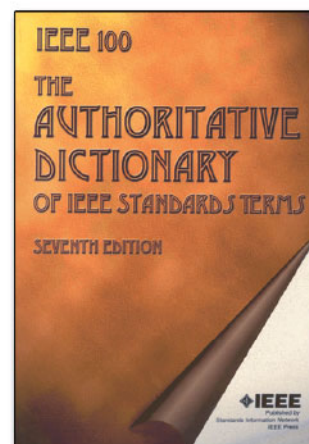


IEEE 100
The Authoritative Dictionary of
IEEE Standards Terms

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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Don Messina

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
 dielectrics and electrical insulation
 dispersed energy storage and generation
 education
 electrical equipment and components
 electricity metering
 electromagnetic compatibility
 electron devices
 engineering in medicine and biology
 engineering management
 geoscience and remote sensing
 graphic symbols and designations
 industrial electronics
 industry applications
 information infrastructure
 information theory
 instrumentation and measurement
 intelligent vehicle highway systems
 lasers and electro-optics
 magnetics
 microwave theory and techniques
 military
 National Electrical Code
 National Electrical Safety Code
 National Fire Protection Association
 neural networks
 non-ionizing radiation
 nuclear and plasma sciences
 nuclear instruments
 oceanic engineering
 photovoltaics
 power electronics
 power engineering
 power quality
 power switchgear
 quantities, units, and letter symbols
 reliability
 roadway lighting
 robotics and automation
 rotating electrical machinery
 signal processing
 Standard 100 legacy data
 stationary batteries
 substations
 surge-protective devices
 systems, man, and cybernetics
 test technology
 time and frequency
 transformers, regulators, and reactors
 transmission and distribution
 ultrasonics, ferroelectrics, and frequency control
 vehicular technology

CS
 DEI
 DESG
 EDU
 EEC
 ELM
 EMC
 ED
 EMB
 EM
 GRS
 GSD
 IE
 IA
 II
 IT
 IM
 IVHS
 LEO
 MAG
 MTT
 MIL
 NEC
 NESC
 NFPA
 NN
 NIR
 NPS
 NI
 OE
 PV
 PEL
 PE
 PQ
 SWG
 QUL
 R
 RL
 RA
 REM
 SP
 Std100
 SB
 SUB
 PSPD
 SMC
 TT
 TF
 TRR
 T&D
 UFFC
 VT

explicitly in a transaction-initiation message and returned in a transaction-completion message. (C/MM) 1212.1-1993

transaction initiation (request) A request generated by the initiator to start an action by the responder. An initiation message usually transfers a command and sometimes data. For a disk read I/O transaction, for example, the initiation transfers the address and command. (C/MM) 1212.1-1993

transaction, I/O See: I/O transaction.

transaction layer (1) The layer above the packet layer for use by applications. It is unspecified in this standard. See also: transaction. (C/BA) 1355-1995

(2) The layer, in a stack of three protocol layers defined for the Serial Bus, that defines a request-response protocol to perform bus operations of type read, write, and lock.

(C/MM) 1394-1995

transaction matrix A matrix that identifies possible requests for database access and relates each request to information categories or elements in the database. (C) 610.12-1990

transaction record A record, representing one transaction, used to process data stored in a master file. See also: update transaction; null transaction; change transaction; delete transaction; add transaction. (C) 610.2-1987

transactor A magnetic device with an air-gapped core having an input winding which is energized with an alternating current and having an output winding which produces a voltage that is a function of the input current. Note: The term "transactor" is a contraction of the words "transformer" and "reactor." (SWG/PE/PSR) C37.110-1996, C37.100-1992

transadmittance For harmonically varying quantities at a given frequency, the ratio of the complex amplitude of the current at one pair of terminals of a network to the complex amplitude of the voltage across a different pair of terminals. See also: interelectrode transadmittance. (IM/HFIM) [40]

transadmittance compression ratio (electron tube) The ratio of the magnitude of the small-signal forward transadmittance of the tube to the magnitude of the forward transadmittance at a given input signal level. (ED) 161-1971w

transadmittance, forward See: forward transadmittance.

transceiver (1) (data transmission) The combination of radio transmitting and receiving equipment in a common housing, usually for portable or mobile use, and employing common circuit components for both transmitting and receiving. (PE) 599-1985w

(2) (navigation aids) A combination transmitter and receiver in a single housing, with some components being used by both parts. See also: transponder. (AES/GCS) 172-1983w

(3) (A) A device that both transmits and receives data. (B) A device that connects a host interface to a network. (C) A device that applies electronic signals to the cable and may sense collisions. Note: Definition (C) is contextually specific to IEEE Std 802.3. (C) 610.7-1995

transceiver cable A four-pair, shielded cable which interconnects a workstation to a transceiver or fan-out box. Note: This term is contextually specific to IEEE Std 802.3. See also: coaxial cable; trunk cable; drop cable; attachment unit interface cable. (C) 610.7-1995

transceiver chatter See: chatter.

transconductance The real part of the transadmittance. Note: Transconductance is, as most commonly used, the interelectrode transconductance between the control grid and the plate. At low frequencies, transconductance is the slope of the control-grid-to-plate transfer characteristic. See also: interelectrode transconductance; electron-tube admittances. (ED) 161-1971w

transconductance meter (mutual-conductance meter) An instrument for indicating the transconductance of a grid-controlled electron tube. See also: instrument. (EEC/PE) [119]

transcribe (electronic computation) To convert data recorded in a given medium to the medium used by a digital computing machine or vice versa. (C) 162-1963w

transcriber (electronic computation) Equipment associated with a computing machine for the purpose of transferring input (or output) data from a record of information in a given language to the medium and the language used by a digital computing machine (or from a computing machine to a record of information). (Std100) 270-1966w

transducer (1) (electrical heating applications to melting furnaces and forehearth in the glass industry) A device that is actuated by power from one system and supplies power in any other form to a second system. (IA) 668-1987w

(2) (communication and power transmission) A device by means of which energy can flow from one or more transmission systems or media to one or more other transmission systems or media. Note: The energy transmitted by these systems or media may be of any form (for example, it may be electric, mechanical, or acoustical), and it may be of the same form or different forms in the various input and output systems or media. (MIL/C/AP/ANT) [2], [85], 145-1983s

(3) (metering) A device to receive energy from one system and supply energy (of either the same or of a difference kind) to another system, in such a manner that the desired characteristics of the energy input appear at the output. (ELM) C12.1-1988

(4) (thyristor) A device which under the influence of a change in energy level of one form or in one system, produces a specified change in energy level of another form or in another system. (IA/IPC) 428-1981w

(5) A device for converting energy from one form to another. (C) 610.10-1994w

(6) A device converting energy from one domain into another. The device may either be a sensor or an actuator. (IM/ST) 1451.2-1997

(7) A device converting energy from one domain into another, calibrated to minimize the errors in the conversion process. A sensor or an actuator. (IM/ST) 1451.1-1999

transducer, active See: active transducer.

Transducer Block An instance of a subclass of IEEE1451-TransducerBlock. (IM/ST) 1451.1-1999

transducer conversion loss The ratio of the SAW power generated in the substrate at the transducer output to the power available in the circuit at the transducer input in decibels. (UFFC) 1037-1992w

Transducer Electronic Data Sheet (TEDS) (1) A data sheet describing a transducer stored in some form of electronically readable memory. (IM/ST) 1451.2-1997

(2) Several of the IEEE 1451.X standards use TEDS to provide a machine-readable specification of the characteristics of the transducer interface. (IM/ST) 1451.1-1999

transducer gain (1) The ratio of the power that the transducer delivers to the specified load under specified operating conditions to the available power of the specified source. Notes: 1. If the input and/or output power consist of more than one component, such as multifrequency signals or noise, then the particular components used and their weighting must be specified. 2. This gain is usually expressed in decibels. See also: transducer. (Std100) 270-1966w

(2) (two-port linear transducer) At a specified frequency, the ratio of the actual signal power transferred from the output port of the transducer to its load, to the available signal power from the source driving the transducer. (ED) 161-1971w

transducer, ideal See: ideal transducer.

Transducer Independent Interface The digital interface used to connect a Smart Transducer Interface Module to a Network Capable Application Processor. (IM/ST) 1451.2-1997

transducer interface The physical connection by which a transducer communicates with the control or data systems that it is a member of, including the physical connector, the signal wires used and the rules by which information is passed across the connection. (IM/ST) 1451.2-1997

transducer, line See: line transducer.

transducer loss The ratio of the available power of the specified source to the power that the transducer delivers to the speci-

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