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## **Red Hat Enterprise Linux Release 9.2 Manual Pages on 'tty\_ioctl.4' command**

**\$ man tty\_ioctl.4**

IOCTL\_TTY(2)          Linux Programmer's Manual          IOCTL\_TTY(2)

### NAME

ioctl\_tty - ioctls for terminals and serial lines

### SYNOPSIS

```
#include <termios.h>
```

```
int ioctl(int fd, int cmd, ...);
```

### DESCRIPTION

The `ioctl(2)` call for terminals and serial ports accepts many possible command arguments. Most require a third argument, of varying type, here called `argp` or `arg`.

Use of `ioctl` makes for nonportable programs. Use the POSIX interface described in `termios(3)` whenever possible.

Get and set terminal attributes

`TCGETS`    `struct termios *argp`

Equivalent to `tcgetattr(fd, argp)`.

Get the current serial port settings.

`TCSETS`    `const struct termios *argp`

Equivalent to `tcsetattr(fd, TCSANOW, argp)`.

Set the current serial port settings.

`TCSETSW`   `const struct termios *argp`

Equivalent to `tcsetattr(fd, TCSADRAIN, argp)`.

Allow the output buffer to drain, and set the current serial port settings.

TCSETSF const struct termios \*argp

Equivalent to tcsetattr(fd, TCSAFLUSH, argp).

Allow the output buffer to drain, discard pending input, and set the current serial port settings.

The following four ioctls are just like TCGETS, TCSETS, TCSETSW, TCSETSF, except that they take a struct termio \* instead of a struct termios \*.

TCGETA struct termio \*argp

TCSETA const struct termio \*argp

TCSETAW const struct termio \*argp

TCSETAF const struct termio \*argp

#### Locking the termios structure

The termios structure of a terminal can be locked. The lock is itself a termios structure, with nonzero bits or fields indicating a locked value.

TIOCGLOCKTRMIO struct termios \*argp

Gets the locking status of the termios structure of the terminal.

TIOCSLOCKTRMIO const struct termios \*argp

Sets the locking status of the termios structure of the terminal. Only a process with the CAP\_SYS\_ADMIN capability can do this.

#### Get and set window size

Window sizes are kept in the kernel, but not used by the kernel (except in the case of virtual consoles, where the kernel will update the window size when the size of the virtual console changes, for example, by loading a new font).

The following constants and structure are defined in <sys/ioctl.h>.

TIOCGWINSZ struct winsize \*argp

Get window size.

TIOCSWINSZ const struct winsize \*argp

Set window size.

The struct used by these ioctls is defined as

```

struct winsize {
    unsigned short ws_row;
    unsigned short ws_col;
    unsigned short ws_xpixel; /* unused */
    unsigned short ws_ypixel; /* unused */
};

```

When the window size changes, a SIGWINCH signal is sent to the foreground process group.

#### Sending a break

TCSBRK int arg

Equivalent to tcsendbreak(fd, arg).

If the terminal is using asynchronous serial data transmission, and arg is zero, then send a break (a stream of zero bits) for between 0.25 and 0.5 seconds. If the terminal is not using asynchronous serial data transmission, then either a break is sent, or the function returns without doing anything. When arg is nonzero, nobody knows what will happen.

(SVr4, UnixWare, Solaris, Linux treat tcsendbreak(fd, arg) with nonzero arg like tcdrain(fd). SunOS treats arg as a multiplier, and sends a stream of bits arg times as long as done for zero arg. DG/UX and AIX treat arg (when nonzero) as a time interval measured in milliseconds. HP-UX ignores arg.)

TCSBRKP int arg

So-called "POSIX version" of TCSBRK. It treats nonzero arg as a time interval measured in deciseconds, and does nothing when the driver does not support breaks.

TIOCSBRK void

Turn break on, that is, start sending zero bits.

TIOCCBRK void

Turn break off, that is, stop sending zero bits.

#### Software flow control

TCXONC int arg

Equivalent to tcflow(fd, arg).

See `tcflow(3)` for the argument values `TCOOFF`, `TCOON`, `TCIOFF`, `TCION`.

#### Buffer count and flushing

`FIONREAD` int \*argp

Get the number of bytes in the input buffer.

`TIOCINQ` int \*argp

Same as `FIONREAD`.

`TIOCOUTQ` int \*argp

Get the number of bytes in the output buffer.

`TCFLSH` int arg

Equivalent to `tcflush(fd, arg)`.

See `tcflush(3)` for the argument values `TCIFLUSH`, `TCOFLUSH`, `TCIOFLUSH`.

#### Faking input

`TIOCSTI` const char \*argp

Insert the given byte in the input queue.

#### Redirecting console output

`TIOCCONS` void

Redirect output that would have gone to `/dev/console` or `/dev/tty0` to the given terminal. If that was a pseudoterminal master, send it to the slave. In Linux before version 2.6.10, anybody can do this as long as the output was not redirected yet; since version 2.6.10, only a process with the `CAP_SYS_ADMIN` capability may do this. If output was redirected already, then `EBUSY` is returned, but redirection can be stopped by using this `ioctl` with `fd` pointing at `/dev/console` or `/dev/tty0`.

#### Controlling terminal

`TIOCSCTTY` int arg

Make the given terminal the controlling terminal of the calling process. The calling process must be a session leader and not have a controlling terminal already. For this case, `arg` should be specified as zero.

If this terminal is already the controlling terminal of a dif?

ferent session group, then the ioctl fails with EPERM, unless the caller has the CAP\_SYS\_ADMIN capability and arg equals 1, in which case the terminal is stolen, and all processes that had it as controlling terminal lose it.

TIOCNOTTY void

If the given terminal was the controlling terminal of the calling process, give up this controlling terminal. If the process was session leader, then send SIGHUP and SIGCONT to the foreground process group and all processes in the current session lose their controlling terminal.

Process group and session ID

TIOCGPGRP pid\_t \*argp

When successful, equivalent to \*argp = tcgetpgrp(fd).

Get the process group ID of the foreground process group on this terminal.

TIOCSPGRP const pid\_t \*argp

Equivalent to tcsetpgrp(fd, \*argp).

Set the foreground process group ID of this terminal.

TIOCGSID pid\_t \*argp

Get the session ID of the given terminal. This fails with the error ENOTTY if the terminal is not a master pseudoterminal and not our controlling terminal. Strange.

Exclusive mode

TIOCEXCL void

Put the terminal into exclusive mode. No further open(2) operations on the terminal are permitted. (They fail with EBUSY, except for a process with the CAP\_SYS\_ADMIN capability.)

TIOCGEXCL int \*argp

(since Linux 3.8) If the terminal is currently in exclusive mode, place a nonzero value in the location pointed to by argp; otherwise, place zero in \*argp.

TIOCNXCL void

Disable exclusive mode.

## Line discipline

`TIOCGETD` `int *argp`

Get the line discipline of the terminal.

`TIOCSETD` `const int *argp`

Set the line discipline of the terminal.

## Pseudoterminal ioctls

`TIOCPKT` `const int *argp`

Enable (when `*argp` is nonzero) or disable packet mode. Can be applied to the master side of a pseudoterminal only (and will return `ENOTTY` otherwise). In packet mode, each subsequent `read(2)` will return a packet that either contains a single non-zero control byte, or has a single byte containing zero (`'\0'`) followed by data written on the slave side of the pseudoterminal. If the first byte is not `TIOCPKT_DATA` (0), it is an OR of one or more of the following bits:

`TIOCPKT_FLUSHREAD` The read queue for the terminal is flushed.

`TIOCPKT_FLUSHWRITE` The write queue for the terminal is flushed.

`TIOCPKT_STOP` Output to the terminal is stopped.

`TIOCPKT_START` Output to the terminal is restarted.

`TIOCPKT_DOSTOP` The start and stop characters are `^S/^Q`.

`TIOCPKT_NOSTOP` The start and stop characters are not `^S/^Q`.

While packet mode is in use, the presence of control status information to be read from the master side may be detected by a `select(2)` for exceptional conditions or a `poll(2)` for the `POLL_PRI` event.

This mode is used by `rlogin(1)` and `rlogind(8)` to implement a remote-echoed, locally `^S/^Q` flow-controlled remote login.

`TIOCGPKT` `const int *argp`

(since Linux 3.8) Return the current packet mode setting in the integer pointed to by `argp`.

`TIOCSPTLCK` `int *argp`

Set (if `*argp` is nonzero) or remove (if `*argp` is zero) the lock on the pseudoterminal slave device. (See also `unlockpt(3)`.)

TIOCGPTLCK int \*argp

(since Linux 3.8) Place the current lock state of the pseudoter-  
minal slave device in the location pointed to by argp.

TIOCGPTPEER int flags

(since Linux 4.13) Given a file descriptor in fd that refers to  
a pseudoterminal master, open (with the given open(2)-style  
flags) and return a new file descriptor that refers to the peer  
pseudoterminal slave device. This operation can be performed  
regardless of whether the pathname of the slave device is acces-  
sible through the calling process's mount namespace.

Security-conscious programs interacting with namespaces may wish  
to use this operation rather than open(2) with the pathname re-  
turned by ptsname(3), and similar library functions that have  
insecure APIs. (For example, confusion can occur in some cases  
using ptsname(3) with a pathname where a devpts filesystem has  
been mounted in a different mount namespace.)

The BSD ioctls TIOCSTOP, TIOCSTART, TIOCUCNTL, TIOCREMOTE have not been  
implemented under Linux.

#### Modem control

TIOCMGET int \*argp

Get the status of modem bits.

TIOCMSET const int \*argp

Set the status of modem bits.

TIOCMBIC const int \*argp

Clear the indicated modem bits.

TIOCMBIS const int \*argp

Set the indicated modem bits.

The following bits are used by the above ioctls:

TIOCM\_LE DSR (data set ready/line enable)

TIOCM\_DTR DTR (data terminal ready)

TIOCM\_RTS RTS (request to send)

TIOCM\_ST Secondary TXD (transmit)

TIOCM\_SR Secondary RXD (receive)

TIOCM\_CTS CTS (clear to send)

TIOCM\_CAR DCD (data carrier detect)

TIOCM\_CD see TIOCM\_CAR

TIOCM\_RNG RNG (ring)

TIOCM\_RI see TIOCM\_RNG

TIOCM\_DSR DSR (data set ready)

TIOCMWAIT int arg

Wait for any of the 4 modem bits (DCD, RI, DSR, CTS) to change.

The bits of interest are specified as a bit mask in arg, by OR?

ing together any of the bit values, TIOCM\_RNG, TIOCM\_DSR, TI?

OCM\_CD, and TIOCM\_CTS. The caller should use TIOCGICOUNT to see

which bit has changed.

TIOCGICOUNT struct se?

serial\_icounter\_struct \*argp

Get counts of input serial line interrupts (DCD, RI, DSR, CTS).

The counts are written to the serial\_icounter\_struct structure

pointed to by argp.

Note: both 1->0 and 0->1 transitions are counted, except for RI,

where only 0->1 transitions are counted.

#### Marking a line as local

TIOCGSOFTCAR int \*argp

("Get software carrier flag") Get the status of the CLOCAL flag

in the c\_cflag field of the termios structure.

TIOCSSOFTCAR const int \*argp

("Set software carrier flag") Set the CLOCAL flag in the termios

structure when \*argp is nonzero, and clear it otherwise.

If the CLOCAL flag for a line is off, the hardware carrier detect (DCD)

signal is significant, and an open(2) of the corresponding terminal

will block until DCD is asserted, unless the O\_NONBLOCK flag is given.

If CLOCAL is set, the line behaves as if DCD is always asserted. The

software carrier flag is usually turned on for local devices, and is

off for lines with modems.



For the TIOCLINUX ioctl, see `ioctl_console(2)`.

## Kernel debugging

```
#include <linux/tty.h>
```

```
TIOCTTYGSTRUCT          struct tty_struct *argp
```

Get the `tty_struct` corresponding to `fd`. This command was re?  
moved in Linux 2.5.67.

## RETURN VALUE

The `ioctl(2)` system call returns 0 on success. On error, it returns -1 and sets `errno` appropriately.

## ERRORS

`EINVAL` Invalid command parameter.

`ENOIOCTLCMD`

Unknown command.

`ENOTTY` Inappropriate `fd`.

`EPERM` Insufficient permission.

## EXAMPLES

Check the condition of DTR on the serial port.

```
#include <termios.h>
```

```
#include <fcntl.h>
```

```
#include <sys/ioctl.h>
```

```
int
```

```
main(void)
```

```
{
```

```
    int fd, serial;
```

```
    fd = open("/dev/ttyS0", O_RDONLY);
```

```
    ioctl(fd, TIOCMGET, &serial);
```

```
    if (serial & TIOCM_DTR)
```

```
        puts("TIOCM_DTR is set");
```

```
    else
```

```
        puts("TIOCM_DTR is not set");
```

```
    close(fd);
```

```
}
```

## SEE ALSO

ldattach(1), ioctl(2), ioctl\_console(2), termios(3), pty(7)

## COLOPHON

This page is part of release 5.10 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.

Linux

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