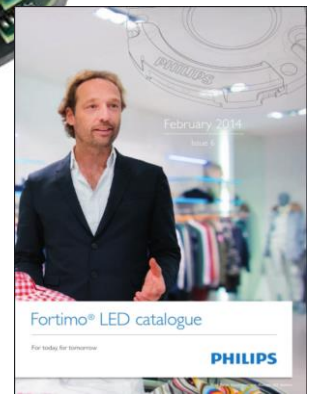
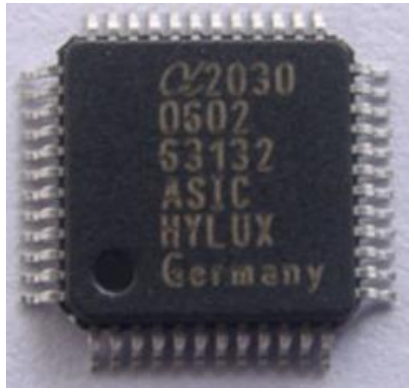
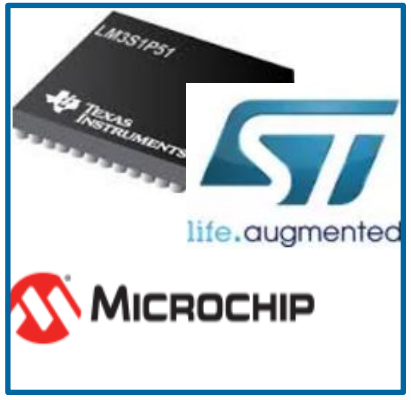
Standard interfaces for Lighting Components.



Lighting goes digital → connected components.



→



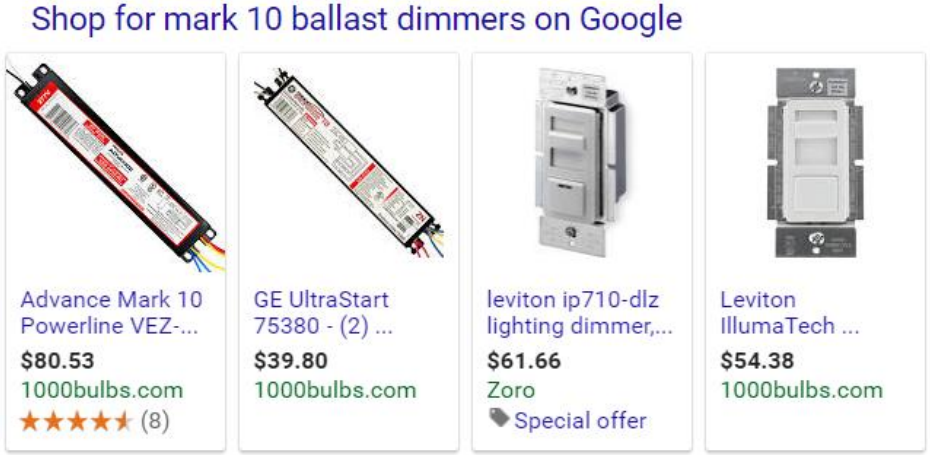
Digital interfaces are mostly bidirectional and allow logging of data → makes sense to 'connect' lighting

Analogue ASIC's (0-10V drivers)

Digital general purpose µC's

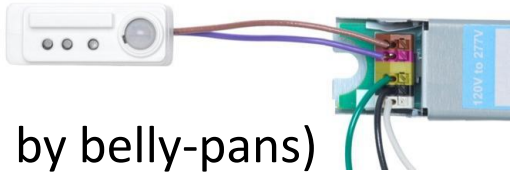
From analogue 0-10v dimming to digital interface standardization

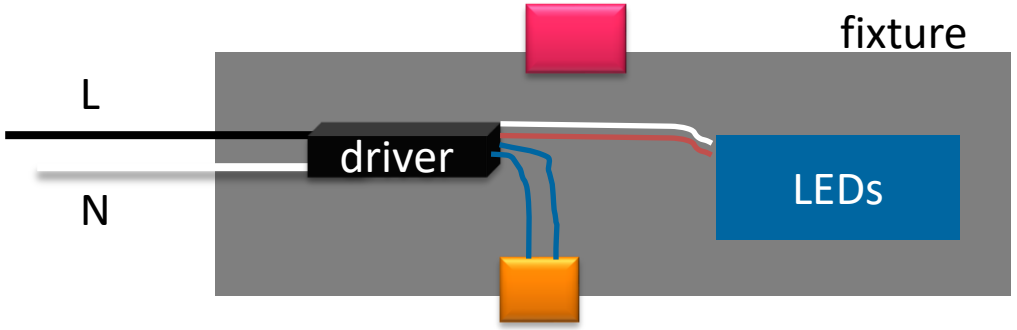
From remote control to App



Inside fixture

Connectivity = Wired
(especially when covered by belly-pans)





Outside the fixture

Connectivity = Wireless

Topic of 2nd presentation

Boxes need power, power requires wires.
Why not make “Class II-power” in the driver and run data over same 2 wires.

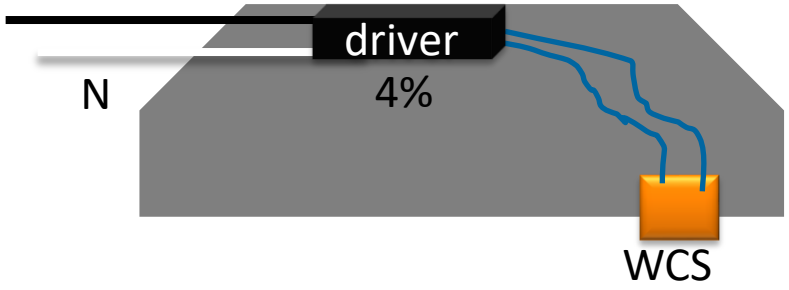
e.g. Occ. Sensor

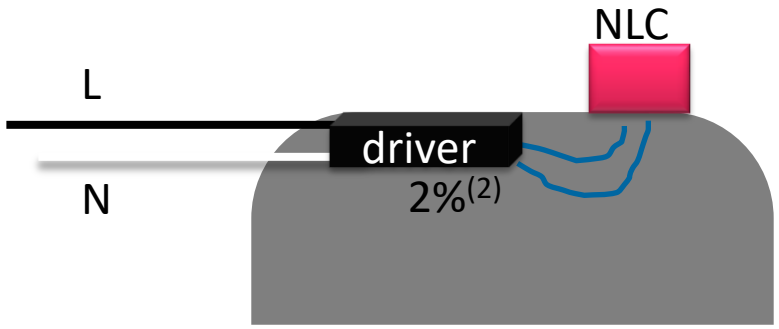
e.g. NLC

PHILIPS

Connectivity inside fixture: DALI

- Not for room control with multiple controllers, addressing, zoning etc.: that's a nightmare.
- Lighting language very well established, better than any other standard (e.g. DMX)(1)
- Good industry understanding for 1 to 1, not any issues to go to 1:N or outside fixture.
- A well defined power supply on the lines
- Dims to off without relay
- As the driver looks to the mains anyway, power reporting pretty straight forward: 4% spec. in indoor, 2% accuracy in outdoor.





The increasing number of possible operational states, and related power draws, that are possible in connected lighting systems is rapidly making it difficult to describe the energy performance of such systems in traditional ways. While many available systems provide some form of energy self-reporting capability, the accuracy of reported values, and which system components are responsible for it, is often unclear. (2)

(1) DALI however still in software on general purpose uC, no dedicated co-processor yet for DALI decoding towards UART/I2C

(2) C136.52 LED Driver with Integral Energy Measurement Means

Standardization Already Starting

OSRAM OPTOTRONIC® LED Programmable Driver with DEXAL™ Technology

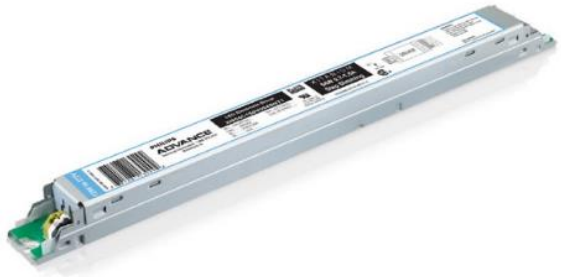
An intra-luminaire, bi-directional interface

Create smart fixtures and simplify luminaire configuration requirements with DEXAL Technology. DEXAL is a non-proprietary, intra-luminaire interface that enables bi-directional communications between the OSRAM OPTOTRONIC® LED Programmable Driver and the fixture-integrated component. It provides exact luminaire-specific data, including diagnostics, to light management systems. Fixture manufacturers can design smart fixtures and streamline the configuration process by leveraging DEXAL as a standard bi-directional communications interface from within their luminaire. It is proven compatible with multiple manufacturers' light management systems.

View the DEXAL Video or FAQs to learn more about DEXAL Technology.

Features and Benefits:

- Non-proprietary interface
- Leverage a standard means of enabling power and bi-directional communications between dri
  fixture-integrated component manufacturers.
- Streamline luminaire configuration and manufacturing process using one interface supported
  management systems.
- Support data-driven applications that require exact, not estimates, luminaire data including:
  - Power consumption
  - Driver case temperature
  - LED module and/or driver failure
  - Luminaire operating hours



SR Drivers for Indoor Linear Applications

Philips pioneered SR LED drivers first for indoor commercial office lighting. SR has set the pace to make networked lighting more useful and practical while further accelerating the integration of lighting into building networks. Available in 40W and 75W models, these drivers have the following features:

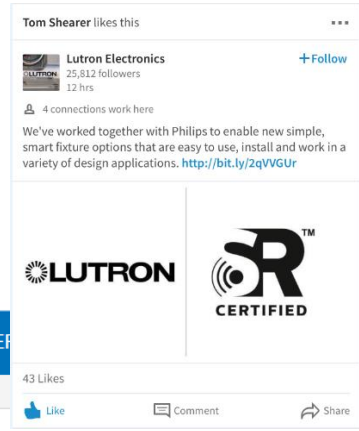
- Standardized digital interface
- Dim-to-off
- Integral power supply
- Simple 2-wire connection to sensors
- Energy reporting (4%)
- SimpleSet programming
- Common Xitanium form factors

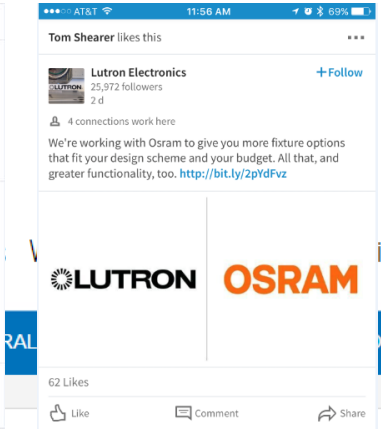
Further outline of this presentation:

1) Digital awakes ‘Connectivity’, and goes wired in the fixture, wireless outside.
2) For wired: DALI as starting point, and with commercial success, we can further enhance the standard.
3) Examples of where we add functionality in outdoor:
    - Asset management
    - Occ sensor in system with NLC

A healthy EcoSystem developing…:

Recently added: Dimonoff Smartest & Proven Intelligent SCADA System for Smart Cities; CIMCON Lighting, Inc. Controls Simplified; eluminocity; LUTRON





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Home » Smart Lighting/IoT » Philips adds Gooee, Silvair as smart lighting partners

Philips adds Gooee, Silvair as smart lighting partners

Published on:March 24, 2017

By Mark Halper

Contributing Editor, LEDs Magazine, and Business/Energy/Technology Journalist

The lighting giant expands its OEM list by four companies and leaves open the possibility that it will use the products in its own branded line.

Samsung Phones using Samsung/Sony image sensors

- Demarcation of driver and node…..no emerging standard for wireless so best to separate

PHILIPS

Memory Bank 1 - Description

- Luminaire OEM's can store luminaire related data in the driver so the NLC can determine what kind of loads are connected

- Example of parameters:
  - GTIN of the luminaire *(per DALI Standard)*
  - ID of the luminaire *(per DALI Standard)*
  - Electrical input data (Input power, voltage, Pf)
  - Optical data (Lm, CCT, distribution type)

Memory Bank 1: Detailed implementation

Address	Size	Functionality
0	1	Last accessible location
1	1	Memory bank version control
2	1	Lock byte
3-8	6	OEM GTIN
9-16	8	OEM ID

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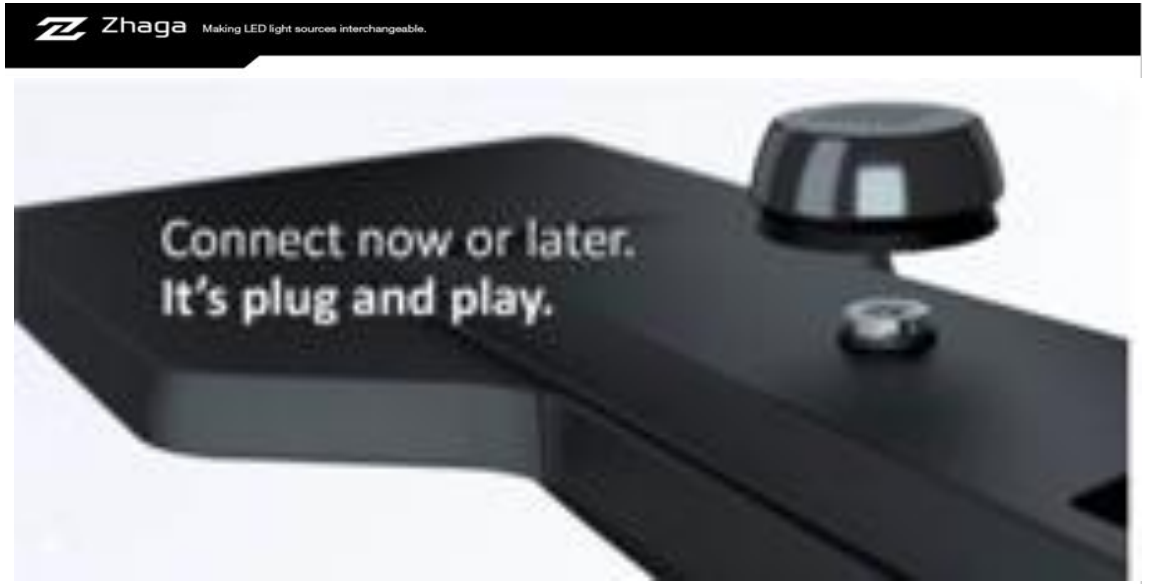
In the meantime, across the globe:



- Example modules: sensors, network modules

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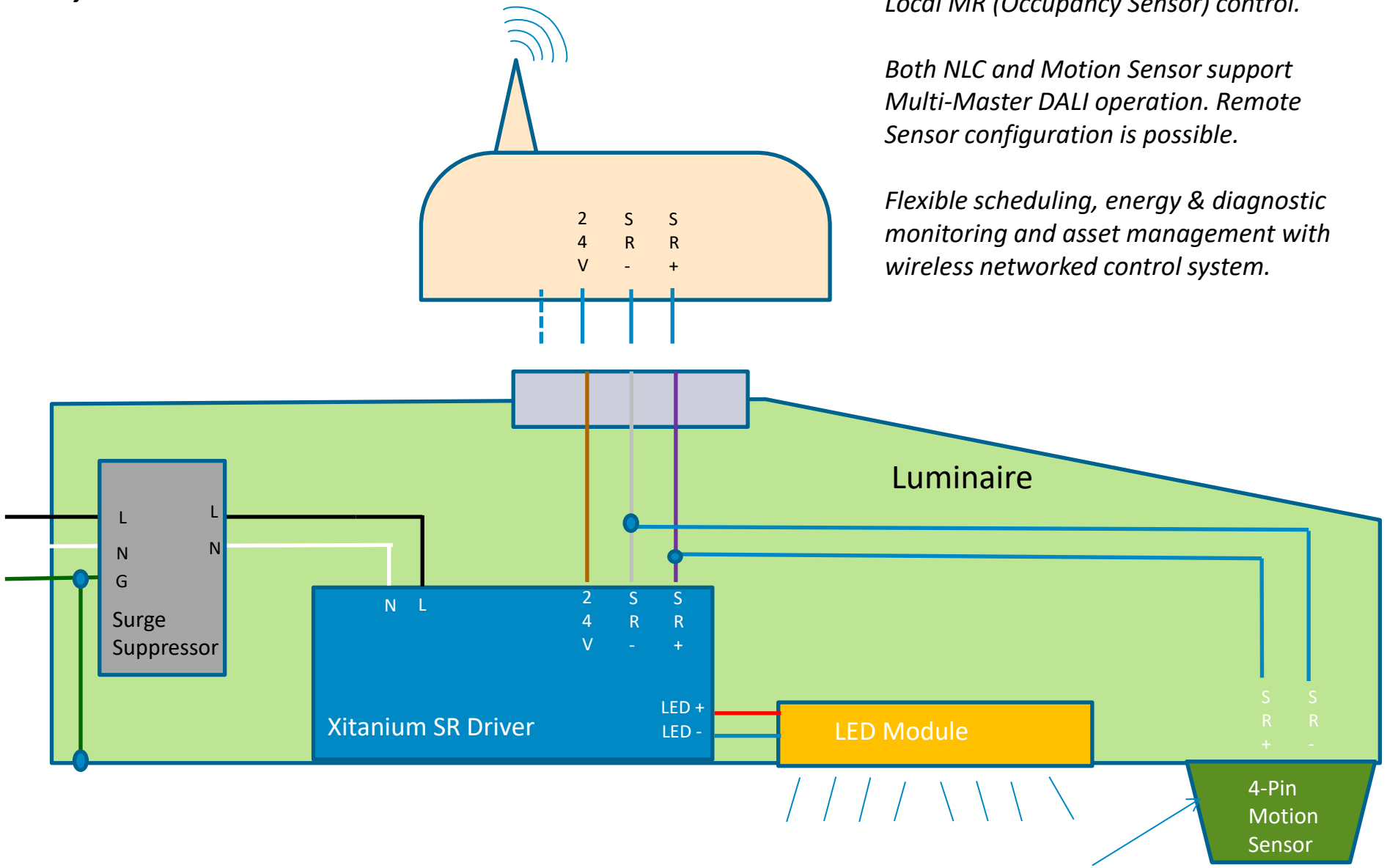
Outdoor Use Cases

Fully Networked Luminaire with OS



Local MR (Occupancy Sensor) control.

Both NLC and Motion Sensor support Multi-Master DALI operation. Remote Sensor configuration is possible.

Flexible scheduling, energy & diagnostic monitoring and asset management with wireless networked control system.

Eg: DALI Motion Sensor with MM support

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Closing remarks

- It is happening: connectivity in fixtures shapes DALI standard.
- Recipe: drive business success, others will follow, and then drive standard to meet the needs
- Globally