



Software Manual

**RealPort Unix Utilities
ditty and DigiPRINT**

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Introduction

Digi's RealPort™ device drivers for Unix operating systems provide features not available with standard serial ports.

This manual contains instructions for the following features:

- **ditty**, a utility, modeled on the Unix **stty** command, which sets and displays the terminal options for Digi intelligent asynchronous products. In addition to controlling the intelligent features of Digi products, **ditty** supports all of the usual **stty** options, and may be used in place of **stty** for all RealPort asynchronous devices.
- DigiPRINT™ transparent printing, which permits the user to connect a serial printer to a terminal that supports transparent (or “pass-through”) printing. With DigiPRINT, the user may work on the terminal while printing is in progress. The software automatically directs screen data to the terminal screen and printer data to the printer port.

Setting Terminal Options with **ditty**

ditty is a utility program that sets and displays the terminal options for the Digi PortServer modules.

The 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.

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**). 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 reset 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 was received.
- startout** Restart stopped output exactly as if an **xon** character was 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, so 50 baud becomes 57,600 baud, 75 baud becomes 76,800 baud and 110 baud becomes 115,200 baud.
- [-]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** Enable [disable] Persistent Open. When this option is selected, an open to a busy port will not return busy; instead it will block the open until that port is available. Note: The implementation of this flag in the RealPort Unix driver is different from its use in other Digi Unix drivers (AccelePort® C/X, Xr, etc.).

- 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).
- astartc** *c* Sets auxiliary XON 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).
- astopc** *c* Sets auxiliary 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* Sets the terminal escape sequence to turn transparent printing on. The string *s* can be composed of standard ASCII printing and non-printing characters; control (non-printing) characters must be entered by their octal values, and must consist of three digits preceded by a back-slash (“\”) character. For example, the “Escape” character <Esc>, 33 octal, should be entered as “\033”. Thus, if transparent printing is turned on by the string “<Esc>[5i” (ANSI standard), *s* should be entered as “\033[5i”.
- offstr** *s* Sets the terminal escape sequence to turn transparent printing off. See “**onstr**”, above, for the format of the string *s*.
- 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**, **pcterm**, **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.

Also see **stty**(1), **ioctl**(2), **termio**(4), and **terminfo**(5).

DigiPRINT Transparent Print Feature

Description & Theory of Operation

Most terminals have an auxiliary port that can be connected to a serial printer. These terminals support two print modes, Auxiliary and Transparent. If both print modes are OFF, data received by the terminal is simply displayed on the screen. With Auxiliary print mode ON, data received by the terminal is displayed on the screen, and is also transmitted to the printer. With Transparent Print Mode ON, the terminal transmits data received directly to the printer, without displaying it on the screen.

DigiPRINT allows you to use your terminal in a normal manner, while information is also being sent over the same serial connection from the host to the printer connected to the terminal's auxiliary printer port. This is "transparent printing." DigiPRINT determines whether packets of data are bound for the screen or for the printer, and precedes data bound for the printer with the Transparent Print Mode ON command, and follows it with the Transparent Print Mode OFF command.

Data for the terminal screen has the highest priority, and DigiPRINT sends data to the printer only if there is a break in information being sent to the screen. If continuous data is being transmitted to the terminal device, nothing gets sent to the printer.

Whenever an auxiliary printer port is used, flow control to the printer becomes an issue. If the printer falls behind and invokes flow control, output to both the printer and the terminal is stopped: this is aggravating to the terminal user. The **ditty** command provides three parameters to limit printer output and avoid this situation. See *Setting Terminal Options with ditty* on page 5 for a complete description of the **ditty** command.

The parameter **maxcps** limits the maximum printer port character-per-second data rate. This number should be set to the minimum character rate the printer can sustain in typical use.

The parameter **maxchar** 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.

The parameter **bufsize** 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.

The printer on/off strings are also set using **ditty**.

DigiPRINT will be available for use after the Digi device driver software for your operating system is installed, and the transparent print options are activated with the **ditty** program.

A cable must be connected between the auxiliary port of the terminal and the printer. The baud rate on the terminal auxiliary port and the printer must be the same, and the printer and the auxiliary port of the terminal must use the same handshaking mode. The auxiliary port must also be enabled. If your terminal is not one of those directly supported, you must know the escape sequence of your terminal.

Refer to your terminal and printer manuals for connection information, escape codes, and to see what handshaking modes are supported (XON/XOFF, busy/ready, RTS/CTS, etc.).

Transparent Print Activation

DigiPRINT is activated with **ditty**. The **ditty** program configures the Digi tty device driver for transparent print options. See *Setting Terminal Options with ditty* for a complete description of the **ditty** command. The **ditty** command must be run each time the machine is booted. Usually, the best way to do this is by adding **ditty** commands to your system initialization file:

- **SCO OpenServer, SCO Unix:** `/etc/rc.d/8/userdef`
- **SVR4, MP-RAS, SCO UnixWare, Solaris:** `/etc/rc2.d/s99filename`
(*filename* is a name of your choice, but must be preceded by **s99**)

To set DigiPRINT transparent print options, use **ditty** as follows:

```
ditty [option(s)] port
```

The command line options are:

maxcps <i>n</i>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. See <i>Setting Terminal Options with ditty</i> (page 5) for more information.
maxchar <i>n</i>	Sets the maximum number of transparent print characters the driver will place in the output queue. See <i>Setting Terminal Options with ditty</i> for more information.
bufsize <i>n</i>	Sets the driver's estimate of the size of the transparent printer's input buffer. See <i>Setting Terminal Options with ditty</i> for more information.
onstr <i>s</i>	Sets the terminal escape sequence to turn the transparent printer on. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code> .
offstr <i>s</i>	Sets the terminal escape sequence to turn the transparent printer off. An arbitrary octal character <i>xxx</i> may be given as <code>\xxx</code> .
term <i>t</i>	Specifies the terminal type. See <i>Setting Terminal Options with ditty</i> for more information.
port	Specifies the tty device.

Once the above options have been set, data can be sent to your printer via the printer devices.

Examples:

```
cat filename > /dev/dpr/a001s (Solaris)
cat filename > /dev/pr01s (SCO UnixWare, SVR4, MP-RAS)
cat filename > /dev/pr01 (SCO Unix, SCO Open Server)
```

ditty Examples

Example 1:

The following command configures the DigiPRINT options for a DEC VT100 terminal (note that in the **ditty** command, the tty device name is used, rather than the corresponding printer device name). **maxcps**, **maxchar** and **bufsize** are left to defaults. Enter:

```
ditty term vt100 /dev/term/a01s (SCO UnixWare, SVR4, MP-RAS)
ditty term vt100 /dev/ttya01 (SCO Unix, SCO Open Server)
ditty term vt100 /dev/cua/a001 (Solaris)
```

Example 2:

The following example uses **onstr** and **offstr** arguments to set the terminal to use ANSI Standard. Again **maxcps**, **maxchar**, and **bufsize** are defaults. Enter:

```
ditty onstr "\033[5i" offstr "\033[4i" /dev/term/a01s
```

(this example uses an SVR4 device name; substitute the appropriate name for your operating system)

Example 3:

This example command sets the DigiPRINT option for a WYSE30 terminal, with **maxcps** of 75, a **maxchar** of 100, and a printer buffer size, **bufsize**, of 1000. Enter:

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

(this example uses an SCO Unix device name; substitute the appropriate name for your operating system)