Lisa Isaacson
CBDO/Founder
Electricity explained...

T-shirt design:

ALL WOMEN ARE CREATED EQUAL BUT ONLY THE FINEST BECOME ELECTRICIANS
INTELLIGENT LIGHTING SYSTEMS

Delivering the IoT Revolution to your Ceiling.
Power-over-Ethernet Lighting

Changing an Industry
You know you are on to something when…

IEEE 802.3bt Moves PoE Into The Limelight

…management applications are already emerging using the “smart power” concept that enables more granular control of lighting and HVAC by providing a data link between the power source (such as a lighting fixture) and sensors and/or a control center. PoE is a natural fit for some of these applications. LED lighting, which is currently powered with only 40 to 50 V (PoE supplies 44 to 57 V), is another potential high-volume application.
# Rules of Engagement

## Detection and Classification

<table>
<thead>
<tr>
<th></th>
<th>PSE Voltage</th>
<th>PD Requested Power</th>
<th>PSE Granted Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PoE 802.3af</strong></td>
<td>36V-57VDC</td>
<td>12.95W</td>
<td>15.4W</td>
</tr>
<tr>
<td><strong>PoE+ 802.3at</strong></td>
<td>42V-57VDC</td>
<td>25.5W</td>
<td>30W</td>
</tr>
<tr>
<td><strong>UPOE 803bt</strong></td>
<td>42V-57VDC</td>
<td>51W</td>
<td>60W</td>
</tr>
</tbody>
</table>
Power over Ethernet (PoE) Delivers DC power and data over a standard copper Ethernet Cable (RJ45)

IEEE 802.3af/at Industry Standard

PoE Plus – two twisted pairs
Cisco Universal PoE (UPOE) – four twisted pairs

Power over Ethernet is the foundation for nuLEDS Light-over-IP™
Benefits

**Connectivity**
- Lights have IP Addresses
- Data for Building Analytics

**Safety**
- People
- System

**Installation**
- Cat6 cable
- Modular
Collapsing the Infrastructure

Traditional Lighting Control

VS
Structured Cable
Reducing TCO with a Converged Strategy
NuLEDs SpiceBox

• 6 position terminal post is provided on the side opposite the network connection for wiring of the luminaire.

• SpiceBoxes should be placed:
  • in well ventilated areas
  • near the light it powers
Turning to the San Diego Community
Jan 2012 Cisco Lab

Cisco Call Manager
CyberSwitching
Joulex Energy Mgr
Lenovo

EnergyWise Office

Catalyst 4500 UPOE
CommScope iPatch
NuLEDs
POE LED Lighting

3N121
3N120
3N123
3N122
The first PoE ceiling troffer light came to life!

Lisa Isaacson, NuLEDs Inc.
Cisco Live June 2012
Cisco CIO Summit, Summer 2012

Cisco is actively promoting PoE LED Lighting from NuLEDs being an integral part of their strategy.

Lighting now becomes part of the Internet of Things
2013-2015: ‘First movers’ begin pilots and POCs with PoE Lighting
Feb 2016 in Berlin: Cisco Digital Ceiling

Cisco Digital Ceiling
Smart, Secure, Seamlessly Connected Buildings
Dec 2015-June 2016: The Big Players Get Behind the Technology

PHILIPS
nuLEDs™
EATON
CREE™

Cisco Live June 2016
Eaton and NuLEDs Collaborate to Make Smart, Connected Lighting a Reality

PEACHTREE CITY, Ga.---(BUSINESS WIRE)---Power management company Eaton today announced a collaboration with NuLEDs™, Inc., a leader in Power-over-Ethernet (PoE) lighting systems, aimed at making buildings smarter and seamlessly securely connected. The two companies will go to market with a joint product offering including Eaton’s complete portfolio of PoE-enabled light-emitting diode (LED) luminaires and NuLEDs’ drivers, software, sensors and keypads.
Miami Dade School Kelvin-Tunable Lights
Miami Dade School Kelvin-Tunable Lights
Independence Blue Cross
Cisco Telepresence
Kelvin-tunable Troffers
Enabling the Digital Ceiling
THE FUTURE IS NOW
NuLEDs TCO Graph

20K Square Foot Facility
15 Year TCO