Signify

LED drivers
The engine inside

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IGOV, 9 September 2018

From Conventional to Connected

Sensor
GPS control
Bluetooth configuration

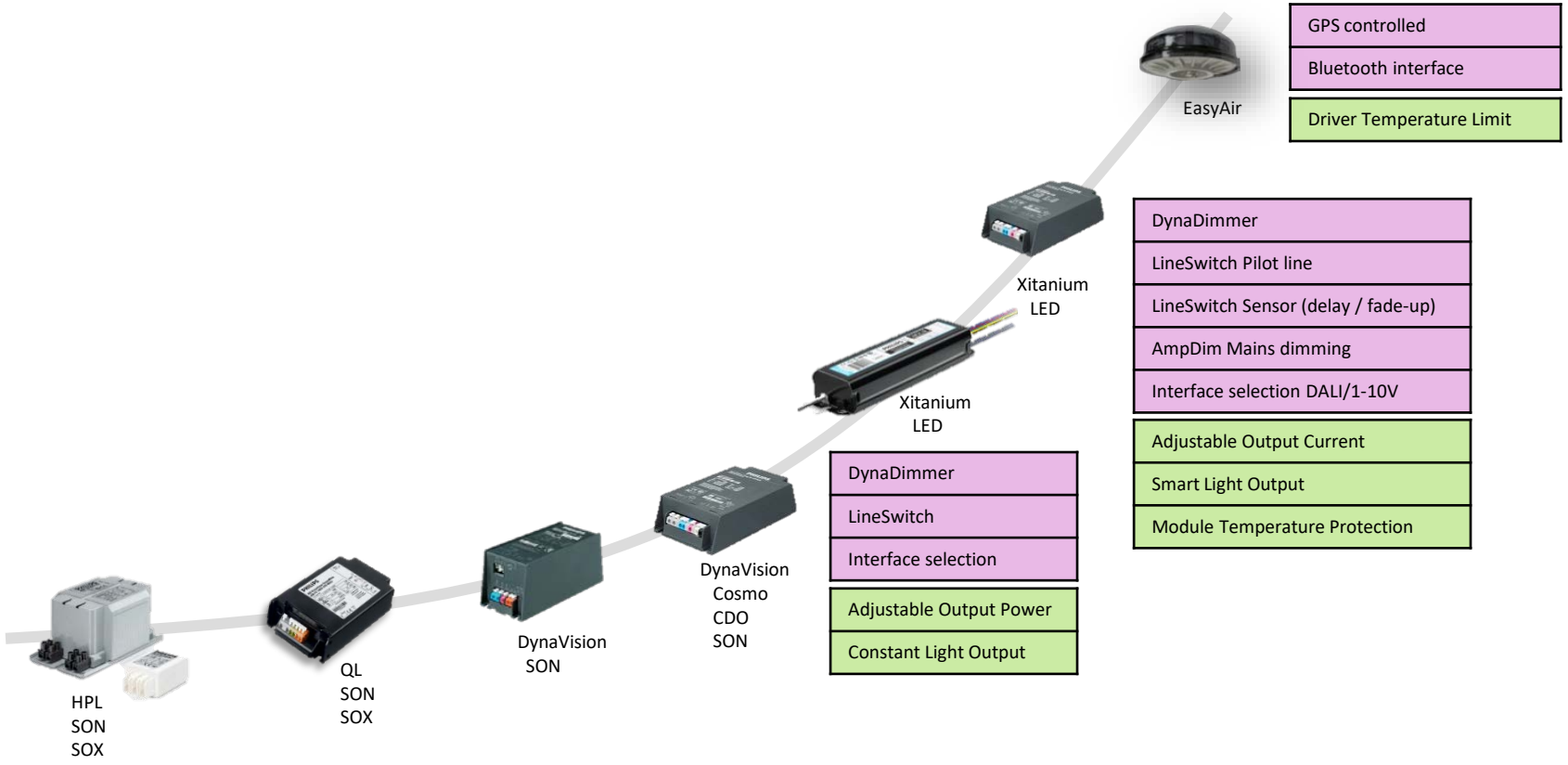
Configurable/Connected
Asset Management
Sensor ready
Smart Sensor

Integrated Controls
DynaDimmer
LineSwitch / Presence sensor
AmpDim

Digital
LineSwitch
DALI

Analogue
1-10V

Electromagnetic



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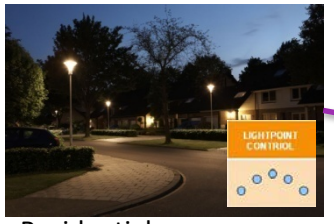
Solutions for every application

Highway



Residential

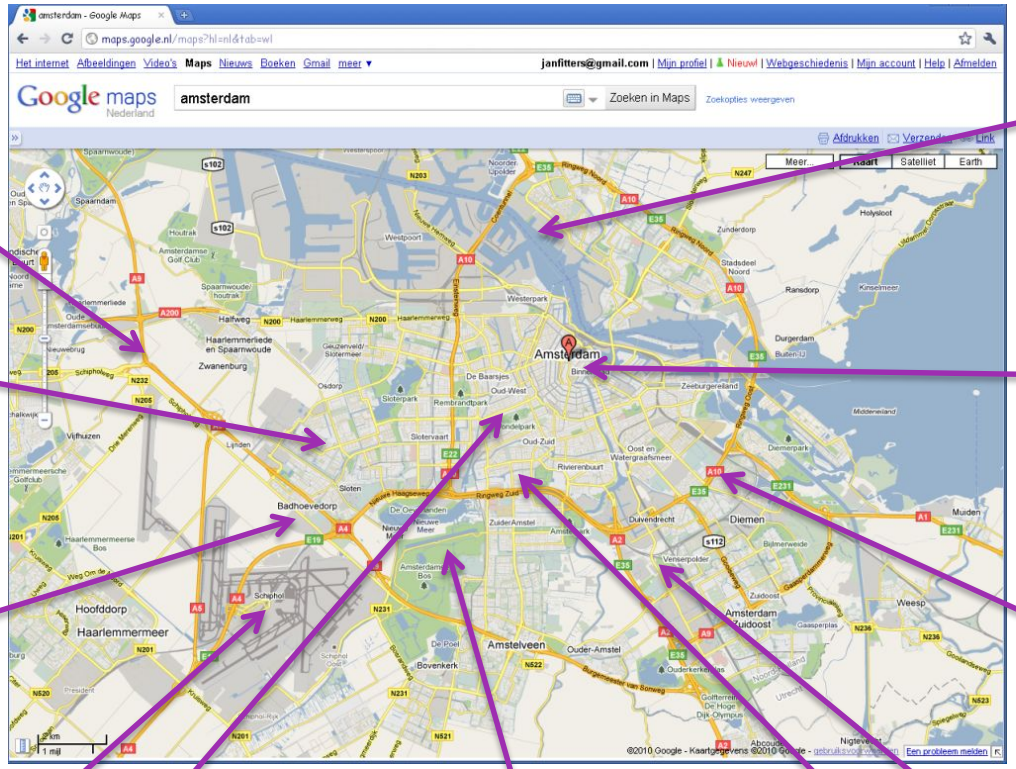
Parking lot

Area (Airport)

Flood lighting

Park

Pedestrian / Bicycle



Area (harbour)

Urban

Petrol Station

Arena stadium

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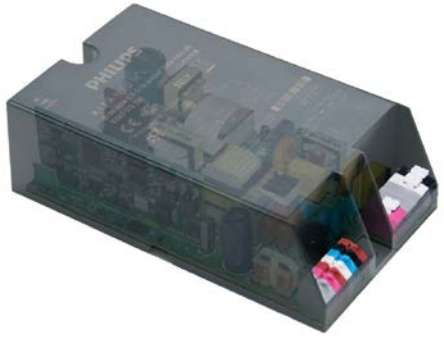
LED driver - the engine in your luminaire



Specifications:

Output Power	12..330W
Input voltage	190..264V
Output voltage	8..300V
Output current	0.05..1.0A
Efficiency	>90%
Power factor	>0.98
Temperature	-30..55°C
Dim-range	100…5%
Build-in control	DynaDimmer, CLO
Interface	LineSwitch, DALI, SR

http://www.lighting.philips.co.uk/oem-emea/support/technical-downloads

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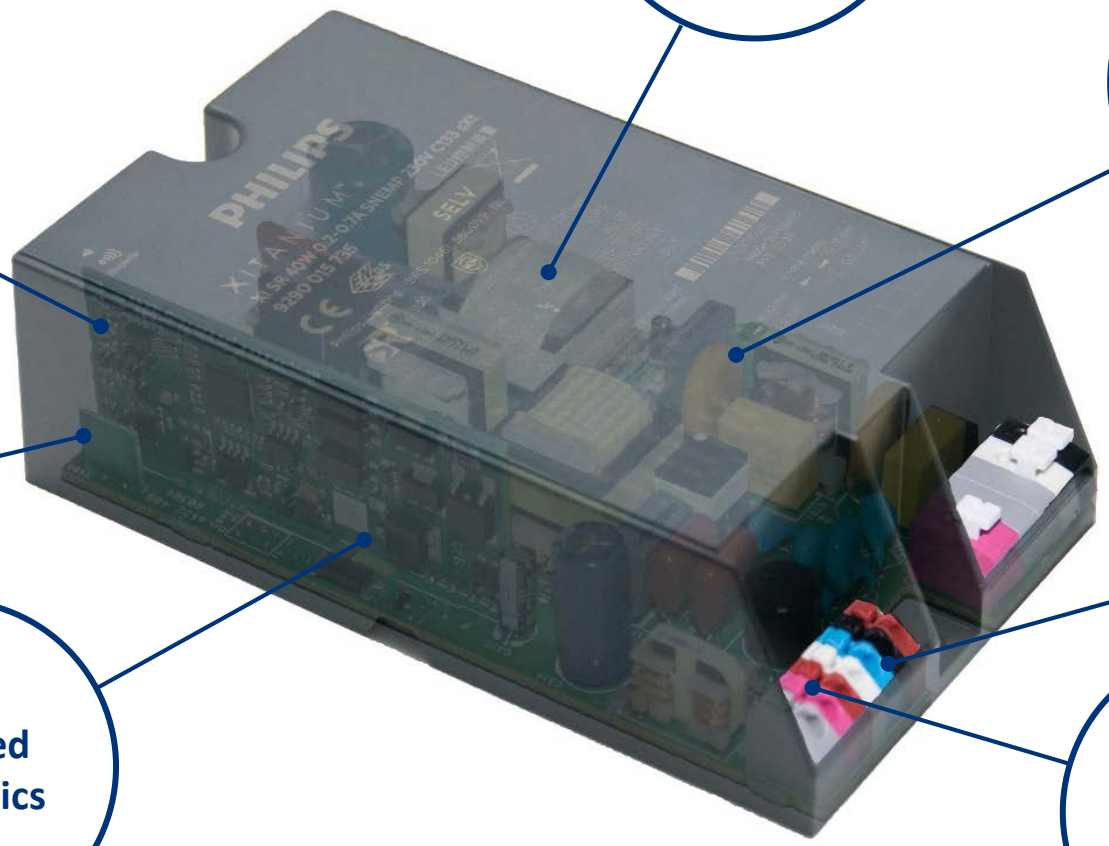
Xitanium LED driver



24V Auxiliary Supply

1% accurate metering

DALI-2 with power Supply

SimpleSet (NFC)

Extended diagnostics

Module and Driver Temperature Protection

SR interface

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SR and EasyAir

Next step of drivers for connectivity

Make features available for end-users

- Light level
- DynaDimmer

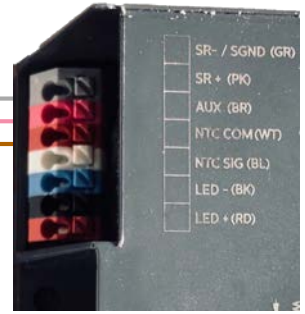
Enable connectivity via SR connector, Future-proof

Worldwide standardized via Zhaga and DiiA

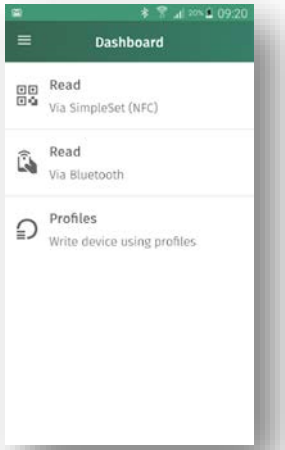
EasyAir SNO110

SR CERTIFIED

SR Connector



Xitanium SR



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Workshop LED driver

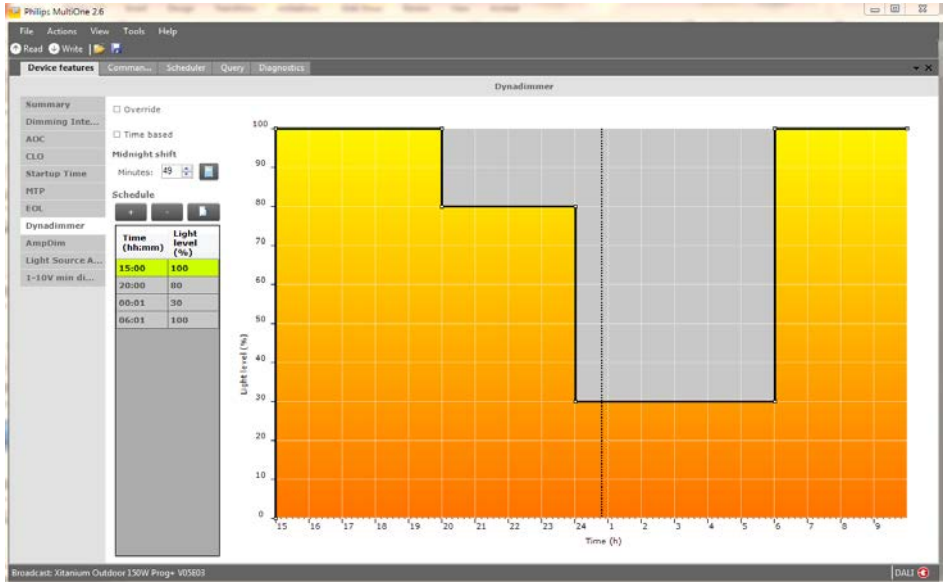
- Build-in controls – DynaDimmer/Constant Light
- Inrush current
- Dynamic behavior – Power-factor/Mains Guard
- AC or DC?

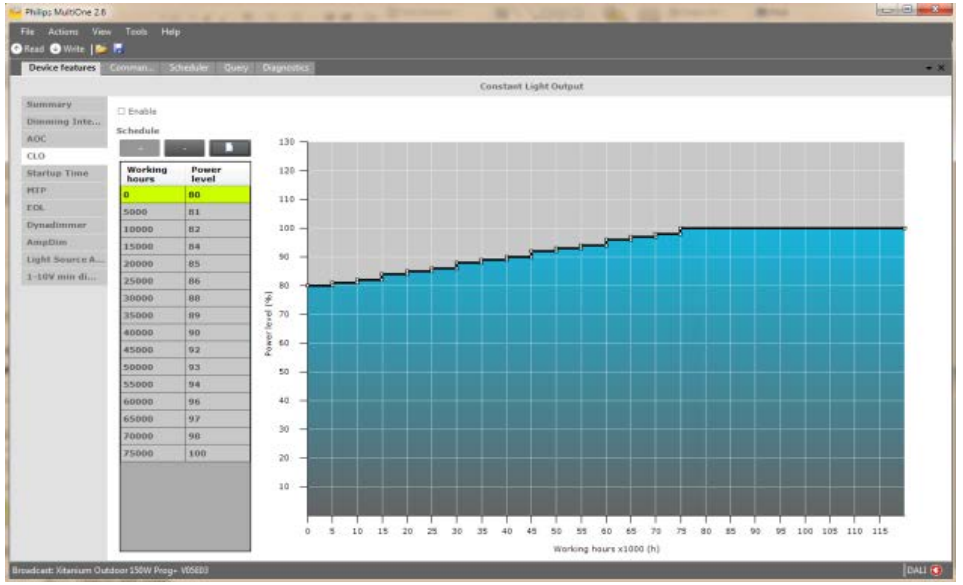
Stellingen voor workshop

- Door de hogeren aanloopstroom zullen sommige installaties niet omgezet kunnen worden naar LED.
- DynaDimmer is niet bruikbaar omdat deze te onnauwkeurig is.
- Een arbeidsfactor onder 0.85 is niet belangrijk omdat de stroom tijdens dimming toch lager is.
- Over vijf jaar zullen alle lantaarnpalen aan internet gekoppeld zijn.
- DC zal een hoge vlucht gaan nemen in nederland.

Build-in Control

Build-In control





DynaDimmer

- 5-Step Autonomous dimming
- Controlled by on/off switching

Constant Light Output

- Compensation of lumen depreciation

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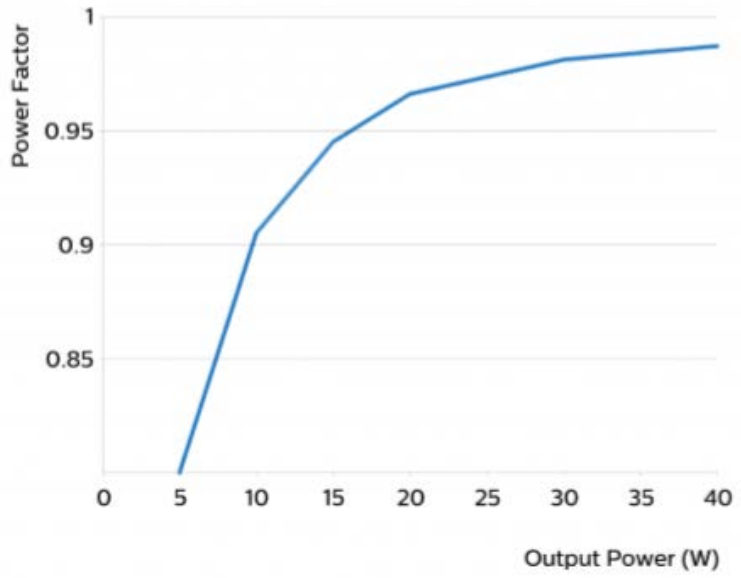
Power-factor and Mains Guard

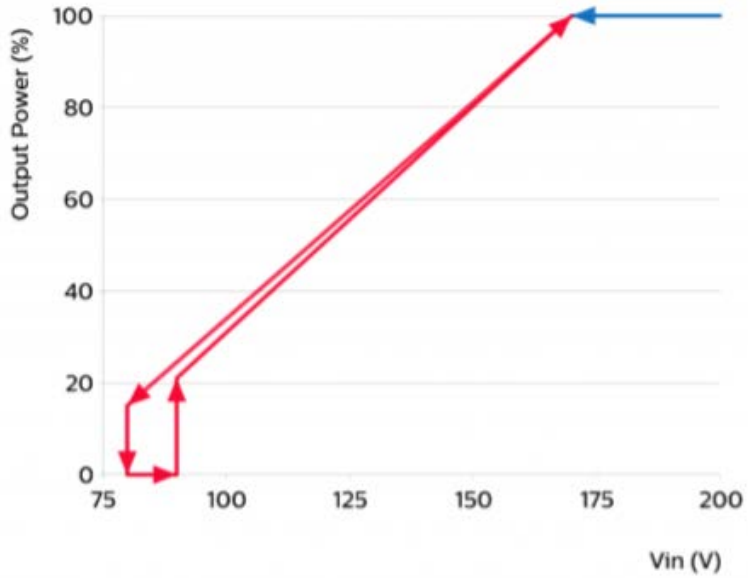
Dynamic characteristics

Power factor versus output power



Power-factor as function of output power

Mains Guard



Build-in mains guard to protect luminaire for low mains voltage

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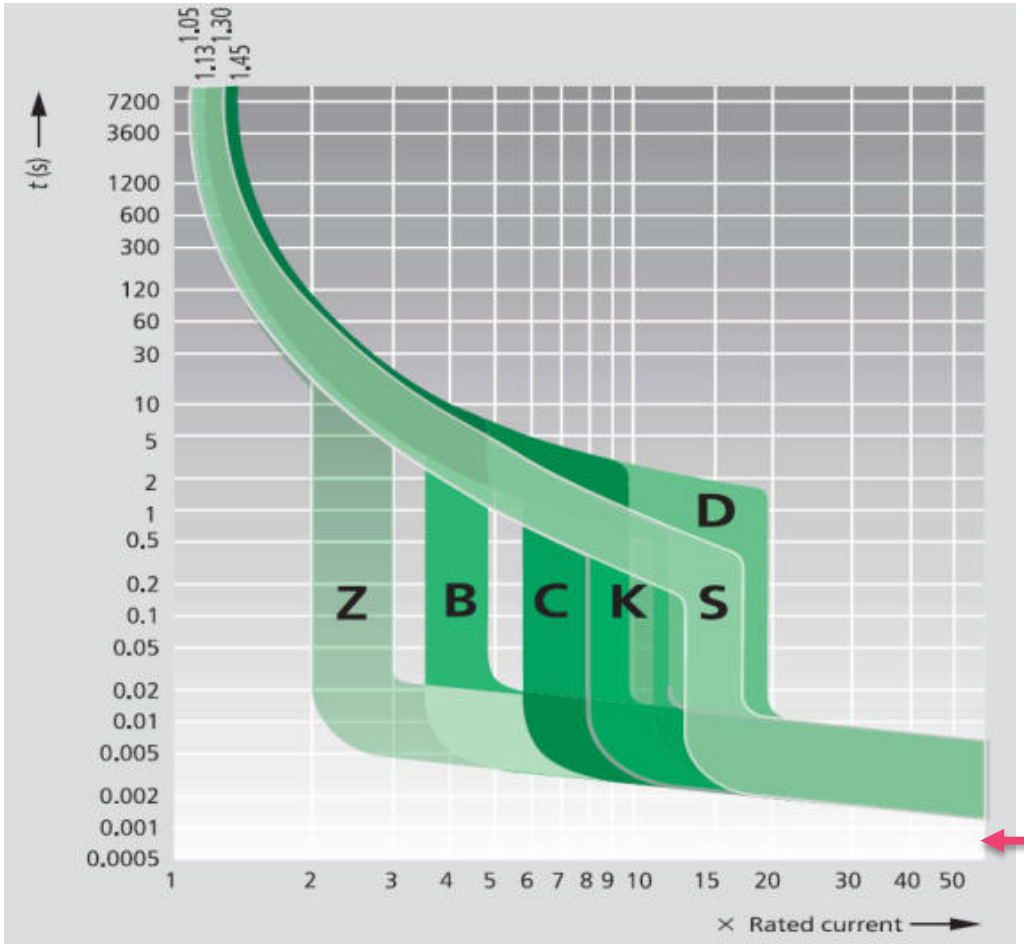
Mini Circuit Breaker and # drivers

Inrush current



Example Xi FP 40W

- Input current 0,2A
- Max 21 drivers on MCB 16A B-type

- Inrush current 21A
- Inrush current width 0.0003 Sec

MCB	Rating	Relative number of LED drivers
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%

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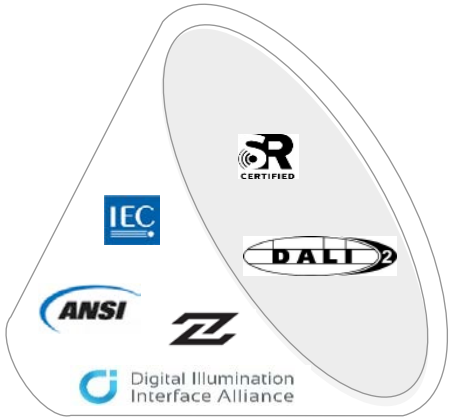
Connected light and new regulations

How to make a luminaire Connected Ready?

IoT World

Lighting fixture industry



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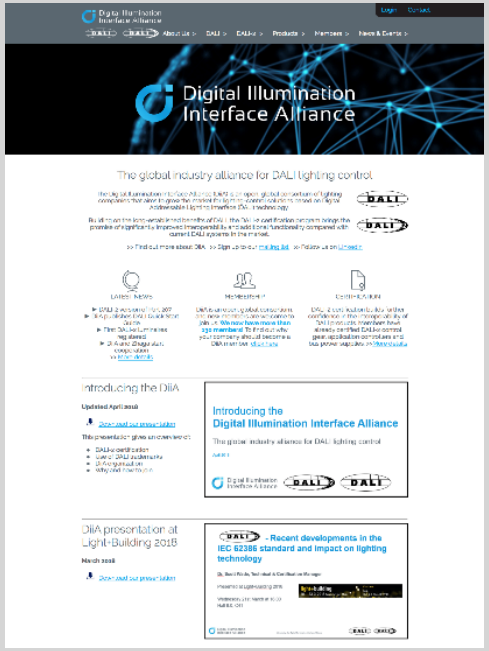
Global standardization

SR-Connector

- Zhaga Book 18 (part-I/II)
- Standardized by ANSI (C136.54)

SR-Interface

- Based on DALI-2
- Defined in SR specification v1.7
- Standardized by ANSI (C137.4)
- Standardization in IEC 62386 series, to be initiated by DiiA



Regular Members (23)

- Acuity Brands Lighting, Inc.
- Cooper Lighting, LLC
- CP Electronics
- DEKRA Certification B.V.
- Delta Electronics, Inc.
- ERCO GmbH
- ESYLUX Deutschland GmbH
- Helvar Oy Ab
- LEDVANCE GmbH
- LEEDARSON Lighting Co., Ltd.
- Lutron Electronics Co.
- Novar ED&S Ltd. (A Honeywell Company)
- OSRAM GmbH
- Panasonic Lighting Europe GmbH
- Siemens Schweiz AG
- Signify
- Simmtronic Limited
- Simon S.A.
- STEINEL GmbH
- Tridonic GmbH Co.kg
- TRILUX Group i2TZ GmbH
- WAGO Kontakttechnik GmbH & Co. KG
- Zencontrol Limited

Associate Members (130)

- ABB
- AcTEC Electronics Co., Ltd.
- Airam Electric Oy AB
- ALVIT SRL
- Artemide SpA
- Artilect Green Co., Ltd.
- Aurex Industrial
- B.E.G. Brück Electronic GmbH
- Beckhoff Automation GmbH & Co. KG
- Bega Gantenbrink-Leuchten KG
- Beghelli SpA
- Bes A Electronics
- Carlo Gavazzi Controls S.p.A.
- Cincon Electronics Co., Ltd.
- Clevertronics Pty Ltd
- Coolon Pty. Ltd.
- Cosine Developments
- Current, Powered by GE
- Daisalux S.A.U.
- Dalcnet srl
- Delmatic Ltd.
- Delta Dore
- DEUTA Controls GmbH
- DIAL GmbH
- Dongguan BOKE LED Drivers Co., LTD
- DPPUL Electronic Co., Ltd.
- Eaglerise Electric & Electronic (China) Co., Ltd.
- Eckerle Technologies GmbH
- Edison Opto Corporation
- EEC Electronics
- EFORE SpA
- ELT
- Emergency Lighting Products Limited
- ES- System SA
- Ever Shining Optotech Co., Ltd.
- exscitron GmbH
- Feelux Co., Ltd.
- feno GmbH
- Finder S.p.A
- Foshan Huaquan Electrical Lighting Co., Ltd.
- FRIWO
- FSP
- FULHAM

- Gerard Lighting Pty. Ltd.
- GEWISS S.p.A.
- Glamox AS
- GRE Alpha Electronics Limited
- Hadler GmbH
- Hager/Berker Holding GmbH
- Harvard Technology Ltd
- HEP Tech Co., Ltd.
- Herbert Waldmann GmbH & Co. KG
- Hytronik Industrial Co., Ltd.
- I+D LED S.L.
- Industrias Ventura S.L.
- Insta Elektro GmbH
- Intertek Testing Services
- Intesis Software, S.L.
- Inventronics Europe B.V.
- IPAS GmbH
- Je Woo Corporation Ltd
- KingLumi Co.,Ltd.(K&L) China
- LCI- Lighting Components International
- Ledolight Sweden AB
- Lichtvision Engineering GmbH
- LiFud Technology Co., Ltd.
- LITE-ON Technology Corporation
- Liteplan Limited
- Lumenpulse Group
- Lumitech Produktion und Entwicklung GmbH
- Lunatone Industrielle Elektronik GmbH
- Mackwell Electronics Ltd.
- MEAN WELL Europe B.V.
- Meijay Technologies Co., Ltd.
- Menowatt Ge Spa
- Minulamp SRL
- Newlab S.r.l.
- Niko Group
- Ningbo Ledeshi Electric Equipment Co.,Ltd
- Ningbo Violet Lighting Electric Co., Ltd.
- Nordic Automation Systems
- Norka Automation GmbH
- NormaGrup Technology, SA
- novaccess

- Ozuno
- Phoenix Contact GmbH & Co. KG
- Pleid AB
- polynom ag
- Projektleuchten GmbH
- Prolojik Limited
- QUALITRON SRL
- Renesas Electronics Europe GmbH
- SAMSUNG Electronics Co., Ltd.
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- Schneider Electric
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- Shanghai Euchips Industrial Co., Ltd.
- Shanghai Institute of Quality Inspection and Technical Research
- Shanghai MOONS' Automation Control Co., Ltd
- Shenzhen City Hengyao Lighting Technology Co., Ltd.
- Shenzhen Longyun Lighting Electric Appliances
- Shenzhen Merrytek Technology Co., Ltd.
- Shenzhen Moso Electronics Technology Co., Ltd.
- Shenzhen Sosen Electronics Co., Ltd.
- Shenzhen Sunricher Technology Limited
- Silvair, Inc.
- Suzhou Opple Lighting Co., Ltd.
- TCI Telecomunicazioni Italia
- TE Connectivity Nederland B.V.
- Tepcomp Oy
- Tessera Technology, Inc.
- Theben AG
- TM TECHNOLOGIE Sp. z o.o.
- Traditech BV - TRADIM
- United Control Technology Co., Ltd.
- Vadsbo Transformatorer AB
- Vestel Electronics
- Virtual Extension Ltd.
- Vkan Certification & Testing Co., Ltd.
- Wieland Electric GmbH
- XAL GmbH
- XenerGI Ltd.
- Xiamen Yankon Energetic Lighting Co., Ltd.
- Zhejiang Klite Lighting Holdings Co., Ltd.

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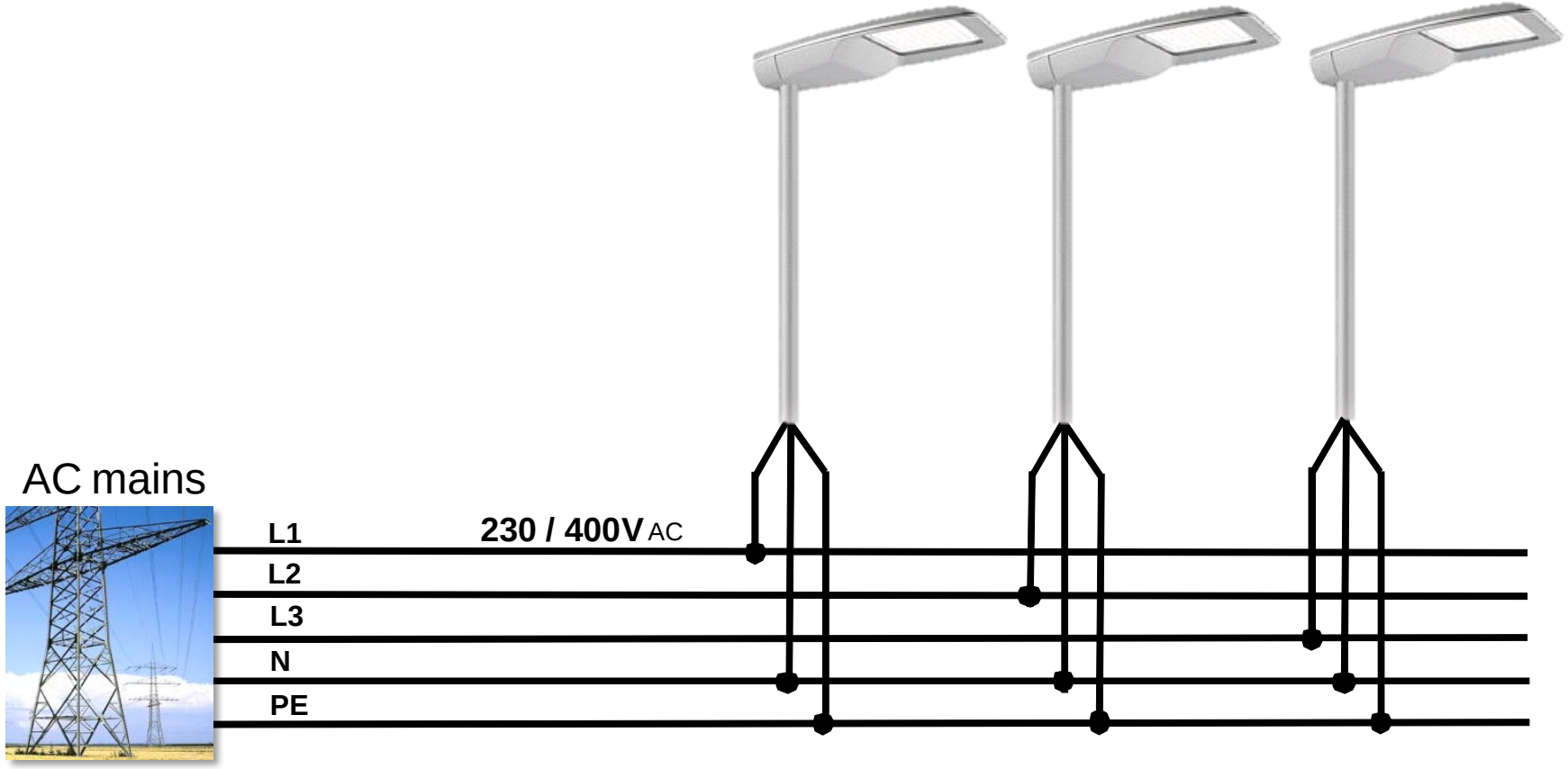
DC

AC/DC



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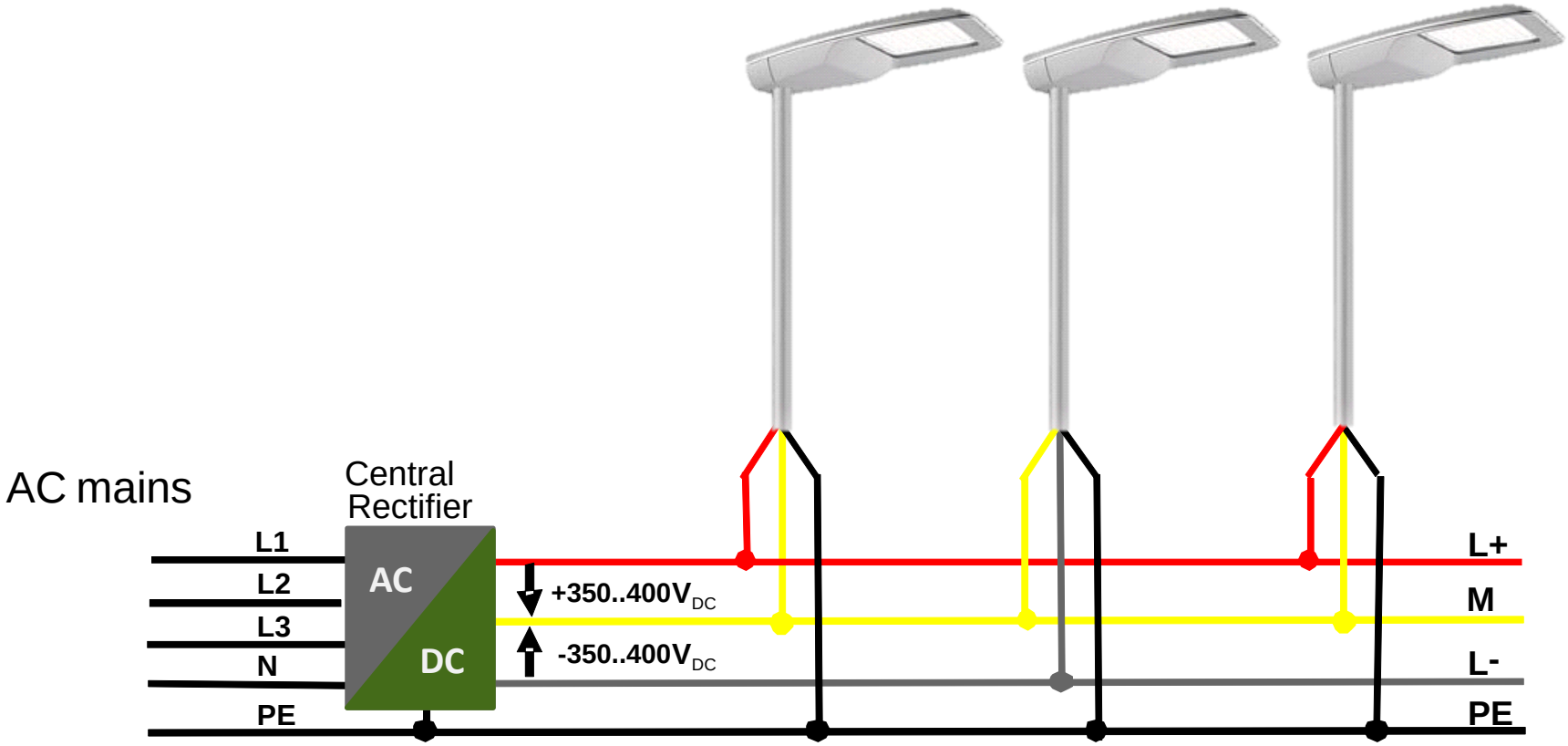
DC mains



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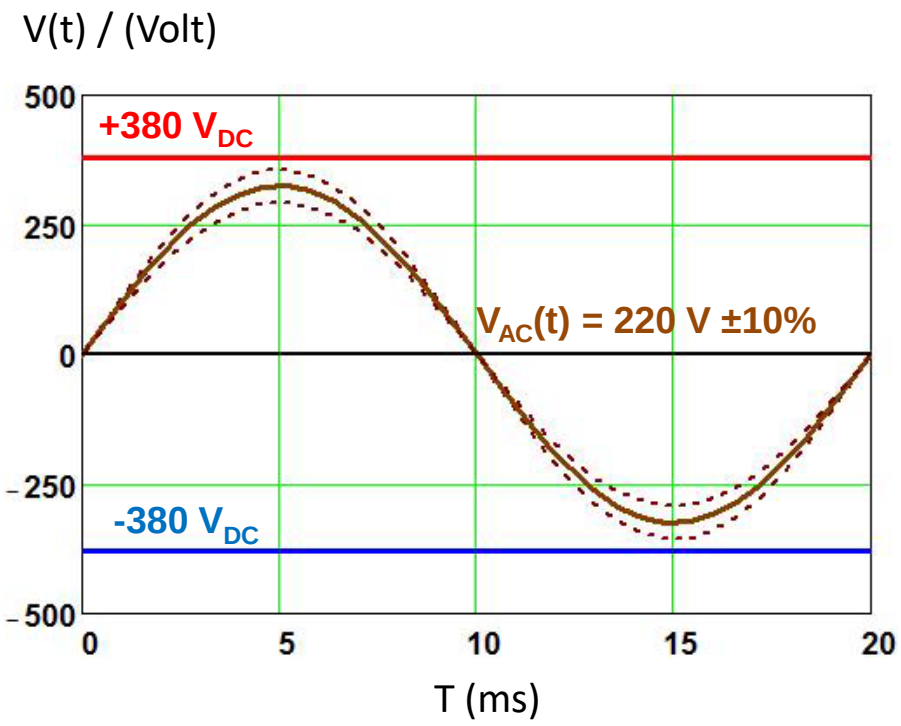
DC mains



- With DC, a higher RMS voltage can be reached on 500V rated cable
- No inductive losses
- Power factor will remain 1
- Because of lower current, losses will be lower and less copper is needed.

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DC mains - Savings on cable

Example A44: Draka “EO-YMeKaszh OV 0,6/1kV”

	3-fase AC grid	**2-fase DC grid**
Cable type	4x 10 mm^2	3x 6 mm^2
Total cable weight	0.795 kg/m	0.440 kg/m
Copper weight	0.357 kg/m	0.161 kg/m

Savings by using DC

0.196 kg/m copper ~ 1.14 €/m

0.159 kg/m Steel and isolation material

55 % less copper needed or existing cable can be used to transport more energy !!

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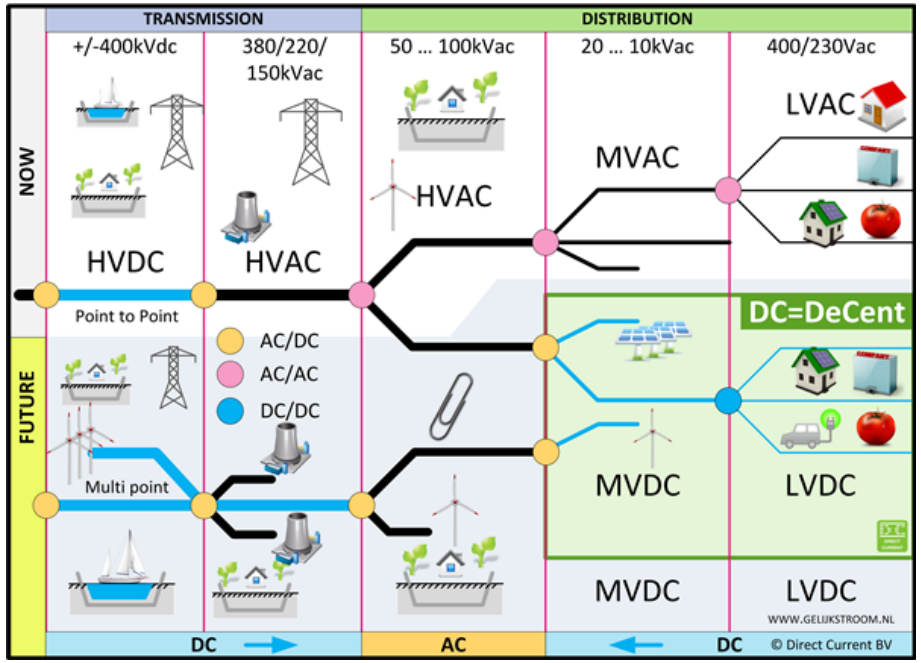
DC mains - considerations



https://www.gelijkspanning.org/

Only used in the Netherlands (Stichting Gelijkspaning)

Infrastructure is designed for AC mains

Protection of DC mains (DC is more difficult to switch off)

Limited number of suppliers

Acceptation of IEC regulations

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