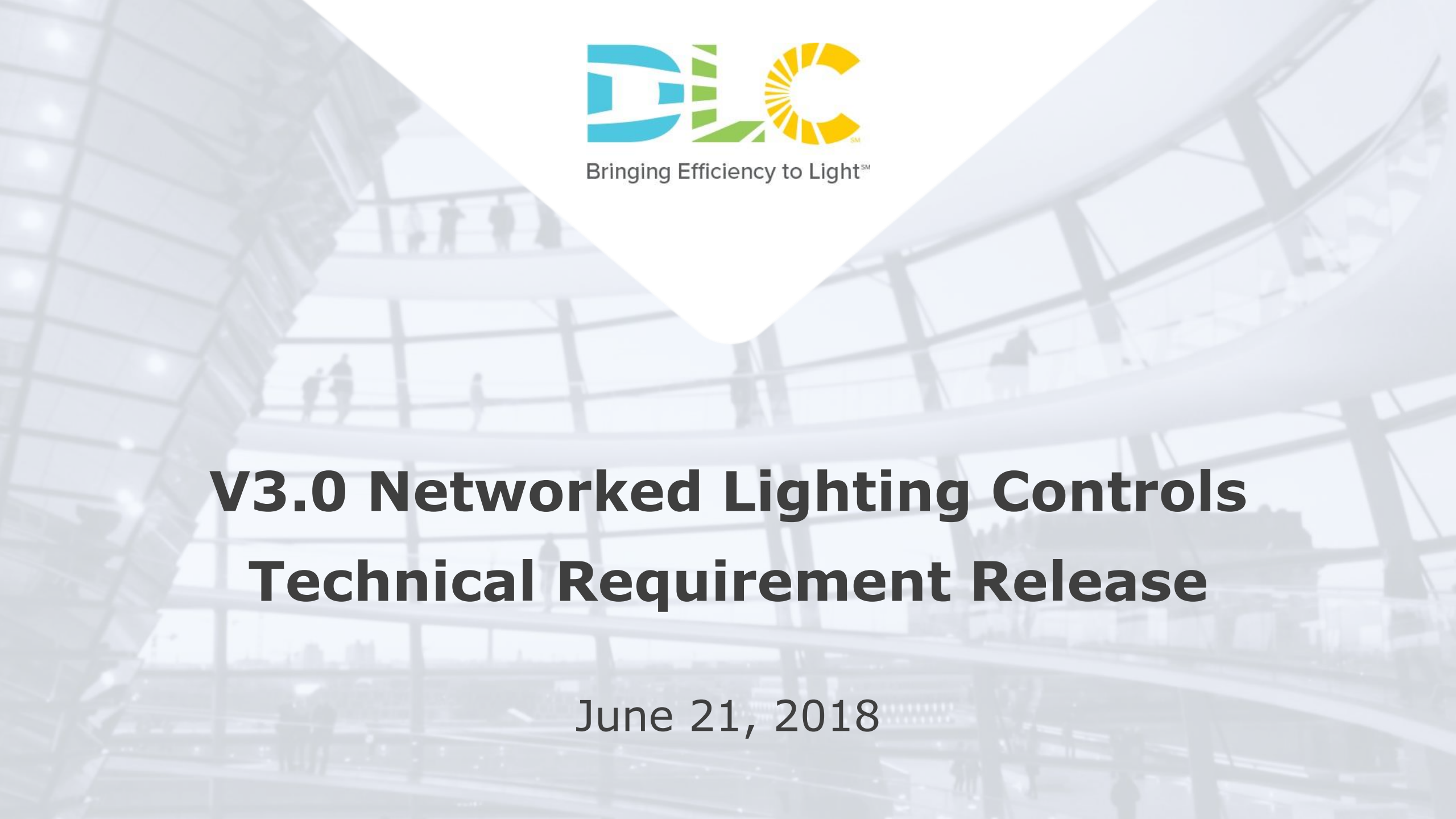


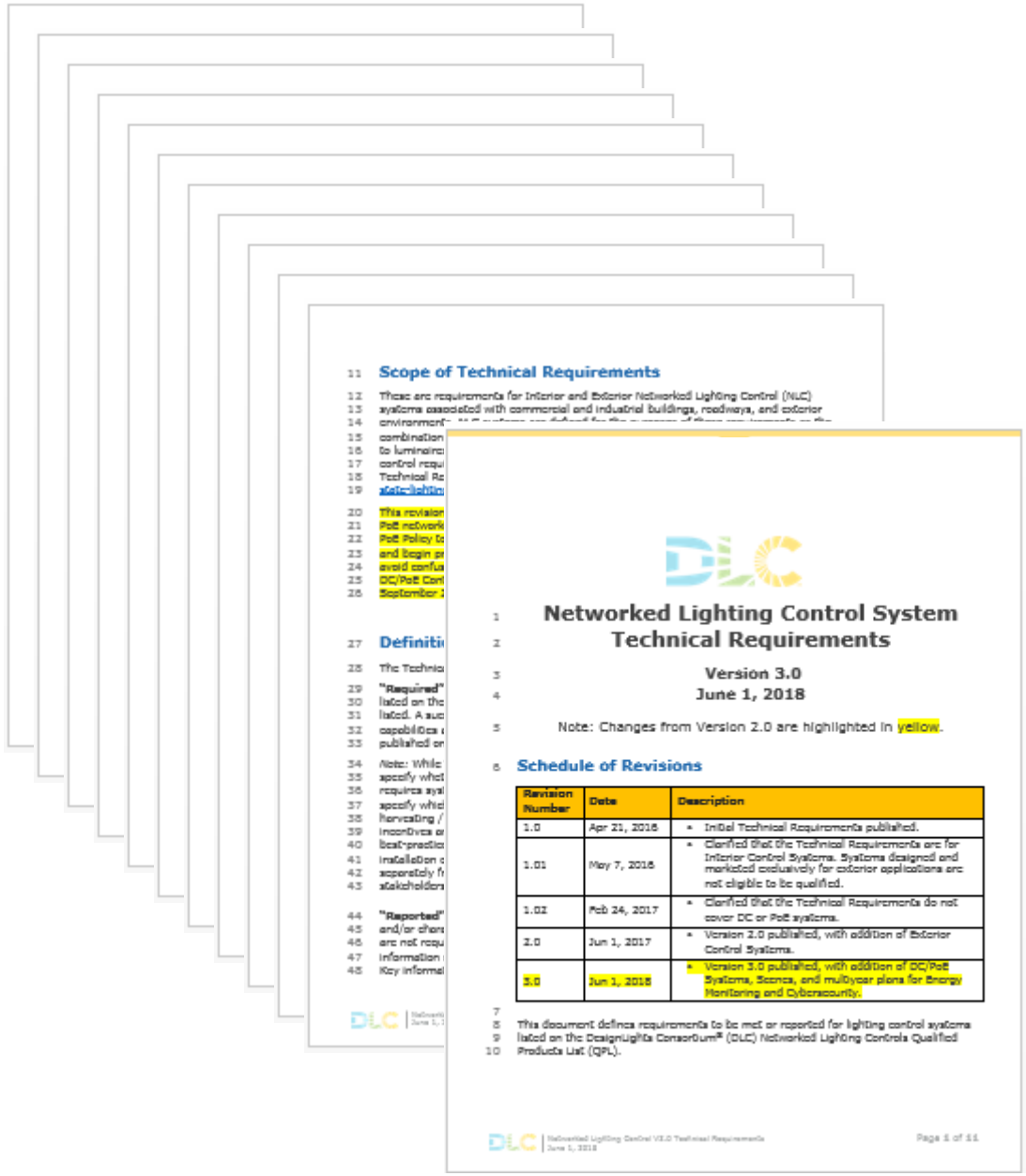
Bringing Efficiency to Light℠

V3.0 Networked Lighting Controls Technical Requirement Release

June 21, 2018

Agenda

1. Introduction
2. Energy Monitoring
3. New Documentation Requirements
4. Product Families
5. DC/PoE
6. Cybersecurity
7. Stakeholder Meeting



Networked Lighting Control System Technical Requirements

Version 3.0
June 1, 2018

Note: Changes from Version 2.0 are highlighted in yellow.

Schedule of Revisions

Revision Number	Date	Description
1.0	Apr 21, 2016	• Initial Technical Requirements published.
1.01	May 7, 2016	• Clarified that the Technical Requirements are for Interior Control Systems. Systems designed and marketed exclusively for exterior applications are not eligible to be qualified.
1.02	Feb 24, 2017	• Clarified that the Technical Requirements do not cover DC or PoE systems.
2.0	Jun 1, 2017	• Version 2.0 published, with addition of Exterior Control Systems.
3.0	Jun 1, 2018	• Version 3.0 published, with addition of DC/PoE Systems, Scenes, and multiyear plans for Energy Monitoring and Cybersecurity.

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 Technical Requirements

Definiti

Table 1

Interior Lighting Systems

'Required' Interior System Capabilities	'Reported' Interior System Capabilities
•*Networking of Luminaires and Devices* •*Occupancy Sensing* •*Daylight Harvesting / Photocell Control* •*High-End Trim* •*Zoning* •*Luminaire and Device Addressability* •*Continuous Dimming*	•*Control Persistence* •*Scheduling* •*Energy Monitoring* •*Device Monitoring / Remote Diagnostics* •*Type of User Interface* •*Luminaire Level Lighting Control (LLLC, integrated)* •*Personal Control* •*Load Shedding (DR)* •*Plug Load Control* •*External Systems Integration (e.g. BMS, EMS, HVAC, Lighting, API)* •*Emergency Lighting* •*Cybersecurity* •*Color Changing / Tuning* •*Start-Up and Configuration Party* •*Scene Control*

Table 2

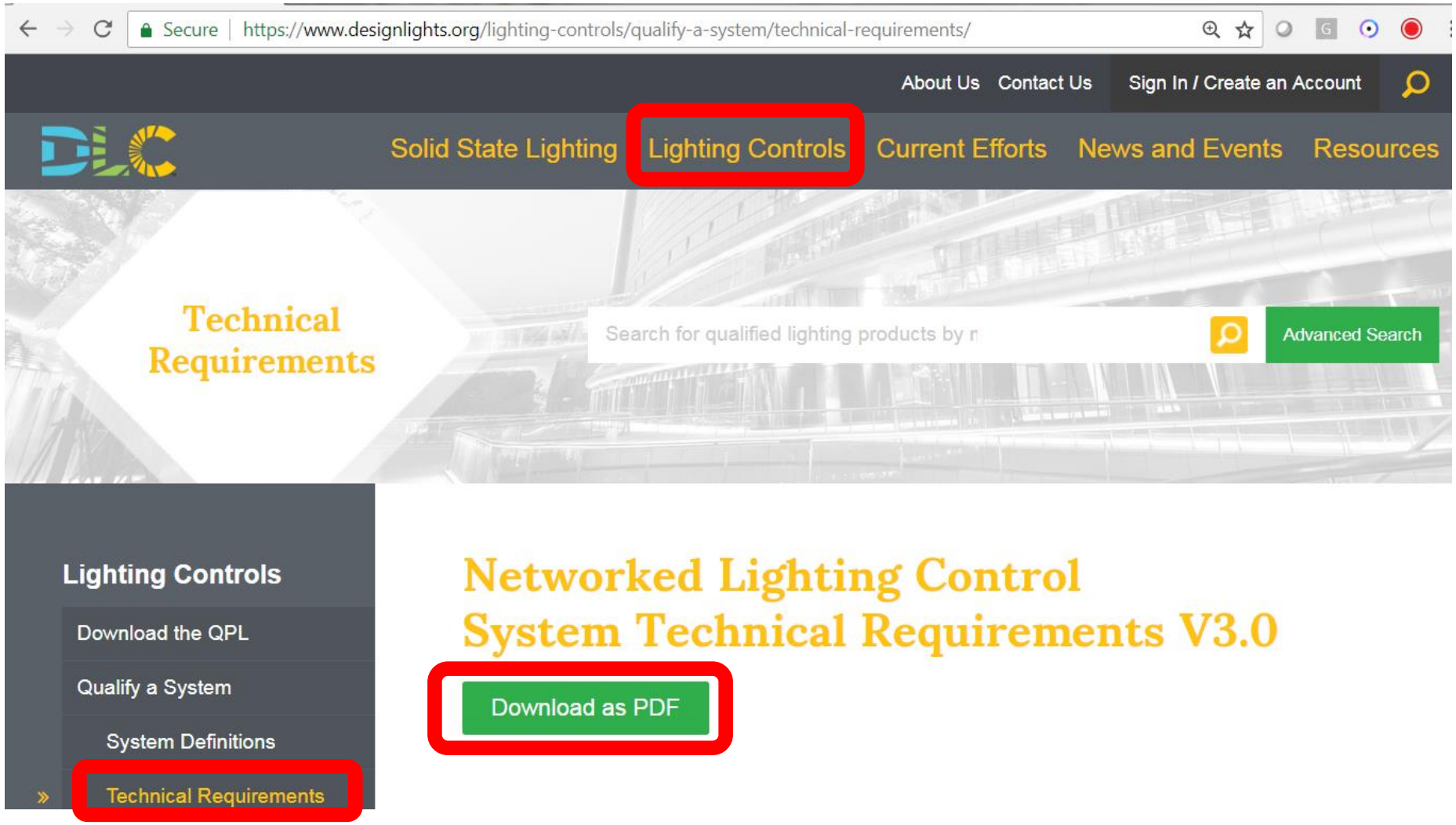
Exterior Lighting Systems

'Required' Exterior System Capabilities	'Reported' Exterior System Capabilities
•*Networking of Luminaires and Devices*	•*Control Persistence*
•*Occupancy Sensing AND/OR Traffic Sensing*	•*Energy Monitoring*
•*Daylight Harvesting / Photocell Control*	•*Device Monitoring / Remote Diagnostics*
•*High-End Trim*	•*Type of User Interface*
•*Zoning*	•*Load Shedding (DR)*
•*Luminaire and Device Addressability*	•*External Systems Integration (EMS/BMS/HVAC/Lighting/API)*
•*Continuous Dimming*	•*Emergency Lighting*
•*Scheduling*	•*Cybersecurity*
	•*Color Changing / Tuning*
	•*Start-Up and Configuration Party*
	•*Scene Control*

Table 3:
Capability and Requirement Definitions

Row	Capability	Definition
1	Networking of Luminaires and Devices	The capability of individual luminaires and control devices to exchange digital data with other luminaires and control devices on the system. This capability is required at the room, space, or area level, but not at the whole building level or beyond (e.g. non-lighting systems, or the internet).
2	Occupancy Sensing	The capability to affect the operation of lighting equipment based upon detecting the presence or absence of people in a space or exterior environment. Exterior systems must include either Occupancy Sensing or Traffic Sensing. They may include both, but that is not required.
...		
23		

V3.0 available on www.designlights.org



Networked Controls Revision Cycle

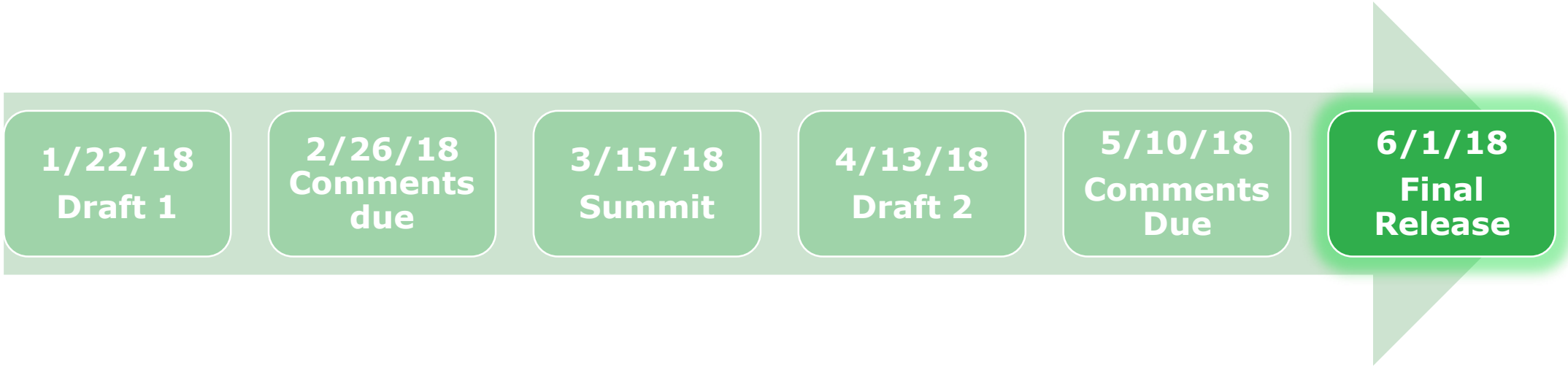
Technical Requirement
Revised Annually every June 1

Revision process begins every January to allow time for stakeholder input

One Year Grace Period:

re-apply under last year's version.

NLC V3.0 – Networked Lighting Controls



Energy Monitoring

Energy Monitoring Multi-Year Plan

June 2018 V3

- The Energy Monitoring type is **Reported**, whether “Direct Measurement”, or “Calculated”.

June 2019 V4

- Energy Monitoring Capability is **Required**
- Manufacturers will self-report accuracy of direct measurement methods.

June 2020 V5

- Calculated methods no longer accepted unless supported by new ANSI standard that specifies the accuracy of the methodology

New Documentation Requirements

Customer Available Information

"In order for an applicant to claim a capability listed in Tables 1 and 2, the manufacturer's customer literature must specify that the system has the capability, with instructions for how to configure and/or use this feature.

"Customer available" means the documentation is a finished product available publicly on a website, and/or included with the product packaging, and/or provided to the customer upon request. It should not be a document produced for the sole purpose of obtaining DLC qualification without further use for customers. The DLC reserves the right to accept, reject, or require changes to documentation to satisfy this requirement. Any documentation provided to the DLC will be used for the purpose of verifying compliance with DLC Technical Requirements and will not be made available publicly or distributed."

Customer Available Information & Exceptions

16 topics, not 500

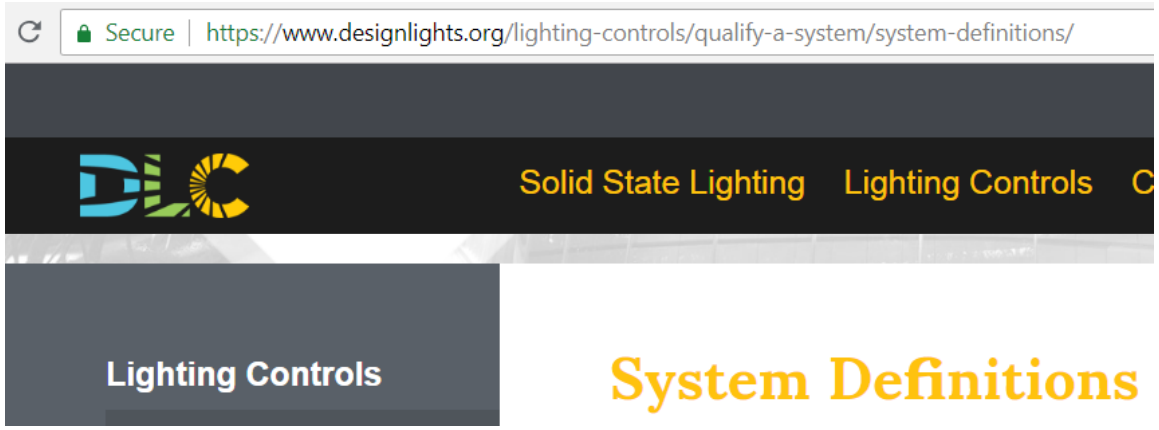
Required Interior Capabilities

- ~~Networking of Luminaires & Devices~~
- Occupancy Sensing
- Daylight Harvesting/Photocell Control
- High-End Trim
- Zoning
- ~~Luminaire and Device Addressability~~
- ~~Continuous Dimming~~

Reported Interior Capabilities

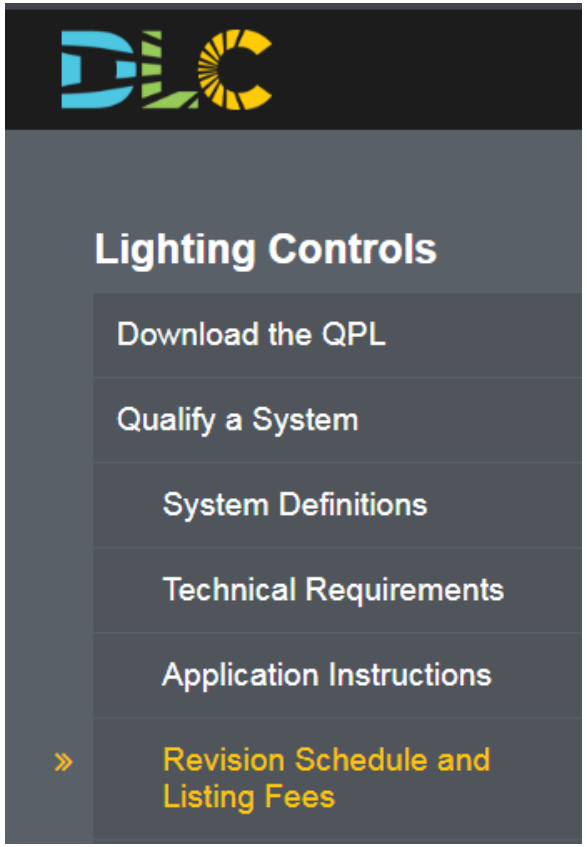
- Control Persistence
- Scheduling
- Energy Monitoring
- Device Monitoring / Remote Diagnostics
- ~~Type of User Interface~~
- ~~Luminaire Level Lighting Control~~ (LLLC, integrated)
- Personal Control
- Load Shedding (DR)
- Plug Load Control
- External Systems Integration (e.g. BMS, EMS, HVAC, Lighting, API)
- Emergency Lighting
- Cybersecurity
- Color Changing / Tuning
- ~~Start-Up and Configuration Party~~
- Scene Control

Product Families



Family of Related Systems

The DLC offers reduced fee amounts for family member systems. Family member systems are child or derivative systems of a parent system that may offer small differences in feature sets and/or characteristics, but are otherwise identical to the parent system. For example, they may have a reduced or simplified feature set for less complex applications, or feature sets that are configured for a specific vertical or application, such as an exterior child of a parent interior system. In these cases, the parent system would typically be the most fully-featured system. Manufacturers interested in preparing a family set of applications must contact **info@designlights.org** to confirm a plan before completing the applications.



Applications Received	Single Interior or Exterior System	Family Member / Child System	Private Label System
June 1, 2018 – August 31, 2018	$15,000	$8,000	$5,000
September 1, 2018 – November 30, 2018	$12,000	$7,000	$5,000
December 1, 2018 – February 28, 2019	$9,000	$6,000	$5,000
March 1, 2019 – May 31, 2019	$6,000	$5,000	$5,000

DC / PoE

Topic: DC/PoE

Next Steps

- DLC will accept SSL applications beginning in September 2018
- DLC will accept and begin processing Control applications beginning in June 2018
- To avoid confusion with rebate/incentive programs, DLC will not publicly qualify and list DC/PoE Control Systems until the corresponding SSL application process is available in September.

Cybersecurity

Cybersecurity: Multi-Year Plan

June 2018 V3

- Cybersecurity is reported for components that comply with ANSI UL 2900 or IEC 62443
- Manufacturers may also report compliance with ISO 27000 and and/or NIST IoT Cybersecurity Framework

June 2019 V4

- DLC will propose how components, systems, and/or manufacturers must be certified, and to which standard(s), in order to claim this optional capability

June 2020 V5

- Cybersecurity compliance as outlined from V4 will be required

ANSI UL 2900

Cybersecurity for
Network-Connectable Products

https://industries.ul.com/cybersecurity/ul-2900-standards-process

Design methods

Building blocks

- Open source software
- Integrated circuit hardware and firmware

Known vulnerabilities of each block

Try to hack, see what happens

Test each networked component SKU (not the system as a whole)

ANSI UL 2900
Standards Process

https://industries.ul.com/cybersecurity/ul-2900-standards-process

Cybersecurity for
Network-Connectable Products

UL 2900-1:2017 applies to network-connectable products that shall be evaluated and tested for vulnerabilities, software weaknesses and malware.

Introductory Webinar recording about lighting

https://industries.ul.com/events/lighting-systems-and-cybersecurity-are-your-systems-ready

Some industry-specific versions available

- UL 2900-2-1: Healthcare systems
- UL 2900-2-2: Industrial control systems
- UL 2900-2-3: Security and life safety signaling systems such as Automated Teller Machines, Fire Alarm Control…

IEC 62443 Series

Standards derived from ISA ISA99 series that began in 2005 (Instrumentation Society of America)

Applies to whole corporation

Precursor to -4-2. Published and certifiable

Applies to NLC Products. In draft for vote Added details to -3-3

Applies to department developing a product -- not the whole corporation (just published 6/18)

From IEC 62443-4-1:2018 © IEC 2018, page 9

IEC 62443 Lab Tests

International Electrotechnical Commission

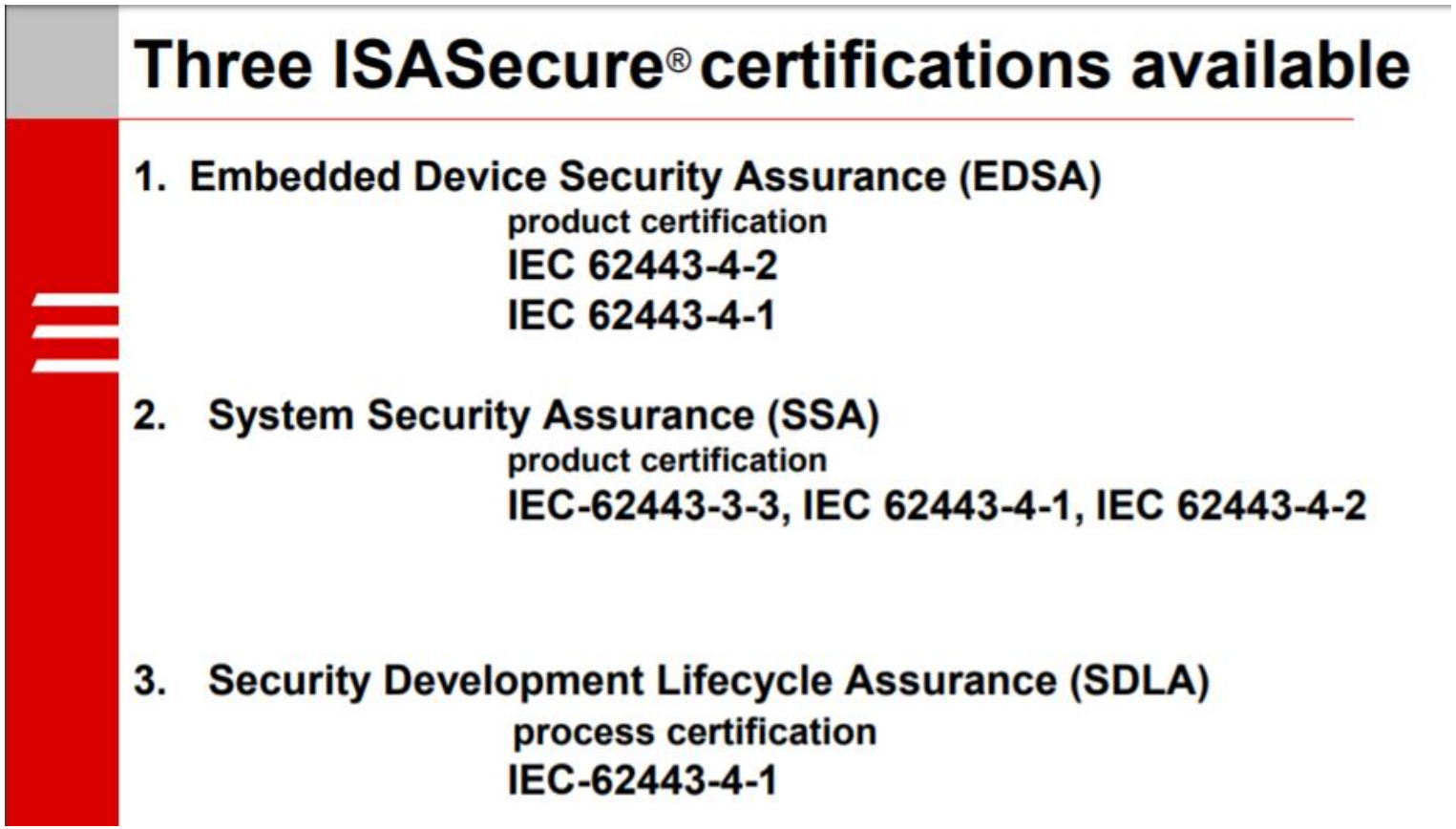
IEC.ch

Through ISASecure.org

ISASecure® IEC 62443 CONFORMANCE CERTIFICATION

Through IECEE.org

IECEE™ IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE)



From report "ISA/IEC 62443 STANDARDS AND ISASECURE® CERTIFICATION: APPLICABILITY TO BUILDING CONTROL SYSTEMS", 16 JANUARY 2017

http://www.isasecure.org/en-US/Building-Control-Systems-Report

IEC 62443: 4 security assurance levels

Security Level	Target	Skills	Motivation	Means	Resources
SL1	Casual or coincidental violations	No Attack Skills	Mistakes	Non-intentional	Individual
SL2	Cybercrime, Hacker	Generic	Low	Simple	Low (Isolated Individual)
SL3	Hacktivist, Terrorist	ICS Specific	Moderate	Sophisticated (Attack)	Moderate (Hacker Group)
SL4	Nation State	ICS Specific	High	Sophisticated (Campaign)	Extended (Multi-disciplinary Teams)

"Practical Overview of Implementing IEC 62443 Security Levels in Industrial Control Applications" 5/2018

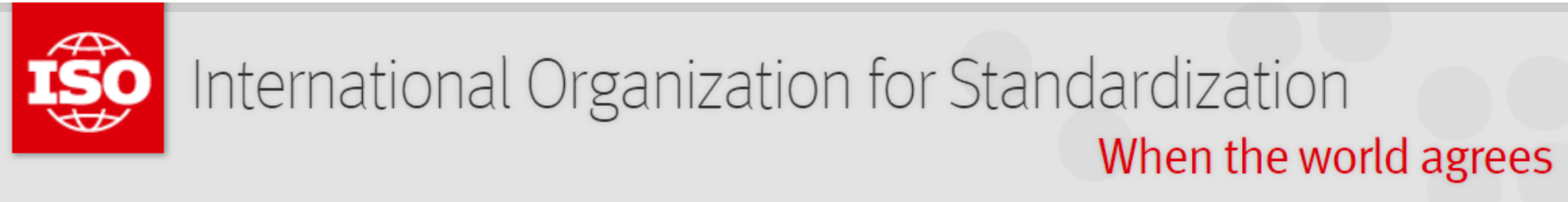
https://www.schneider-electric.com/en/download/document/998-20186845/

ISO/IEC 27000 family – Information security management systems

The ISO/IEC 27000 family of standards helps organizations keep information assets secure…

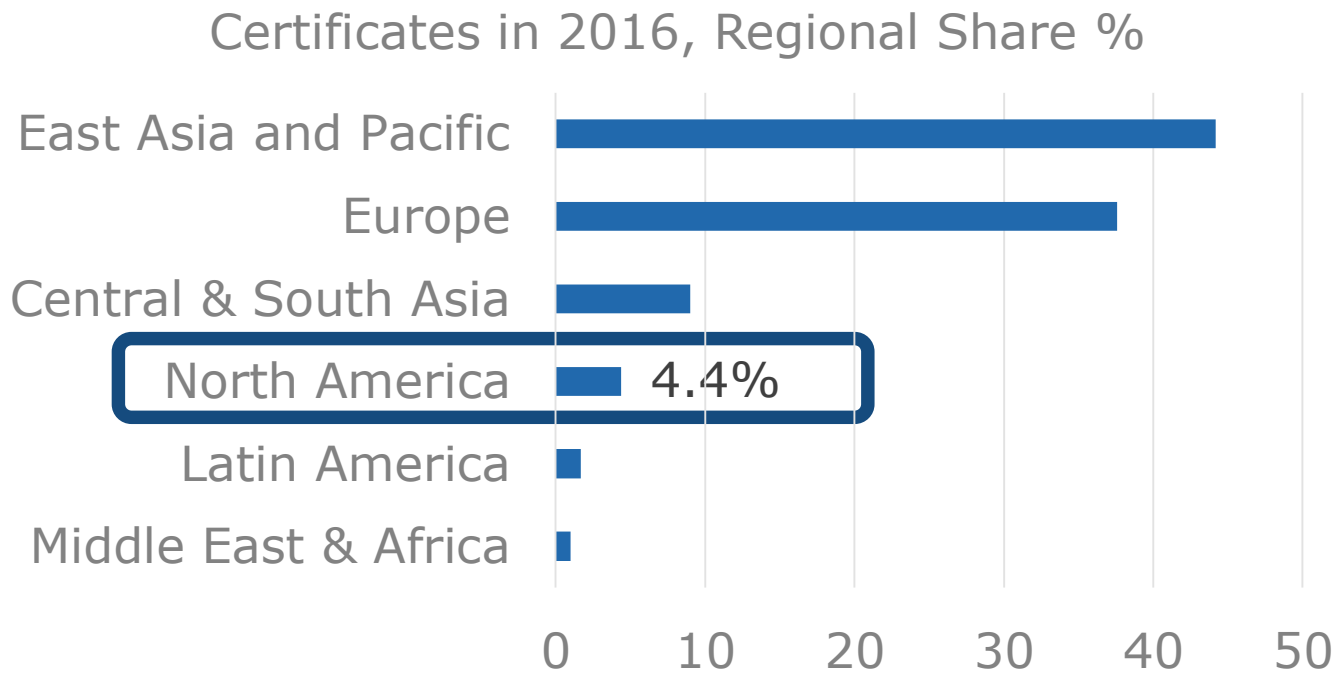
ISO/IEC 27001 is the best-known standard in the family…

https://www.iso.org/isoiec-27001-information-security.html



ISO/IEC 27001

Certificates in 2016	
Canada	133
USA	1,115
Total World	33,310



NEMA Cyber Best Practices

- Hygiene: NEMA White Paper CPSP 2-2018
- Supply Chain: NEMA Guideline CPSP 1-2015

Secure | https://www.nist.gov/programs-projects/nist-cybersecurity-iot-program

NIST Search NIST NIST MENU

PROJECTS/PROGRAMS

NIST Cybersecurity for IoT Program

DESCRIPTION

Announcements

Register for NIST's public workshop "Considerations for Managing IoT Cybersecurity and Privacy Risks Workshop" on July 11th in Gaithersburg, MD!

Register

Read the latest *Considerations for Managing IoT Cybersecurity & Privacy Risk* Discussion Draft!

PDF

Video

ORGANIZATIONS

Information Technology Laboratory
Applied Cybersecurity Division

CONTACT

Katerina Megas, Program Manager
Information Technology Laboratory
Applied Cybersecurity Division
Trusted Identities Group

Jim St. Pierre, Deputy Director
Information Technology Laboratory

DATES

Started: November, 2016

Stakeholder Meeting


DLC
STAKEHOLDER
MEETING 2018
July 9 - 11 • Boston, MA
Visit the DLC's Hometown!





	Day	Agenda
Monday	**Day 1 – morning**	In-person Member meeting
	Day 1 – afternoon	Pre-conference workshops & DLC Controls Training Opening Reception
Tuesday	**Day 2**	Full day conference Panels Breakout sessions Structured Networking Off-site Reception
Wednesday	**Day 3**	Full day conference Panels Discussion Sessions Breakout Sessions Structured Networking

Topics

Panels

- The Future of Lighting
- Outdoor Lighting: Filtering Facts from Fiction
- DLC V 5.0
- NLCs in Action: The Good, The Bad, and the Awesome
- Horticultural Lighting: The Root of New Industrial Infrastructure

Discussion Sessions

- SSL V5.0: Lighting Quality
- SSL V5.0: Lighting Controls
- Horticultural Lighting Requirements
- Component and Module Qualification

Pre-Conference Workshops

- Lighting for Health and Energy Savings
- Flicker
- TM33 - Rethinking the Photometric Data File Format
- Cybersecurity / UL 2900 (Practicing/Testing/Approvals)
- Energy Monitoring
- IoT Ready Alliance new standard
- Controls Training*

Questions