

Module 8

UART interface (Part 2)

`termios` is a Unix API for terminal IO. A typical program which talks over a serial terminal contains the following:

- `open()` to open a serial device
- Configuring communication parameters

```
tcgetattr() tcsetattr()  
cfgetispeed() cfgetospeed()  
cfsetispeed() cfsetospeed()
```

- Setting line-control functions

```
tcdrain() tcflow() tcflush() tcsendbreak()
```

- `read()` and `write()` for reading/writing data from/to the serial interface
- `close()` to close the serial device when done

Opening and closing a serial device

- Opening:

```
fd = open("/dev/ttyS0", O_RDWR | O_NOCTTY | O_NDELAY);  
if (fd == -1)  
    printf("Failed to open port.\n");
```

- Closing:

```
close(fd);
```

Example configuration

```
struct termios config;  
...  
tcgetattr(fd, &config);  
config.c_iflag = 0;  
config.c_oflag = 0;  
config.c_lflag = 0;  
config.c_cflag = CS8 | CREAD | CLOCAL;  
config.c_cc[VMIN] = 1;  
config.c_cc[VTIME] = 0;  
cfsetispeed(&config, B9600);  
cfsetospeed(&config, B9600);  
tcsetattr(fd, TCSANOW, &config);
```

More information can be found on

<http://man7.org/linux/man-pages/man3/termios.3.html>

Example reading/writing

```
unsigned char buffer = 's';  
...  
while (buffer != 'q')  
{  
    // loopback  
    if (read(fd, &buffer, 1) > 0)  
        write(fd, &buffer, 1);  
}
```