Strategic Direction of DLC Specifications
Solid-State Lighting Specs
Proposed Spec Changes (TRT 4.1)

- New General Application Category
  - Very High Output Outdoor Lighting, ≥25,000 lumens
- New Primary Use Designation
  - U-Bend Replacement Lamps
- Definition Change
  - Allow Refrigerator Case Luminaires to employ pin-type connectors for the electrical connection only, but not for mechanical support
- Input Requested
  - “Hazardous” definition for future Hazardous Environment Lighting Category
- Additional Efforts Under Discussion For Development
  - Definition change to restrict Linear Replacement Lamps to G13 base
  - T5 Linear Replacement Lamps
Policy Proposals Overview

• Revision to Private Labeling Policy
  – Require Private Label Applicants to provide proof of safety certification under own organization

• Rated Data for Single and Family Grouping Applications
  – Require rated data to be representative of product’s tested configuration

• Adoption of ANSI C78-377-2015
  – Updated color metrics standard

• Additional Proposals Requested Addressing:
  – DC/PoE Systems
  – White Color Tuning
Summarized Wish List

- Ambient Lighting
- Kits and Lamps
- Niche and Misc. Products
- Non-SSL Technologies
- Dimmable Lamps
- Definitional Clarifications
- Removable/Replaceable Lamps
- Warranty
- Pre-Set Drivers to Manage Lumen Depreciation Over Time
- Dimming Performance
- Remote Phosphor
- AC LEDs
- Testing Large Products
- Flicker
- Surge Protection
- Lab Accreditation
- Ambient Temperature Testing
- Multiple Sourcing of LEDs
- Color Tuning
- Expansion to Family Grouping
- Strict Worst Case Rules
- Rules on Aimable Products
- Thermal Fold-back
- Pre-Set Drivers to Manage Lumen Depreciation Over Time
- Multiple, Unknown LED Variations Within a Product
- Safety Certification
Balancing Needs

Pushing Efficacy
- Reducing Testing Burden
- Additional Product Metrics
- Informing Product Selection

Compromising Quality
- Maintaining Rigor
- Manufacturer Cost
- Luminaire Level Requirements
Establish Predictable Schedule for Spec Revisions

- Increase transparency
- Provide signal to market
- Increase opportunity for input
Revision Schedule

- Listing accuracy
- Phase out discontinued products

Maintain Up-To-Date Performance Data
Drive Efficacy AND Quality

- Ensure current metrics remain relevant in the market
- Define “quality” metrics
- Create system of Allowances for products with special features
Consider Opportunities to Reduce Testing Burden

- Relevant metrics
- Increased flexibility
- Accommodation for versatility
Enable Product Selection

- Translate luminaire level performance to the application setting
- Additional metrics?
- Design guidance?
Attend Discussion Sessions for More Info

Wednesday, 10:30 - Noon

- SSL Category and PUD Development (Onyx)
- Allowances for Unique Applications (Ballroom A)
- DC/PoE Lighting (Ballroom B)
First Networked Lighting Control Spec Published April 21, 2016

Networked Lighting Control Systems Specification
Version 1.01
Issued April 21, 2016
Revised May 6, 2016

Schedule of Revisions

<table>
<thead>
<tr>
<th>Revision Number</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>April 21, 2016</td>
<td>Initial Specification Published</td>
</tr>
<tr>
<td>1.01</td>
<td>May 7, 2016</td>
<td>Clarified that the specification is for Interior Control Systems. Systems designed and marketed exclusively for exterior applications are not eligible to be qualified.</td>
</tr>
</tbody>
</table>

This document defines requirements to be met or reported for lighting control systems listed on the DesignLights Consortium™ (DLC) Networked Lighting Controls Qualified Products List (QPL).

Scope of Specification

This is a specification for Interior Networked Lighting Control systems. Such systems are defined for the purposes of this specification as the combination of sensors, network interfaces, and controllers that effect 'Required' System Capabilities

- Networking of Luminaires and Devices
- Occupancy Sensing
- Daylight Harvesting
- High-End Trim
- Zoning
- Luminaire and Device Addressability
- Continuous Dimming

'Reported' System Capabilities

- Type of User Interface
- Luminaire Level Control
- Integrated Luminaire Level Control
- Localized Processing / Distributed Intelligence
- Scheduling
- Personal Control
- Load Shedding (DR)
- Plug Load Control
- Other Building Systems Integration
- Energy Monitoring
- Device Monitoring / Remote Diagnostics
A Framework for the Future

• Flexible structure supports evolving technology and varying utility program needs
• Equips utilities with key resource to scale up support of technology
• Provides a resource to the market to understand, evaluate, and compare control systems
First NLC QPL Published June 27, 2016

<table>
<thead>
<tr>
<th>Company</th>
<th>Brand</th>
<th>Name of Control System</th>
<th>Technical support phone number</th>
<th>Scope/Scale of System (Room, Whole Building, Enterprise)</th>
<th>Product Website</th>
<th>System/Component Warranty</th>
<th>If the system is available in some configurations that meet the DLC specification, and other configurations that do not meet the specification, what components or combinations are necessary to meet the specification?</th>
<th>Case studies available?</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB Lighting</td>
<td>Lightcloud</td>
<td>Lightcloud</td>
<td>844 LIGHTCLOUD</td>
<td>Room level solution, whole building level solution, and enterprise solution</td>
<td>lightcloud.com and <a href="http://www.rebweb.com/lightcloud-dl.php">http://www.rebweb.com/lightcloud-dl.php</a></td>
<td>30 Years</td>
<td>1 or more LC GATEWAY for networking, high end trim, continuous dimming. 1 or more LC DAYLIGHT for daylight harvest. 1 or more LC DENSE15/D10 for occupancy control. 1 LC CONTROL 20/D10 or LC DENSE15/D10 per luminaire for addressability &amp; zoning. 1 or more browser interface device to adjust settings (tablet, mobile, computer)</td>
<td>no cases studies are currently available</td>
</tr>
</tbody>
</table>

Networked Lighting Control QPL
Qualified Systems Summary Information

Instructions
* Press to filter list by company, brand, system name, or characteristic.
QPL Status

Qualified Systems

Systems under Review

enlighted

RAB Lighting

Acuity Brands

CREE

Eaton

nedap

PHILIPS
DLC Members that will require Systems to be on NLC QPL in 2016 or 2017*

*Based on Survey Responses from 55% of DLC Members
DLC Members launching specialized programs/rebates for NLCs

*Based on Survey Responses from 55% of DLC Members
DLC Members actively considering specialized programs/rebates for NLCs

*Based on Survey Responses from 55% of DLC Members
Where to find this information

Newly Updated **Member Program Summary** on ‘DLC Member’ page includes information on programs/incentives available from DLC Members.

- Incentive types/amounts
- Incentives for DLC Premium
- Current and planned use of Networked Lighting Control QPL
Networked Lighting Controls Revision Cycle

- Specification Revised Annually every June 1
- Revision process begins every February to allow time for stakeholder input
- One Year Grace Period
From Capabilities to Performance of Capabilities

Add more specific capability performance requirements

- Example: Requirements for how 0-10V dimming is implemented following forthcoming ANSI C137 0-10V Standard
Verification: Add Performance Testing over Time

- Support development of testing standards
- Explore “Test Room” Concept
- Adopt applicable standards that are completed
  - Example: Nearly completed ANSI C1370-10V Standard
Develop Requirements for Exterior Controls

Image Credit: DOE
Spec Requirements for DC and PoE
Support Utility Implementation of Specs

- Develop guidance for where/when spec requirements are required at the project level
  - Individual luminaire addressability
  - Occupancy Sensing
  - Daylight Harvesting
  - High-End Trim
Promote QPL as a Product Selection and Comparison Tool

'Required' System Capabilities

- Networking
- Occupancy Sensing
- Daylight Harvesting
- High-End Trim
- Zoning
- Luminaire and Device Addressability
- Continuous Dimming

Understand, Evaluate, Compare Control Systems

What capabilities?  How?

Wired? Wireless?

‘Optional' System Capabilities

- Type of User Interface
- Luminaire Level Control
- Integrated Luminaire Level Control
- Localized Processing / Distributed Intelligence
- Scheduling
- Personal Control
- Load Shedding (DR)
- Plug Load Control
- BMS/EMS/HVAC Integration
- Energy Monitoring
- Device Monitoring / Remote Diagnostics

BMS/EMS Compatible?

Open Standard? Proprietary?

Stand-Alone, Local Server, or Cloud?

Case Studies?

Energy Monitoring?

OpenADR Compliant?
Attend Discussion Sessions for More Info

Wednesday, 10:30 - Noon

- DC and PoE Lighting (Ballroom B)
- Networked Lighting Control Specification Development: 2017 (Lodo)
Panelist

Chris Wolgamott
Senior Product Manager
Northwest Energy Efficiency Alliance
Panelist

Rishi Sondhi
Product Management and Marketing
Eversource
Panelist

Jackie Ducharme
Product Portfolio Manager
Xcel Energy
DLC recently unveiled the Premium Tier for SSL (V3.0) and announced significantly increased efficacy requirements (V4.0) that will take full effect in April 2017. How are these changes impacting your programs now and in the future? Do you plan to use the Premium Tier? Is it important that DLC continues to raise the efficacy bar?
In June, DLC launched the Networked Lighting Control QPL. How do you see the current and future role of Lighting Controls in your programs? How do you plan to use the DLC Networked Lighting Control QPL?
As the market and technology continue to evolve, how do you see your program evolving in the next 3-5 years with respect to DLC?
In the next few years, what would you like to see from manufacturers? (Products, performance, services, participation, etc.)