ioctl()

The `ioctl()` function is a device-specific system call used to interact with hardware devices, network interfaces, terminals, and other low-level kernel objects. It's defined in the "sys/ioctl.h" system header.

It can be used for different tasks, like:

- Configure device parameters
- Query terminal window size
- Control network interfaces

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

// "fd" is the file descriptor of the hardware device
// "request" is a device-specific command.
//           Defined in kernel headers
// "arg" is an optional pointer to i/o data
int ioctl(int fd, unsigned long request, ... /* void *arg */);
```

On success, usually returns 0. In case of failure, returns -1 and sets "errno".

- Each device driver defines its own "ioctl()" commands
- Many "ioctl()" commands require root permissions

Example Usage

Disable echo:

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

int main(void)
{
    struct termios tty;
    int fd;

    fd = open("/dev/tty", O_RDWR);
    // get current terminal settings
    ioctl(fd, TCGETS, &tty);
    // disable echo
    tty.c_lflag &= ~ECHO;
    ioctl(fd, TCSETS, &tty);
    close(fd);
    return (0);
}
```

Query window size:

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

int main(void)
{
   struct winsize w;

   ioctl(STDOUT_FILENO, TIOCGWINSZ, &w);
   printf("Terminal size: %d rows x %d cols\n", w.ws_row, w.ws_col);
   return (0);
}
```