Luminext®

NEXT GENERATION ILLUMINATION

Solution & Technology Overview

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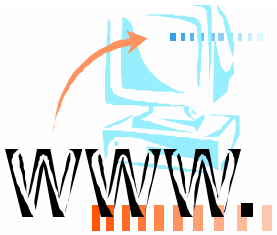
Solution architecture

Traffic volume &
accident detection

Reporting & Management

Standard PC with browser



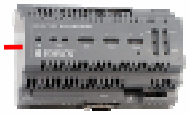
Weather/luminance

LUMINIZER
Central server

WAN IP
Connection
of any type

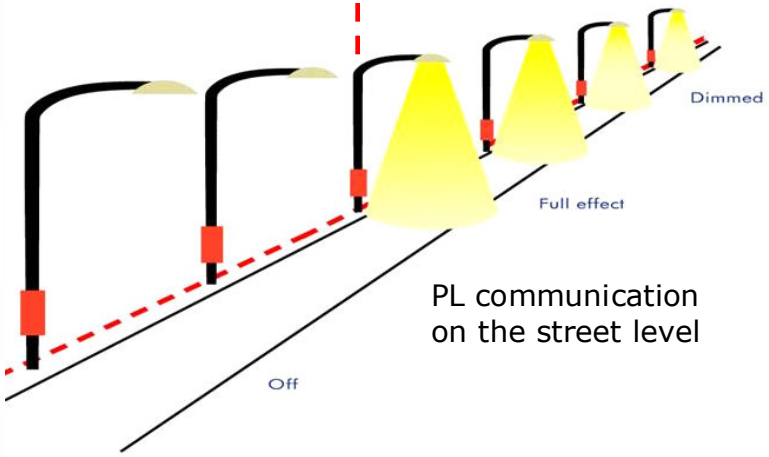
Schedule

Energy
meter



LUMINYX SC

LUMINYX OLC



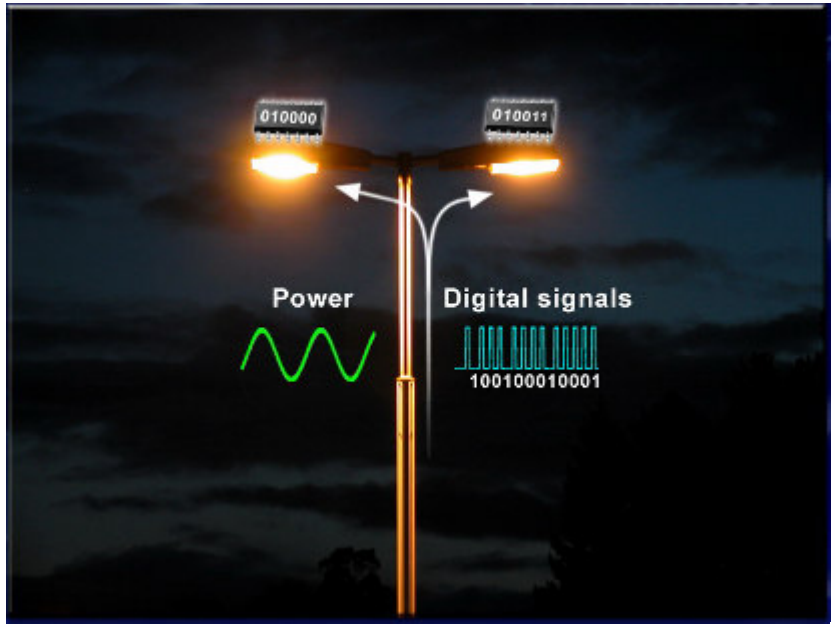
PL communication
on the street level

Equipment controlling the Lamp

Outdoor Lamp Controller <-> Segment controller

How to communicate with the lamp controller is key:

- ✓ for your reliability
- ✓ for your scalability
- ✓ for your solution cost
- ✓ for your solution performance
- ✓ for your independence



Communication with the lamp controller

You have three basic options:

- ✓ Pull control wire  (not really an option)
- ✓ Take wireless 
- ✓ Use the Power grid (PLC communication) where again you have several options:
  - Domosys
  - ST²
  -
  -
  - LonWorks®

Why did we choose LonWorks®

Because it is the right solution:

- ✓ There is experience:
  - 18 years from a serious company Echelon with +4000 users with amongst them the biggest controls companies
  - +30.000.000 PLC nodes installed (and growing fast)
- ✓ It is based on the right technology:
  - Digital Signal Processing/Dual Frequency
  - CENELEC and FCC compliant (global solution)
- ✓ There is a standard protocol:
  - ANSI 709.2 standard
- ✓ There is an Industry Standards Association:
  - LonMark
  - Interoperability between solutions from different vendors

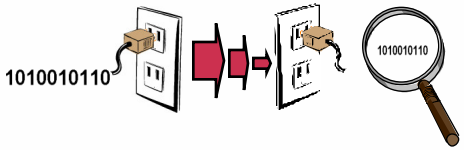
There is competition (Philips, Siteco, Viabus, CECE, Luminext, etc.)

What does 'the right PLC technology' mean?

Power lines meant for carrying power, not data

- ✓ ALL devices connected to the power lines have an adverse effect on communications
- ✓ TVs, computers, printers, vacuum cleaners, hair dryers, ovens…….electronic ballasts
- ✓ communication performance can vary between different buildings, neighborhoods, and countries
- ✓ Impediments to communication are time varying and change throughout the day

Noise



Attenuation

Distortion

Measures to insure reliability

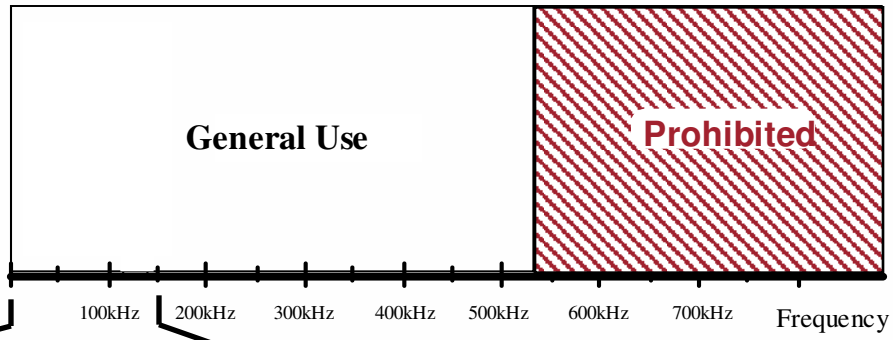
LonWorks® Incorporates unique technical innovations to ensure reliable communication:

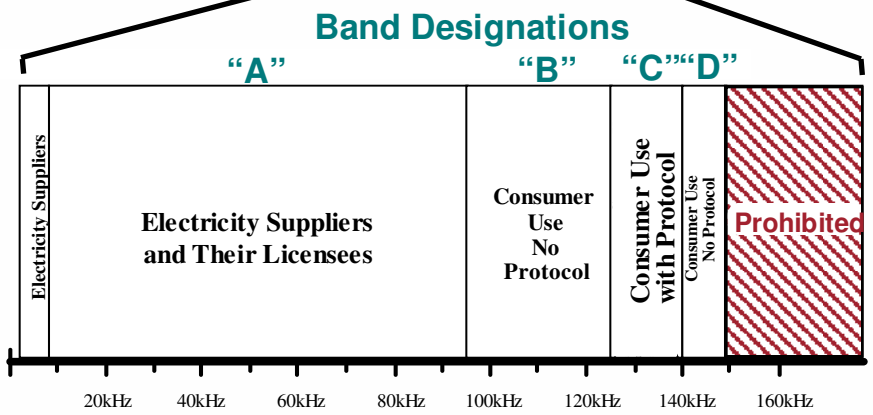
- ✓ Automatic dual frequency operation
- ✓ Narrow Band technology employing several, signal processing algorithms
- ✓ Powerful output amplifier
- ✓ Low-overhead error correction algorithm
- ✓ Repeating algorithms

Automatically switches when a frequency is blocked

What does globally approved mean?

North American regulations





CENELEC Regulations (Europe)

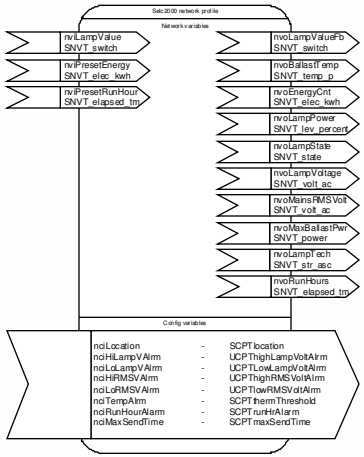
LonWorks® PLC meets *all* international power-line signaling regulations

What does standard mean?

The LonWorks is an ANSI 709.2 solution and the LonMark Association assures interoperability.

You can choose a main solution without specifying a vendor:

- it makes live a lot easier to maintain one base technology (cheaper too)
- solutions from different vendors do not interfere
- solutions from different vendors mix and match
  - No forced product combinations (ballast/luminaire/controls)
- standard equipment available
- tools and software from available from different vendors



Solutions available from different vendors competition is good (when you are on your side of my PC)

Example of standard equipment

Segment Controller

- ✓ Manages the segment locally
  - scheduling/astroclock
  - data logging
  - alarm handling
  - up to 120 lamps
- ✓ Manages IP communication
  - GPRS/fiber/copper/WiFi
- ✓ Segment metering

No single point of failure available from different vendors that add value

In summary

- ✓ Reliable communications for safe solutions
- ✓ Open technology for freedom of choice in vendors of hardware software and tools
- ✓ Competition for better pricing and innovation
- ✓ Formal standards for easier specification and lower operational cost
- ✓ LonMark standards for interoperability

Thank you for your attention