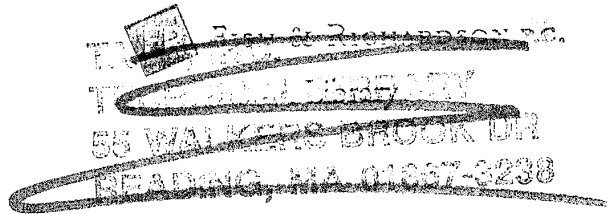


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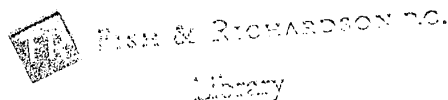


The IEEE Standard Dictionary of Electrical and Electronics Terms

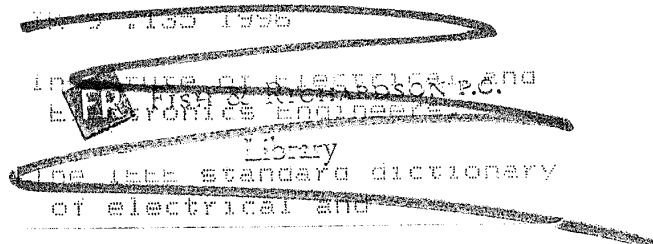
Sixth Edition

Standards Coordinating Committee 10, Terms and Definitions
Jane Radatz, Chair

This standard is one of a number of information technology dictionaries being developed by standards organizations accredited by the American National Standards Institute. This dictionary was developed under the sponsorship of voluntary standards organizations, using a consensus-based process.



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Introduction

Since the first edition in 1941 of the American Standard Definitions of Electrical Terms, the work now known as IEEE Std 100, The IEEE Standard Dictionary of Electrical and Electronics Terms, has evolved into the unique compendium of terms that it is today.

The current edition includes all terms defined in approved IEEE standards through December 1996. Terms are categorized by their technical subject area. They are also associated with the standards or publications in which they currently appear. In some cases, terms from withdrawn standards are included when no current source can be found. Earlier editions of IEEE Std 100 included terms from sources other than IEEE standards, such as technical journals, books, or conference proceedings. These terms have been maintained for the sake of consistency and their sources are listed with the standards in the back of the book.

The practice of defining terms varies from standard to standard. Many working groups that write standards prefer to work with existing definitions, while others choose to write their own. Thus terms may have several similar, although not identical, definitions. Definitions have been combined wherever it has been possible to do so by making only minor editorial changes. Otherwise, they have been left as written in the original standard.

Users of IEEE Std 100 occasionally comment on the surprising omission of a particular term commonly used in an electrical or electronics field. This occurs because the terms in IEEE Std 100 represent only those defined in the existing or past body of IEEE standards. To respond to this, some working groups obtain authorization to create a glossary of terms used in their field. All existing, approved standard glossaries have been incorporated into this edition of IEEE Std 100, including the most current glossaries of terms for computers and power engineering.

IEEE working groups are encouraged to refer to IEEE Std 100 when developing new or revised standards to avoid redundancy. They are also encouraged to investigate deficiencies in standard terms and create standard glossaries to alleviate them.

The sponsoring body for this document was Standards Coordinating Committee 10 on Definitions (SCC10), which consisted of the following members:

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How to use this dictionary

The terms defined in this dictionary are listed in *letter-by-letter* alphabetical order. Spaces are ignored in this style of alphabetization, so *cable value* will come before *cab signal*. Descriptive categories associated with the term in earlier editions of IEEE Std 100 will follow the term in parentheses. New categories appear after the definitions (see Categories, below), followed by the designation of the standard or standards that include the definition. If a standard designation is followed by the letter s, it means that edition of the standard was superseded by a newer revision and the term was not included in the revision. If a designation is followed by the letter w, it means that edition of the standard was withdrawn and not replaced by a revision. A bracketed number refers to the non-IEEE standard sources given in the back of the book.

Acronyms and abbreviations are no longer listed in a separate section in the dictionary; rather, they are incorporated alphabetically with other terms. Each acronym or abbreviation refers to its expanded term, where it is defined. Acronyms and abbreviations for which no definition was included in past editions have been deleted from this edition of IEEE Std 100.

Abstracts of the current set of approved IEEE standards are provided in the back of the book. It should be noted that updated information about IEEE standards can be obtained at any time from the IEEE Standards World Wide Web site at <http://standards.ieee.org/>.

Categories

The category abbreviations that are used in this edition of IEEE Std 100 are defined below. This information is provided to help elucidate the context of the definition. Older terms for which no category could be found have had the category "Std100" assigned to them. Note that terms from sources other than IEEE standards, such as the National Electrical Code® (NEC®) or the National Fire Protection Association, may not be from the most recent editions; the reader is cautioned to check the latest editions of all sources for the most up-to-date terminology.

Cat

AE
 AHD
 AMF
 AP
 ATL
 BA
 BT
 C
 CAS
 CE
 CHM
 COM
 CS
 DA
 DEI
 DES
 DIS
 ED
 EDU
 EEC
 ELM
 EM
 EMI
 EMC
 GRS
 GSE
 IA
 IE
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 IM
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 IVH
 LEC
 LM
 MA
 MIL
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operation of a signal in
(EEC/PE) [119]

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(EEC/PE) [119]

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(PE/SWG) [56]
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980s, C37.100-1992
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(EEC/PE) [119]
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(EEC/IE) [126]

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76], C63.4-1991
: button without
(C) 1295-1993
ts services of a
f) 1296-1987s
orporation.

93, 1351-1994
sting a service.
) 610.7-1995

(4) Software that uses an interface. (C/PA) 1224.1-1993
(5) *See also:* batch client.

client execution environment The machine state that exists
when a client program begins execution.

(BA/C) 1275-1994

client interface A set of data and procedures giving a client
program access to client interface services.

(BA/C) 1275-1994

client instance A manifestation of the client that shares the input
and output queues of the client with other instances.

(C/PA) 1224.1-1993

client interface handler A mechanism by which control and
data are transferred from a client program to the firmware,
and subsequently returned, for the purpose of providing client
interface services.

(BA/C) 1275-1994

client layer In the OSI model, refers to the data link and phys-
ical layers. *See also:* application layer; data link layer; entity
layer; logical link control sublayer; medium access control
(MAC) sublayer; network layer; physical layer; presentation
layer; session layer; sublayer; transport layer.

(C) 610.7-1995

client interface services Those services that Open Firmware
provides to client programs, including device tree access,
memory allocation, mapping, console I/O, mass storage, and
network I/O.

(BA/C) 1275-1994

client-server In a communications network, the client is the
requesting device and the server is the supplying device. For
example, the user interface could reside in the client work-
station while the storage and retrieval functions could reside
in the server database.

(C) 610.7-1995

client role The location where the software is actually executed
or used (as opposed to the target where it is actually installed).
The configuration of software is performed by this role.

(C/PA) 1387.2-1995

climber in training A worker who is in training to become a
qualified climber.

(PE/T&D) 1307-1996

client program A software program that is loaded and executed
by Open Firmware (or a secondary boot program). (The client
program may use services provided by the Open Firmware
client interface.)

(BA/C) 1275-1994

climbing The vertical movement (ascending and descending)
and horizontal movement to access or depart the worksite.

(NESC/PE/T&D) 1307-1996, C2-1997

climbing space The vertical space reserved along the side of a
pole or structure to permit ready access for linemen to equip-
ment and conductors located on the pole structure.

(PE/T&D) [10], 196-1951w, C2.2-1960

clinometer (navigation aids) An instrument for indicating the
degree of slope of the angle of roll or pitch of a vehicle,
according to the plane in which it is mounted.

(AE) 172-1983w

clip (1) (charged-particle detectors) (radiation detectors)
(x-ray energy spectrometers) A limiting operation, such as
the use of a high-pass filter or a nonlinear operation such as
diode limiting of pulse amplitude. *Synonym:* clipping. *See*
also: contact clip; differentiated; fuse clips.

(NPS) 301-1976s, 325-1971w, 759-1984r

(2) **(charged-particle detectors)** A limiting operation, such
as the use of a high-pass filter (differentiator) or a nonlinear
operation to limit the amplitude of a pulse. The first usage is
archaic. *Synonym:* clipping.

(NPS) 300-1988r

(3) *See also:* clamp, cable.

(PE/T&D) 524-1992

clipboard A software storage device that is used to store an
object that is cut or copied from the screen and to retrieve an
object that is pasted.

(C) 1295-1993

clipper (data transmission) A device that automatically limits
the instantaneous value of the output to a predetermined max-
imum value. *Note:* The term is usually applied to devices
which transmit only portions of an input wave lying on one
side of an amplitude boundary.

(PE) 599-1985w

clipper limiter A transducer that gives output only when the
input lies above a critical value and a constant output for all

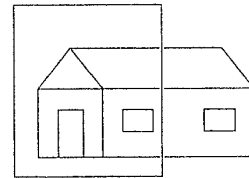
inputs above a second higher critical value. *Synonym:* ampli-
tude gate. *See also:* transducer.

(AP) 145-1983s

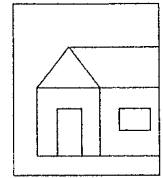
clipping (1) (voice-operated telephone circuit) The loss of ini-
tial or final parts of words or syllables due to nonideal oper-
ation of the voice-operated devices.

(EEC/PE) [119]

(2) **(computer graphics)** A computer graphics technique in
which display elements lying totally outside a view area are
made invisible and display elements lying partially inside a
view area are scissored to remove the parts outside the view
area before they are mapped to the display image. *Note:* In
two-dimensional graphics, this view area is called the win-
dow; in three-dimensional graphics, it is called the view
volume. *See also:* scissoring; view volume; window; wrap-
around.



Before Clipping



After Clipping

clipping

(C) 610.6-1991

(3) *See also:* clip.

(NPS) 300-1988r

(4) *See also:* clipping-in.

(PE/T&D) 524-1992

clipping-in (conductor stringing equipment) The transferring
of sagged conductors from the travelers to their permanent
suspension positions and the installing of the permanent sus-
pension clamps. *Synonyms:* clamping-in; clipping.

(PE/T&D) 524-1992, 524a-1993

clipping offset (conductor stringing equipment) A calculated
distance, measured along the conductor from the plumb
mark to a point on the conductor at which the center of the
suspension clamp is to be placed. When stringing in rough
terrain, clipping offsets may be required to balance the hori-
zontal forces on each suspension structure.

(PE/T&D) 524-1992

clips *See:* contact clips; fuse clips.

CLIST A command language used in the IBM MVS environ-
ment.

(C) 610.13-1993

CLK A fixed-frequency clock signal. The main SBus timing
signal.

(BA/C) 1496-1993

clock (1) (A) A device that generates periodic signals used for
synchronization. **(B)** A device that measures and indicates
time. *See also:* master clock; real-time clock; time-of-day
clock; timer; wall clock. **(C)** A register whose content
changes at regular intervals in such a way as to measure time.

(C) [20]

(2) A signal, the transitions of which (between the low and
high logic level [or vice versa]) are used to indicate when a
stored-state device, such as a flip-flop or latch, may perform
an operation.

(C/TT) 1149.1-1990, 1149.5-1995

(3) An object that measures the passage of time. The current
value of the time measured by a clock can be queried and,
possibly, set to a value within the legal range of the clock.

(C/PA) 1003.5b-1995, 9945-1-1996

(4) **(A)** A device that generates periodic, accurately spaced
signals used for such purposes as timing, regulation of the
operations of a processor, or generation of interrupts.

(B) To trigger a circuit to perform an operation, such as to
accept data into a register.

(C) 610.10-1994

(5) *See also:* dynamometer.

(PE/T&D) 516-1987s, 524-1992

clock accuracy The deviation from absolute accuracy per unit
of time. In a hierarchical, master-slave synchronization plan,
with one primary and at least one backup reference being
designated for each local digital switch, the clock rate of the
local switch is controlled by the master. Under that method
of operation, the local digital switch should operate at zero

nominal slips. If the link connecting the master switch to the slave switch is broken, the number of slips will depend on clock accuracy. (COM) 973-1990w

clock cycle One period of the CLK signal, beginning with the rising edge of the signal and ending on the following rising edge of the signal. (BA/C) 1496-1993

clocked data one (CD1) A Manchester-encoded data 1. A CD1 is encoded as a LO for the first half of the bit-cell and a HI for the second half of the bit-cell. (C/LM) 802.3u-1995

clocked data zero (CD0) A Manchester-encoded data 0. A CDO is encoded as a HI for the first half of the bit-cell and a LO for the second half of the bit-cell. (C/LM) 802.3u-1995

clocked logic (power-system communication) The technique whereby all the memory cells (flip-flops) of a logic network are caused to change in accordance with logic input levels but at a discrete time. *See also:* digital. (PE) 599-1985w

clocked violation HI (CVH) A symbol that deliberately violates Manchester-encoding rules, used as a part of the Collision Presence signal. A CVH is encoded as a transition from LO to HI at the beginning of the bit cell, HI for the entire bit cell, and a transition from HI to LO at the end of the bit cell. (C/LM) 802.3u-1995

clocked violation LO (CVL) A symbol that deliberately violates Manchester-encoding rules, used as a part of the Collision Presence signal. A CVL is encoded as a transition from HI to LO at the beginning of the bit cell, LO for the entire bit cell, and a transition from LO to HI at the end of the bit cell. (C/LM) 802.3u-1995

clocking (data transmission) The generation of periodic signals used for synchronization. *See also:* data processing. (COM) [49]

clocking bit (1) In asynchronous transmission, a bit that signals a synchronization event. (C) 610.7-1995

(2) A bit containing an encoded signal, preceding the data within a data stream, or on a separate channel; used for establishing timing intervals. *See also:* clock track; synchronization bit. (C) 610.10-1994

clock pulse *See:* clock signal.

clock reference (digital accelerometer) Basic system timing reference. (MTT) 457-1982w

clock, reference A clock of very high stability and accuracy that may be completely autonomous and whose frequency serves as a basis of comparison for the frequency of other clocks. (COM) 1007-1991

clock register *See:* timer.

clock signal A periodic signal used for synchronizing events. *Synonyms:* clock pulse; timing pulse. (C) 610.10-1994

clockStrobe signal A packet that causes a node to record its time-of-day registers (if any) when it is received, and to record the duration of the propagation of the packet within the node. Used for precisely synchronizing multiple time-of-day clocks within a system. (C/MM) 1596-1992

clock tick An interval of time. A number of these occur each second. Clock ticks are one of the units that may be used to express a value found in type *clock.t*. (C/PA) 9945-1-1996

clock track A track on which a pattern of signals, known as synchronization bits, is recorded to provide a timing reference. *Synonym:* timing track. *See also:* clocking bit. (C) 610.10-1994

CLOS *See:* Common LISP Object System.

close To destroy a package instance. (BA/C) 1275-1994

close and latch The capability of a switching device to close (allow current flow) and immediately thereafter latch (remain closed) and conduct a specified current through the device under specified conditions. (PE/SWG) C37.100-1992

close coupling Any degree of coupling greater than the critical coupling. *Synonym:* tight coupling. *See also:* coupling; critical coupling. (EEC/PE) [119]

closed air circuit (rotating machinery) A term referring to duct-ventilated apparatus used in conjunction with external components so constructed that while it is not necessarily airtight, the enclosed air has no deliberate connection with the external air. *Note:* The term must be qualified to describe the means used to circulate the cooling air and to remove the heat produced in the apparatus. (PE) [9]

closed amortisseur An amortisseur that has the end connections connected together between poles by bolted or otherwise separable connections. (EEC/PE) [119]

closed architecture An architecture for which design parameters and specifications are not available to anyone except the manufacturer of the system. *Contrast:* open architecture. (C) 610.10-1994

closed-circuit cooling (rotating machinery) A method of cooling in which a primary coolant is circulated in a closed circuit through the machine and if necessary a heat exchanger. Heat is transferred from the primary coolant to the secondary coolant through the structural parts or in the heat exchanger. (PE) [9]

closed-circuit principle The principle of circuit design in which a normally energized electric circuit, on being interrupted or de-energized, will cause the controlled function to assume its most restrictive condition. (EEC/PE) [119]

closed-circuit signaling (data transmission) That type of signaling in which current flows in the idle condition, and a signal is initiated by increasing or decreasing the current. (PE) 599-1985w

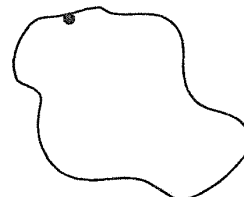
closed-circuit transition As applied to reduced-voltage controllers, including star-delta controllers, a method of starting in which the power to the motor is not interrupted during the starting sequence. *See also:* electric controller. (IA) [60]

closed-circuit transition auto-transformer starting (rotating machinery) The process of auto-transformer starting whereby the motor remains connected to the supply during the transition from reduced to rated voltage. (PE) [9]

closed-circuit voltage (batteries) The voltage at its terminals when a specified current is flowing. *See also:* battery. (EEC/PE) [119]

closed construction Any building, building component, assembly or system manufactured in such a manner that all concealed parts of processes of manufacture cannot be inspected before installation at the building site without disassembly, damage, or destruction. (NEC/NESC) [86]

closed curve (image processing and pattern recognition) A curve whose beginning and ending points are the same point.



closed curve

(C) 610.4-1990

closed loop (1) (automatic control) A signal path that includes a forward path, a feedback path, and a summing point and that forms a closed circuit. *See also:* feedback loop. (IA) [60], [69]

(2) (software) A loop that has no exit and whose execution can be interrupted only by intervention from outside the computer program or procedure in which the loop is located. *Contrast:* UNTIL; WHILE. (C) 610.12-1990

closed-loop c

A type of action on signals from the control of the control system.

(2) Pertaining to the range of the system's response.

closed-loop control system A control system and comparison. A control system into the control system.

(2) (high-power) A standard reference quantity from the such sense of quantity from the

closed-loop gain gain, measuring across the required at a sufficiently large proximated resistor. *See*

closed-loop system that employs is always a direct-current

closed-loop test (ment) Test the equipment

closed network inating external; contrast: open network

closed-numbering numbering system

closed subunit one place at one or more

(2) (software) tion rather than place that it

closed user group permitted other network

close-open operation followed immediately delay operation: Close

close operation contacts from position. *Note:*

close-talking for use close phone.