

**NAME**

outb, outw, outl, outsb, outsw, outsl, inb, inw, inl, insb, insw, insl, outb\_p, outw\_p, outl\_p, inb\_p, inw\_p, inl\_p – port I/O

**SYNOPSIS**

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

```
unsigned char inb(unsigned short int port);
unsigned char inb_p(unsigned short int port);
unsigned short int inw(unsigned short int port);
unsigned short int inw_p(unsigned short int port);
unsigned int inl(unsigned short int port);
unsigned int inl_p(unsigned short int port);

void outb(unsigned char value, unsigned short int port);
void outb_p(unsigned char value, unsigned short int port);
void outw(unsigned short int value, unsigned short int port);
void outw_p(unsigned short int value, unsigned short int port);
void outl(unsigned int value, unsigned short int port);
void outl_p(unsigned int value, unsigned short int port);

void insb(unsigned short int port, void *addr,
           unsigned long int count);
void insw(unsigned short int port, void *addr,
           unsigned long int count);
void insl(unsigned short int port, void *addr,
           unsigned long int count);
void outsb(unsigned short int port, const void *addr,
           unsigned long int count);
void outsw(unsigned short int port, const void *addr,
           unsigned long int count);
void outsl(unsigned short int port, const void *addr,
           unsigned long int count);
```

**DESCRIPTION**

This family of functions is used to do low-level port input and output. The out\* functions do port output, the in\* functions do port input; the b-suffix functions are byte-width and the w-suffix functions word-width; the \_p-suffix functions pause until the I/O completes.

They are primarily designed for internal kernel use, but can be used from user space.

You must compile with `-O` or `-O2` or similar. The functions are defined as inline macros, and will not be substituted in without optimization enabled, causing unresolved references at link time.

You use `ioperm(2)` or alternatively `iopl(2)` to tell the kernel to allow the user space application to access the I/O ports in question. Failure to do this will cause the application to receive a segmentation fault.

**CONFORMING TO**

`outb()` and friends are hardware-specific. The *value* argument is passed first and the *port* argument is passed second, which is the opposite order from most DOS implementations.

**SEE ALSO**

`ioperm(2)`, `iopl(2)`

**COLOPHON**

This page is part of release 5.05 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/>.