

CONTROL TECH TERMS

This guide outlines key terms and concepts *you need to know* in order to communicate effectively with all project stakeholders.

LET'S GET ON THE SAME PAGE

With the rapid pace of change in the lighting and controls industry, it is easy to confuse the ever-expanding list of new terms, technologies, and concepts being applied to networked lighting control solutions.

Part #1: Understanding System Components

Most Networked Lighting Control (NLC) Systems have basic components in common. Understanding the discrete components will help you better understand the pros and cons of different systems available on the market.

| COMPONENT | WHAT DOES IT DO | HOW DOES IT DO IT | NOTES |
|--------------------|---|--|---|
| Luminaire driver | Controls power to the luminaire and regulates dimming | Various control protocols; 0-10 volt, DALI, DMX | Not all LED fixtures come standard with dimming |
| Load controller | Sends commands and data from luminaire to NLC system | Wireless radio signal to Gateway | Load may be luminaires, receptacles, or motors |
| Gateway or hub | Communicates wirelessly with NLC components and other building systems | RF, cellular, ethernet server | May be wired in very large systems or POE |
| Central server | A more robust computing platform for NLC's and other whole building systems | Programmed through system computer software | Not required for all NLC, but will be needed to interface with other BMS |
| Configuration tool | Allows users to program functionality wirelessly throughout the NLC system | Programs load controllers and all system devices | Can be an App, a computer application or a mix of proprietary hardware and software |
| Wall station | Allows users to send signals to the system and relevant luminaires | By manually pushing a button or touchscreen | Wall stations were formally just known as "switches" or "dimmers" |

Part #2: Basic Controls Terminology

Once you understand the system components, it's easier to understand basic controls concepts and terminology.

| CATEGORY | PHRASE/CONCEPT | WHAT'S IT DOING |
|---------------------|-----------------------------|--|
| Sensors | Occupancy / Vacancy | Detects room or space occupancy |
| | Photo Sensing | Detects changes in light levels |
| Control Methods | High end Trim (task-tuning) | Reduces initial maximum light output to target levels |
| | Occupancy / Vacancy | Turns luminaires on when occupied, and down or off when nobody is present |
| | Daylight Harvesting | Reduces luminaire output when natural daylight is present |
| Controls Allocation | Zone | A collection of fixtures that are always controlled together the same way |
| | Group | A collection of control zones that are frequently controlled together, but not always |
| | Scene | A collection of control zones – with preset's – that can initiate a number of complex control strategies easily and repeatably |

SO IT'S ON MY NETWORK?

It is important to understand that though the system is a network, it does not necessarily need to be on the building IT network.

Many NLC systems operate on their own independent network.



COMMUNICATION PROTOCOLS AND LOAD CONTROL PROTOCOLS

A **communication protocol** is a system of rules that allows two or more devices to transmit information.

Common wireless examples include WiFi, bluetooth, Zigbee or cellular networks.

A **load control protocol** can be thought of as the actual content in the message being communicated.

Examples include DALI, DMX512, proprietary digital protocols or 0-10 volts (analog).

Part #3: Networked Lighting Controls and Luminaire Level Lighting Controls, What's the Difference?

Now that you understand the basic components and concepts, we can take a closer look at the two primary ways these lighting systems operate in commercial buildings.

LLLC IS A TYPE OF NETWORKED LIGHTING CONTROLS SYSTEM

NLC and Luminaire Level Lighting Controls (LLLC) systems both deploy the same control strategies to ensure code compliance, tenant comfort, and sustained energy savings. Some products can be configured to operate in either mode.

The primary difference (and key concept) between these two approaches can be understood as a **1 to 1 vs. a 1 to many relationship**.

NETWORKED LIGHTING CONTROLS

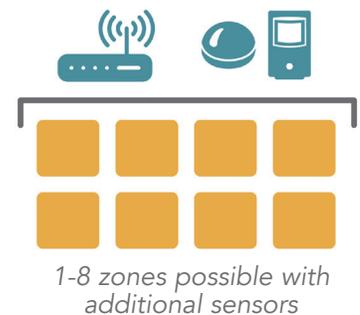
A Networked Lighting Controls (NLC) system is the combination of sensors, network interfaces, wall stations, and controllers that affect lighting changes to luminaires.

In a NLC system configuration there is a **one to many** relationship with one sensor controlling many luminaires.

LUMINAIRE LEVEL LIGHTING CONTROLS

Increasingly, manufacturers are integrating NLC system components directly into luminaires. With LLLC, there is a **one to one** relationship with every light fixture being capable of being controlled directly. Each luminaire is its own control zone or may be grouped into zones with multiple luminaires – simplifying design, installation, and space reconfiguration.

BASIC NLC CONFIGURATION



LLLC CONFIGURATION

