

Light is outstanding

OPTOTRONIC® LED Drivers

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OPTOTRONIC® indoor LED Drivers

Re-Evolution. System Focus. Price Resilient.

System Match w/ Modules + Light Management Components



COMPACT FORM

- Built-in & independent
- 1 inch height
- Plastic

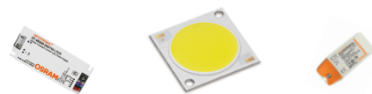
SSL SPOT&DOWNLIGHTS

Driver in compact built-in and independent forms

Serving PrevaLED / Zhaga



and commodity LE



Dimmable via DALI, 0-10V and Phase-Cut

SSL LINEAR&AREA

Driver in linear built-in form

Serving PrevaLED / Zhaga and customized modules



Dimmable via DALI & 0-10V

LINEAR FORM

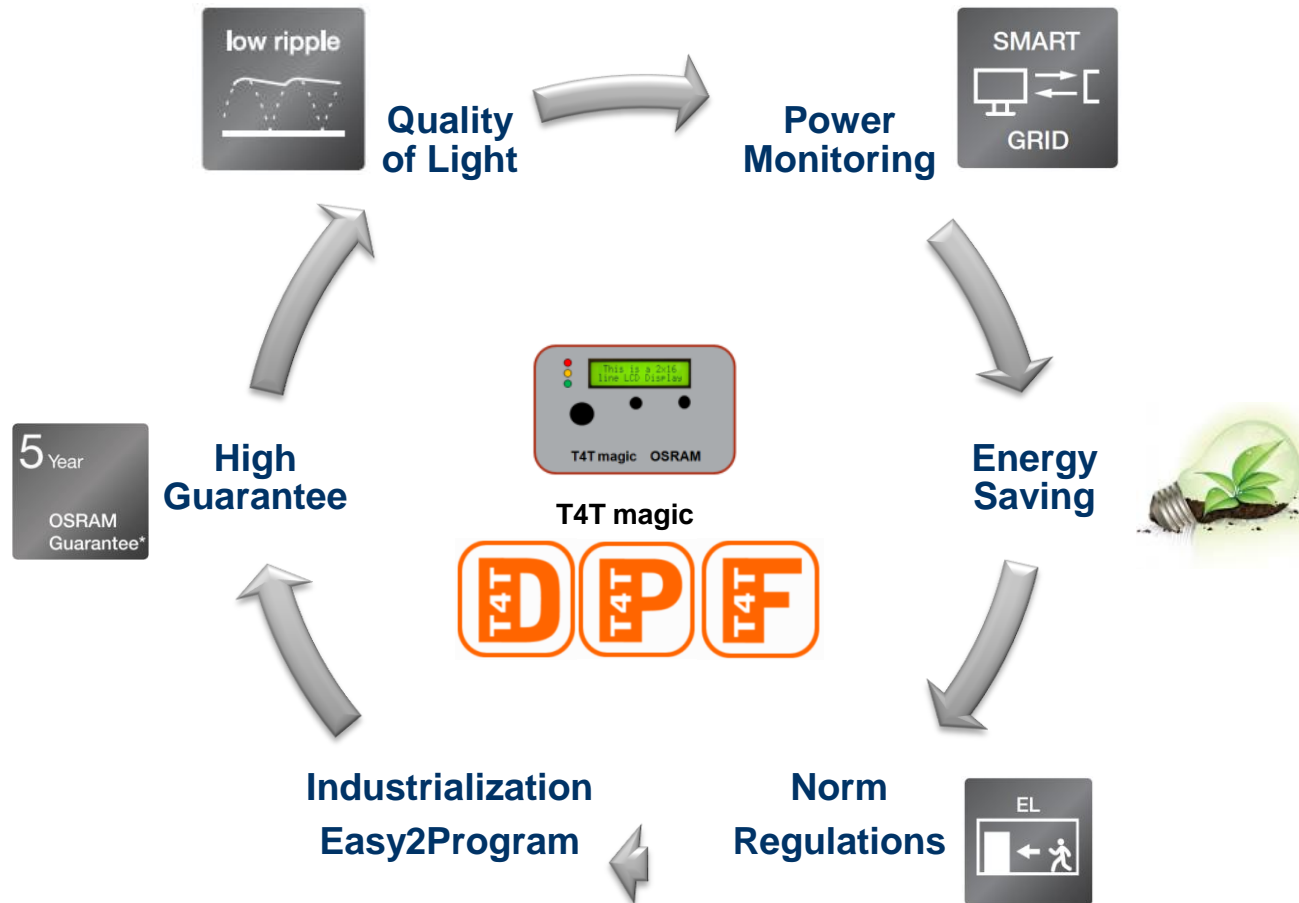
- Built-in
- HxW 21x30mm
- L 280 / 360 mm
- Metal



Professional and cost leading basic portfolio based on electronic ballasts technology

OPTOTRONIC 2014: Leading NEW Ways / Core Features

More Intelligent. More Dynamic. More Performance.



Optimized System-Solutions (Modules + Drivers + Light Management)

OPTOTRONIC® Compact indoor

Applications & Trends

SpotLighting

- High Lumen packages (>2000lm)
- **Miniaturization** (Design)
- Flexibility in **handling CoB evolution**
- Increase of Ta 50°C -> 65°C / Robustness

Downlighting

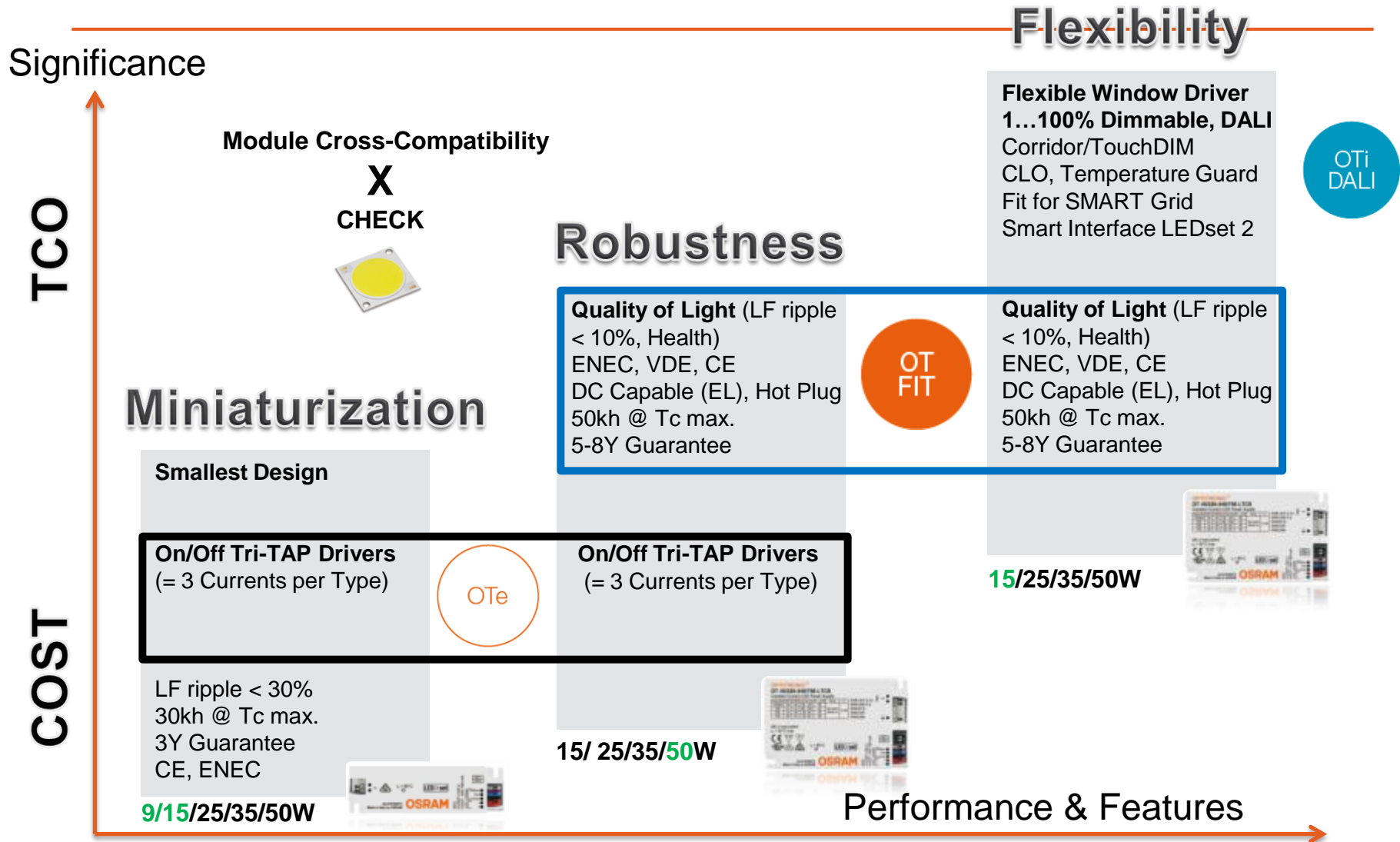
- **Reduction of Drivers** / Current standardization
- Independent mounting (80% w/o Throughlooping, 20% with)
- Price & Dimmability (DALI, High Quality)

SSL trend

- TLS vs. SSL closing the price gap
- Professional is 50khrs + 5years guarant.; 8years starting
→ **No Maintenance during Lifetime**
- **Quality of Light** (Low Ripple/Flicker, Current Accuracy, Interface Dynamics)
- **Programmability** (Development, Production, Field)

Product Segmentation Compact Drivers CC

Added Values. Flexible. FIT4Future.



OPTOTRONIC® Linear indoor

Applications & Trends



- Slowing down replacement BIZ (SELV) – **strong growth of new non-SELV LED luminaires**
- **Sealed for life as a trend** → change in value chain
- New SSL luminaires with specific luminaire design

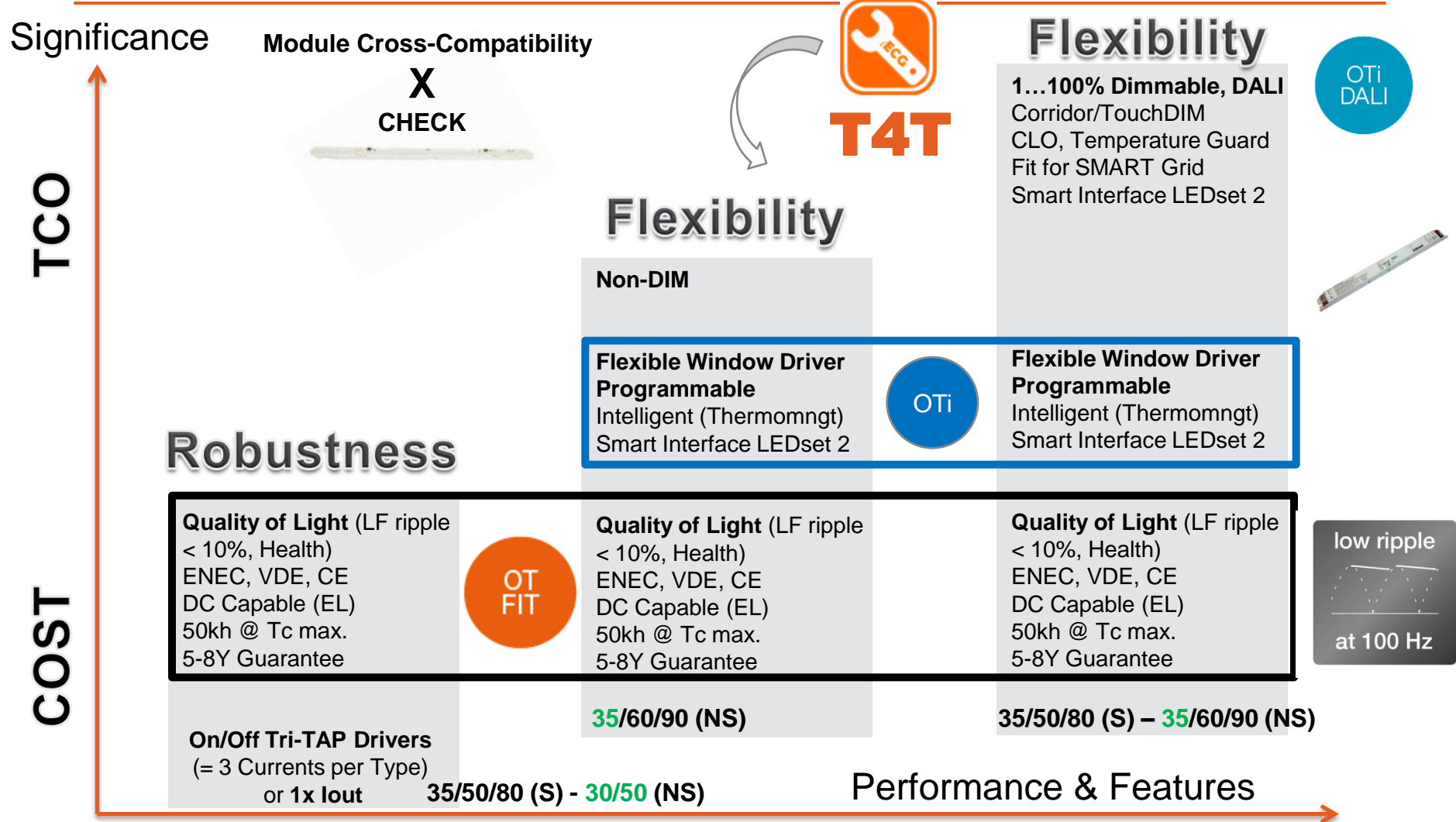
- **Few OT replace** a huge amount of ECG, replace **hundrets of FL ballasts** → KPI: Cost/Lifetime
- **Industrialization/Programmability**, Quality of Light, Lifetime & Guarantee
- Customized Modules



T4T

Product Segmentation Linear Drivers CC

Added Values. Flexible. FIT4Future.

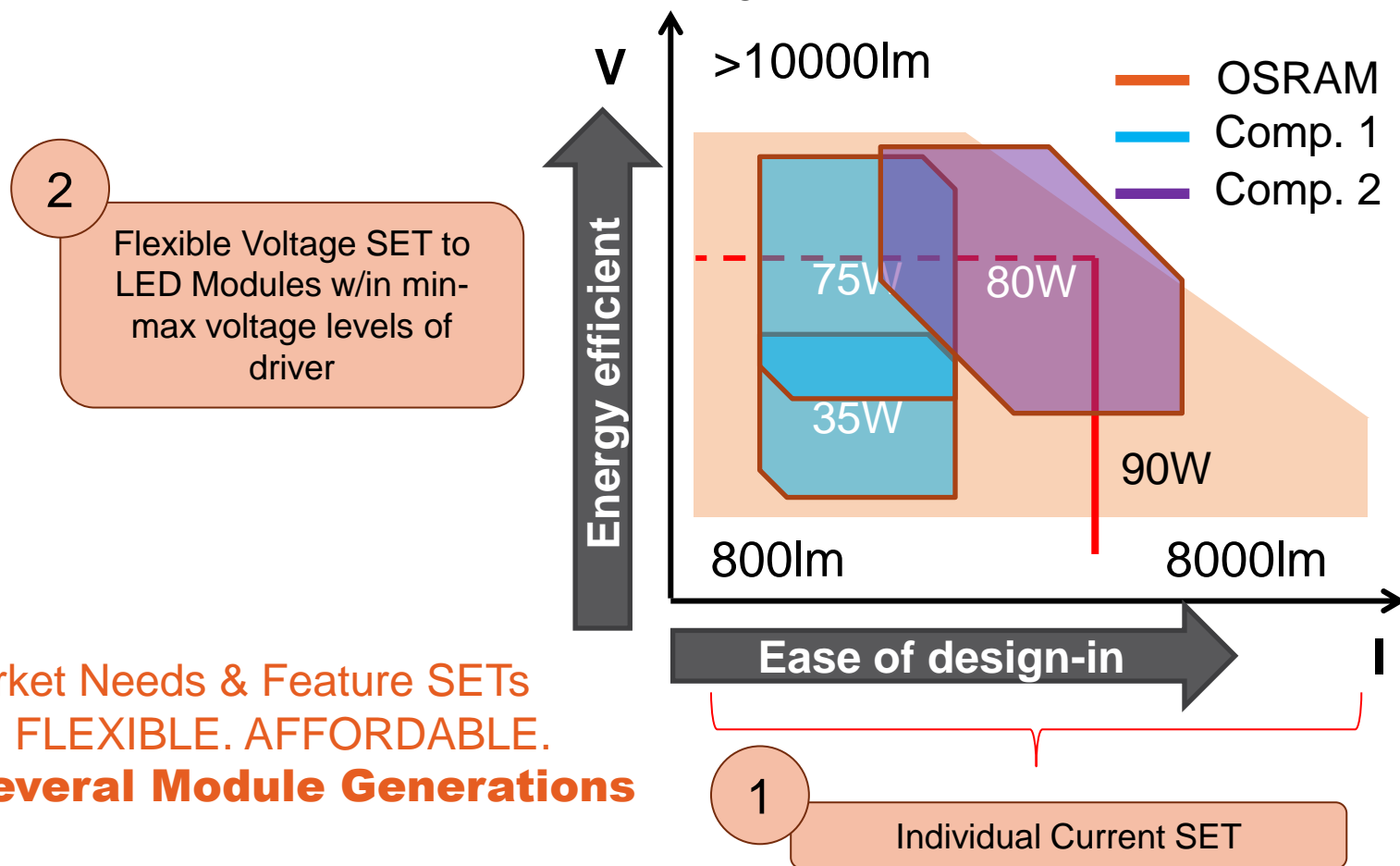


Window Drivers – Leading NEW Ways

One Product Covers Main Competition!

FUTURE PROOF

ONE Window replaces Dozens of ECG, enabling hundreds of FL combinations

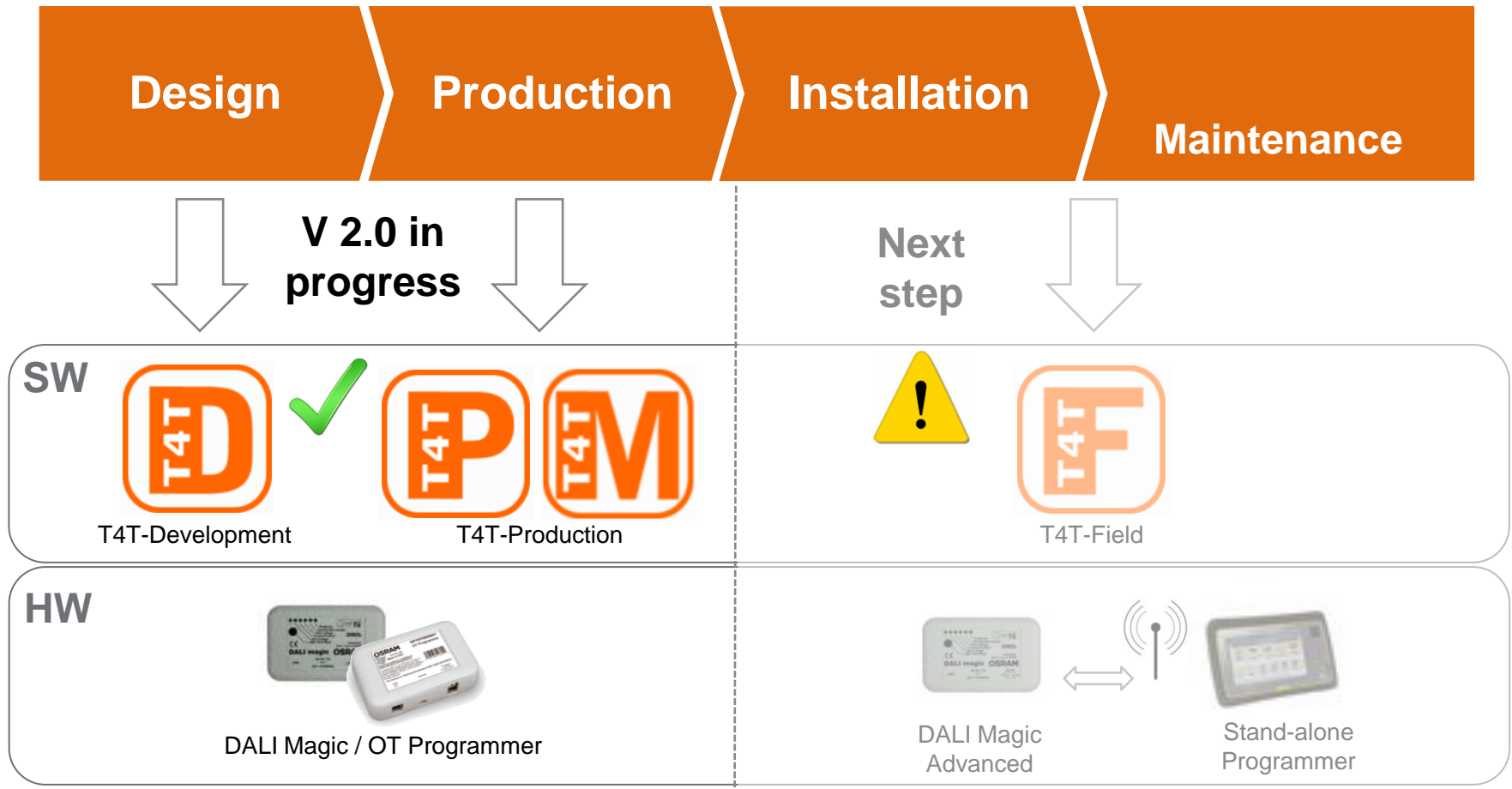


- Covers Market Needs & Feature SETs
- RELIABLE. FLEXIBLE. AFFORDABLE.
- **FIT for Several Module Generations**

Tuner4TRONIC: Software to Simplify Life.





OEM's value chain overview

Flexibility: settings can be changed @ any point of the luminaire lifecycle!



LED driver Product segmentation & positioning

Affordable Flexibility.

Product segmentation	STAKEHOLDERS' OPPORTUNITY	VALUE
 	<p>Flexibility</p> <ul style="list-style-type: none"> • Replacement of TLS lumen packages including a performance dimming • Follow the increase of energy efficiency of LED (window benefit) • Miniaturization of DALI ballast • Play with light, adapt the light to needs, Individual Comfort 	<ul style="list-style-type: none"> • Highest Quality of Light (Low Ripple, 1...100% Comfort Dimming (lowest dimming Steps), Integrated LMS (TouchDIM, Corridor) & affordable Energy/Cost Saving, FIT4Smart Grid (Feedback of Power Consumption) • Highest Efficiency in all Dimming Ranges • Fully Programmable via t4T, Highest Flexibility in Production • Easy to Approbate LUMs due to Intelligent Thermomanagement & Power Regulation
	<p>Optimal application fit</p> <ul style="list-style-type: none"> • Replacement of TLS lumen packages including a comparable Lighting Quality to Fluorescent Systems • Trend to Installed4Life, Robust & long living product • FIT4Emergency Lighting (DC cap.) 	<ul style="list-style-type: none"> • High Quality of Light (Low Ripple, Excellent Current accuracy < ±5%) • Highest Efficiency in all Output Voltage Ranges • Flexible Module Designs due to Highest Output Voltage Span
	<p>Economic application fit</p> <ul style="list-style-type: none"> • Replacement of Halo lumen packages in Shops/Dwonlights • Best Efficiency vs. Miniaturization 	<ul style="list-style-type: none"> • Highest Power Clusters in smallest Formfactors • Integrable in smallest LUMs due to Miniaturization • SAME driver Ready for Built-In OR Independent Installations due to Click-On Cable Clamp

OPTOTRONIC: Cross the RED Line

Additional USPs to catch...



Extended Guarantee

W/in scope of **manufacturer declarations** (limited On-Time per 24h day, limited ambient temperature range):

- 5Y → 8Y** (8h Powered/On, Ta 15...23°C)
- 3Y → 5Y** (done for OTe, Tc-5°C, effective NOW)

10Y possible w/ window drivers, conditions tb. checked for EACH project/customer

Temperature Guard

- Increases the minimum safety level required by standard
- Preserves LED driver functionality when Ta is exceeded** temporarily

Can be used as:

- Additional safety in unpredictable conditions** (e.g. Middle East)
- Base thermal protection** for bare CoB “w.o. LEDSet”
- Help to keep lights “on” when Ta is exceeded** (for instance EL)



Low Ripple Story

(1) Healthy Light

Flickering may cause (even if not detected/realized by individuals immediately) **headaches**, even could trigger **epilepsy** or **may reduce concentration** etc. – already norms are taking this issue into consideration

(2) Lifetime of LED modules

a) 40% current ripple w/ 700mA average current delivers 560mA current ripple pk-pk. The output current will swing between 980 mA and 420 mA with the average at 700 mA. **Heavy loads for some LEDs**, reducing lifetimes.

(3) Efficiency of SSL Systems

a) Ripple current can increase the LED driver power dissipation that leads to **increased junction temperatures**. Rippled LED systems (LED+heatsink+lamp) have a higher temperature compared to the RIPPLE FREE solutions. **LEDs are less efficient** when their temperature increases.

(4) Camera/Video Proof

a) Visible Black Lines in Videos/Lifemeetings

(5) FIT4Future

a) **Future LED technology** (higher efficient LEDs, internal die inside the LED reduces its resistance) will make the **HIGH RIPPLE LED drivers performance worse**.