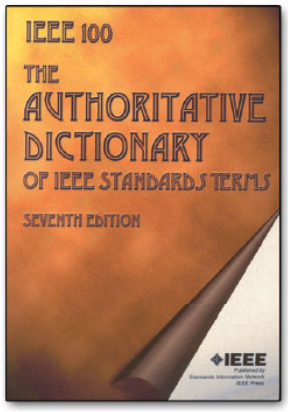
IEEE 100
The Authoritative Dictionary of IEEE Standards Terms

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.

How to Use This Dictionary

The terms defined in the 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 the Dictionary 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.

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 the Dictionary 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.

Categories sorted by abbreviation

AES	aerospace and electronic systems
AHDL	computer—Analog Hardware Descriptive Language
AMR	automatic meter reading and energy management
AP	antennas and propagation
ATL	computer—Abbreviated Test Language for All Systems
BA	computer—bus architecture
BT	broadcast technology
C	computer
CAS	circuits and systems
CE	consumer electronics
CHM	components, hybrids, and manufacturing technology
COM	communications
CS	control systems
DA	computer—design automation
DEI	dielectrics and electrical insulation
DESG	dispersed energy storage and generation
DIS	computer—distributed interactive simulation
ED	electron devices
EDU	education
EEC	electrical equipment and components
ELM	electricity metering
EM	engineering management
EMB	engineering in medicine and biology
EMC	electromagnetic compatibility
GRS	geoscience and remote sensing
GSD	graphic symbols and designations
IA	industry applications
IE	industrial electronics
II	information infrastructure
IM	instrumentation and measurement
IT	information theory

IVHS	intelligent vehicle highway systems
LEO	lasers and electro-optics
LM	computer—local and metropolitan area networks
MAG	magnetics
MIL	military
MM	computer—microprocessors and microcomputers
MTT	microwave theory and techniques
NEC	National Electrical Code
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NI	nuclear instruments
NIR	non-ionizing radiation
NN	neural networks
NPS	nuclear and plasma sciences
ODM	computer—optical disk and multimedia platforms
OE	oceanic engineering
PA	computer—portable applications
PE	power engineering
PEL	power electronics
PQ	power quality
PSPD	power surge protective devices
PV	photovoltaics
QUL	quantities, units, and letter symbols
R	reliability
RA	robotics and automation
REM	rotating electrical machinery
RL	roadway lighting
S&P	computer—security and privacy
SB	stationary batteries
SE	computer—software engineering
SMC	systems, man, and cybernetics
SP	signal processing
Std100	Standard 100 legacy data
SUB	substations
SWG	power switchgear
T&D	transmission and distribution
TF	time and frequency
TRR	transformers, regulators, and reactors
TT	test technology
UFFC	ultrasonics, ferroelectrics, and frequency control
VT	vehicular technology

Categories sorted by name

aerospace and electronic systems	AES
antennas and propagation	AP
automatic meter reading and energy management	AMR
broadcast technology	BT
circuits and systems	CAS
communication	COM
components, hybrids, and manufacturing technology	CHM
computer	C
computer—Abbreviated Test Language for All Systems	ATL
computer—Analog Hardware Descriptive Language	AHDL
computer—bus architecture	BA
computer—design automation	DA
computer—distributed interactive simulation	DIS
computer—local and metropolitan area networks	LM
computer—microprocessors and microcomputers	MM
computer—optical disk and multimedia platforms	ODM
computer—portable applications	PA
computer—security and privacy	S&P
computer—software engineering	SE
consumer electronics	CE

control systems	CS
dielectrics and electrical insulation	DEI
dispersed energy storage and generation	DESG
education	EDU
electrical equipment and components	EEC
electricity metering	ELM
electromagnetic compatibility	EMC
electron devices	ED
engineering in medicine and biology	EMB
engineering management	EM
geoscience and remote sensing	GRS
graphic symbols and designations	GSD
industrial electronics	IE
industry applications	IA
information infrastructure	II
information theory	IT
instrumentation and measurement	IM
intelligent vehicle highway systems	IVHS
lasers and electro-optics	LEO
magnetics	MAG
microwave theory and techniques	MTT
military	MIL
National Electrical Code	NEC
National Electrical Safety Code	NESC
National Fire Protection Association	NFPA
neural networks	NN
non-ionizing radiation	NIR
nuclear and plasma sciences	NPS
nuclear instruments	NI
oceanic engineering	OE
photovoltaics	PV
power electronics	PEL
power engineering	PE
power quality	PQ
power switchgear	SWG
quantities, units, and letter symbols	QUL
reliability	R
roadway lighting	RL
robotics and automation	RA
rotating electrical machinery	REM
signal processing	SP
Standard 100 legacy data	Std100
stationary batteries	SB
substations	SUB
surge-protective devices	PSPD
systems, man, and cybernetics	SMC
test technology	TT
time and frequency	TF
transformers, regulators, and reactors	TRR
transmission and distribution	T&D
ultrasonics, ferroelectrics, and frequency control	UFFC
vehicular technology	VT

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trays for routing to all parts of the plant. (PE/EDPG) 422-1977

cable-system enclosure (nuclear power generating station) (cable-penetration fire stops, fire breaks, and system enclosures) An assembly installed around a cable system to maintain circuit integrity, for a specified time, of all circuits within the enclosure when it is exposed to the most severe fire that may be expected to occur in the area. (PE/SUB/EDPG) 690-1984r, 525-1992r

cable terminal (1) A device that provides insulated egress for the conductors. *Synonyms:* termination. (NESC) C2-1997
(2) (power work) A device that seals the end of a cable and provides insulated egress for the conductors. *Synonyms:* pothead; end bell. (PE/T&D) [10]

cable termination Parts assembled onto the end of the cable to provide the electrical and mechanical interface into the gas-insulated environment. Typically this includes a solid insulation barrier between the cable/cable fluid and the gas insulation of the GIS. (PE/IC) 1300-1996

cable tilt (loss) The amount of RF signal attenuation by a given coaxial cable. Cable attenuation is mainly a function of signal frequency, cable length, and diameter. Cables attenuate higher frequency signals more than lower frequency signals (tilt). Cable losses are usually referenced to the highest frequency carried (greatest loss) on the cable. (LM/C) 802.7-1989r

cable tray (1) (raceway systems for Class 1E circuits for nuclear power generating stations) A prefabricated metal raceway with or without covers consisting of siderails and bottom support sections. Bottom support sections may be ladder, trough, or solid. (PE/NP) 628-1987r
(2) (electric power systems in commercial buildings) A unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible material forming a continuous rigid structure used to support cables. (IA/PSE) 241-1990r
(3) A raceway resembling a ladder and usually constructed of metal. Other styles of trays include solid-bottom and channel type. (PE/IC) 848-1996
(4) A continuous rigid structure used to support cables. Cable trays include ladders, troughs, channels and other similar structures. Conduits are not included in this category. (PE/IC) 817-1993w

cable tray system (raceway systems for Class 1E circuits for nuclear power generating stations) An assembly of metallic cable tray sections, fittings, supports, anchorages, and accessories that form a structural system to support wire and cables. (PE/NP) 628-1987r

cable trolley *See:* cable car.

cable TV A communication system that simultaneously distributes several different channels of broadcast programs and other information to customers via a coaxial cable. Previously called community antenna television (CATV). (LM/C) 802.7-1989r

cable type (nuclear power generating station) A cable type for purposes of qualification testing shall be representative of those cables having the same materials, similar construction, and service rating, as manufactured by a given manufacturer. (PE/NP) 380-1975w

cable value *See:* manhole.

cab signal (1) A signal located in the engineman's compartment or cab indicating a condition affecting the movement of a train or engine and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals. *See also:* automatic train control. (EEC/PE) [119]
(2) (system) A signal located in the cab, indicating a condition affecting the movement of a train and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals. (VT) 1475-1999

cache (1) A buffer inserted between one or more processors and the bus, used to hold currently active copies of blocks from main memory. (C/BA) 896.3-1993w
(2) A small portion of high-speed memory used for temporary storage of frequently-used data, instuctions, or operands. *See also:* instruction cache; disk cache; high-speed buffer; caching; cache architecture; data cache; cache memory. (C) 610.10-1994w
(3) *See also:* copy. (C/PA) 1328.2-1993w, 1224.2-1993w

cache coherence A system of caches is said to be coherent with respect to a cache line if each cache and main memory in the coherence domain observes all modifications of that same cache line. A modification is said to be observed by a cache when any subsequent read would return the newly written value. (C/BA) 1014.1-1994w, 10857-1994, 896.3-1993w, 896.4-1993w

cache agent A module that uses split transactions to assume all the rights and responsibilities of some number of remote cache modules. (C/BA) 896.4-1993w

cache line (1) Often called simply a "line." The unit of data on which coherence checks are performed, and for which coherence tag information is maintained. In SCI, a line consists of 64 data bytes. (MM/C) 1596-1992
(2) Often called simply a "line." The block of memory (sometimes called a "sector") that is managed as a unit for coherence purposes; i.e., cache tags are maintained on a per-line basis. SCI directly supports only one line size, 64 bytes. (C/MM) 1596.5-1993
(3) Often simply called a "line," the block of memory (sometimes called a sector) that is managed as a unit for coherence purposes; i.e., cache tags are maintained on a per-line basis. Although the SCI line size influenced the RamLink packet sizes, coherence protocols are beyond the scope of this standard. (C/MM) 1596.4-1996

cache architecture (A) A computer architecture that employs an extremely high-speed memory block, called a cache, in which data is stored. **(B)** The organization of cache memory; for example, direct mapped cache, two-way set associative cache. (C) 610.10-1994

cache hit *See:* hit.

caching The process of accessing a cache. (C) 610.10-1994w

cache memory (1) A buffer memory inserted between one or more processors and the bus, which is used to hold currently active copies of blocks of information from main memory. (C/BA) 1014.1-1994w
(2) A buffer memory inserted between one or more processors and the bus, used to hold currently active copies of blocks from main memory. Cache memories exploit spatial locality by what is brought into a cache. Temporal locality is exploited by the strategy employed for determining what is removed from the cache. (C/BA) 10857-1994, 896.4-1993w

CAD *See:* computer-aided design.

CADD *See:* computer-aided design and drafting.

CADEM *See:* computer-aided engineering; computer-aided manufacturing; computer-aided design.

CADF *See:* commutated antenna direction finder.

CADM *See:* computer-aided manufacturing; computer-aided design.

CAE *See:* computer-aided engineering; computer-aided education.

cage (1) A system of conductors forming an essentially continuous conducting mesh or network over the object protected and including any conductors necessary for interconnection to the object protected and an adequate ground. *See also:* Faraday cage. (EEC/PE) [119]
(2) emptydef;. *See also:* aerial platform. (T&D/PE) 524-1992r

cage antenna A multi-wire element whose wires are so disposed as to resemble a cylinder, in general of circular cross section; for example, an elongated cage. (AP/ANT) 145-1993