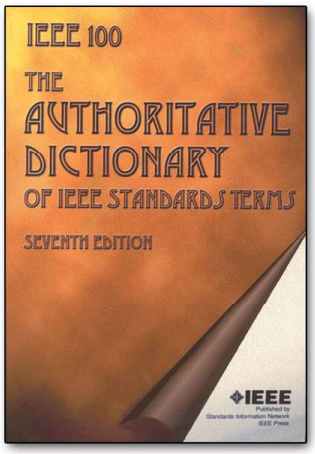
IEEE 100
The Authoritative Dictionary of IEEE Standards Terms

Seventh Edition



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Introduction

IEEE standards establish an authoritative common language that defines quality and sets technical criteria. By guaranteeing consistency and conformity through open consensus, IEEE standards add value to products, facilitate trade, drive markets, and ensure safety. That's why leading companies, organizations, and industries around the globe rely on them.

Critical components of this common language are the terms and definitions that are at the foundation of the vast body of IEEE standards. In the past decade alone, hundreds of terms—describing the latest tools, techniques, and best practices—have been added to the lexicon of IEEE standards.

In this newly updated *Authoritative Dictionary of IEEE Standards Terms,* professional experts and students alike will gain an in-depth understanding and appreciation for the breadth of coverage of IEEE standards terms and definitions not found in any other single source.

The seventh edition of IEEE 100 has been revised to include nearly 35 000 technical terms and definitions from over 800 standards—covering areas such as power and energy, communications, information technology, and transportation systems. In addition to an extensive list of widely used acronyms and abbreviations, this new edition also contains detailed abstracts of each term's associated standard(s). What's more, all definitions are augmented by a combination of indispensable information, including:

- Preferred and popular usage of each term
- Variations in meanings among different technical specialties
- Cross-indexing to related works
- Key explanatory notes for further term clarification

In preparing this latest edition of the Dictionary, we realized that the standards community desired more than just a compilation of IEEE standardized terms and definitions. They needed an authoritative resource created by the organization that develops and produces the standards from which the terms and definitions are derived—the IEEE. In addition, we determined the Dictionary needed to be not only user friendly, but also rich in information. In other words, it needed to be the *Authoritative Dictionary of IEEE Standards Terms.*

Susan K. Tatiner
Director, IEEE Standards Publishing Programs

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Additional assistance was provided by the IEEE Standards editorial staff.

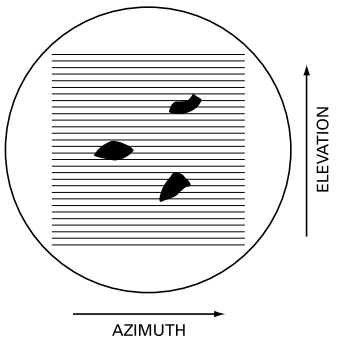
C conditioning A North American term for a type of conditioning that controls attenuation, distortion, and delay distortion, thus making transmission impairments of a circuit lie within specified limits. *See also:* D conditioning. (C) 610.7-1995

CCR *See:* condition code register.

CCS Hundreds of call seconds per hour. A measure of traffic intensity or event data. *Synonym:* call attempts per hour. *See also:* time-consistent traffic measures. (COM/TA) 973-1990w

CD *See:* compact disc; collision detection.

C-display A rectangular display in which each target appears as an intensity-modulated blip with azimuth indicated by the horizontal coordinate and angle of elevation by the vertical coordinate.



C-display

(AES) 686-1997

CDL *See:* Computer Design Language.

CDO *See:* unattended automatic exchange.

CD1 *See:* clocked data one.

CDP *See:* commercial data processing.

CDR *See:* critical design review.

CD-ROM *See:* compact disc read-only memory.

CD-ROM storage A read-only form of optical storage employing compact discs to store information. (C) 610.10-1994w

CD state The state of an analog pin when it is isolated from the core circuit and all test circuits. *Note:* When a pin is in the CD state, there may be residual elements to which it remains connected. *See also:* core disconnect; residual element. (C/TT) 1149.4-1999

CD0 *See:* clocked data zero.

C-effective A capacitance value, often computed as an approximation to a resistor/inductor/capacitor (RLC) network or a π-model, that characterizes the admittance of an interconnect structure at a particular driver. The reduction of real parasitics and pin capacitances to a C-effective allows the calculation of delay and slew values from cell characterization data which assumes a pure capacitive output load. *Synonym:* effective capacitance. (C/DA) 1481-1999

CEI (television) The initials of the official French name, Commission Éléctrotechnique Internationale, of the International Electrotechnical Commission (IEC). (BT/AV) 201-1979w

ceiling The result obtained by rounding a number up to the nearest integer. For example, the ceiling of 5.3 is 6. *Contrast:* floor. (C) 1084-1986w

ceiling area lighting (illuminating engineering) A general lighting system in which the entire ceiling is, in effect, one large luminaire. *Note:* Ceiling area lighting includes luminous ceilings and louvered ceilings. *See also:* luminous ceiling; louvered ceiling. (EEC/IE) [126]

ceiling cavity ratio (illuminating engineering) For a cavity formed by the ceiling, the plane of the luminaire, and the wall surfaces between these two planes, the CCR is computed by using the distance from the plane of the luminaire to the ceiling (h_c as the cavity height in the equations given in the definition of "cavity ratio." (EEC/IE) [126]

ceiling current (excitation systems for synchronous machines) The maximum direct current that the excitation system is able to supply from its terminals for a specified time. (PE/EDPG) 421.2-1990, 421.1-1986r

ceiling direct voltage (direct potential rectifier unit) The average direct voltage at rated direct current with rated sinusoidal voltage applied to the alternating-current line terminals, with the rectifier transformer set on rated voltage tap and with voltage regulating means set for maximum output. *See also:* rectification; power rectifier. (IA/EEC/PCON) [62], [110]

ceiling projector (illuminating engineering) A device designed to produce a well-defined illuminated spot on the lower portion of a cloud for the purpose of providing a reference mark for the determination of the height of that part of the cloud. (EEC/IE) [126]

ceiling ratio (illuminating engineering) The ratio of the luminous flux which reaches the ceiling directly to the upward component of the luminaire. (EEC/IE) [126]

ceiling voltage (1) (excitation systems for synchronous machines) The maximum direct voltage that the excitation system is able to supply from its terminals under defining conditions. *Notes:* 1. The no-load ceiling voltage is determined with the excitation system supplying no current. 2. The ceiling voltage under load is determined with the excitation system supplying ceiling current. 3. For excitation systems whose supply depends on the synchronous machine voltage and (if applicable) current, the nature of power system disturbance and specific design parameters of the excitation system and the synchronous machine influence the excitation system output. For such systems, the ceiling voltage is determined considering an appropriate voltage drop and (if applicable) current increase. 4. For excitation systems employing a rotating exciter, the ceiling voltage is determined at rated speed. (PE/EDPG) 421.1-1986r

(2) (excitation systems) The maximum direct voltage that the excitation system is able to supply from its terminals under defined conditions. (PE/EDPG) 421.2-1990

ceiling voltage, exciter nominal The ceiling voltage of an exciter loaded with a resistor having an ohmic value equal to the resistance of the field winding to be excited and with this field winding at a temperature of (A) 75°C for field windings designed to operate at rating with a temperature rise of 60°C or less; or (B) 100°C for field windings designed to operate at rating with a temperature rise greater than 60°C. (PE/EDPG) 421-1972s

ceilometer (navigation aid terms) An instrument for measuring the height of clouds. (AES/GCS) 172-1983w

celestial fix (navigation aid terms) A position fix established by observation of celestial bodies. (AES/GCS) 172-1983w

celestial-inertial navigation equipment (navigation aid terms) An equipment employing both celestial and inertial sensors. *Synonyms:* astro-inertial navigation equipment; stellar-inertial navigation equipment. (AES/GCS) 172-1983w

celestial mechanics (communication satellite) The mechanics of motion of celestial bodies, including satellites. (COM) [19]

celestial navigation (navigation aid terms) Navigation with the aid of celestial bodies. Applied principally to the measurement of the altitudes of a celestial body. (AES/GCS) 172-1983w

cell (1) (lead-acid batteries for photovoltaic systems) The basic electrochemical unit, characterized by an anode and a cathode used to receive, store, and deliver electrical energy. For a lead-acid system, the cell is characterized by a nominal two-volt potential. (PV) 937-1987s

(2) (batteries for photovoltaic systems) The basic electrochemical unit, characterized by an anode, a cathode, and electrolyte, used to receive, store, and deliver electrical energy. *Notes:* 1. For a nickel-cadmium cell, the nominal voltage is 1.2 V. 2. For a lead-acid cell, the nominal voltage is 2.0 V. (PV) 1013-1990, 1144-1996, 1145-1990s

gate electric contact *See:* car-door contact.

gate limit (speed governing system, hydraulic turbines) A device which acts on the governor system to prevent the turbine-control servomotor from opening beyond the position for which the device is set. (PE/EDPG) [5]

gate nontrigger current (thyristor) The maximum gate current that will not cause the thyristor to switch from the OFF state to the ON state. *See also:* principal current; gate trigger current. (IA/ED/CEM) 223-1966w, [62], [58], [46]

gate nontrigger voltage (thyristor) The maximum gate voltage that will not cause the thyristor to switch from the OFF state to the ON state. *See also:* gate trigger voltage; principal voltage-current characteristic. (IA/ED/CEM) 223-1966w, [46], [58], [62]

gate power closer *See:* car-door closer.

gate protective action (thyristor converter) Protective action that takes advantage of the switching property in the converter protection network. (IA/IPC) 444-1973w

gate suppression (thyristor power converter) Removal of gating pulses. (IA/IPC) 444-1973w

gate terminal (thyristor) A terminal that is connected to a gate. *See also:* anode. (IA/ED/CEM) 223-1966w, [46], [58]

gate trigger current (thyristor) The minimum gate current required to switch a thyristor from the OFF state to the ON state. *See also:* principal current. (IA/ED/CEM) 223-1966w, [62], [58], [46]

gate trigger voltage (thyristor) The gate voltage required to produce the gate-trigger current. *See also:* principal voltage-current characteristic. (IA/ED/CEM) 223-1966w, [58], [46], [62]

gate turn-off current (gate turn-off thyristor) The minimum gate current required to switch a thyristor from the ON state to the OFF state. *See also:* principal current. (IA/ED/CEM) 223-1966w, [46], [58], [62]

gate turn-off voltage (gate turn-off thyristor) The gate voltage required to produce the gate turn-off current. *See also:* principal voltage-current characteristic. (IA/ED/CEM) 223-1966w, [58], [46], [62]

gate voltage (thyristor) The voltage between a gate terminal and a specified main terminal. *See also:* principal voltage-current characteristic. (IA/ED/CEM) 223-1966w, [62], [46], [58]

gateway A functional unit that interconnects a local area network (LAN) with another network having different higher layer protocols. (LM/C) 8802-6-1994

(2) (A) A dedicated computer that attaches to two or more networks and that routes packets from one to the other. **(B)** In networking, a device that connects two systems that use different protocols. *Contrast:* bridge. *See also:* router; mail gateway. (C) 610.7-1995

gather write A write operation in which information from nonadjacent storage areas is placed into a single physical record. *Contrast:* scatter read. (C) 610.10-1994w

gating (1) The process of selecting those portions of a wave that exist during one or more selected time intervals or that have magnitudes between selected limits. *See also:* wavefront; modulation. (AP/ANT) 145-1983s

(2) The application of enabling or inhibiting pulses during part of a cycle of equipment operation. (AES) 686-1997

gating signal (keying signal) A signal that activates or deactivates a circuit during selected time intervals. (PE/EEC) [119]

gating techniques (thyristor) Those techniques employed to provide controller (thyristor) gating signals. (IA/IPC) 428-1981w

gauss (centimeter-gram-second electromagnetic-unit system) The gauss is 10^{-4} webers per square meter or one maxwell per square centimeter. (Std100) 270-1966w

Gaussian beam (1) (fiber optics) A beam of light whose electric field amplitude distribution is gaussian. When such a beam is circular in cross section, the amplitude is $E(r) = E(0) \exp[-(r/w)^2]$ where r is the distance from beam center and w is the radius at which the amplitude is $1/e$ of its value on the axis; w is called the beamwidth. *See also:* beam diameter. (Std100) 812-1984w

(2) (laser maser) A beam of radiation having an approximately spherical wave front at any point along the beam and having transverse field intensity over any wave front that is a Gaussian function of the distance from the axis of the beam. (LEO) 586-1980w

Gaussian density function (radar) Sometimes referred to as normal probability distribution, the Gaussian probability-density function is given by

$$f(X) = \frac{1}{\sigma\sqrt{2\pi}} \exp - \left(\frac{x^2}{2\sigma^2}\right)$$

Often used to describe statistical nature of random noise, where σ = standard deviation. (AES/RS) 686-1982s

Gaussian distribution A probability distribution characterized by the probability density function

$$f(x) = \frac{1}{\sqrt{2\pi}\,\sigma} \exp\left[-\frac{(x-m)^2}{2\sigma^2}\right]$$

where

x = the random variable
m = the mean
σ = the standard deviation

The Gaussian distribution is often used for analytical modeling of radar noise and various measurement errors. *Synonym:* normal distribution. (AES) 686-1997

Gaussian filter A polynomial filter whose magnitude-frequency response approximates the ideal Gaussian response, the degree of approximation depending on the complexity of the filter. The ideal Gaussian response is given by

$$\left|H(j\omega)\right| = \exp[-0.3466(\omega/\omega_c)^2]$$

where ω_c 3 dB frequency. Gaussian filters, because of their good transient characteristics (small overshoot and ringing), find applications in pulse systems. (CAS) [13]

Gaussian frequency shift keying (GFSK) A modulation scheme in which the data is first filtered by a Gaussian filter in the baseband and then modulated with a simple frequency modulation. (C/LM) 8802-11-1999

Gaussian noise Noise characterized by a wide frequency range with regard to the desired signal of communication channel, statistical randomness, and other stochastic properties. (C) 610.7-1995

Gaussian pulse (1) (fiber optics) A pulse that has the waveform of a gaussian distribution. In the time domain, the waveform is

$$f(t) = A \exp[-(t/a)^2]$$

where A is a constant, and a is the pulse half duration at the $1/e$ points. *See also:* full width (duration) half maximum. (Std100) 812-1984w

(2) A pulse shape tending to follow the Gaussian curve corresponding to $A(t) = e-a(b-t)^2$. *See also:* pulse. (IM/HFIM) [40]

Gaussian random noise *See:* random noise.

Gaussian response (1) (amplifiers) A particular frequency-response characteristic following the curve $y(f) = e-af^2$. *Note:* Typically, the frequency response approached by an amplifier having good transient response characteristics. *See also:* amplifier. (IM/HFIM) [40]

(2) (oscilloscopes) (amplifiers) A particular frequency response characteristic following the curve

$$y(f) = e^{-af^2}$$

Typically, the frequency response approached by an amplifier having good transient response characteristics. (IM) 311-1970w

Gaussian system (units) A system in which centimeter-gram-second electrostatic units are used for electric quantities and

Consensus

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