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Lighting Controls Terminology

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LIGHTING CONTROLS TERMINOLOGY

1. Scope

To define terminology related to controls for lighting systems for non-residential and residential applications.

2. Background

NEMA's Lighting Controls Section established an Industry Definitions Working Group to create a set of industry-accepted definitions for lighting controls terminology typically found in energy codes, standards, design guides, and other industry documents. The working group was established because there are many inconsistent and sometimes conflicting definitions for lighting and lighting control terminology among the many industry documents. Most energy codes and standards, design guides, recommended practices, textbooks, and professional handbooks have either a glossary or terminology section that provides definitions for terms used in the document. The definitions are typically written by the document authors. Because these documents are authored by different organizations and committees, the definitions are inconsistent, which causes inconsistent application of terms in codes and standards, and confusion in the industry. The goal is to have the NEMA definitions ultimately used as the definitive reference for codes, standards, and legislation. This will eliminate the creation of new definitions for already defined terms, minimize misapplication of controls terminology, and eliminate the need for customized glossaries and terminology sections. Furthermore as codes and standards are updated, it will ultimately result in unified definitions across multiple types of documents and hopefully throughout the lighting and lighting controls industry.

This document was developed by reviewing every known definition for lighting control terminology and ultimately agreeing upon the best definition. The working group reviewed definitions from documents such as American Society of Heating and Refrigerating and Air Conditioning Engineers (ASHRAE) Standards, Illuminating Engineering Society of North America (IESNA) Handbook, NEMA guides, and all energy codes in use at the time, including California Title 24, (see section 4).

3. Terms and Definitions

	Term	Definition
1	Adaptive Compensation	Lowering illuminance at night in spaces, based on research indicating that people both need and prefer less light at night than during the day. For example, in applications with long hours of operation during the night, such as airports and 24-hour retailers, this can produce significant energy savings.
2	Ambient Lighting	See <i>general lighting</i> .
3	Analog Control	A control loop in which data is expressed or measured by means of one or more physical properties that can express any value along a continuous scale.
4	Astronomical Time Switch	A device that provides a signal to turn a load on or off or adjust power in steps based on the time of day or based on astronomical events such as sunset or sunrise, accounting for geographic location and day of the year. Also known as an <i>astronomical time clock</i> .
	Astronomical Time Clock	See <i>astronomical time switch</i> .
5	Automatic	Self-acting, operating by its own mechanism when actuated by some non-manual influence.
6	Automatic Daylighting Control	A device or system of devices that are used for automatically regulating electric lighting power in response to the amount of daylight that is present in a space. Such a control may adjust lighting in multiple steps, or continuously.
7	Automatic Shut-off Control	A device capable of automatically turning loads off without manual intervention.

8	Automatic Time Switch	See <i>time switch</i> .
9	Bi-level Control	A lighting control strategy that provides two light levels—one at full-ON and one at a lower level. This may include turning off some portion of the lighting so that uniform light level and distribution is maintained. In addition to the two ON settings, bi-level control may provide for full-OFF. Also known as <i>bi-level switching</i> .
10	Bi-level Occupancy Sensor	An <i>occupancy sensor</i> that provides the capability for two light levels—one at full-ON and one at a lower level. The device may also provide automatic-OFF.
11	Bi-level Switching	See <i>bi-level control</i> .
12	Captive Key Switch	A type of switch in which a key is required to activate or deactivate the load; the key cannot be removed when the load is in the ON position.
13	Continuous Dimming	See <i>dimming, continuous</i> .
14	Clerestory	A portion of an interior rising above adjacent rooftops and having vertical windows admitting daylight to the interior.
15	Control Device	A device used to regulate the operation of equipment.
16	Count-Down Timer	See <i>timer switch</i> .
17	Daylighting Control(s)	A device or system of devices that are used for regulating electric lighting power in response to the amount of daylight that is present in a space.
18	Daylight Dimming	See <i>daylight harvesting</i> .
19	Daylight Harvesting	A lighting control strategy used to manage a building's energy consumption by automatically regulating the use of electric lighting in response to the amount of daylight available.
20	Daylight Hours	The time period from 30 minutes after sunrise to 30 minutes before sunset.
21	Daylight Management	Manual or <i>automatic</i> means of controlling daylight penetration ideally enabling daylight to enter the building without creating glaring visual conditions or damaging interior contents that are sensitive to solar radiation. Daylight management can be achieved by using window treatments, glazing, light shelves, louvers, etc. It may also be called <i>shade control</i> or <i>daylight control</i> , not to be confused with <i>daylight harvesting</i> .
22	Daylight Sensor	See <i>photosensor</i> .
23	Daylighted Area	The area substantially illuminated by daylight where the illumination provided by electric lighting may be reduced or eliminated.
24	Daylighting	The practice of applying architectural design principles to use windows, light shelves, or other openings and reflective surfaces in the design of the building so that during the day natural light provides effective internal illumination.
25	Demand Response	<i>Load shedding</i> initiated by the energy provider.
26	Demand Responsive Lighting System	A <i>lighting system</i> that has the ability to automatically control power consumption in response to a <i>demand response</i> signal.
27	Dimmer	A control device that is capable of varying the light output of light sources. It may be capable of <i>continuous</i> or <i>stepped dimming</i> .
28	Dimming, Continuous	A lighting control strategy that varies the light output of a lighting system over a continuous range from full light output to a minimum light output without flickering in imperceptible steps.
29	Dimming, Stepped	A lighting control method that varies the light output of lamps in one or more predetermined, discrete steps of greater than one percent of full output. The changes between levels may be perceptible.
30	Energy	The capacity of a system to do work. In electrical terms, energy (E) is the amount power used over a time period, typically reported in watt-hours (Wh), kilowatt-hours (kWh) or British Thermal Units (BTU).

31	Energy Management Control System	A control system used for managing the energy use of building systems such as heating, ventilation and air conditioning (HVAC), lighting, refrigeration, plug loads, and water heating systems. The system may also be capable of monitoring environmental and system loads, and performing adjustments to optimize energy usage and respond to demand-response signals.
32	Energy Use Intensity	An expression of building energy use in terms of net energy divided by gross floor area; commonly abbreviated as EUI. Also known as <i>energy utilization index</i> .
33	Energy Utilization Index	See <i>energy use intensity</i> .
34	Fenestration	All areas in the building envelope that let in light including windows, plastic panels, <i>clerestories</i> , <i>skylights</i> , glass doors that are more than one-half glass and glass block walls.
35	Fixture	See <i>luminaire</i> .
36	General Lighting	Lighting designed to provide a uniform level of illuminance throughout an area, exclusive of any provision for additional task-specific lighting requirements.
37	Lamp	A generic term for a man-made light source created to produce optical radiation. The term is also used to denote sources that radiate energy in other regions of the spectrum such as IR and UV. A lamp is sometimes called a bulb or tube.
38	Light Source	See <i>lamp</i> .
39	Lighting Control	Electrical devices and techniques used to regulate the output of <i>luminaires</i> or <i>light sources</i> to provide the necessary amount of light.
40	Lighting Control System	A <i>lighting control</i> where two or more components are required to be installed in the field to provide all of the functionality required to make up a fully functional and compliant lighting control.
41	Lighting Control Zone	An illuminated area or group of areas for which the lighting conditions are sufficiently similar as to allow the lighting equipment to be controlled in unison.
42	Lighting control, Self-Contained	A unitary <i>lighting control</i> device where no additional components are required for a fully functional lighting control.
43	Lighting Power Density (LPD)	The lighting power per unit area typically expressed as watts per square foot or meter.
44	Lighting System	A collection of <i>luminaires</i> and related lighting equipment installed in an application to provide the right amount of light where and when needed, with consideration of human comfort, visibility, safety and security, the physical environment, and daylight integration. Such a system is comprised of multiple components such as <i>luminaires</i> , <i>lighting controls</i> , and windows or <i>skylights</i> designed to minimize energy use while maintaining lighting quality.
45	Load Shedding	A control strategy for selectively reducing the load of a system on a temporary basis to reduce energy usage. A building manager or system may utilize load shedding to avoid peak pricing or to avoid a condition where demand exceeds supply.
46	Lumen Depreciation Compensation	See <i>lumen maintenance control</i> .
47	Lumen Maintenance Control	A lighting control strategy that adjusts <i>lamp</i> power over time to maintain constant light output as lamps age, dirt accumulates in <i>luminaires</i> or both. This strategy allows for energy savings early in the life of a system then increases power as the system ages. Also known as <i>lumen depreciation compensation</i> .
48	Luminaire	A device to produce, control, and distribute light. It is a complete lighting unit consisting of one or more <i>lamps</i> and some or all of the following components: optical <i>control devices</i> designed to distribute the light; sockets or mountings to position and protect the lamps and to connect the lamps to a supply of electric power; the mechanical components required to support or attach the luminaire, and various electrical and electronic components to start, operate, dim, or otherwise control and maintain the operation of the lamps.
49	Manual Control	A lighting control strategy that requires human intervention to control electric lighting. For example, wall switches or remote controls.

50	Master Lighting Shut-Off Control	A <i>manual control</i> used to turn off permanently installed lighting from one location or from a remote location. This strategy is typically used to turn off most or all permanently installed lighting in a building.
51	Motion Sensor	An <i>occupancy sensor</i> used for exterior areas.
52	Multi-level Lighting Control	A lighting control strategy that provides at least three light levels—one at full-ON and two at lower levels. This may include turning off some portion of the lighting so that uniform light level and distribution is maintained. In addition to the three ON settings, multi-level control may provide for full-OFF. Continuous dimming systems meet this requirement. Also known as <i>multi-level switching</i> or <i>stepped switching</i> .
53	Multi-level Occupancy Sensor	An <i>occupancy sensor</i> that provides the capability for at least three light levels—one at full-ON and two at lower levels. The device may also provide automatic-OFF.
54	Multi-level Switching	See <i>multi-level lighting control</i> .
55	Multi-scene Control	A <i>lighting control</i> device or system that allows for two or more pre-defined lighting settings, an “all off” setting, and allows for the recall of these settings for a <i>luminaire</i> ; a group or multiple groups of luminaires to suit multiple activities in the space.
56	Occupancy Sensing	A lighting control strategy that regulates the operation of lighting or other equipment based upon detecting the presence or absence of people within a space.
57	Occupancy Sensor	A <i>control device</i> that detects the presence or absence of people within a space or area and causes lighting, equipment, or appliances to be regulated according to the required <i>sequence of operation</i> .
58	On-off Switching	A lighting control strategy that turns a <i>luminaire</i> or group of luminaires on or off using manual or automatic methods.
59	Override	A <i>manual control</i> that is used for operating lighting or other equipment that is under the control of an automatic system. For example, an override may be used to turn lights ON after scheduled automatic shut-off.
60	Personal Control	A lighting control strategy that enables users to adjust their illuminated environment to their personal preference within their work space.
61	Photocell	A solid-state device that converts light into electrical energy by producing a voltage as in a photovoltaic cell, or, uses light to regulate the flow of current as in a photoconductive cell.
62	Photocontrol	See <i>photosensor</i> .
63	Photosensor	A <i>control device</i> that detects the presence of visible light, infrared (IR) transmission, and/or ultraviolet (UV) energy. This may also be referred to as a <i>photocontrol</i> or a <i>daylight sensor</i> .
64	Rooftop Monitor	Vertical <i>fenestration</i> integral to the roof, may also be referred to as a roof monitor.
65	Scheduling	A control strategy that controls lighting, equipment, or systems based on the time of day or astronomical event. For example, scheduling building lighting to automatically turn OFF at 6 p.m. or sunset.
66	Sequence of Operation	A description of how lighting and/or other systems shall operate to fully meet the control design intent.
67	Sequence of Operation: Automatic Partial-ON/ Automatic- OFF	Automatic activation of a lighting load to a reduced power level between full-ON and full-OFF and automatic deactivation of the lighting load from either an occupancy or time-based system.
68	Sequence of Operation: Automatic-ON/ Automatic-OFF	Automatic activation of a lighting load to full power and automatic deactivation with no manual intervention.
69	Sequence of Operation: Automatic-ON/Partial-OFF	Automatic activation of a lighting load to full power and automatic reduction of lighting power to a level between full-ON and full-OFF from either an occupancy or time-based system.

70	Sequence of Operation: Manual-ON/Automatic-OFF	Manual activation/automatic deactivation of an electrical load. See <i>vacancy sensor</i> .
71	Shade Control	A method of <i>daylight management</i> using manual or automatically controlled window or <i>skylight</i> treatments to manage daylight and glare.
72	Sidelighting	<i>Daylighting</i> provided by vertical <i>fenestration</i> mounted below the ceiling plane.
73	Skylight	<i>Fenestration</i> installed on a roof less than 60 degrees from the horizontal.
74	Stepped Dimming	See <i>dimming, stepped</i> .
75	Stepped switching	See <i>multi-level lighting control</i> .
76	Task Tuning	See <i>tuning</i> .
77	Time Clock	See <i>time switch</i> .
78	Time Scheduling	See <i>scheduling</i> .
79	Time Switch	A device that controls lighting, equipment, or systems based on the time of day—typically used for time scheduling strategies. Also known as <i>time clock</i> . See also <i>astronomical time switch</i> .
80	Timer Switch	A <i>control device</i> that turns lights or other loads on when manually activated and automatically turns lights or other loads off when a user-selected time period elapses. Sometimes referred to as <i>count-down timer switch</i> or <i>count-down timer</i> .
81	Toplighting	<i>Daylighting</i> provided by <i>fenestration</i> mounted above the ceiling plane including <i>skylights</i> , tubular daylighting devices, and vertical fenestration in <i>rooftop monitors</i> , and fenestration mounted above a lower adjacent ceiling plane in the spaces in <i>clerestories</i> .
82	Tuning	A lighting control strategy in which the maximum light output of an individual or group of <i>luminaires</i> is set to provide the appropriate amount of light for a space, task or area. Tuning is sometimes accomplished using high-end trim. Also known as <i>task tuning</i> .
83	Vacancy Sensor	An <i>occupancy sensor</i> using a <i>manual-ON/automatic-OFF sequence of operation</i> .

4. References

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