

LED EVENEMENT 2013

LED applicaties voor designers,
engineers en lichtarchitecten

1931 CONGRESCENTRUM
BRABANTHALLEN DEN BOSCH

WOENSDAG 27 NOVEMBER 2013



PRE



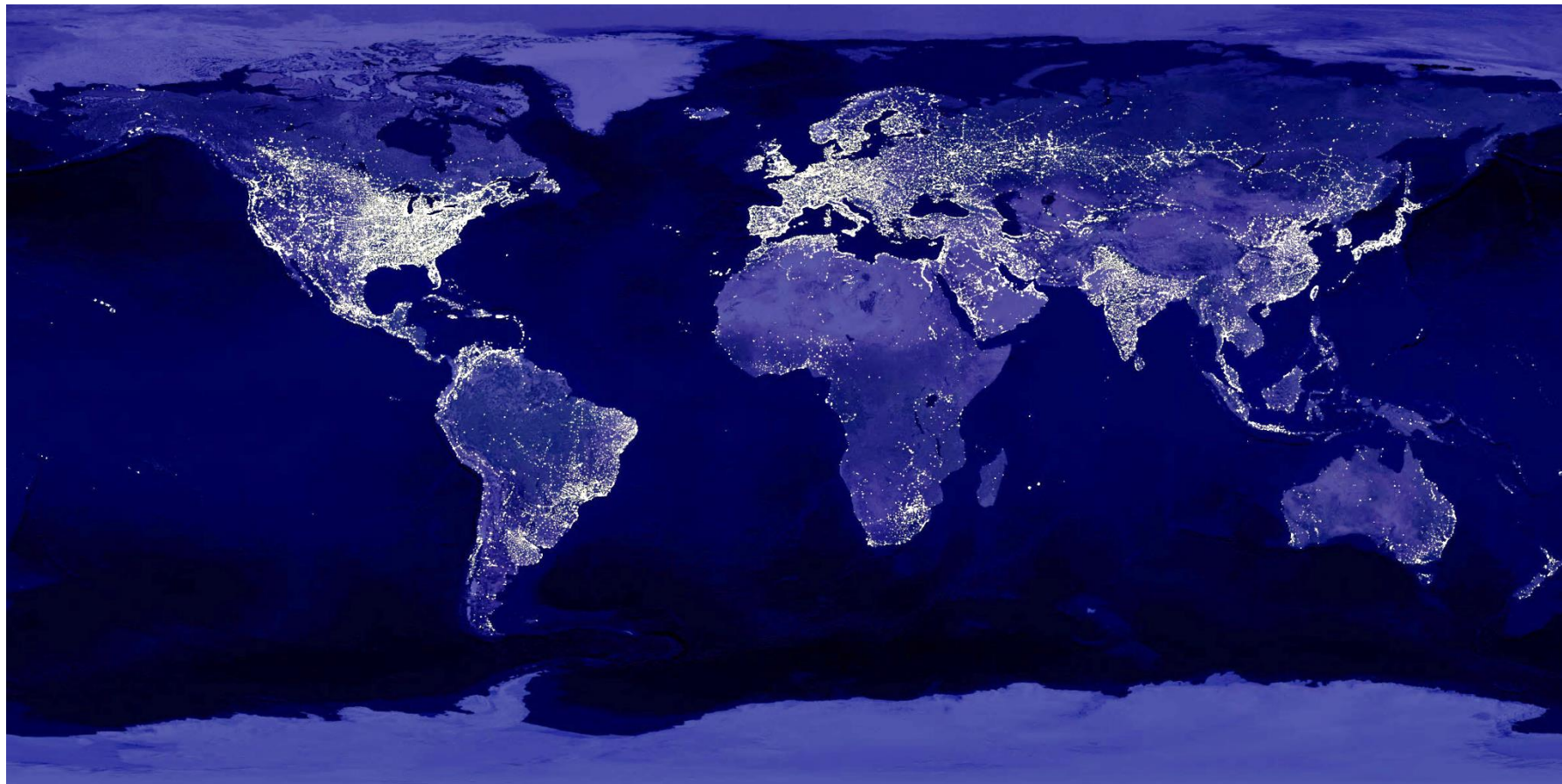
Custom made LED drivers

Dolf van Casteren

LEDdriven
www.leddriven.nl

Lighting revolution

Worldwide, grid-based electric lighting consumes 19% of the global electricity production.

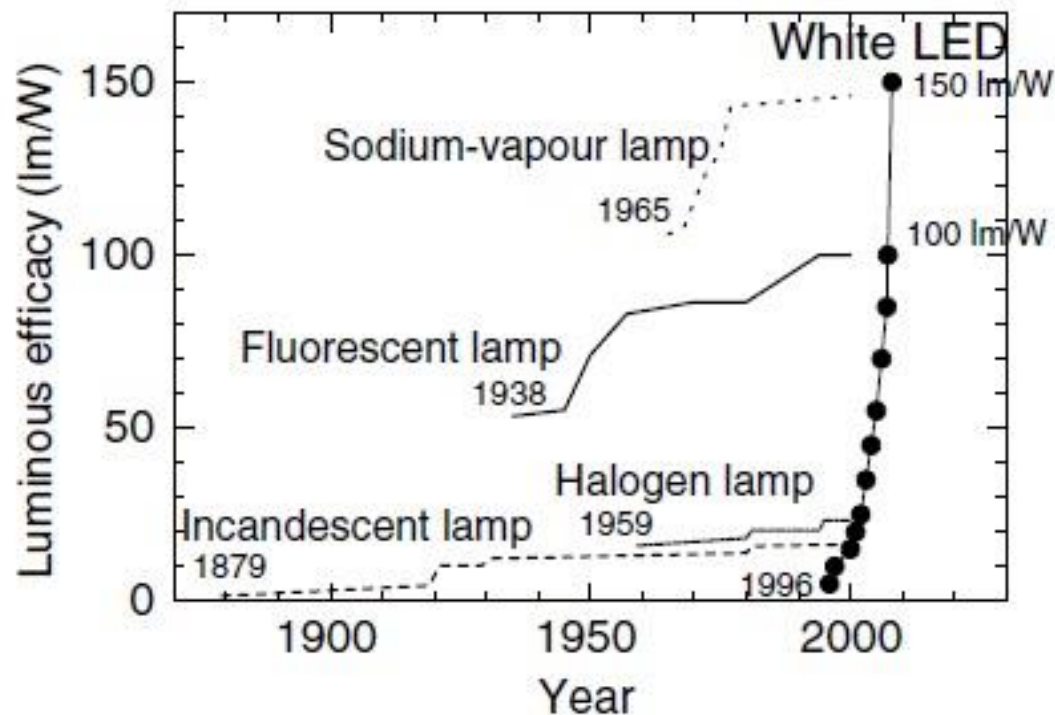


Credit: Data courtesy Marc Imhoff of NASA GSFC and Christopher Elvidge of NOAA NGDC.
Image by Craig Mayhew and Robert Simmon, NASA GSFC.

Lighting revolution



The creation of a light source requires profound knowledge of physics and the control of complex production processes.

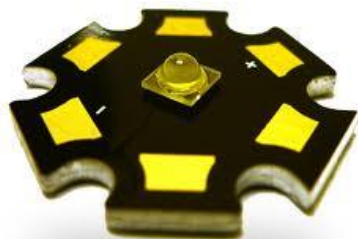


Ref: Y. Narukawa, M. Ichikawa, D. Sanga, M. Sano and T. Mukai, "White light emitting diodes with super-high luminous efficacy", 2010, *J. Phys. D: Appl. Phys.* **43** 354002

Lighting revolution



LED standard components



LED assembly



Optics



Cooling



Driver electronics + control

Catalogs filed with standard components

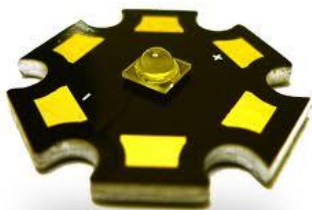
Lighting ready!

Now let's find some customers...



SSL value chain

Level 2. LED assembly

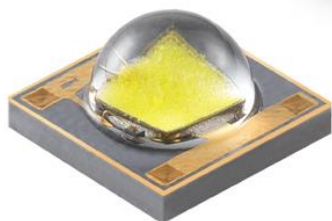


Level 4. Luminair

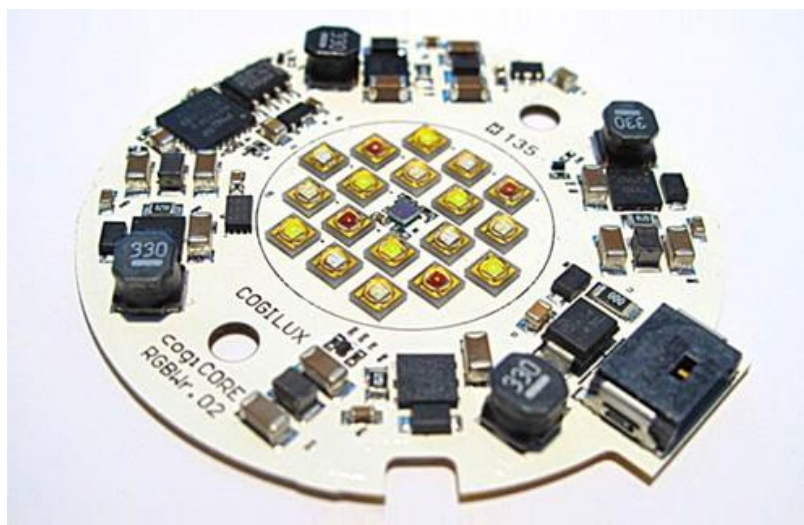


Ref: C. A. Yuan, C. N. Han, H. M. Liu, W. D. van Driel, "Solid-State Lighting Technology in a Nutshell" in Solid State Lighting Reliability, Springer, 2013, ch. 2, pp 13-41

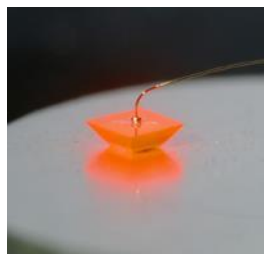
Level 5. Lighting system



Level 1. Packaged die

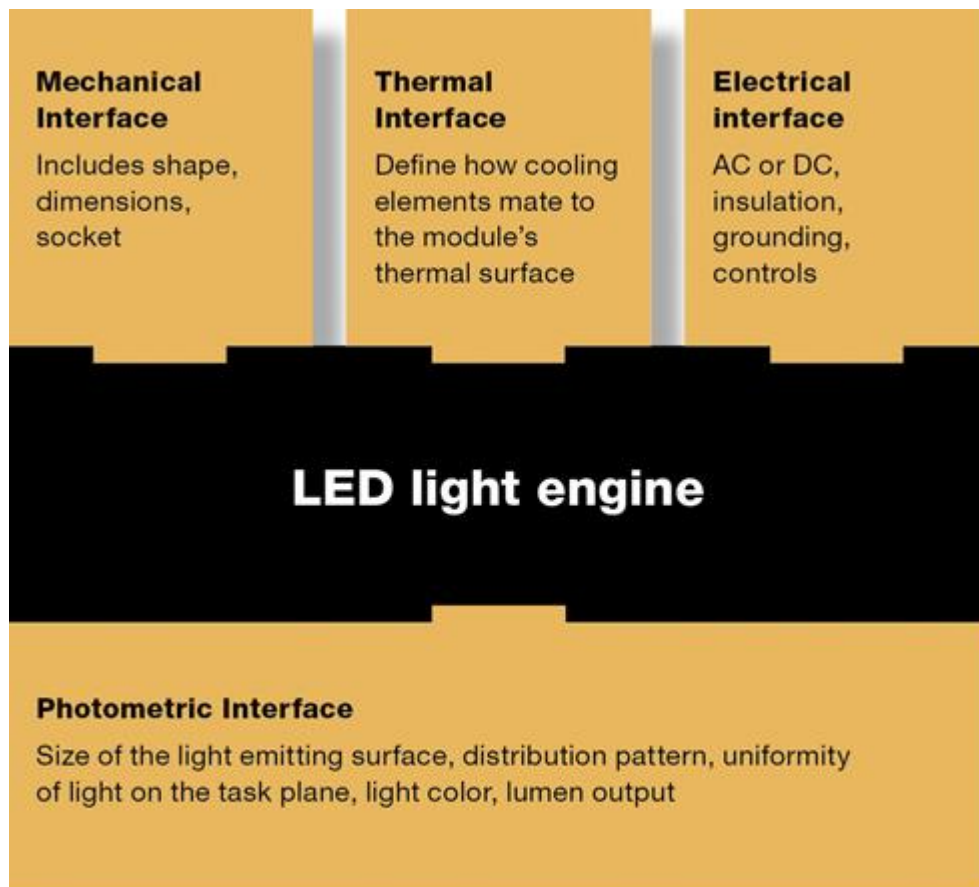


Level 3. LED engine



Level 0. LED die

LED engine



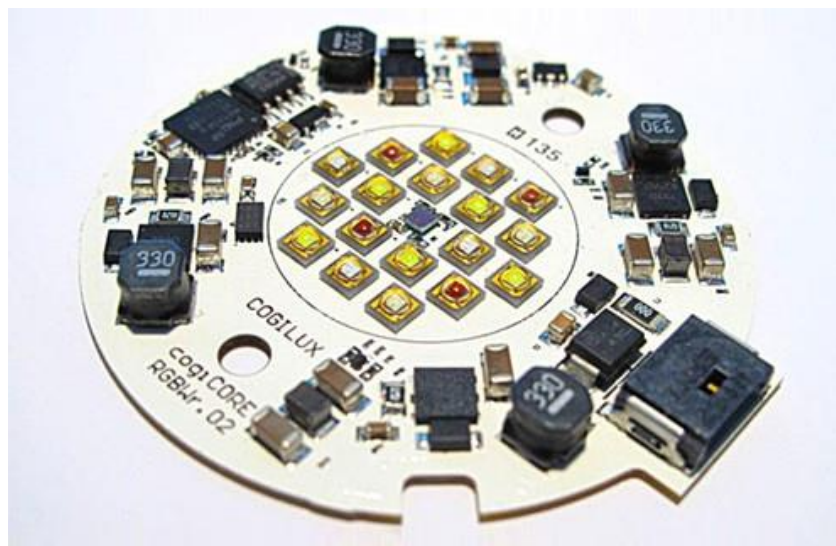
LED engine

LED packaging

LED assembly

Optics

Cooling



Communication

Sensors

Driver

Control

LED driven

Intelligent lighting systems

LED / actuators

- Single / multi-channel LED
- Fan control

Internal sensors

- LED temperature
- Driver temperature
- Light output
- Color temperature

External sensors

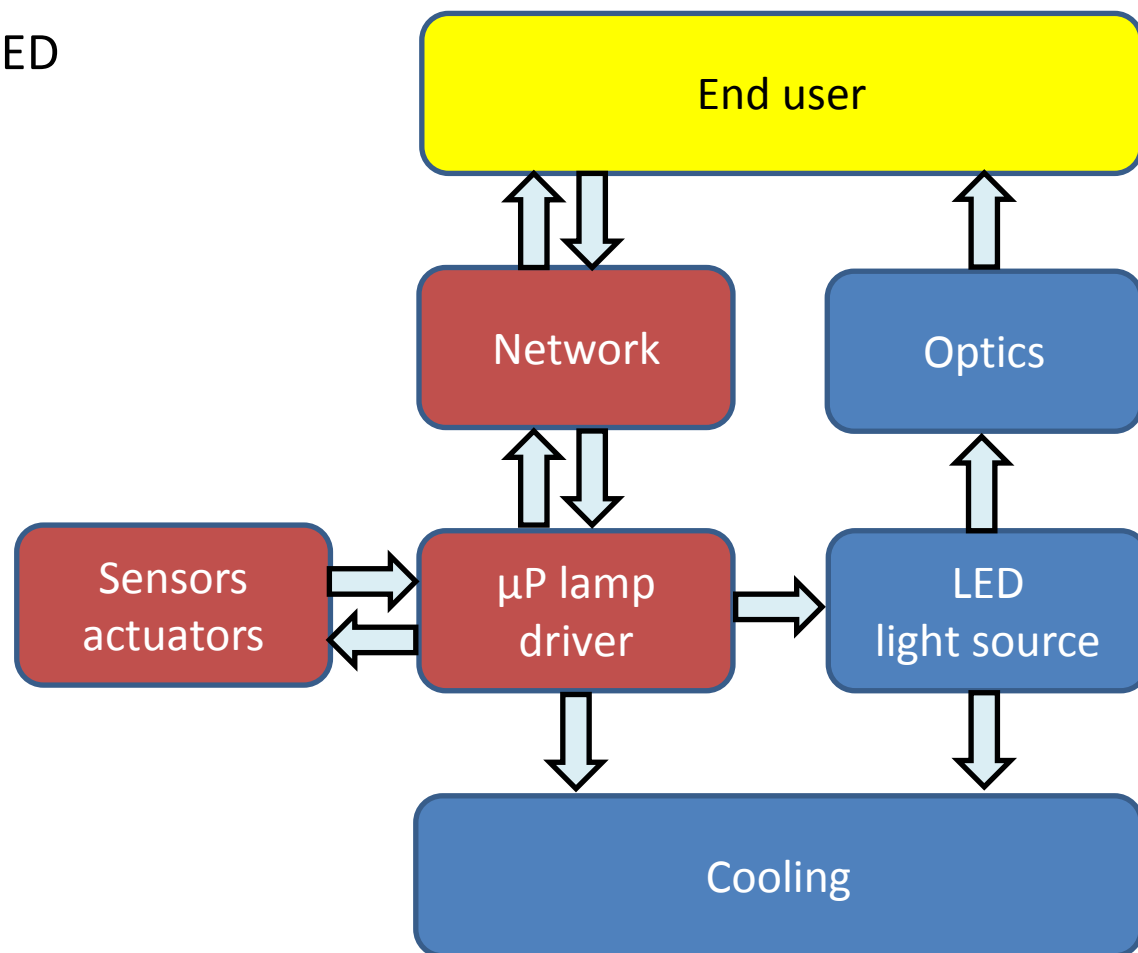
- Day light sensor
- PIR occupancy sensor
- Gesture control

Logging

- Operation conditions

Network

- Commissioning
- Service mode



Lighting network



Key value drivers

Total cost of ownership

- Efficiency (Lm/watt)
- Standby power
- Dimming

Performance

- Constant light output
- Light ripple / flickering
- Power factor, Inrush current

Controls

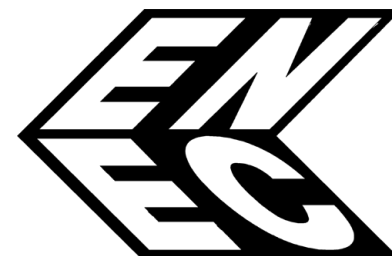
- Home automation
- Sensors, actuators
- Gesture control
- Network – DALI, ZigBee, DMX...



Critical to quality

Reliability

- MTBF
- High / low temperatures
- Mains transients



Environmental

- RoHS



Conformity with Standards

- CE, UL, DEKRA, ENEC
- EMI emission / immunity



Custom made LED drivers

PRE – Power Research Electronics B.V.

- 30 years of experience in power electronics
- 10 years of experience in LED drivers



Business unit LED driven

- Custom made LED drivers solutions
- Partner in innovation



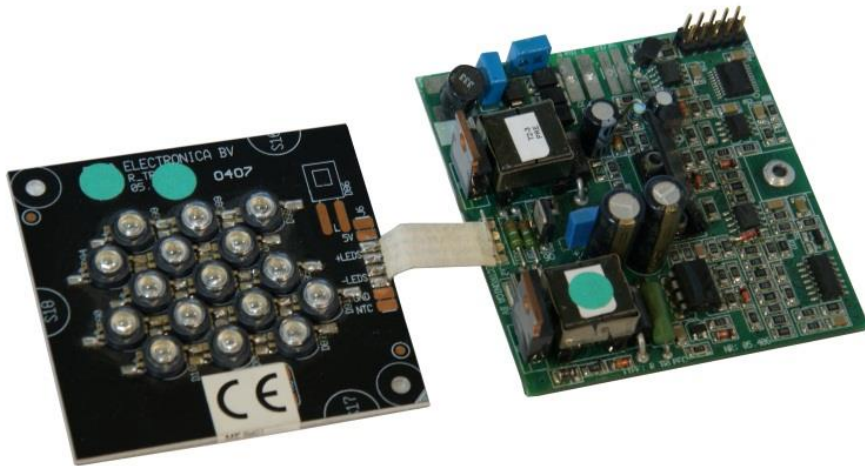
PRE market focus

- Energy harvesting and supply systems
- E-Mobility
- Industrial power supplies
- LED lighting → LED driven

EV Charger station 50kW



LED projects



Traffic Light



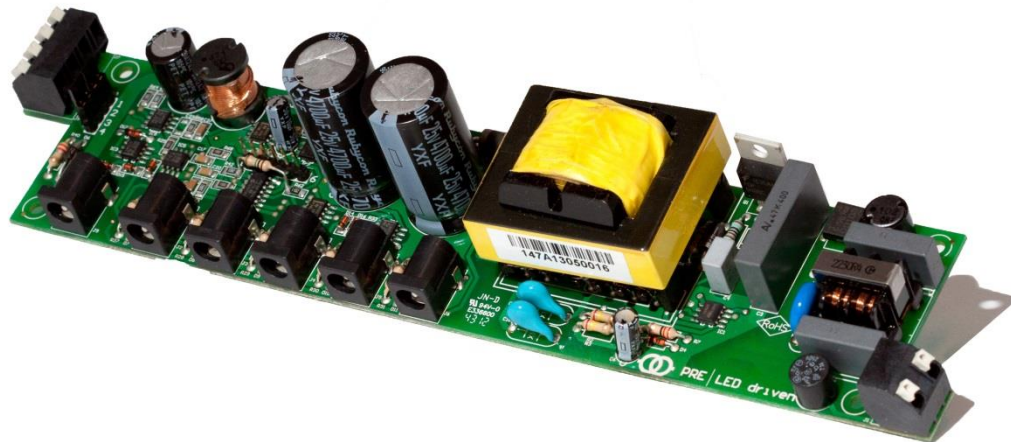
E27 and E14

LED + Solar

 **WAKA WAKA**
share the sun



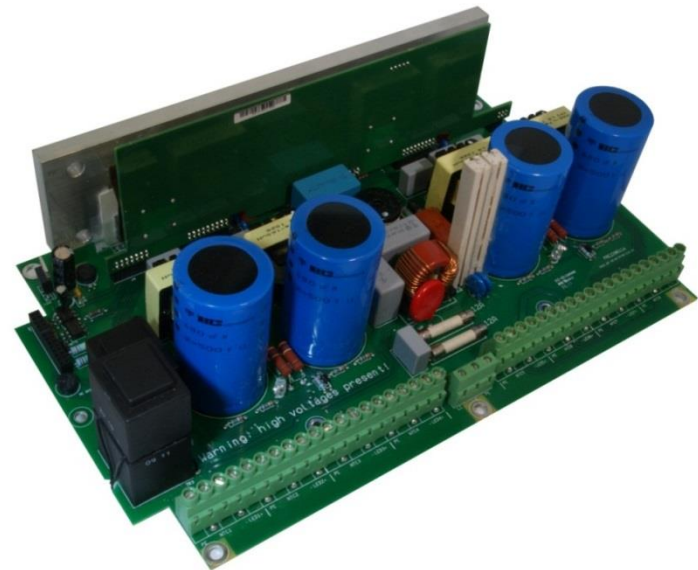
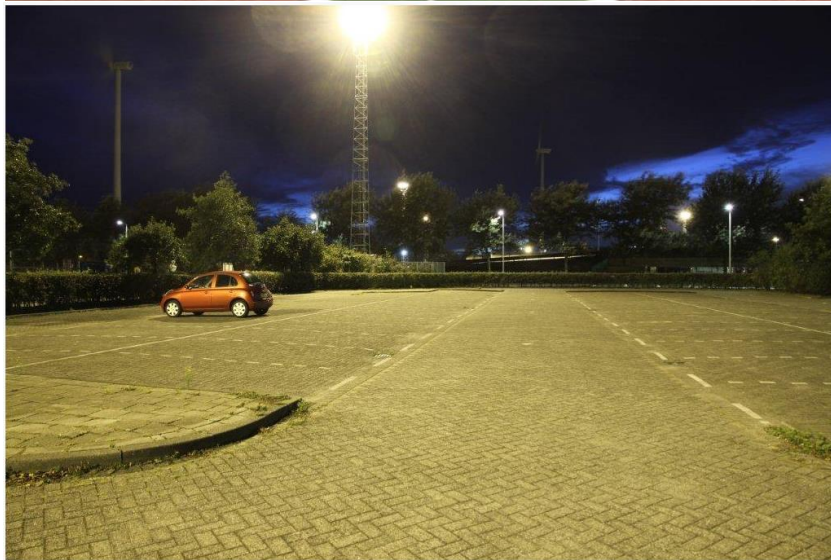
Multi-channel driver



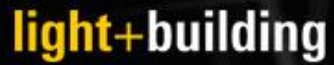
600W modular DC system



2000W driver



Light + Building 2012

 light+building

30/3/2014 – 4/4/2014





Custom made LED drivers

LEDdriven

www.pr-electronics.nl

Thank you for your attention!