

**WILEY ELECTRICAL AND
ELECTRONICS ENGINEERING
DICTIONARY**

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WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

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Lexicographer



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PREFACE AND NOTES ON THE USE OF THIS DICTIONARY

This dictionary has over 35,000 entries, each of which occupies a place in one or more of the many areas of expertise encompassed by electrical and electronics engineering. All available sources were consulted, seeking to ascertain the exact manners in which each term is currently utilized. Textbooks, handbooks, treatises, instruction manuals, theses, articles, reports, Usenet postings, and so on, were researched during the process of selecting the terms and writing their definitions, with a good number of entries having multiple provided connotations.

The Internet was used extensively throughout this project, and if one or more persons or entities used a given technical term in the areas covered by this dictionary, there is a decent chance it was taken into consideration. If any given words or phrases were used frequently by multiple people, in varied settings, and when referring to serious endeavors, there is a pretty good chance it can be found in this dictionary. Even so, some terms that continue to appear may not be found here. If a user feels that a given word or phrase not found in this dictionary should be added to a future edition, or wishes to otherwise comment on this book, an email may be sent to the author at: wileyieee@yahoo.com.

There are no special rules for the use of this dictionary. The user simply looks up the desired term to find its definition, plus other practical information when appropriate. When a word or phrase is the same as another, this is clearly stated so as to easily find the definition.

This dictionary could not have been prepared without the contributions of George J. Telecki, Associate Publisher at John Wiley & Sons. He had the idea for this dictionary, suggested the approach and format, and throughout the project provided inestimable support and guidance.

This dictionary has been prepared within the exquisite nature settings of Northwestern Austria. Mr. Wolfgang Gießler is the person who determined that I should be allowed to perform my work as an author in this wonderful country. I am tremendously grateful to him for kindly providing me with the opportunity to live here.

Steven M. Kaplan

*Austria, Europe
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its own. Each autonomous robot has its own controller, while a single controller is shared by multiple **insect robots**.

autonomous system In networks such as the Internet, a collection of routers under a single administrative authority using its own management rules and protocols.

autonomous system number A number which identifies an **autonomous system**.

autopatch A remote-controlled device for interconnecting a radio communicator and a landline telephone network.

autopilot Same as **automatic pilot**.

autoplay Abbreviation of **automatic playback**. A feature which automatically begins playback or runs a program when an optical disc, such as a DVD, CD, or CD-ROM, is placed in its drive. Also spelled **auto play**.

autopolarity The ability of a digital meter to display readings with the correct polarity, without having to interchange the input connectors.

autopolling Also spelled **auto polling**. Also called **polling**. 1. In a system, the periodic detection of the status of all connected devices, to address any needs for resources. This contrasts with an **event-driven** allocation scheme, where interrupts are sent to request resources. 2. In networking, the sequential determination of which terminals wish to transmit data, to allow doing so in an orderly manner. 3. A feature which allows a fax machine to call another, and request that the remote machine transmit documents.

autopolling cycle A complete **autopolling** (1) or **autopolling** (2) sequence. For example, in one such cycle, each connected terminal is interrogated once. Also called **polling cycle**.

autoranging In meters with multiple ranges of measurement, automatic switching upward of intervals until readings are made in the range within which the highest indication does not exceed the full-scale value. Some meters also adjust downwards. Also spelled **auto ranging**. Also called **automatic ranging**.

autoreadial Same as **auto redial**.

autorefresh Abbreviation of **automatic refresh**. The updating of a Web page without user intervention. Seen, for instance, when the same page displays different ads every few seconds or minutes. Also spelled **auto-refresh**.

autoreset Abbreviation of **automatic reset**.

autoresponder Abbreviation of **automatic responder**. Also spelled **auto-responder**. A feature or program which automatically sends a previously prepared email in response to a received email. Used, for instance, to inform that an email has been received and will be responded to at a later time. Also called **email autoresponder**, or **mail autoresponder**.

autoresume Same as **auto resume**.

autorun A program that launches automatically under the appropriate circumstances. For example, a CD-ROM may activate the installation program after insertion into the drive. Also spelled **auto-run**.

autosave A feature in many computer programs which provides for automatically saving to disk at specified intervals. This is useful in minimizing data loss in the event of a program, system, or power failure. Also spelled **auto-save**.

autoscroll Acronym for **automatic scrolling**. Scrolling that occurs without user intervention. For example, a Web browser or Web page may provide an option for the pages viewed to be automatically scrolled at a given rate. Also spelled **auto scroll**.

autostart routine The sequence of steps a computer is programmed to follow upon turning on its power. These include running diagnostic procedures, loading the operating system, and otherwise preparing for use. Also spelled **auto-start routine**.

autotest One or more tests that are automatically performed in preparation for use, or to ascertain proper operation. Also spelled **auto-test**.

autotrace A method of converting a bitmap image into a vector-graphics image. This allows for simpler editing, especially when using object-oriented programs. Also spelled **auto-trace**.

autotracking Also spelled **auto-tracking**. 1. Tracking which is maintained autonomously. 2. Control of two or more power supplies by one of them. 3. In a video-cassette player, a feature which automatically makes the necessary adjustments so that the heads continuously scan the tracks on the tape accurately.

autotransductor A transducer in which the same windings carry the main current and the control current.

autotransformer A transformer that has a single tapped winding, so that part serves as the primary winding, and part as the secondary winding. Voltage step-up or step-down of is effected using a tap on the common winding. Also spelled **auto-transformer**.

aux input Same as **auxiliary input**.

auxiliary anode In electroplating, a supplementary anode utilized to obtain a better distribution of plating.

auxiliary channel A supplemental communications channel, which can serve, for instance, for backup, for testing, or for transmission of a secondary audio program. Also known as **secondary channel**.

auxiliary circuit A supplementary circuit which can serve, for instance, as an alternate path for current.

auxiliary contacts In a switching device, supplemental contacts whose function is linked to that of the main circuit contacts.

auxiliary device A device which serves in a supplemental or auxiliary capacity, or that is added to enhance the performance of the main device. Also called **ancillary device**.

auxiliary equipment Equipment which serves in a supplemental or auxiliary capacity, or that is added to enhance performance. Also called **ancillary equipment**.

auxiliary function A function which supplements or enhances the operation of a device, piece of equipment, or system.

auxiliary input An additional input, such as that found on the back panel of a stereo receiver, which accepts signals from certain devices which do not already have dedicated inputs. For example, an input for an additional CD player such as an SACD player. Its abbreviation is **aux input**.

auxiliary memory 1. A form of high-speed computer memory which accessed through a high-speed data channel. Unlike RAM, this memory is not directly addressable by the CPU. 2. Same as **auxiliary storage**.

auxiliary power An alternate or supplemental source of electrical power that may be used when the main power source is interrupted, depleted, or insufficient. Also called **supplemental power**, or **secondary power** (1).

auxiliary relay A relay that supplements the action of another.

auxiliary storage Also known as **auxiliary memory** (2), or **backing storage**. 1. Any device that a computer uses as a storage medium. For example, disk drives or tape drives. 2. Additional computer storage beyond that in the main storage.

auxiliary switch A switch that works in unison with another.

aV 1. Abbreviation of **attovolt**. 2. Abbreviation of **abvolt**.

AV Abbreviation of **audiovisual**, or **audio video**.

AV connector Abbreviation of **audio/video connector**.

AV inputs Abbreviation of **audio/video inputs**, or **audiovisual inputs**.

electro-optical Same as **electro-optic**.

electro-optical device Same as **electro-optic device**.

electro-optical effect Same as **electro-optic effect**.

electro-optical Kerr effect Same as **electro-optic Kerr effect**.

electro-optical material Same as **electro-optic material**.

electro-optical modulator Same as **electro-optic modulator**.

electro-optics The study and application of the physical and optical properties of electron beams under the influence of electric and/or magnetic fields, in a manner analogous to the behavior of light beams passing through a refractive medium such as a lens. Electro-optics also deals with devices and phenomena incorporating both electronics and optics, as is the case with photoelectricity, lasers, and fiber-optics. It is sometimes utilized as a synonym for **optoelectronics**, but this usage is incorrect. Also called **electron optics**.

electro-osmosis Same as **electroosmosis**.

electroacoustic Pertaining to devices whose operation involves both electric and acoustic energy. Speakers and microphones are examples.

electroacoustic effect The development of a DC voltage in a crystalline or metallic material caused by acoustic waves traveling parallel to its surface. Also known as **acoustoelectric effect**.

electroacoustic transducer **1.** A device which transforms acoustic energy into electric energy. For example, a microphone. **2.** A device which transforms electric energy into acoustic energy. For example, a speaker.

electroacoustics The science that deals with the transformation of acoustic energy into a corresponding electric energy, and vice versa. Speakers, microphones, and amplifiers are examples of devices used in this field.

electroanalysis **1.** The use of electrolysis for chemical analysis. **2.** The use of electrochemical methods for chemical analysis.

electrobiolgy The science pertaining to electrical phenomena in living organisms. This includes, for instance, the study of bioelectricity.

electrocardiogram A graphical recording of the variations in the electrical activity of the heart. An **electrocardiograph** is used to detect and record such activity. Its abbreviation is **ECG**, or **EKG**. Also called **cardiogram**.

electrocardiograph An instrument which detects and records variations in the electrical activity of the heart. An **electrocardiogram** is the graphical recording of this activity. Its abbreviation is **ECG**, or **EKG**. Also called **cardiograph**.

electrocardiography The technique employed to obtain an **electrocardiogram**. Electrocardiography utilizes electrodes applied to various parts of the body, which detect the electrical signals produced by the heart. Also called **cardiography**.

electrocautery The use of an electrically-heated probe to destroy tissue. For instance, one or more platinum wires may be heated to a very high temperature by a direct current or an alternating current.

electrochemical Pertaining to **electrochemistry**.

electrochemical cell A cell which consists of two electrodes immersed in an electrolyte, and in which a chemical reaction occurs that either generates or consumes electrical current. When a current is generated it is a voltaic or galvanic cell, and when current is consumed it is an electrolytic cell.

electrochemical deposition The use of electrolysis for the formation of a metallic layer on a substrate. May be used, for instance, to electroplate.

electrochemical equivalent For an electrolytic solution through which one coulomb of current is passed, the mass, in grams, of any chemical substance produced or consumed.

It may refer, for instance, to the mass of a metal deposited during electroplating.

electrochemical machining The process of removing a metal or alloy from a material, through electrolytic action. The shape of the cathode determines the final shape of the material. It is the reverse of electroplating. Used, for instance, to remove excess metal from an otherwise finished piece. Its abbreviation is **ECM**. Also called **electrolytic machining**.

electrochemical power Electric energy derived from the conversion of chemical energy. For example, the power obtained from a galvanic cell.

electrochemical process **1.** A chemical process which gives rise to an electric current. This occurs, for instance, in a galvanic cell. **2.** A process in which an electric current gives rise to a chemical process. This occurs, for instance, in electrolysis.

electrochemical series Also called **electromotive series**. **1.** A series of elements listed in the order of their relative tendency to lose electrons. The greater the tendency to lose electrons, the higher on the list. Highly reactive metals such as lithium, potassium, and calcium are at the top of such a list, while inert metals such as silver, platinum, and gold are at the bottom of it. Hydrogen is arbitrarily set as the zero point. **2.** An **electrochemical series (1)** listing only metals.

electrochemical transducer **1.** A transducer that converts an electrical quantity into a chemical change. **2.** A transducer that converts a chemical change into an electrical quantity.

electrochemiluminescence Also called **electrogenated luminescence**. **1.** The emission of light as a consequence of a transformation of chemical energy into electric energy. **2.** The emission of light as a consequence of a transformation of electric energy into chemical energy.

electrochemistry The science that pertains to the electrical effects of chemical phenomena, and to the chemical effects of electrical phenomena. Also, all that pertains to the transformation of chemical energy into electrical energy, and vice versa. Myriad processes involve electrochemistry, including electrolysis, chemical bonding, electrometallurgy, bioelectricity, and so on.

electrochromic display A passive solid-state display which incorporates a material whose light-transmitting and light-reflecting characteristics are controlled by an electric field.

electrocoagulation The use of a high-frequency electric current to destroy tissue, or to coagulate blood.

electrocochleography A technique for the measurement of electrical activity in the inner ear resulting from sound stimuli.

electrocute To produce death by means of an **electric shock**. May also refer to a severe injury resulting from an electric shock.

electrocution An **electric shock** producing death. May also refer to an electric shock resulting in a severe injury.

electrode A conductor which serves to deliver, receive, collect, emit, deflect, or control electric charge carriers. An electrode provides the path for current entering or leaving a medium such as a dielectric, electrolytic solution, semiconductor, gas, or vacuum. In an electron tube or electrolytic cell, for instance, the anode is the positive electrode, while the cathode is the negative electrode. It is often a metal, and may consist, for instance, of a wire, grid, plate, or region.

electrode admittance A measure of the ease with which AC flows through an electrode. It is the reciprocal of **electrode impedance**.

electrode capacitance The capacitance between an electrode and a reference, such as ground or all other electrodes connected together.

electrode characteristic A curve or graph representing the relationship between the electrode potential and the current. **Optoelectronic Sciences LLC, v. IPR2024-01133**