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IEEE Std 1003.1-2017 (Revision of IEEE Std 1003.1-2008)
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NAME

termios.h – define values for termios

SYNOPSIS

#include <termios.h>

DESCRIPTION

The *<termios.h>* header shall contain the definitions used by the terminal I/O interfaces (see *General Terminal Interface* for the structures and names defined).

The termios Structure

The *<termios.h>* header shall define the following data types through **typedef:**

cc_t
     Used for terminal special characters.
speed_t
     Used for terminal baud rates.
tcflag_t
     Used for terminal modes.

The above types shall be all unsigned integer types.

The implementation shall support one or more programming environments in which the widths of **cc_t, speed_t,** and **tcflag_t** are no greater than the width of type **long.** The names of these programming environments can be obtained using the *confstr*() function or the *getconf* utility.

The *<termios.h>* header shall define the **termios** structure, which shall include at least the following members:

tcflag_t c_iflag   Input modes.
tcflag_t c_oflag   Output modes.
tcflag_t c_cflag   Control modes.
tcflag_t c_lflag   Local modes.
cc_t   c_cc[NCCS] Control characters.

The *<termios.h>* header shall define the following symbolic constant:

NCCS
     Size of the array *c_cc* for control characters.

The *<termios.h>* header shall define the following symbolic constants for use as subscripts for the array *c_cc*:

Subscript Usage		
Canonical Mode	**Non-Canonical Mode**	**Description**
VEOF		EOF character.
VEOL		EOL character.
VERASE		ERASE character.

VINTR	VINTR	INTR character.
VKILL		KILL character.
	VMIN	MIN value.
VQUIT	VQUIT	QUIT character.
VSTART	VSTART	START character.
VSTOP	VSTOP	STOP character.
VSUSP	VSUSP	SUSP character.
	VTIME	TIME value.

The subscript values shall be suitable for use in **#if** preprocessing directives and shall be distinct, except that the VMIN and VTIME subscripts may have the same values as the VEOF and VEOL subscripts, respectively.

Input Modes

The *<termios.h>* header shall define the following symbolic constants for use as flags in the *c_iflag* field. The *c_iflag* field describes the basic terminal input control.

BRKINT
      Signal interrupt on break.
ICRNL
      Map CR to NL on input.
IGNBRK
      Ignore break condition.
IGNCR
      Ignore CR.
IGNPAR
      Ignore characters with parity errors.
INLCR
      Map NL to CR on input.
INPCK
      Enable input parity check.
ISTRIP
      Strip character.
IXANY
      Enable any character to restart output.
IXOFF
      Enable start/stop input control.
IXON
      Enable start/stop output control.
PARMRK
      Mark parity errors.

Output Modes

The *<termios.h>* header shall define the following symbolic constants for use as flags in the *c_oflag* field. The *c_oflag* field specifies the system treatment of output.

OPOST
      Post-process output.
ONLCR
      [XSI] ⊠▷ Map NL to CR-NL on output. ⊠
OCRNL
      [XSI] ⊠▷ Map CR to NL on output. ⊠
ONOCR
      [XSI] ⊠▷ No CR output at column 0. ⊠
ONLRET
      [XSI] ⊠▷ NL performs CR function. ⊠
OFDEL
      [XSI] ⊠▷ Fill is DEL. ⊠

OFILL

[XSI] ⊠ Use fill characters for delay. ⊠

NLDLY

[XSI] ⊠ Select newline delays:

NL0

Newline type 0.

NL1

Newline type 1.

⊠

CRDLY

[XSI] ⊠ Select carriage-return delays:

CR0

Carriage-return delay type 0.

CR1

Carriage-return delay type 1.

CR2

Carriage-return delay type 2.

CR3

Carriage-return delay type 3.

⊠

TABDLY

[XSI] ⊠ Select horizontal-tab delays:

TAB0

Horizontal-tab delay type 0.

TAB1

Horizontal-tab delay type 1.

TAB2

Horizontal-tab delay type 2.

TAB3

Expand tabs to spaces.

⊠

BSDLY

[XSI] ⊠ Select backspace delays:

BS0

Backspace-delay type 0.

BS1

Backspace-delay type 1.

⊠

VTDLY

[XSI] ⊠ Select vertical-tab delays:

VT0

Vertical-tab delay type 0.

VT1

Vertical-tab delay type 1.

⊠

FFDLY

[XSI] ⊠ Select form-feed delays:

FF0

Form-feed delay type 0.

FF1

Form-feed delay type 1.

⊠

Baud Rate Selection

The *<termios.h>* header shall define the following symbolic constants for use as values of objects of type **speed_t.**

The input and output baud rates are stored in the **termios** structure. These are the valid values for objects of type **speed_t.** Not all baud rates need be supported by the underlying hardware.

B0
      Hang up
B50
      50 baud
B75
      75 baud
B110
      110 baud
B134
      134.5 baud
B150
      150 baud
B200
      200 baud
B300
      300 baud
B600
      600 baud
B1200
      1200 baud
B1800
      1800 baud
B2400
      2400 baud
B4800
      4800 baud
B9600
      9600 baud
B19200
      19200 baud
B38400
      38400 baud

Control Modes

The *<termios.h>* header shall define the following symbolic constants for use as flags in the *c_cflag* field. The *c_cflag* field describes the hardware control of the terminal; not all values specified are required to be supported by the underlying hardware.

CSIZE
      Character size:

      CS5
            5 bits
      CS6
            6 bits
      CS7
            7 bits
      CS8
            8 bits

CSTOPB
      Send two stop bits, else one.
CREAD
      Enable receiver.
PARENB
      Parity enable.
PARODD

      Odd parity, else even.
HUPCL
      Hang up on last close.
CLOCAL
      Ignore modem status lines.

The implementation shall support the functionality associated with the symbols CS7, CS8, CSTOPB, PARODD, and PARENB.

Local Modes

The *<termios.h>* header shall define the following symbolic constants for use as flags in the *c_lflag* field. The *c_lflag* field of the argument structure is used to control various terminal functions.

ECHO
      Enable echo.
ECHOE
      Echo erase character as error-correcting backspace.
ECHOK
      Echo KILL.
ECHONL
      Echo NL.
ICANON
      Canonical input (erase and kill processing).
IEXTEN
      Enable extended input character processing.
ISIG
      Enable signals.
NOFLSH
      Disable flush after interrupt or quit.
TOSTOP
      Send SIGTTOU for background output.

Attribute Selection

The *<termios.h>* header shall define the following symbolic constants for use with *tcsetattr*():

TCSANOW
      Change attributes immediately.
TCSADRAIN
      Change attributes when output has drained.
TCSAFLUSH
      Change attributes when output has drained; also flush pending input.

Line Control

The *<termios.h>* header shall define the following symbolic constants for use with *tcflush*():

TCIFLUSH
      Flush pending input.
TCIOFLUSH
      Flush both pending input and untransmitted output.
TCOFLUSH
      Flush untransmitted output.

The *<termios.h>* header shall define the following symbolic constants for use with *tcflow*():

TCIOFF
      Transmit a STOP character, intended to suspend input data.
TCION
      Transmit a START character, intended to restart input data.

```
TCOOFF
      Suspend output.
TCOON
      Restart output.
```

The *<termios.h>* header shall define the **pid_t** type as described in <u><sys/types.h></u>.

The following shall be declared as functions and may also be defined as macros. Function prototypes shall be provided.

```
speed_t cfgetispeed(const struct termios *);
speed_t cfgetospeed(const struct termios *);
int     cfsetispeed(struct termios *, speed_t);
int     cfsetospeed(struct termios *, speed_t);
int     tcdrain(int);
int     tcflow(int, int);
int     tcflush(int, int);
int     tcgetattr(int, struct termios *);
pid_t   tcgetsid(int);
int     tcsendbreak(int, int);
int     tcsetattr(int, int, const struct termios *);
```

The following sections are informative.

APPLICATION USAGE

The following names are reserved for XSI-conformant systems to use as an extension to the above; therefore strictly conforming applications shall not use them:

CBAUD	EXTB	VDSUSP
DEFECHO	FLUSHO	VLNEXT
ECHOCTL	LOBLK	VREPRINT
ECHOKE	PENDIN	VSTATUS
ECHOPRT	SWTCH	VWERASE
EXTA	VDISCARD	

RATIONALE

None.

FUTURE DIRECTIONS

None.

SEE ALSO

<u><sys/types.h></u>

XSH <u>cfgetispeed</u>, <u>cfgetospeed</u>, <u>cfsetispeed</u>, <u>cfsetospeed</u>, <u>confstr</u>, <u>tcdrain</u>, <u>tcflow</u>, <u>tcflush</u>, <u>tcgetattr</u>, <u>tcgetsid</u>, <u>tcsendbreak</u>, <u>tcsetattr</u>

XCU <u>General Terminal Interface</u>, <u>getconf</u>

CHANGE HISTORY

First released in Issue 3.

Included for alignment with the ISO POSIX-1 standard.

Issue 6

The LEGACY symbols IUCLC, OLCUC, and XCASE are removed.

FIPS 151-2 requirements for the symbols CS7, CS8, CSTOPB, PARODD, and PARENB are reaffirmed.

IEEE Std 1003.1-2001/Cor 1-2002, item XBD/TC1/D6/19 is applied, changing ECHOK to ECHOKE in the APPLICATION USAGE section.

Issue 7

Austin Group Interpretation 1003.1-2001 #144 is applied, moving functionality relating to the IXANY symbol from the XSI option to the Base.

SD5-XBD-ERN-35 is applied, adding the OFDEL output mode.

This reference page is clarified with respect to macros and symbolic constants, and a declaration for the **pid_t** type is added.

End of informative text.

[Main Index | XBD | XSH | XCU | XRAT]