming Convention

The devices are named according to the following convention:

*[prefix][ID][port]*

These elements are defined as follows:

Element	Description
prefix	Standard TTY devices have the prefix “tty”, callout devices have the prefix “cu”, and transparent print devices have the prefix “pr”.
ID	The RealPort ID for the Digi device associated with this port. A RealPort ID consists of one or two alphanumeric characters. An underscore character may be used for any of the two ID characters.
port	The port number must consist of two digits. The ports are numbered beginning with 00.

The following are examples of the devices which would be created for the first port of a Digi device with the RealPort ID “aa”.

Device Type	Full Path Name
Standard TTY Device	/dev/ttyaa00
Callout Device	/dev/cuaa00
Transparent Print Device	/dev/praa00

### Standard TTY Devices

The behavior of the standard tty devices is that of a modem controlled port. They require the Data Carrier Detect (DCD) signal to be high before they will operate. When used on a dial-in modem, the ports will wait for DCD before sending out the login prompt.

When these devices are used with a terminal or other locally connected device, it is usually the practice to wire the DCD signal to the remote equipment's Request To Send (RTS) line. When a terminal is then used for log-in, the system will generate a prompt when the terminal is powered-on (RTS, and thus DCD is asserted), and will kill the user session if the terminal is powered-off (lowering the signals).

### Callout Devices

These devices will be obsoleted in a future version of Linux, so should generally be avoided. Data Carrier Detect (DCD) need not be present to open the device.

Once a connection is established and DCD becomes active, these devices behave in the same way as the standard tty devices. Subsequent loss of the DCD signal will cause active processes on the port to be killed.

### Transparent Print Devices

The transparent print device can be used with auxiliary printer ports on terminals. Output to the “pr” device goes out the auxiliary port of a terminal while you continue to use the terminal normally.

## Managing a Digi Device with Digi RealPort Manager

### Introduction

Digi RealPort Manager can be used to perform these tasks. .

Task	Procedure
Add a Digi device	See "Adding a Digi Device" on page 79.
Delete a Digi device	See "Deleting a Digi Device" on page 79.
Start a RealPort daemon	See "Starting a RealPort Daemon" on page 80.
Stop a RealPort daemon	See "Stopping a RealPort Daemon" on page 80.
Monitor port status	See "Monitoring Port Status" on page 80.

### The Main Screen

The main screen of the Digi RealPort Manager is used to manage the Digi devices registered with the RealPort driver. It lists all of the currently configured Digi devices in the central window, and provides buttons and menu options to manipulate these Digi devices..

Menu Field	Description
RealPort ID	The RealPort ID must be one or two alphanumeric characters used to designate your TTY devices for RealPort. This id must be unique to your system. An underscore character may also be used for an ID character. An example for a RealPort device name where the letters rp are used would be: <i>TTYrp01</i>
address	The address may be specified as an IP number, or IP name. No attempt is made to validate this address, nor to connect to the specified address during the installation.

Menu Field	Description
ports	This field is an integer indicating the number of device files which should be created for this Digi device. This does not have to match the physical number of ports, but physical ports beyond the number specified will not be available. The maximum port count allowed is 64.
IP Port	This is the Digi device IP port number. Normally this should be left at the default.
Access Mode	Access Mode sets the file protection mode for any device files created.
Owner	This field sets the user ID of the file owner for any device files created. The value must be an integer.
Group	This field sets the group ID of the file owner for any device files created. The value must be an integer.
Link Speed	Link Speed sets the link speed string. The default is auto, and can be used under most circumstances. See the drpd(8) man page for information on the custom speed parameters.

### Adding a Digi Device

Use this procedure to add a Digi device to your Linux System.

1. Access Digi RealPort Manager by entering this command at a Linux prompt:

```
/usr/bin/dgrp/config/dgrp_gui
```

**Note:** Digi will only support use of the GUI with the wish interpreter. The wish tcl interpreter needs to be in the Linux "path" before the dgrp\_gui command will work.

2. There are two ways to register a new Digi device with the RealPort package. Either press the Add button that appears at the bottom of the main screen, or choose the PortServer > Add New from the menu. In either case, the Digi device Settings window will appear.
3. Specify values for each of the fields displayed (some of the fields have defaults).
4. Press the Commit button and the RealPort Command Logger window will appear and an appropriate dgrp\_cfg\_node command will be displayed.
5. Press the Run It button to execute the command and finish adding and initializing your Digi device. Watch for any errors in the log window.

### Deleting a Digi Device

Use this procedure to delete a Digi device from your Linux System.

1. Access Digi RealPort Manager by entering this command at a Linux prompt:

```
/usr/bin/dgrp/config/dgrp_gui
```

**Note:** Digi will only support use of the GUI with the wish interpreter. The wish tcl interpreter needs to be in the Linux "path" before the dgrp\_gui command will work.

2. Choose the appropriate Digi device in the list box,
3. Press the Delete button that appears on the bottom of the main screen, or choose PortServer > Delete/Uninitialize from the menu. The Digi PortServer Settings window will appear.
4. Confirm that the correct PortServer is being deleted and press the Remove button. The RealPort Command Logger window will appear and an appropriate dgrp\_cfg\_node command will be displayed.
5. Press the Run It button to execute the command and complete the removal of the Digi device, along with all of its device nodes.

### Starting a RealPort Daemon

Use this procedure to start a RealPort daemon for a Digi device.

1. Access Digi RealPort Manager by entering this command at a Linux prompt:

```
/usr/bin/dgrp/config/dgrp_gui
```

**Note:** Digi will only support use of the GUI with the wish interpreter. The wish tcl interpreter needs to be in the Linux "path" before the dgrp\_gui command will work.

2. Choose the appropriate Digi device in the list box.
3. Choose Daemon > Start Daemon from the menu. The Command Logger screen will appear and a dgrp\_cfg\_node command will display.
4. Press the Run It button to execute the command and attempt to start the daemon. If the daemon is already running, the command will silently exit.

### Stopping a RealPort Daemon

Use this procedure to stop a RealPort daemon or Digi device.

1. Access Digi RealPort Manager by entering this command at a Linux prompt:

```
/usr/bin/dgrp/config/dgrp_gui
```

**Note:** Digi will only support use of the GUI with the wish interpreter. The wish tcl interpreter needs to be in the Linux "path" before the dgrp\_gui command will work.

2. Choose the appropriate Digi device in the list box.
3. Choose the Daemon > Stop Daemon from the menu. The Command Logger screen will appear and a dgrp\_cfg\_node command will display.
4. Press the Run It button to execute the command and attempt to stop the daemon. If the daemon is not running, the command will silently exit.

### Monitoring Port Status

When monitoring ports, you can change the port monitoring delay by using the sliding scale along the bottom of the Ports window. Modem signal



values are only correct for open ports. Ports in the **closed** or **waiting** state may not display the correct modem signals. When monitoring ports, the Refresh button may be selected at any time to update the port fields. Use the following procedure to monitor the status of a RealPort port.

**Procedure**

1. Access Digi RealPort Manager by entering this command at a Linux prompt:

```
/usr/bin/dgrp/config/dgrp_gui
```

**Note:** Digi will only support use of the GUI with the wish interpreter. The wish tcl interpreter needs to be in the Linux "path" before the dgrp\_gui command will work.

2. Choose the appropriate Digi device in the list box.
3. Choose the Ports option of the View menu.
4. Choose the appropriate port in the Ports Window.
5. Press either the Modem Status button or select the Modem Status option of the Ports menu. The Port Status window will appear. A signal will show a red box if it is active or a gray box if it is inactive.

**Ports Window Information**

These are the fields of the Ports Window:

Field	Description
Port	Port is the port number of an individual port. The first port on a Digi device is port number 0.
Status	The value of this field is either open, closed, or waiting. A port moves into the waiting state when there are devices waiting to open the port (either waiting for an event, or for another process to release the port).
Speed	This value is the last known speed (in bps) of the port. If unknown (for instance, before the port is used for the first time), the value 0 is shown.
Description	This field is not yet active and will always show NA

**Managing a Digi Device with dgrp\_cfg\_node**

The dgrp\_cfg\_node tool is a command-line based configuration program designed to automate a number of steps which are required in order to enable the serial ports on Digi devices for general use. The path to the dgrp\_cfg\_node executable is /usr/bin/dgrp/config.

The dgrp\_cfg\_node tool has four modes of operation:

Operation	Description
init operation	This operation can be used to add or reinitialize a Digi device in Linux.

uninit operation	This operation removes a Digi device from Linux.
stop operation	This operation stops a RealPort daemon.
start operation	This operation attempts to start a RealPort daemon.

#### **About the RealPort ID**

The RealPort tools refer to an individual Digi device with an ID. You must choose the ID to use for each Digi device, and this ID must be unique within your system. The `dgrp_cfg_node init` operation allows you to assign an ID to a Digi device.

A RealPort ID consists of one or two alphanumeric characters. The underscore character may be used in the ID.

Once an ID is assigned, the device files in the `/dev` directory which are created by the package will encode the ID into the device name. This allows one, by inspection, to determine which Digi device with which a particular device is associated. For more information on the device naming, see "RealPort Devices" on page 77.

#### **The init Operation**

The `init` operation has the following effects:

- If necessary, it will attempt to load the driver module.
- It will determine whether a daemon is already running for the specified node. If it is not running, it will start the daemon.
- It will create all necessary device files in the `/dev` directory. If a device file exists, the ownership and permissions are preserved.

The standard usage requires a command like:

```
dgrp_cfg_node init ID IPaddr ports
```

The parameters are defined as follows:

Parameter	Definition
init	Indicates the operation being requested
ID	Assigns the supplied ID to the Digi device. A RealPort ID consists of one or two alphanumeric characters. The underscore character may be used in the ID.
IPaddr	Either an IP address or an IP name may be assigned to the daemon via this parameter.
ports	This parameter indicates the number of device files which should be created for this particular Digi device. This does not have to match the physical number of ports, but physical ports beyond the ports value specified will be unavailable. The maximum number of ports supported by the tool is 64.

For further details, see the `dgrp_cfg_node` man page, which is installed with this package.

#### The uninit Operation

The uninit operation has the following effects:

- It will determine whether a daemon is running for the specified Digi device, and if so, will kill it.
- It will erase all information about this Digi device from its internal database (this distinguishes the behavior from that of stop; please see below).

The standard usage requires a command like:

```
dgrp_cfg_node uninit ID
```

The parameters are defined as follows:

Parameter	Definition
uninit	Indicates the operation being requested
ID	Specifies which Digi device to unconfigure.

**Note:** The command will fail if any ports are in use. Be sure to kill all applications using the Digi device ports before uninitialization.

**Note:** Even if you have removed all of the Digi devices you have previously registered with the driver, the `dgrp_cfg_node` utility will not unload the driver module.

For further details, see the `dgrp_cfg_node` man page, which is installed with this package.

### The stop operation

The stop operation has the following effect:

- It will determine whether a daemon is running for the specified Digi device, and if so, will kill it.
- The RealPort software retains the information associated with this ID, so that the daemon can be restarted with a minimum of information.

The simplest usage requires one to execute a command with a form similar to:

```
dgrp_cfg_node stop ID
```

The parameters are defined as follows:

Parameter	Definition
stop	Indicates the operation being requested
ID	Specifies which Digi device's daemon to stop.

One might stop a daemon in order to change the daemon's parameters, like the IP address (i.e. stop, then restart with new parameters). For further details, please see the `dgrp_cfg_node` man page, which is installed with this package.

### The Start Operation

The start operation determines whether a daemon is running for the specified node, and if not, will attempt to execute a daemon based on the supplied parameters.

The simplest usage requires one to execute a command with a form similar to:

```
dgrp_cfg_node start ID IPAddr
```

The parameters are defined as follows:

Parameter	Definition
start	Indicates the operation being requested
ID	Specifies which Digi device's daemon to start.
IPAddr	The (possibly new) IP address or IP name to use when referring to the Digi device with the specified ID.

For further details, see the `dgrp_cfg_node` man page, which is installed with this package.

## Device Configuration Overview

Use these overviews of device configuration topics to decide which tool(s) you should use to configure your devices.

### *ditty-rp*

Features or Description	<ul style="list-style-type: none"><li>• Digi's device configuration program</li><li>• Run from a command prompt</li><li>• ditty-rp commands are normally included in a system startup file.</li></ul>
Uses	<ul style="list-style-type: none"><li>• Manually configure Digi-specific device settings such as altpin or forcedcd</li><li>• Configure printer devices. See "Configuring a Device for a Printer" on page 86</li></ul>
Resources	<ul style="list-style-type: none"><li>• Refer to the man page for ditty-rp</li><li>• See</li></ul>

### *Configuring a Port for a:*

Terminal	See "Configuring a Device for a Terminal" on page 86. This procedure describes how to configure a device for a terminal.
Printer	See "Configuring a Device for a Printer" on page 86. This procedure describes how to configure a device for a printer.
Modem	See "Configuring a Device for a Modem" on page 87 This procedure describes how to configure a device for a modem.

### *Miscellaneous Topics*

altpin	This option should be enabled on a port when an RJ-45 8-pin cable is used and the Data Carrier Detect (DCD) signal is required. For example, altpin should be enabled on a port where an RJ-45 8-pin cable is used with a modem. See "About Transparent Printing" on page 88, and refer to the Cable Guide for your Digi product.
fastbaud	RealPort devices support baud rates in excess of the maximum baud rate supported by Linux. To enable the use of these fast baud rates, a ditty-rp parameter, fastbaud, has been provided. See the topic <i>fastbaud Data Rate Mapping</i> in "About Transparent Printing" on page 88.

Data Carrier Detect (DCD)	<p>In some cases, depending on your operating system requirements and/or your device requirements, it may be necessary for the Data Carrier Detect (DCD) signal to be active on a port before it will function. There are two ways to fulfill this requirement.</p> <p><i>Cabling</i></p> <p>One way to fulfill the DCD requirement is to create a cable and have your device force the signal high. See the Digi One RealPort and PortServer Cable Guide.</p> <p><i>ditty-rp</i></p> <p>Another way to fulfill the DCD requirement is to enable the forcedcd ditty-rp option. See "About Transparent Printing" on page 88.</p>
---------------------------	---

## Configuring a Device for a Terminal

Use this procedure to configure a Digi serial device for a terminal. See your operating system documentation for more information on configuring a serial device for a terminal.

### Procedure

1. Connect a serial cable between the port and terminal.
2. Edit the /etc/inittab file and add a getty entry for the device. The getty name that configures your device can vary from system to system. The following examples are only meant to serve as a guide. Substitute your device for ttyaa011 in these examples:

Example 1: RedHat getty\_ps

An example of a common RedHat terminal install script where getty is getty\_ps would be:

```
dl:2345:respawn:/sbin/getty_ps ttyaa11 DT9600 vt100
```

Example 2: Debian agetty

An example of a common Debian terminal install script where getty is agetty would be:

```
Dl:23:respawn:sbin/agetty -L ttyaa11 19200 vt100
```

Example 3: mgetty

An example of an mgetty modem script which is available both in RedHat and Debian is:

```
T3:23:respawn: /sbin/mgetty -x0 -s 115200 ttyaa11
```

**Note:** The mgetty command is hardcoded to use hardware flow control - which means 8-wire cable is a must and a 3-wire connection will not work.

3. Enable the port for login by rebooting the system or by entering this command at your Linux command prompt:

```
init q
```

## Configuring a Device for a Printer

You have two options in configuring your printers with Linux drivers.

1. Connect a serial cable between the port and printer.
2. Use either the Linux `printtool` command to configure your printer or, set up the printers manually. To install a printer manually, add lines similar to this example to the `/etc/inittab` file:

```
DG01:2345:once: cat < /dev/ttyaa11 > /dev/null &
dg01:2345:once: ditty-rp 38400 ctspc altpin -ixon -ixoff -ixany /
dev/ttyaa11
```

The device `/dev/ttyaa11` is used as an example here. Substitute your particular device name in the previous commands. This example also sets the port speed to 38400, enables `altpin`, enables hardware flow control (`ctspc` and `rtspc`) and disables software flow control (`-ixon`, `-ixoff`, `-ixany`) on the port. Configure the `ditty-rp` parameters as required by your specific printer and cable configuration. For more information on `ditty-rp`, see "About Transparent Printing" on page 88.

## Configuring a Device for a Modem

Use this procedure to configure a Digi device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

### *Procedure*

1. Connect a serial cable between the port and modem.
2. Power the modem on. (This example depicts hardware flow control configuration.)
3. At the command prompt enter:

```
chown uucp:uucp /dev/ttyaa00
```

where `ttyaa00` is the name of the device and `uucp` is an UNIX application..

4. Connect to the modem by entering this command at a command prompt

```
cu -l /dev/ttyaa00 -s 38400
```

where `ttyaa00` is the name of the non modem control device for the port.

5. Set the modem to answer after the first ring with this command:

```
ats0=1
```

6. Train the modem to the port speed with this command:

```
at&w
```

7. Enter any other desired modem commands.
8. Terminate the connection to the modem with a tilde followed by a period:

```
~ .
```

9. To manually configure the port to use hardware flow control by inserting this command in a Linux startup file:

```
ditty-rp rtspc ctspc /device
```

where /device is the name of the Digi device. Insert the command in a startup file so it remains in effect after a reboot.

Alternately, use a gettydef entry that uses hardware flow control (see the next step)

10. Edit the /etc/inittab file and add a getty entry for the device. The getty name that configures your device can vary from system to system. The following example is only meant to serve as a guide.

Example:

An example of an mgetty modem script which is available both in RedHat and Debian is:

```
T3:23:respawn: /sbin/mgetty -x0 -s 115200 ttyaa00
```

where *tyaa00* is the name of the device.

11. Enable the port for login by rebooting the system or by entering this command at your Linux command prompt:

```
init q
```

## About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.

## Configuring Transparent Printers

Use this procedure to set up transparent printers on terminals.

**Note:** This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

### *Procedure*

At the command prompt, enter:

```
ditty -n ttyname [options]
```

where *ttyname* is the name of the terminal device and options are selected from the list below.

maxcps <i>n</i>	Limits the maximum printer port character-per-second data rate. <i>n</i> should be set to the minimum character rate the printer can sustain in typical use.
-----------------	--



<code>maxchar <i>n</i></code>	Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.
<code>bufsize <i>n</i></code>	This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.
<code>onstr "<i>s</i>"</code>	Defines the terminal escape sequence to direct subsequent data to the transparent printer.  <i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code> .  For example, the sequence " <code>&lt;Esc&gt;[5i</code> " would be entered as: <code>"\033[5i"</code> .
<code>offstr "<i>s</i>"</code>	Defines the terminal escape sequence to stop directing data to the printer.  <i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code> .  For example, the sequence " <code>&lt;Esc&gt;[4i</code> " would be entered as: <code>"\033[4i"</code> .
<code>term <i>t</i></code>	Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: <code>adm31</code> , <code>ansi</code> , <code>dg200</code> , <code>dg210</code> , <code>hz1500</code> , <code>mc5</code> , <code>vt100</code> , <code>vt220</code> , <code>vt320</code> , <code>vt420</code> , <code>wang2x36</code> , <code>wyse30</code> , <code>wyse50</code> , <code>wyse60</code> or <code>wyse75</code> .  If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the <code>mc5/mc4</code> attributes found there.

## Setting TTY Options

The RealPort Linux device driver package includes a command, `ditty-rp`, which is a superset of `stty`, and may be used to set and display the device options for Digi RealPort devices.

The general command format is:

```
ditty-rp [-a] [-n ttyname] [option(s)] [ttyname]
```

With no options, `ditty-rp` displays all Digi special driver settings, modem signals, and all standard parameters displayed by `stty(1)` for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to `stty(1)` for interpretation. `ditty-rp` commands may be executed from the command line, or placed in a

startup script to be run whenever the system is booted.

The options are:

- a            Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by `stty -a`.
- n  
*ttyname*    Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.
- ttyname*    Set and display options for the specified TTY device. Replace *ttyname* with the TTY pathname (such as `/dev/ttya01s`, `/dev/term/a01` or `/dev/dty/a001s`, depending on your operating system). This option may be used on a modem control line when no carrier is present.

The following options specify transient actions to be performed immediately:

- `break`        Send a 250 MS break signal out on the TTY line.
- `flush`        Immediately flush (discard) TTY input and output.
- `flushin`      Flush TTY input only.
- `flushout`     Flush TTY output only.

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will use the default values the next time it is opened.

- `stopout`      Stop output exactly as if an XOFF character were received.
- `startout`     Restart stopped output exactly as if an XON character were received.
- `stopin`       Activate flow control to stop input.
- `startin`      Release flow control to resume stopped input.
- `[-]dtr`       Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
- `[-]rts`       Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

- `[-]fastbaud`   Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See "fastbaud Data Rate Mapping" on page 92.

<code>[-]rtspace</code>	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
<code>[-]ctspace</code>	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
<code>[-]dsrpace</code>	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
<code>[-]dcdpace</code>	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
<code>[-]dtrpace</code>	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
<code>[-]forcedcd</code>	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.
<code>startc c</code>	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
<code>stopc c</code>	Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astartc c</code>	Sets auxiliary XON flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astopc c</code>	Sets auxiliary XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>[-]aixon</code>	Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.
<code>maxcps n</code>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.

- maxchar *n*** Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
- bufsize *n*** Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the maxcps rate selected above. Default is 100 characters.
- onstr "*s*"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence `<Esc>[5i` would be entered as: `"\033[5i"`.
- offstr "*s*"** Defines the terminal escape sequence to stop directing data to the printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence `<Esc>[5i` would be entered as: `"\033[5i"`.
- term *t*** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.

#### **fastbaud Data Rate Mapping**

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657

150	153600
200	230400
300	460800

## Troubleshooting RealPort in Linux:

**If none of the ports work:**

**Check the Status of the RealPort Daemon:**

From the Linux root prompt, type:

```
ps -ef | grep drpd
```

You should see an entry for each Digi device similar to the following, please verify the respective IP address.

```
root 2254 1 0 Dec 13 ? 0:03/usr/bin/dgrp/daemon/drpd a 192.168.2.2
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (**ping nodename**)

To restart the daemon type the following from the Linux root prompt using an Xterm capable session:

```
/usr/bin/dgrp/config/dgrp_gui
```

This graphical utility will allow you to highlight the desired entry, then simply select the Daemon Menu item from the top to be able to check, stop and start RealPort daemons. To stop and start the RealPort daemons from a non graphical interface, type the following from the Linux root prompt:

```
/usr/bin/dgrp/config/dgrp_cfg_node -v -v stop x
```

This will stop the RealPort daemon, where 'x' represents the ID letter of the unit. To start the daemon, issue the following command:

```
/usr/bin/dgrp/config/dgrp_cfg_node -v -v start x ###.###.###.###
```

Again, where 'x' represents the unit ID letter and ###.###.###.### represents the IP address.

**If some of the ports do not work:**

**Check for carrier detect:**

Check the serial signals by typing "display port range=[port\_number]" from the Device root prompt. For a graphical utility to display port signals, please download and install DPA Remote:

<http://ftp.digi.com/support/utilities/ts/>

If an 8 pin RJ45 cable is being used and DSR is asserted but not DCD, use the following command:

```
#> set flow altpin=on ra=[port_number]
```

If DCD is not wired on the cable (using less than 8 wires) then force carrier must be enabled. This can be set in

```
#> set flow forcedcd=on range=[port_number]
```

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the Linux root prompt can clear the port:

```
# ditty-rp startin startout flush ttyx##
```

If this command does not work, a reboot of the Linux server may be required to clear the port from an overflow condition. Afterwards, be sure to match the flow control values that are configured on the attached device (terminal, printer, etc...).

**Kill any active processes:**

To kill any active processes, which may be stuck on the Linux host, please issue the following commands from the root prompt:

```
# fuser -k /dev/ttyx##
```

Where ttyx### represents the actual tty id.



## Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- The Solaris RealPort device driver works with Solaris (SPARC) and Solaris (Intel) operating systems. For the latest versions of Solaris supported, see the Release Notes.
- Installing the RealPort software on a Solaris host where RealPort has already been installed will overwrite the existing RealPort configuration on that host.
- The Digi RealPort device driver for Solaris is an installable device driver; the software development system is not required to create a new kernel.
- Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended.

## Information to Gather

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

## Configuring Digi Device for RealPort

Use this procedure to configure the Digi device for use with Digi RealPort drivers.

**Note:** See the appropriate Command Reference or Configuration and Administration Guide for information on how to perform the steps below.

### *Procedure*

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.



4. For all ports that will be using RealPort, set the device type to rp. The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```

## Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

### *Procedure*

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

## Assigning an IP Address

EtherLite IP addresses may be set by either of two methods:

- dgipserv, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

## Using dgipserv to Assign an IP Address

The dgipserv utility is used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on dgipserv consult the man pages.

### *Procedure*

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device. An example of this command is:

```
dgipserv -store 10:e0:f7:15:20:8g 143.182.5.63
```

## Master Setup Process

1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See Information to Gather, on page 96.
3. Install the RealPort driver. See "Installing the Driver (Including Encrypted RealPort): CD" on page 98 or "Installing the Driver: Download or Integration Kit" on page 98.
4. Configure the PortServer for RealPort. See "Configuring Digi Device for RealPort" on page 96 or "Configuring EtherLite for RealPort" on page 97.

5. Add Digi devices to the RealPort configuration with drpadmin. See "Adding a Digi Device with drpadmin" on page 99.

## Installing the Driver (Including Encrypted RealPort): CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

### *Procedure*

1. Choose an operating system.
2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.
5. Follow the prompts.

Note: You will be prompted with the following to install Encrypted RealPort:

```
Would you like this RealPort session to be encrypted?
```

```
NOTE: Not all RealPort products support encrypted RealPort sessions.
```

```
Please check your RealPort product's firmware release notes or product literature before selecting "always".
```

```
If in doubt, select "never".
```

```
(always/never) : (never): always
```

```
The following device will be configured,
```

```
0      10.1.3.68      16      aa      secure (always)
```

```
Is this correct (y to add or x to abort) ? y
```

6. Confirm your configuration.
7. Reboot your system if necessary.

## Installing the Driver: Download or Integration Kit

Use this procedure to install a downloaded Solaris device driver.

### *Procedure*

1. Download the appropriate driver file.
2. If you have downloaded the driver file from a system other than the Solaris system, copy the file to the Solaris system.
3. Log onto the console as superuser (root).
4. Enter this command:

```
pkgadd -d path-filename
```

where *path-filename* is the path to and the name of the downloaded driver file.

5. Follow the prompts.

## Uninstalling the Driver

Use this procedure to remove the RealPort driver from your system.

### *Procedure*

1. Delete any configured Digi devices before uninstalling the RealPort driver. See "Deleting a Digi Device with drpadmin" on page 100.
2. Enter the following command at a root prompt:

```
pkgrm realport
```

3. Follow the prompts.

## Adding a Digi Device with drpadmin

Use this procedure to create RealPort devices and start the RealPort daemons.

### *Procedure*

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Answer the prompts as appropriate.

When Prompted to:	Action:
Select an option	Choose add.
Enter the node name or IP address for this Digi device	<p>If an IP address is used, make sure it is unique and does not conflict with any other network device.</p> <p>If a name is entered, the name must be registered in /etc/hosts or with an accessible nameserver.</p>
Enter the number of ports on the Digi device	<p>Enter the number of ports for this Digi device. The installation will prompt to confirm this number.</p> <p><b>Note:</b> If PORTS/Xem (EBI) modules will be attached to a PortServer II module, include these ports.</p>
Enter TTY device ID letter(s)	Enter one or two letters. These letters will be used to create the RealPort device names.
Enter WAN speed if the connection between the Digi device and HP-UX system includes a WAN link slower than 1 MB	Enter the WAN speed if this is the case. Otherwise, choose Enter to continue.

Confirm the configuration	Enter <b>y</b> to proceed or <b>n</b> to reenter the information.
Select an option	Enter <b>a</b> to add another Digi device. Enter <b>s</b> to show configured Digi devices. Enter <b>q</b> to exit drpadmin.

## Deleting a Digi Device with drpadmin

Use this procedure to delete a Digi device.

### *Procedure*

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Enter **s** to show all installed Digi devices.
3. Note the number of the Digi devices to delete.
4. Choose Enter to make the options prompt reappear.
5. Enter **d** (delete).
6. Enter the Digi device number to delete.
7. Enter **y** to confirm the deletion.

## RealPort Devices

The RealPort installation creates four different devices for each port.

- Standard device
- Modem device
- Standard transparent print device
- Modem transparent print device.

## Device Name Format

The devices are named according to the following conventions:

a-z	The Digi device letter ID. Legal letters are a-z.
001-096	The port number on the individual Digi device.
s	At the end of a device name indicates a standard device.
m	At the end of a device name indicates a modem device.

Here are examples of the devices created for the first port of a Digi device with the identification letter "a".

Device	Path/Name Example
Actual Standard Device (terminal)	/dev/dty/a001s

Actual Modem Device	/dev/dty/a001m
Standard Device Link (terminal)	/dev/cua/a001 (linked to /dev/dty/a001s)
Modem Device Link	/dev/term/a001 (linked to /dev/dty/a001m)
Standard Transparent Print Device	/dev/dpr/a001s
Modem Transparent Print Device	/dev/dpr/a001m

## Standard Device

**Example:** /dev/dty/a001s

A standard Digi device uses an identification letter "s" in its name. The default handshake method is XON/XOFF. Data Carrier Detect (DCD) need not be present to open the device.

Once a connection is established and DCD becomes active, standard devices behave in the same way as modem devices--subsequent loss of the Data Carrier Detect signal will cause active processes on the port to be killed and the user will be automatically logged off.

## Modem Device

**Example:** /dev/dty/a001m

Digi device modem devices use an identification letter "m" in their names. They are sometimes referred to as "dial-in" devices.

Modem devices are traditional UNIX ports with modem control. They require Data Carrier Detect to be high before they will operate. RTS/CTS handshaking is enabled by default. When used with a modem, the ports will wait for DCD before sending out the login prompt.

When used with a terminal or other device, it is usually wise to wire the Digi DCD signal to the terminal's Data Terminal Ready (DTR) line. When the terminal is turned on, the system outputs a login prompt. When the terminal is turned off, any associated jobs are killed, and the user is logged out.

## Transparent Print Devices

**Examples:** /dev/dpr/a001s and /dev/dpr/a001m

The transparent print devices can be used with auxiliary printer ports on terminals. Output directed to a dpr device goes out the auxiliary port of a terminal while you continue to use the terminal normally.

Use /dev/dpr/a001s if the terminal device is /dev/dty/a001s or /dev/cua/a001 (standard device); use /dev/dpr/a001m if the terminal device is /dev/dty/a001m or /dev/term/a001 (modem device).

## Setting Device Options with ditty

With the ditty command, display options such as flow control settings,

speed and transparent print settings can be configured for your RealPort TTY devices. For detailed information on the ditty command, refer to the Solaris man pages and "Setting TTY Options" on page 104.

**Note:** To use the man pages for the first time, the path /usr/share/man must be added to the system MANPATH. Here is an example of such a command that is sufficient in most cases. At a root prompt on the system, enter:

```
MANPATH=$MANPATH:/usr/share/man
```

ditty commands should be manually inserted in the startup file /etc/rc2.d/S99ditty (or any other file beginning with "S99" in the same directory) so they are executed every time the system is booted.

## Configuring a Device with admintool

The Solaris system administration utility, admintool, can be used to configure RealPort devices.

**Note:** In order to use admintool, the Digi devices need to be linked to devices in /dev/term and /dev/cua. These links are normally created when the driver is installed. If these links are not there, they can be created manually.

### *Procedure*

1. Access admintool through a window interface, or entering this command at a root prompt:

```
admintool
```

2. From the admintool window, select Browse>Serial Ports.
3. Select a device.
4. Select Edit > Modify.
5. Configure the port as needed.

## Configuring a Device for a Terminal

Use this procedure to configure a RealPort device for a terminal. See your Solaris documentation for more information on configuring a serial device for a terminal.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

### *Procedure*

1. Connect a proper cable between the port and terminal.
2. Invoke admintool either through the window interface, or by entering this command at a root prompt:

```
admintool
```

3. Select Browse > Serial Ports.
4. Select a device.
5. Select Edit > Modify.
6. Configure the device parameters. Typically a terminal device is set to Terminal-Hardwired and Service Enabled.

## 7. Set the Baud Rate.

**Note:** The default admintool baud rates cycle, meaning the speed at the end of the corresponding /etc/ttytype entry is different than the speed at the beginning of the entry. It is preferable to configure a device to a fixed rate.

As an example, this line can be added to /etc/ttytype and used as a fixed rate for devices:

```
38400N:38400 hupcl:38400 hupcl::38400N
```

If a custom /etc/ttytype entry is created and used, set Baud Rate to Other and enter the /etc/ttytype identifier (e.g. 38400N).

## Troubleshooting Tips

- If a login does not appear on the terminal, try disabling and reenabling the device in admintool.
- If a cycling baud rate is used and scrambled characters appear on the terminal screen, hitting the Enter key several times at the terminal may cause the port to change baud rates and display a login.
- If a cycling baud rate is used and scrambled characters appear on the terminal screen, change the baud rate to a fixed /etc/ttydef entry matching the terminal's settings.

## Configuring a Device for a Printer

Use this procedure to configure a RealPort device for a printer. See your Solaris documentation for more information on configuring a serial device for a printer.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

### *Procedure*

1. Connect a proper cable between the port and printer.
2. Set flow control on the port to match the printer settings.

To set hardware flow control on the port (which is more stable than software flow control), edit the file /etc/rc2.d/S99digi (create it if necessary) and add the following commands:

```
cat < /dev/dty/a001s > /dev/null &  
ditty ctspace -ixon -ixoff -ixany /dev/dty/a001s
```

To use software flow control, edit the file /etc/rc2.d/S99digi (create the file if necessary) and add the following commands:

```
cat < /dev/dty/a001s > /dev/null &  
ditty ixon ixoff -ixany /dev/dty/a001s
```

## Configuring a Device for a Modem

Use this procedure to configure a RealPort device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to

take additional steps to properly configure your modem or to set up the operating system for a specific application.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

*Procedure*

1. Connect a proper cable between the port and modem.
2. Connect to the modem with tip.

```
tip -38400 /dev/dty/a001s
```

The speed (38400) and device (/dev/dty/a001s) are used as examples in the previous tip command.

3. Enter one of the following commands depending on your modem:

Command	Comment
AT&H1&B0&W	Typically works for a US Robotics modem
AT&H1&W	Typically works for a Hayes or other modem

4. Terminate the connection to the modem with a tilde-period command:

```
~.
```

5. Access admintool by entering this command at a root prompt:

```
admintool
```

6. Select Browse > Serial Ports.
7. Select a device.
8. Select Edit > Modify.
9. Configure the device parameters. Typically a terminal device is set to Terminal-Hardwired and Service Enabled.
10. Set the Baud Rate.

**Note:** The default admintool baud rates cycle, meaning the speed at the end of the corresponding /etc/ttytype entry is different than the speed at the beginning of the entry. It is often preferable to set them to a fixed rate.

As an example, this line can be added to /etc/ttytype to configure the device for a 38400 fixed rate.

```
38400N:38400 hupcl:38400 hupcl::38400N
```

If a custom /etc/ttytype entry is used, set Baud Rate to Other and enter the /etc/ttytype identifier (e.g. 38400N).

11. Edit the file /etc/rc2.d/S99digi (create it if necessary) and add the following command to it:

```
ditty rtspc ctspc /dev/dty/a001m
```

The device a001m is used as an example in the previous ditty command.

## Setting TTY Options

RealPort UNIX device driver packages include a command, ditty, which is a superset of stty, and may be used to set and display the device options for



Digi RealPort devices.

The general command format is:

`ditty [-a] [-n ttyname] [option(s)] [ttyname]`

With no options, `ditty` displays all Digi special driver settings, modem signals, and all standard parameters displayed by `stty(1)` for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to `stty(1)` for interpretation.

`ditty` commands may be executed from the command line, or placed in a startup script to be run whenever the system is booted.

The options are:

- |  |  |
|--|--|
| <code>-a</code>                                | Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by <code>stty -a</code> .   |
| <code>-n</code><br><code><i>ttyname</i></code> | Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.   |
| <code>ttyname</code>                           | Set and display options for the specified TTY device. Replace <i>ttyname</i> with the TTY pathname (such as <code>/dev/ttya01s</code> , <code>/dev/term/a01</code> or <code>/dev/dty/a001s</code> , depending on your operating system). This option may be used on a modem control line when no carrier is present. |

The following options specify transient actions to be performed immediately:

- |                       |  |
|-----------------------|--|
| <code>break</code>    | Send a 250 MS break signal out on the TTY line.                              |
| <code>clear</code>    | Clear the <code>tbusy</code> flag in the channel structure to free the port. |
| <code>flush</code>    | Immediately flush (discard) TTY input and output.                            |
| <code>flushin</code>  | Flush TTY input only.  |
| <code>flushout</code> | Flush TTY output only.   |

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will use the default values the next time it is opened.

- |                       |  |
|-----------------------|--|
| <code>stopout</code>  | Stop output exactly as if an XOFF character were received.           |
| <code>startout</code> | Restart stopped output exactly as if an XON character were received. |
| <code>stopin</code>   | Activate flow control to stop input.                                 |
| <code>startin</code>  | Release flow control to resume stopped input.                        |

- `[-]dtr` Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
- `[-]rts` Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

- `[-]fastbaud` Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See "fastbaud Data Rate Mapping" on page 107.
- `[-]rtspace` Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
- `[-]ctspace` Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
- `[-]dsrpace` Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
- `[-]dcdpace` Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
- `[-]dtrpace` Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
- `[-]forcedcd` Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.
- `startc c` Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
- `stopc c` Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see `startc`, above, for format of octal and hexadecimal numbers).
- `[-]aixon` Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.

- maxcps *n*** Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.
- maxchar *n*** Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
- bufsize *n*** Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the maxcps rate selected above. Default is 100 characters.
- onstr "s"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence `<Esc>[5i` would be entered as:  
`"\033[5i"`.
- offstr "s"** Defines the terminal escape sequence to stop directing data to the printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence `<Esc>[5i` would be entered as:  
`"\033[5i"`.
- term *t*** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.

### fastbaud Data Rate Mapping

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
----------------------	----------------------

50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

## Transparent Printer Setup

### About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.

### Configuring Transparent Printers

Use this procedure to set up transparent printers on terminals.

**Note:** This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

#### *Procedure*

At the command prompt, enter:

```
ditty -n ttyname [options]
```

where *ttyname* is the name of the terminal device and options are selected from the list below.

- maxcps *n*** Limits the maximum printer port character-per-second data rate. *n* should be set to the minimum character rate the printer can sustain in typical use.
- maxchar *n*** Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.

- bufsize *n*** This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.
- onstr "*s*"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence "`<Esc>[5i`" would be entered as: `"\033[5i"`.
- offstr "*s*"** Defines the terminal escape sequence to stop directing data to the printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
 For example, the sequence "`<Esc>[4i`" would be entered as: `"\033[4i"`.
- term *t*** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: adm31, ansi, dg200, dg210, hz1500, mc5, vt100, vt220, vt320, vt420, wang2x36, wyse30, wyse50, wyse60 or wyse75.  
 If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the mc5/mc4 attributes found there.

## Troubleshooting RealPort in Solaris:

**If none of the ports work:**

**Check the Status of the RealPort Daemon:**

From the UNIX root prompt, type:

```
ps -ef | grep ncxd
```

You should see an entry for each Digi device similar to the following, please verify the respective IP address.

```
%%-p 771
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (**ping nodename**)

To restart the daemon type the following from the UNIX root prompt:

```
# drpadmin
```

Select '**r**' to reset, followed by the item number for the entry to reset.

**If some of the ports do not work:**

**Check serial signal activity:**

Check the serial signals by typing “display port range=[port\_number]” from the Device root prompt. For a graphical utility to display port signals, please download and install DPA Remote:

<http://ftp.digi.com/support/utilities/ts/>

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the UNIX root prompt can clear the port:

```
# ditty startin startout flush /dev/dty/x###s
```

If this command does not work, a reboot of the UNIX server may be required to clear the port from an overflow condition.

**Kill any active processes:**

To kill any active processes, which may be stuck on the UNIX host, please issue the following commands from the root prompt:

```
# fuser -k /dev/dty/x###s
```

Where x###s represents the actual tty id.



## Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- It is important to read any release notes that may be included with the installation media.
- The RealPort device driver software for AIX is an Optional Program Product requiring the TCP/IP Runtime System. The presence of the TCP/IP Runtime System can be verified by viewing installed software in smit.
- Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended.

## Information to Gather

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

## Configuring a Digi Device

Use this procedure to configure a Digi device for use with Digi RealPort drivers.

**Note:** See the appropriate Command Reference or Configuration and Administration Guide for information on how to perform the steps below.

### *Procedure*

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.
4. For all ports that will be using RealPort, set the device type to rp. The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```



## Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

### *Procedure*

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

## Assigning an IP Address

EtherLite IP addresses may be set by either of two methods:

- dgipserv, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

## Using dgipserv to Assign an IP Address

The dgipserv utility is used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on dgipserv consult the man pages.

### *Procedure*

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device. An example of this command is:

```
dgipserv -store 10:e0:f7:15:20:8g 143.182.5.63
```

## Master Setup Process

Use this process to install and configure the AIX RealPort driver.

1. Read any release notes that may be included with the installation media. Also read "Requirements and Considerations" on page 112.
2. Gather information necessary for installation. See "Information to Gather" on page 112.
3. Install the RealPort driver. See "Installing the Driver (Including Encrypted RealPort): CD" on page 114 or "Installing the Driver: Download" on page 114.
4. Configure the Digi device for RealPort. See "Configuring a Digi Device" on page 112, or "Configuring EtherLite for RealPort" on page 113.
5. Add the Digi device with smit. See "Adding a Digi Device Using smit" on page 116.
6. Configure the Digi device with smit. See "Configuring a Digi Device with smit" on page 117.

7. Configure the TTY Devices as necessary. See the TTY configuration topics in this chapter.

### Installing the Driver (Including Encrypted RealPort): CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

#### *Procedure*

1. Choose an operating system.
2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.
5. Follow the prompts.

Note: You will be prompted with the following to install Encrypted RealPort:

```
Would you like this RealPort session to be encrypted?
```

```
NOTE: Not all RealPort products support encrypted RealPort sessions.
```

```
Please check your RealPort product's firmware release notes or product literature before selecting "always".
```

```
If in doubt, select "never".
```

```
(always/never) : (never): always
```

```
The following device will be configured,
```

```
0      10.1.3.68      16      aa      secure (always)
```

```
Is this correct (y to add or x to abort) ? y
```

6. Confirm your configuration.
7. Reboot your system if necessary.

### Installing the Driver: Download

Use this procedure to install a downloaded RealPort AIX driver with smit.

#### *Procedure*

1. Choose Software Installation and Maintenance > Install and Update Software > Install/Update Selectable Software (Custom Install) > Install/Update from All Available Software.
2. When smit prompts you for the input device and directory for software, specify the path and file name and then press Enter.
3. At the prompt "Software to install", choose all and then press Enter twice.

## Uninstalling RealPort

Use this procedure to uninstall the AIX RealPort driver.

**Note:** Before uninstalling the RealPort driver, users in most instances should remove the TTY devices and the Digi RealPort device. Not removing the devices leaves files in the system's object database.

### *Procedure*

1. Log onto the system as superuser (root).
2. Disable login on any RealPort TTY device with a login enabled on it.
3. Kill any processes open on any RealPort TTY or lp device.
4. Determine the Digi device sa device(s). At the command prompt, enter:

```
smit devices
```

and choose Digi Ethernet-based Serial Device.

5. Use the rmdev command to remove all the RealPort sa TTY, and lp devices.

```
rmdev -l [sa device] -R -d
```

**Note:** The -R option, when used to remove an sa device, will delete the sa device specified and all the TTY and lp devices assigned to it. This is useful if there are many RealPort devices to remove from the system. If you wish to remove individual TTY and lp devices with the rmdev command, the -R option should not be used.

6. Enter the command:

```
smit install_remove
```

A dialog panel appears.

7. Alter the field SOFTWARE name to:

```
digiasync.ncxa.obj
```

8. Alter the field PREVIEW only to:

```
no
```

9. Choose OK.

This prompt appears: Are You Sure?

10. Choose OK.

The uninstallation should proceed to a successful conclusion.

## Start the RealPort Daemon

1. From the root prompt, enable all devices to available state:

```
# cfgmgr
```

2. Enable one Digi unit to available state or all devices from smit:

```
# mkdev -l sa# -R
```

OR

```
# smit devices
```

3. Select the first menu item: "Install/Configure Devices Added After IPL", press enter on the following screen with the "None" option selected (default).

## Creating and Configuring TTYs

Use this procedure to create and configure TTY devices in AIX. The procedure for creating and configuring TTY devices for Digi serial ports is similar to the procedure used to create standard AIX TTY devices. For complete information, refer to your AIX documentation.

**Note:** The Digi device must be added (see "Adding a Digi Device Using smit" on page 116) either in the "Defined" or "Available" state before attempting to configure TTYs attached to that device.

### *Procedure*

Repeat this procedure for each TTY device.

1. Log onto the system as super-user (root).

2. Enter this command: `smit mktty`

The Add a TTY menu appears.

3. Choose Add a TTY.

A list of TTY types appears.

4. From the list, choose `tty rs232 Asynchronous Terminal`.

A list of sa devices appears.

5. Choose the item that identifies the Digi device. It will be similar to:  
`sa3 Available Digi PortServer II 16`.

A dialog panel appears with fields to configure the port.

6. Configure the fields as necessary. The only required entry is the PORT number field.

7. If the Data Carrier Detect signal is not wired between the port and the peripheral device attached to it, set Force Carrier to enable.

8. Choose Enter to complete the TTY addition. The name of the TTY that was created will be displayed when smit command processing has completed.

## Adding a Digi Device Using smit

Use this procedure to add a Digi device to an AIX system using smit.

### *Procedure*

1. Log onto the console as super-user (root).

2. Enter the following command:

```
smit devices
```

3. Choose Digi Ethernet-based Serial Products > Add Digi Ethernet-based Serial Products.

4. Choose the appropriate Digi device type to be added.

5. Enter the Digi device's IP address in the IP Address field.

An sa device will be created for the Digi device.

6. Initialize the new devices. From the Devices menu, select Install > Configure Devices Added After IPL.

7. Verify that the sa device is available by entering this command at a root prompt:

```
lsdev -Cc nts
```

**Note:** The first character of the above command is the letter, l (ell), and not the numeral, 1 (one).

Following is an example of the output of this command:

```
sa7 Available Digi PortServer 1
```

An error message may display if the Digi device has not been successfully added.

## Configuring a Digi Device with smit

Use this procedure to configure or reconfigure a Digi device. The AIX RealPort software should be installed before using this procedure.

### *Procedure*

1. Enter the following command at a root prompt on the AIX console:

```
smit devices
```

2. Choose Digi device.
3. Configure the Digi device as necessary. Follow the smit prompts.
4. Change / Show Characteristics of the Digi device. Below is an example of configuration information.

```
Digi PortServer sa7 +
Type cts_16 +
Description Digi PortServer 16 +
IP Address [ip address]
STATUS of Device at Config Time up +
Server Port Number [771]
WAN Link Speed [ ]
```

## Setting TTY Device Options with stty-ncxa and chdev

With the stty-ncxa command, display attributes such as flow control settings, speed and transparent print settings can be configured for your Digi TTY devices. The stty-ncxa program is placed into the directory /usr/sbin/tty [ /usr/sbin/tty/stty-ncxa] when RealPort is installed. This directory is not commonly set as a PATH variable. This means that the entire path has to be entered when using the command, or the directory has to be added to the PATH variable so the command can be entered without the path.

For information about stty-ncxa, see "Setting TTY Options" on page 122.

**Note:** Many of the same attributes that can be configured with stty-ncxa can be configured with smit. See "Configuring a Digi Device with smit" on page 117.

The stty-ncxa command configures device attributes until the system is rebooted. Use a chdev command to **permanently** set device attributes.

```
chdev -l [tty#/lp#] -a [attribute]=[value]
```

where:

[tty#/lp#]	is the name of the device to change.
[attribute]	is the attribute or option to set. This can be any stty-ncxa option. 'Term' is such an option.  <b>Note:</b> The "ditty/stty-ncxa" "term" value does NOT correlate in any way with the environmental variable called TERM. (SMIT and "chdev" are both modifying the environmental variable TERM, and not the ditty "term" value). They are 2 distinct and different values.
[value]	is the value assigned to the attribute.

## Configuring a TTY Device for a Terminal

Use this procedure to configure a RealPort device for a terminal. See your operating system documentation for more information on configuring a serial device for a terminal.

### *Procedure*

1. Connect a proper cable between the port and terminal. See the appropriate cable guide (listed in the table of contents) for more information.
2. At an AIX root prompt, enter this command:

```
smit tty
```

3. Choose Change/Show Characteristics of a TTY.
4. Select a TTY device. Here's an example of a listed device:

```
tty7 Available 00-00-04-02 Asynchronous Terminal
```

In this example, the first 00 is the bus number. This is unused and will always be 00. The second 00 is the slot number. This is unused and will always be 00. The number 04 is the sa device number. The number 02 is the port number.

5. Set Enable LOGIN to enable.
6. Set BAUD rate to match the terminal's baud rate.
7. Set PARITY, BITS per character, and Number of STOP BITS to match the terminal's settings.
8. Set TERMINAL type to match the type of terminal on the port. This is important if you will be using transparent printing on the auxiliary port of the terminal.
9. Set FLOW CONTROL to match the flow control used by the terminal
10. If DCD is not physically wired high in your cable, set Force Carrier to enable.

## Configuring a TTY Device for a Printer

The Digi device and RealPort should be properly installed, configured and

functioning before proceeding. This procedure assumes that a tty has been created for the printer. See "Creating and Configuring TTYs" on page 116.

*Procedure*

1. Connect a proper cable between the port and printer. See the appropriate Cable Guide in the online table of contents.
2. At the server, enter this command at a root prompt:  

```
smit printer
```
3. Choose Printer/Plotter Device > Add a Printer/Plotter > osp Other serial printer > rs232.
4. Choose an sa device.
5. Enter a port number in the PORT number field.
6. Set BAUD rate, PARITY, BITS per character, and number of STOP BITS to match the settings of the printer.
7. Set FLOW CONTROL to be used to match the flow control used by the printer.
8. If the Data Carrier Detect signal is not wired between the port and the peripheral device attached to it, set Force Carrier to enable.
9. Choose Enter to complete the TTY addition.

## Configuring a TTY Device for a Modem

Use this procedure to configure a RealPort device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding. This procedure assumes that a tty has been created for the modem. See "Creating and Configuring TTYs" on page 116.

*Procedure*

1. Turn the modem on.
2. Access a root prompt on the AIX system.
3. Add an entry for the device in the file /usr/lib/uucp/Devices. The following example allows a connection of 9600 baud to the device:

```
Direct tty3 - 9600 direct
```

4. Use the following command to connect to the modem:

```
cu -ml ttyX
```

In this command, ttyX is the device name for the port.

The modem should respond with an AT prompt.

5. Train the modem to the port speed by entering this command at the AT prompt:

```
at&w
```

6. Terminate the connection by entering:

~ . (a tilde followed by a period)

and choosing Enter at the AT prompt.

7. At an AIX root prompt, enter this command:

```
smit tty
```

8. Choose Change/Show Characteristics of a TTY.

9. Choose a TTY device. This is an example of a listed device:

```
tty7 Available 00-00-04-02 Asynchronous Terminal
```

In this example, the first 00 is the bus number. This is unused and will always be 00. The second 00 is the slot number. This is unused and will always be 00. The number 04 is the sa device number. The number 02 is the port number.

10. Set Enable LOGIN to share.

11. Set BAUD rate to the modem's highest configurable baud rate.

12. Set PARITY, BITS per character, and number of STOP BITS to match the settings of the modem.

13. Set FLOW CONTROL to be used to match the flow control used by the modem.

## Transparent Printer Setup

### About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.

### Configuring Transparent Printers

This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

#### *Procedure*

At the command prompt, enter:

```
/usr/sbin/tty/stty-ncxa -n ttyname [options]
```

where ttyname is the name of the terminal device and options are selected



from the list below..

- maxcps *n*** Limits the maximum printer port character-per-second data rate. *n* should be set to the minimum character rate the printer can sustain in typical use.
- maxchar *n*** Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.
- bufsize *n*** This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.
- onstr "*s*"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
For example, the sequence "`<Esc>[5i`" would be entered as: `"\033[5i"`.
- offstr "*s*"** Defines the terminal escape sequence to stop directing data to the printer.  
*s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character *xxx* may be given as `\xxx`.  
For example, the sequence "`<Esc>[4i`" would be entered as: `"\033[4i"`.
- term *t*** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: adm31, ansi, dg200, dg210, hz1500, mc5, vt100, vt220, vt320, vt420, wang2x36, wyse30, wyse50, wyse60 or wyse75.  
If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the mc5/mc4 attributes found there.

### Configuring Transparent Printers: Examples

Use the `stty-ncxa` program to set up your terminal for transparent printing.

#### *Example 1:*

The following command configures the transparent print options for a DEC VT100 terminal connected to `/dev/tty1` (note that the printer will be called `/dev/lp1`). `maxcps`, `maxchar` and `bufsize` are left to defaults. Enter:

```
/usr/sbin/tty/stty-ncxa term vt100 /dev/tty1
```

**Note:** The "ditty/stty-ncxa" "term" value does NOT correlate in any way with the

environmental variable called TERM. (SMIT and "chdev" are both modifying the environmental variable TERM, and not the ditty "term" value). They are 2 distinct and different values

**Example 2:**

The following example uses onstr and offstr arguments (this sets the terminal to use the ANSI Standard). Again maxcps, maxchar, and bufsize are defaults. Enter (on a single command line):

```
/usr/sbin/tty/stty-ncxa onstr \033[5i offstr \033[4i /dev/tty1
```

**Example 3:**

This example command sets the transparent print option for a WYSE30 terminal, with a maxcps of 75, a maxchar of 100, and a printer buffer size, bufsize, of 1000. Enter (on a single command line):

```
/usr/sbin/tty/stty-ncxa term wyse30 maxcps 75 maxchar 100 bufsize  
1000 /dev/tty1
```

## Setting TTY Options

RealPort UNIX device driver packages include a command, stty-ncxa, which is a superset of stty, and may be used to set and display the device options for Digi RealPort devices.

The general command format is:

```
/usr/sbin/tty/stty-ncxa [-a] [-n ttyname] [option(s)] [ttyname]
```

With no options, stty-ncxa displays all Digi special driver settings, modem signals, and all standard parameters displayed by stty(1) for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to stty(1) for interpretation.

stty-ncxa commands may be executed from the command line, or placed in a startup script to be run whenever the system is booted.

The options are:

- |                      |   |
|----------------------|---|
| -a                   | Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by stty -a.  |
| -n<br><i>ttyname</i> | Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.  |
| <i>ttyname</i>       | Set and display options for the specified TTY device. Replace <i>ttyname</i> with the TTY pathname (such as /dev/ttya01s, /dev/term/a01 or /dev/dty/a001s, depending on your operating system). This option may be used on a modem control line when no carrier is present. |

The following options specify transient actions to be performed immediately:

- |       |   |
|-------|---|
| break | Send a 250 MS break signal out on the TTY line. |
|-------|---|

flush	Immediately flush (discard) TTY input and output.
flushin	Flush TTY input only.
flushout	Flush TTY output only.

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will use the default values the next time it is opened.

stopout	Stop output exactly as if an XOFF character were received.
startout	Restart stopped output exactly as if an XON character were received.
stopin	Activate flow control to stop input.
startin	Release flow control to resume stopped input.
[-]dtr	Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
[-]rts	Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

[-]fastbaud	Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See "fastbaud Data Rate Mapping" on page 125.
[-]rtspace	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
[-]ctspace	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
[-]dsrpace	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
[-]dcdpace	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
[-]dtrpace	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
[-]forcedcd	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.

<code>startc c</code>	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
<code>stopc c</code>	Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astartc c</code>	Sets auxiliary XON flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astopc c</code>	Sets auxiliary XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>[-]aixon</code>	Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.
<code>maxcps n</code>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.
<code>maxchar n</code>	Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
<code>bufsize n</code>	Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the <code>maxcps</code> rate selected above. Default is 100 characters.

- onstr "s"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.
- s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.
- For example, the sequence <Esc>[5i would be entered as: "\033[5i".
- offstr "s"** Defines the terminal escape sequence to stop directing data to the printer.
- s is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.
- For example, the sequence <Esc>[5i would be entered as: "\033[5i".
- term t** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.

### fastbaud Data Rate Mapping

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

### Troubleshooting RealPort in AIX:

**If none of the ports work -**

**Verify AIX RealPort sa Device is Pointing to the Correct Unit:**

From AIX, type:

```
smit dev → Digi Ethernet Devices → Change show → sa##
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (ping nodename)

#### **Check the Status of the RealPort Daemon:**

From AIX, type:

```
ps -ef | grep ncxd
```

Note the time that the daemon started. Check again several minutes later. If the time has changed then the daemon attempted to connect to the PORTSERVER, failed and tried again.

To restart the daemon type:

```
kill -9 [PID_of_ncxd_process]
```

The daemon will respawn from the inittab entry. Any tty and lp devices should become available. The print queue or login process may need to be restarted.

#### **If some of the ports do not work -**

##### **Check for carrier detect:**

All tty and lp devices in AIX require DCD in order to respond. If DCD is not asserted check to see if the device plugged into the port is powered on and online. Check the serial signals by typing “display port range=[port\_number]” from the Device root prompt.

If an 8 pin RJ45 cable is being used and DSR is asserted but not DCD, use the following command:

```
#> set flow altpin=on ra=[port_number]
```

If DCD is not wired on the cable (using less than 8 wires) then force carrier must be enabled. This can be set in

```
#> set flow forcedcd=on range=[port_number]
```

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the AIX root prompt can clear the port:

```
# /usr/sbin/tty/stty-ncxa startin startout flush tty#
```

If this command does not work, a reboot of the AIX server may be required to clear the port from an overflow condition.

##### **Kill any active processes:**

To kill any active processes which may be stuck on the AIX host, please issue the following commands from the AIX root prompt:

```
# fuser -k /dev/tty#
```

Where tty# represents the actual tty id.



## Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- Check the release notes for HP-UX RealPort driver support versions.
- Encrypted RealPort is a security measure to maintain data integrity. In other words, prevent unauthorized changes in data including intentional destruction or alteration, tampering, duplication, or accidental loss. Encrypted RealPort also prevents disclosure to unauthorized individuals or processes. If your data is sensitive, Encrypted RealPort is strongly recommended.
- Once the RealPort driver is installed, HP-UX manual pages are available for:

Item	Function
ditty	Sets and displays RealPort device TTY options
drpadmin	The Digi RealPort configuration utility
drpd	The Digi RealPort network driver
drp	The Digi RealPort driver

## Information to Gather

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

## Configuring the Digi Device for RealPort

Use this procedure to configure the Digi device for use with Digi RealPort drivers.

**Note:** See the appropriate Command Reference or Configuration and Administration Guide for information on how to perform the steps below.

### *Procedure*

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.



4. For all ports that will be using RealPort, set the device type to rp. The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```

## Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite device for use with Digi RealPort drivers.

### *Procedure*

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

## Assigning an IP Address

EtherLite IP addresses may be set by either of two methods:

- dgipserv, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

## Using dgipserv to Assign an IP Address

The dgipserv utility is used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on dgipserv consult the man pages.

### *Procedure*

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device. An example of this command is:

- dgipserv -store 10:e0:f7:15:20:8g 192.168.2.2

## Master Setup Process

Use this process to install and configure the HP-UX RealPort driver.

1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See "Information to Gather" on page 128.
3. Install the RealPort driver. See "Installing the Driver (Including Encrypted RealPort): CD" on page 130 or "Installing a Driver: Download" on page 130.
4. Configure the Digi device for RealPort. See "Configuring a Digi One RealPort, Digi One IA RealPort or PortServer for RealPort" on page 2, or "Configuring EtherLite for RealPort" on page 3.

5. Create RealPort devices. See "Adding a Digi Device with drpadmin" on page 131.
6. Configure the TTY Devices as necessary. See the TTY configuration topics beginning on page 134.

## Installing the Driver (Including Encrypted RealPort): CD

When installing from CD, the install commands may have been scripted for you. Using the CD front-end program, navigate to the RealPort installation and click install; A terminal window will be launched where you can view install messages and respond to prompts. You may also choose to install the driver manually from CD -- copy the driver files from the CD to a location on your local hard disk (like /tmp) and run the commands given below for downloaded drivers.

### *Procedure*

1. Choose an operating system.
2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.
5. Follow the prompts.

**Note:** You will be prompted with the following to install Encrypted RealPort:

Would you like this RealPort session to be encrypted?

NOTE: Not all RealPort products support encrypted RealPort sessions.

Please check your RealPort product's firmware release notes or product literature before selecting "always".

If in doubt, select "never".

(always/never) : (never): always

The following device will be configured,

0            10.1.3.68            16            aa            secure (always)

Is this correct (y to add or x to abort) ? y

6. Confirm your configuration.
7. Reboot your system if necessary.

## Installing a Driver: Download

Use this procedure to install the HP-UX RealPort device driver after downloading it.

**Note:** This is an example of an installation of RealPort on HP-UX. Your installation steps may vary depending on your version of HP-UX. Consult your HP-UX documentation for information on installing drivers.

### *Procedure*

1. Log onto the console as root.
2. Copy the driver file to /tmp either from a diskette, or by using ftp.
3. Extract the files from the compressed tar file with this command:

```
tar xvf filename.tar
```

where *filename.tar* is the name of the downloaded tar file.

4. Now register the installation package with the system by entering the following command:

```
swreg -l depot /tmp/drp.pkg
```

5. Once the component files have been copied, use the swinstall program to copy the component files to the system.

```
/usr/sbin/swinstall -s /tmp/drp.pkg
```

6. Choose the DRP line item.
7. Choose Actions > Mark for Install.
8. Choose Actions > Install (analysis)...

The Install Analysis window appears.

9. Choose OK to proceed.
10. Confirm the prompts that follow.

Upon successful completion, swinstall will reboot your system.

11. Continue with the procedure "Adding a Digi Device with drpadmin" on page 131.

## Uninstalling RealPort

Use this procedure to remove a Digi device from HP-UX.

### *Procedure*

1. Delete any configured Digi devices on the HP-UX system. See "Deleting a Digi Device with drpadmin" on page 132.
2. Enter this command at a Unix root prompt:

```
swremove
```

The SD - Remove Software Selection window appears.

3. Choose DRP (Digi RealPort Driver).
4. Choose Actions > Remove (Analysis)...
5. Choose OK to continue at the Remove Analysis window.
6. Choose Yes at the Confirmation windows that appear.
7. Choose Done at the Remove window.
8. Confirm the prompt to reboot the system when it appears. If it does not appear, the system should be rebooted manually.
9. After the system reboots, remove any remaining driver files by entering the command:

```
rm -r /tmp/drp.pkg
```

## Adding a Digi Device with drpadmin

Use this procedure to create RealPort devices and start the RealPort daemons.

#### *Procedure*

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Answer the prompts as appropriate.

When Prompted to:	Action:
Select an option	Choose add.
Enter the node name or IP address for this Digi device	If an IP address is used, make sure it is unique and does not conflict with any other network device.  If a name is entered, the name must be registered in /etc/hosts or with an accessible nameserver.
Enter the number of ports on the Digi device	Enter the number of ports for this Digi device. The installation will prompt to confirm this number.  <b>Note:</b> If PORTS/Xem (EBI) modules will be attached to a PortServer II module, include these ports.
Enter TTY device ID letter(s)	Enter one or two letters. These letters will be used to create the RealPort device names.
Enter WAN speed if the connection between the Digi device and HP-UX system includes a WAN link slower than 1 MB	Enter the WAN speed if this is the case. Otherwise, choose Enter to continue.
Confirm the configuration	Enter y to proceed or n to reenter the information.
Select an option	Enter a to add another Digi device. Enter s to show configured Digi devices. Enter q to exit drpadmin.

### Deleting a Digi Device with drpadmin

Use this procedure to delete a Digi device.

#### *Procedure*

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Enter s to show all installed Digi devices.
3. Note the number of the Digi devices to delete.
4. Choose Enter to make the options prompt reappear.
5. Enter d (delete).
6. Enter the Digi device number to delete.
7. Enter y to confirm the deletion.

## RealPort Devices

The RealPort installation creates three different devices for each port in the /dev directory.

- Standard device
- Modem device
- Transparent print device

### Device Name Format

The devices are named according to the following conventions:

aa-zz	The Digi device letter ID.
01-64	The port number on the individual Digi device.

Following are examples of the devices for the first port of a PortServer with the identification letters "aa":

Device	Path Name Example
Standard Device	/dev/cuaa01
Modem Device	/dev/ttyaa01
Standard Transparent Print Device	/dev/praa01

### Standard Device

**Example:** /dev/cuaa01

A standard Digi device begins with the prefix "cu". The default handshake method is XON/XOFF. Data Carrier Detect (DCD) need not be present to open the device.

Once a connection is established and DCD becomes active, standard devices behave in the same way as modem devices. Subsequent loss of the Data Carrier Detect signal will cause active processes on the port to be killed and the user will be automatically logged off.

### Modem Device

**Example:** /dev/ttyaa01

Digi modem devices begin with the prefix "tty". They are sometimes referred to as "dial-in" devices.

Modem devices are traditional UNIX ports with modem control. They require Data Carrier Detect to be high before they will operate. RTS/CTS handshaking is enabled by default. When used with a modem, the ports will wait for DCD before sending out the login prompt

When used with a terminal or other device, it is usually wise to wire the Digi DCD signal to the terminal's Data Terminal Ready (DTR) line. When the terminal is turned on, the system outputs a login prompt. When the terminal is turned off, any associated jobs are killed, and the user is logged out.

## Transparent Print Device

**Example:** /dev/praa01

The transparent print device can be used with auxiliary printer ports on terminals. Output directed to a "pr" device goes out the auxiliary port of a terminal while you continue to use the terminal normally.

## Configuring a Device for a Terminal

Use this procedure to configure a RealPort device for a terminal. See your operating system documentation for more information on configuring a serial device for a terminal.

### *Procedure*

1. In HP-UX, TTY devices require the carrier detect high. This must either be tied high within the cable or it can be forced high in the driver by entering a ditty command, like the following example, for the port in a startup file:

```
ditty forcedcd ttya12
```

2. Connect a proper cable between the port and terminal.
3. Enable the port by editing the /etc/inittab file. Locate the proper RealPort device to enable and change the word off to respawn. This line shows an example of a inittab entry for the first port of a PortServer with a designation letter of "a".

```
Xx01:23:off:/etc/getty ttya12 H
```

4. Change the letter or number at the end of the entry as needed. The last number or letter (H in the previous example) is an entry in the /etc/gettydefs file. This sets the speed, data bits, stop bit(s) and parity for the port. Consult your operating system documentation for more information on /etc/gettydefs.
5. Enter the following command at a root prompt:

```
init q
```

## Configuring a Device for a Printer

Use this procedure to configure a RealPort device for a printer. See your operating system documentation for more information on configuring a serial device for a printer.

### *Procedure*

1. In HP-UX, TTY devices require Data Carrier Detect to be high. This must either be tied high within the cable, or it can be forced high in the driver by entering this ditty command for the port in a startup file:

```
ditty forcedcd ttya12
```

The device, ttya01, is used as an example in this command.

2. Connect a proper cable between the port and printer.

## Configuring a Device for a Modem

Use this procedure to configure a RealPort device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity

with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

*Procedure*

1. Connect a proper cable between the port and modem.
2. On the HP-UX server, use vi to enable the new modem entries in the /etc/inittab file for dial-in. Here are examples of two entries for Digi RealPort ports:

```
Xx01:23:off:/etc/getty ttya12 H
Xx02:23:off:/etc/getty ttyb02 H
```

3. Change the word off to respawn for each port you want enabled. For example:

```
Xx01:23:respawn:/etc/getty ttya12 H
Xx02:23:respawn:/etc/getty ttyb02 H
```

**Note:** The numbers associated with each "tty" represent port number (ttya01 is Port 1, ttya08 is Port 8).

The last number or letter (H in the previous example) is an index into the /etc/gettydefs file, which may be set to any of the allowable baud rates (check your operating system's manual.). In this case, H specifies 9600 baud, 8 data bits, 1 stop bit, and no parity.

4. Enter the following command at a root prompt:

```
init q
```

5. Modify the file /usr/lib/uucp/Devices. Add an entry for the device at the end of the file like this:

```
Direct cua12 - 38400 direct
```

6. Comment out any ACU lines relating to this device until dialin is working properly.

**Note:** An ACU line is necessary for correct operation of the modem in dialout applications. Refer to your modem manual or to the modem manufacturer for the correct initialization string to use for your modem. Refer to your operating system documentation for guidance on setting up an appropriate ACU entry that uses this initialization string.

7. Connect to the modem by entering this command at a root prompt:

```
cu -l /dev/cua12 -s 38400
at&w [train modem to port speed]
```

**Note:** In HP-UX, the TTY device name is for dial-in, the cu name is for dial-out.

8. To exit cu, enter:

```
~. (a tilde followed by a period)
```

## Setting TTY Options

RealPort UNIX device driver packages include a command, ditty, which is a superset of stty, and may be used to set and display the device options for

Digi RealPort devices.

The general command format is:

`ditty [-a] [-n ttyname] [option(s)] [ttyname]`

With no options, `ditty` displays all Digi special driver settings, modem signals, and all standard parameters displayed by `stty(1)` for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to `stty(1)` for interpretation.

`ditty` commands may be executed from the command line, or placed in a startup script to be run whenever the system is booted.

The options are:

- |  |  |
|--|--|
| <code>-a</code>                                | Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by <code>stty -a</code> .   |
| <code>-n</code><br><code><i>ttyname</i></code> | Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.   |
| <code><i>ttyname</i></code>                    | Set and display options for the specified TTY device. Replace <i>ttyname</i> with the TTY pathname (such as <code>/dev/ttya01s</code> , <code>/dev/term/a01</code> or <code>/dev/dty/a001s</code> , depending on your operating system). This option may be used on a modem control line when no carrier is present. |

The following options specify transient actions to be performed immediately:

- |                       |   |
|-----------------------|---|
| <code>break</code>    | Send a 250 MS break signal out on the TTY line.   |
| <code>flush</code>    | Immediately flush (discard) TTY input and output. |
| <code>flushin</code>  | Flush TTY input only.                             |
| <code>flushout</code> | Flush TTY output only.                            |

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will



use the default values the next time it is opened.

stopout	Stop output exactly as if an XOFF character were received.
startout	Restart stopped output exactly as if an XON character were received.
stopin	Activate flow control to stop input.
startin	Release flow control to resume stopped input.
[-]dtr	Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
[-]rts	Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

[-]fastbaud	Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See "fastbaud Data Rate Mapping" on page 139.
[-]rtspace	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
[-]ctspace	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
[-]dsrpace	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
[-]dcdpace	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
[-]dtrpace	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
[-]forcedcd	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.
startc c	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
stopc c	Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see startc, above, for format of octal and hexadecimal numbers).

<code>astartc c</code>	Sets auxiliary XON flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>astopc c</code>	Sets auxiliary XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see <code>startc</code> , above, for format of octal and hexadecimal numbers).
<code>[-]aixon</code>	Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.
<code>maxcps n</code>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.
<code>maxchar n</code>	Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
<code>bufsize n</code>	Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the <code>maxcps</code> rate selected above. Default is 100 characters.
<code>onstr "s"</code>	<p>Defines the terminal escape sequence to direct subsequent data to the transparent printer.</p> <p><i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code>.</p> <p>For example, the sequence <code>&lt;Esc&gt;[5i</code> would be entered as: <code>"\033[5i"</code>.</p>
<code>offstr "s"</code>	<p>Defines the terminal escape sequence to stop directing data to the printer.</p> <p><i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code>.</p> <p>For example, the sequence <code>&lt;Esc&gt;[5i</code> would be entered as: <code>"\033[5i"</code>.</p>

term *t* Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.

### fastbaud Data Rate Mapping

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

### Troubleshooting RealPort in HP-UX:

**If none of the ports work -**

**Check the Status of the RealPort Daemon:**

From the HP-UX root prompt, type:

```
ps -ef | grep drpd
```

You should see an entry for each Digi device similar to the following, please verify the respective IP address.

```
root 2254 1 0 Dec 13 ? 0:03/sbin/drpd 1 199.86.5.1
```

There are entries for IP address and node name. Use only one or the other, not both. Make sure that it is the correct IP address or node name for the particular unit. If using the node name, make sure that the host can ping or telnet to that node name. (**ping nodename**)

To restart the daemon type the following from the UNIX root prompt:

```
/sbin/init.d/drpd.start
```

**If some of the ports do not work:**

**Check for carrier detect:**

All blocking/modem control devices in HP-UX require DCD in order to respond. If DCD is not asserted check to see if the device plugged into the

port is powered on and online. Check the serial signals by typing “display port range=[port\_number]” from the Device root prompt. For a graphical utility to display port signals, please download and install DPA Remote:

<http://ftp.digi.com/support/utilities/ts/>

If an 8 pin RJ45 cable is being used and DSR is asserted but not DCD, use the following command:

```
set flow altpin=on ra=[port_number]
```

If DCD is not wired on the cable (using less than 8 wires) then force carrier must be enabled. This can be set in

```
set flow forcedcd=on range=[port_number]
```

If the OFC or IFC signals are solid, this would indicate either an output buffer overflow (OFC) or an input buffer overflow (IFC). Sometimes, issuing the following command from the HP-UX root prompt can clear the port:

```
ditty startin startout flush ttyx##
```

If this command does not work, a reboot of the HP-UX server may be required to clear the port from an overflow condition.

**Kill any active processes:**

To kill any active processes which may be stuck on the HP-UX host, please issue the following commands from the root prompt:

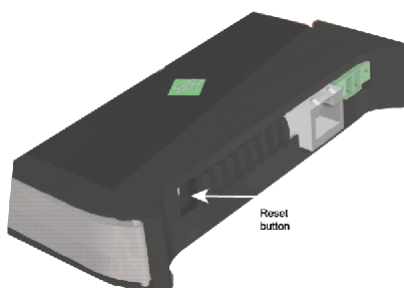
```
fuser -k /dev/ttyx##
```

Where ttyx### represents the actual tty id.



**Digi Network Device Does Not Power On:**

Reset the Digi device back to factory defaults and try again. All of the devices have a reset button. You will need to power cycle the Digi device while holding in the reset button. Continue holding in the reset button for about 60 seconds and then release. The device should now be set back to Factory Defaults. Since it generally takes a few minutes for the unit to reset, you may want to wait before attempting access to the Digi device. If there is any LED activity, check to see if it is flashing a code sequence shown in the table below.



Digi One IA Reset button

PortServer TS 8 Reset Button  
(Hold button down until LEDs flash 5-1-1 pattern)**Power and LED activity:**

Always check the power first. Use the following chart to interpret the LEDs:

LED Activity	Indication
1-1-1	Starting the EOS
9-1-1	Corrupt EOS
1-5-1	Configuration has been returned to the factory default settings
Steady Blinking	Seeking an IP Address from DHCP Server
Solid	Boot Completed Successfully

**Network Communication Verification:**

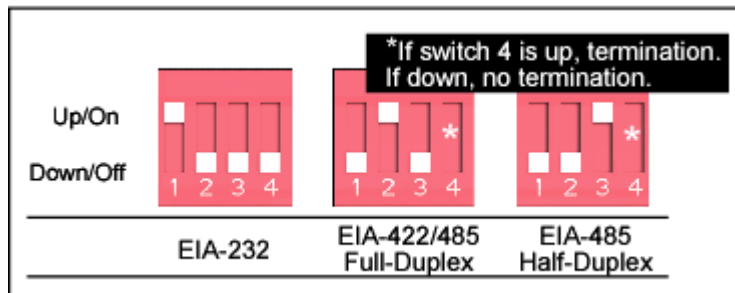
If you are unable to communicate with the Digi unit over the network, try the following:

1. Make sure you are not behind a firewall or running any third party firewall software on your PC.
2. Make sure Internet Connection Firewall is not enabled in Windows XP/2003. Make sure Internet Explorer isn't using proxy server and this has been disabled.
3. Ping the IP address:

```
ping ###.###.###.###
```

Where **###.###.###.###** represents the actual IP address assigned to the unit.

If you do not receive ping responses, please confirm the network settings on the unit match up with your network environment by logging in directly to one of the serial ports. This can be done by connecting a PC (with terminal emulation software such as Hyperterminal), or by attaching a dumb terminal. A crossover (null modem) cable will be necessary. Set the dip switches to EIA-232 communication for the port you will login to: 1-up; 2, 3, & 4-down.



Configure your terminal or emulation software for the following communication settings:

- VT-100 emulation
- 9600 baud
- 8-bit characters
- 1 stop bit
- No parity

You may need to press [Enter] to see the login prompt. Login as root and issue the **"set config"** command to view current network settings. If you are applying a static IP address, make sure dhcp is set to off. Apply any other network settings needed in your environment such as, domain, gateway and nameserver information. A reboot may be required. After these settings are confirmed, try to ping from the Digi device root prompt (#>) to another network node and vice versa to see if the unit is now communicating on the network.

Note: Also verify the Ethernet cable is plugged in securely and is pinned appropriately.

The Link (LI) LED on the Digi device will indicate if the network is being detected.

4. If the unit responds to pings, next try to telnet to the unit:

```
telnet ###.###.###.###
```

You should see the login prompt from the unit. If not, power off the Digi unit and try the ping command again. This will rule out a possible duplicate IP address being assigned to the unit.

Note: Make sure in Windows Operating Systems that Internet Sharing Services is not turned on or you will be able to ping the unit, but not have telnet access to the Digi device.

## Serial Port Problems

**Make sure that the PORTSERVER is configured correctly:**

Review the port settings:

```
#> set port ra=*
```

Any port that is going to have a RealPort device attached, should have:

**dev** - Needs to be set to rp or prn.

**auto** – Needs to be set to off

Note: You can use the Web Interface to verify the device type as well.

```
#> set flow ra=*
```

Any port that is going to have a RealPort device attached, should have all signals off except ixon and ixoff (which can be on or off) and altpin (which should be off for a 10 wire cable and on for anything else).

Note: You can use the Web Interface to verify the port setting as well.

```
#> set auth
```

Will show settings like the following:

Ind	IPaddr	Mask	RealPort	Login	Unrestricted
1	0.0.0.0	0.0.0.0	oooo-ooo	-----	oooooooo
			o-oooooo	-----	oooooooo

Realport should show "o" for all RealPort ports. The ports are indicated across in groups of eight -- In the example above, all ports are set correctly in the RealPort column except ports 5 and 10 (which are possibly being used for non-RealPort connections as indicated by the "-" in position 5 and 10).

Note: This can only be verified in the command line.

**Check for stuck processes:**

At the root command prompt type:

```
#> who
```

If a process (RealPort or otherwise) is running on the port, type:

```
#> kill tty=[port_number]
```

If this does not work, unplug the serial device and reboot the Digi device.

Check the LEDs on the port to see if OFC is on this can be monitored using our DPA Remote software available for download from:

<http://ftp.digi.com/support/utilities/ts/>.

If so, try typing control-Q from a terminal (or PC running terminal emulation software) attached to the port. Otherwise the port will need to be flushed



from the operating system level.

**Make sure that the RealPort host can reach the Digi Device:**

Once the who command (see above) shows no processes on the port, from the UNIX RealPort host root prompt, type:

```
telnet [IP_of_digi_unit] 771
```

From a Windows PC go to Start > Run and enter the above command.

If the host cannot telnet to the 771 socket then RealPort won't connect to it. This would indicate that the IP address or the RealPort (771) socket is in use, being blocked or fire walled. If the connection succeeds, you can disconnect using **<Ctrl> ] <Enter>**, followed by typing **quit** at the telnet prompt.

If you are unable to communicate with the individual ports on the Digi device, first confirm the port dip switches are configured to match your peripheral devices communication protocol for RS-232 (1-up; 2, 3, & 4-down), RS-485 or RS-422.

**Conducting a Loopback Test (All UNIX and Microsoft Windows Operating Systems):**

1. Plug the RJ-45 loopback plug into the serial port to be tested.
2. From the command prompt (or Start > Run in Windows), telnet to the IP address of the Digi device using the following command from your UNIX prompt:

```
telnet ###.###.###.###
```

Replacing **###.###.###.###** with the actual IP address of the unit.

3. Login as root (default password of dbps).

From the Digi device root prompt:

```
#> set line baud=(baud_rate) range=(port_number)
```

```
#> set port dev=prn auto=off range=(port_number)
```

To configure testing at 9600 baud:

```
#> set line baud=9600 range=(port_number)
```

4. Kill any residual processes on the port:

```
#> kill tty=(port_number)
```

5. Connect directly to the port:

```
#> connect (port_number)
```

You will connect directly to the port and see any incoming data from any device attached to the port. By inserting the loopback plug shipped with the Digi product into the appropriate port, you will be able to view any data typed on your "connect" session. Removing the loopback plug will not display data typed on the "connect" session. If the loopback test fails, please contact Digi International Technical Support at (952) 912-3456. If the loopback test worked, you have successfully tested the integrity of the port.

6. Close the connect session:

```
<Ctrl> [ . <Enter>
```

Type **<ctrl> [** followed by a period and the Enter key to close the connect

session.

Loopback plug pin-out information:

<http://support.digi.com/support/manuals/combo/2000-xxxx-conf-cable-loopback.html>

#### **Trouble Accessing Port:**

Verify that there are no processes currently running on the port from the Digi device root prompt:

```
#> who
```

If there appear to be process on the port, the following command will kill non-RealPort processes. If the “Connected To” field shows RealPort, this will need to be killed at the Operating System level of the RealPort server/ host (see your operating system documentation for information about killing a process).

```
#> kill tty=#
```

Note: Rebooting the unit can also clear the process.

#### **Cabling:**

If the loopback test performed in the previous sections passed, but you are unable to communicate to your device, you will need to verify:

You are using the proper cabling:

<http://support.digi.com/support/techsupport/common/cables/async/pscableindex.html>

Note: Altpin settings: When altpin is enabled, DCD becomes available on pin 1 of an 8-pin RJ-45 connector (set flow altpin=on range=(port\_number)).

