Light shapes the city of tomorrow.

PUBLIC LIGHTING · SOLAR · CONNECTED

SMART CITY

WIRELESS MESH NETWORK

CATALOGUE D-SLS-4

2026

D-SLS-4 20 – 120 W · Square luminaire

D-SLS

Digital-Smart Lighting Solutions

OVERVIEW · SQUARE LUMINAIRE · D-SLS-4

Circular post-top luminaire — aluminium canopy carried by two curved arms, six LED modules with indirect reflector

D-SLS-4 — circular post-top head on Y-arm

22 440 lm
max. luminaire flux · 120 W · 4000 K

187 lm/W
luminaire efficacy · CRI 70

Ø 60 mm
post-top · mounting height 3.5 to 6 m

IP66 · IK09
sealing · impact resistance

6 modules
LED with indirect reflector · symmetric

7 years
warranty · 10 years optional

A clean design for public spaces

The **D-SLS-4** combines a circular **cast aluminium** cover carried by two curved arms: the underside stays clear and the optical unit is recessed from view. **Six LED modules with indirect reflector** (ρ ≥ 98 %) provide uniform symmetric distribution. Post-top mounting **Ø 60 mm**, mounting height 3.5 to 6 m; opening cover and base plate removable from a lift.

Squares & forecourts

Uniform 360° light, glare-free.

Parks & gardens

Scheduled dimming, LiDAR detection at night.

Car parks & tracks

Symmetrical or road distribution depending on optic.

D-SLS-4 · NEW EMBEDDED TECHNOLOGIES

Indirect reflector by inter-reflection, LiDAR node, D4i · DALI-2 · Thread — the range's connected platform

Indirect reflector (inter-reflection) — reflectance ≥ 98 %

Satin aluminium reflector optics, the LED is never seen directly: reflected, anti-glare light, no PMMA lens. Reflectance ≥ 98 %, ULOR 0 %, symmetrical 360° distribution. One-piece LED matrix, screw-removable.

New technologies used

LiDAR node
presence detection, counting, Zhaga D4i socket underneath

Static detection
built-in mmWave radar — presence without motion

Thread mesh network
IPv6, self-healing, TALQ 2.7.1

Tunable White
2700 → 6500 K controlled via D4i + DT8

Certified interfaces

THREAD · TALQ 2.7.1 · ZHAGA BOOK 18 · NFC · DALI-2 · D4i

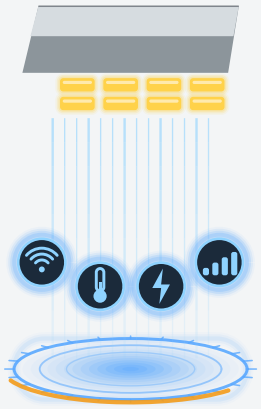
D4i
Intelligence serving urban lighting

Interoperability
D4i-compliant for open ecosystems

Power and data on the same cable
standardised interface

Smart sensors
detection, counting, energy monitoring

Predictive maintenance
real-time diagnostics and remote management



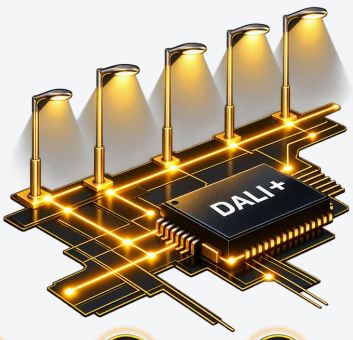
DALI+
Advanced, scalable management

Precise control
dimming and lighting scenarios

Multi-device
group and address management

Interoperability
certified multi-brand DALI+ ecosystem

Flexibility
suited to current and future projects



Scenarios · Schedules · Regulation · Supervision

D-SLS-4 — the six connected functions

TUNABLE WHITE · LIDAR AI · MESH NETWORK · SECURE VPN · OTA SELF-HEALING · AI ANTI-THEFT

PRODUCT ARCHITECTURE · D-SLS-4 · SIX KEY POINTS

A fully dismountable luminaire: everything is replaced on site, no special tools

1 Circular design

Cast aluminium cover and Y-arm: an elegant urban object by day and by night.

2 Six reflector modules

Indirect reflector ρ ≥ 98 %, uniform symmetrical distribution — road optics optional.

3 Programmable driver

DALI-2 · D4i + DT8 via NFC, autonomous dimming profiles.

4 Protection

IP66 / IK09, 10 kV / 10 kA SPD, stainless pressure-equalisation valve.

5 Remote management

Zhaga Book 18 socket ready for the LiDAR-ATMANI-AI node.

6 Maintenance

Tool-free opening cover, plate removable from the aerial platform.

IN BRIEF

Construction	Die-cast aluminium housing (high-pressure) EN AC-46100 — AlSi11Cu2(Fe), UNI EN 1706
Screen / bowl	Extra-clear flat tempered glass
Fixing	Post top Ø 60 mm — mounting height 3.5 to 6 m
Protection	IP66 · IK09 · SPD 10 kV / 10 kA · stainless pressure-equalisation valve
Range	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 W

20 – 120 W	187 lm/W	IP66 · IK09	Zhaga Book 18
power range	luminaire efficacy	sealing · impacts	remote-management ready

PERFORMANCE & SAVINGS · DASHBOARD

≥ 95 %	> 94 %	−78 %
optical efficiency	driver efficiency	energy

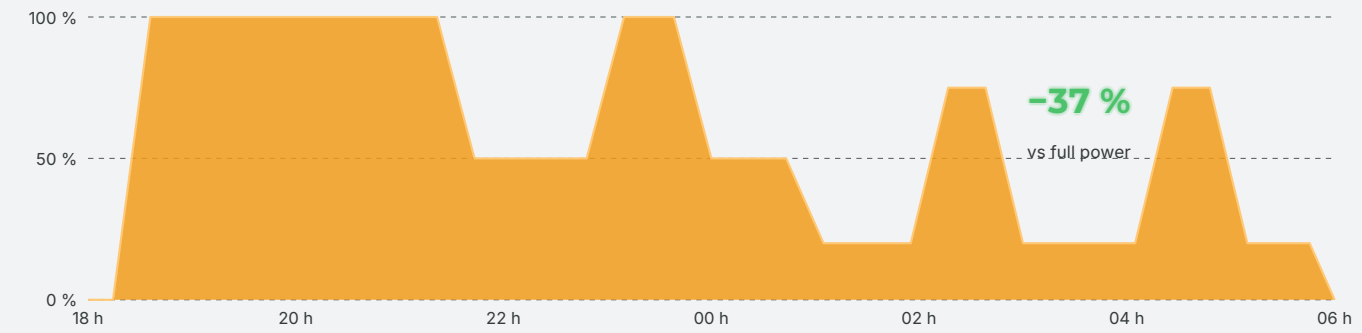
TUNABLE WHITE — CCT RANGE (OPTION TW)

2700 K WARM — COOL 6500 K

D4i + DT8 control — CRI 70 · 80 · 90 · 97, MacAdam < 3 SDCM

Fixed CCT: 2700 · 3000 · 4000 · 5000 K

LiDAR ADAPTIVE DIMMING — TYPICAL NIGHT PROFILE



constant 100 % lighting — D-SLS-4 — LiDAR detection — peaks match detected passages (pedestrian, cyclist, vehicle)

ANNUAL CONSUMPTION PER POINT — 4 200 h/yr · 0.25 €/kWh

Metal halide 150 W (existing)	714 kWh/yr · €178	
D-SLS-4 60 W	252 kWh/yr · €63	−65 %
D-SLS-4 60 W + LidarMesh	158 kWh/yr · €40	−78 %

Assumptions: 150 W metal halide (170 W system, ballast included) replaced by a D-SLS-4 60 W at the same illuminance level.

≈ 4.7 years	−139 kg	zero	100 %
return on investment*	CO2 avoided per point per year	relamping — L90B10 ≥ 100 000 h	remotely controllable (TALQ 2.7.1)

Reading the dashboard

* Energy only, based on the price above and an indicative investment of €650 per point — excluding installation and avoided relamping, exact costing on study. Savings combine the efficacy of the LED platform (187 lm/W luminaire), an optic that directs flux to the useful area, and controlled dimming (LidarMesh) that only lights at full power when needed.

KEY FEATURES · 8 REASONS TO CHOOSE THE D-SLS-4

Circular design

Cast aluminium cover carried by two **curved arms**: an elegant urban object by day and by night.

Maintenance from aerial platform

Tool-free opening cover, removable LED plate — service in a few minutes.

« Dark-light » indirect reflector

Indirect reflector (inter-reflection) in aluminium ρ ≥ **98 %** (ISO 7668 / DIN 5036-3): the LED is never seen directly — optical efficiency ≥ **95 %**, anti-glare, no PMMA lens.

LUSSO-5050AUX LED module

LED CSP source, **187 lm/W** luminaire (4000 K · CRI 70 · Tq 25 °C), L90B10 ≥ 100 000 h (TM-21) — module replaceable on site.

NFC-programmable driver

DALI-2 and **D4i + DT8**: wirelessly adjustable output current, dim-to-off < 0.5 W, autonomous dimming profiles, OLC compensation.

Remote-management ready

Zhaga Book 18 socket: the LiDAR-ATMANI-AI node and the **LidarMesh CMS** platform can be added at any time, without opening the luminaire.

Full protection

SPD **10 kV / 10 kA** type II with end-of-life indicator, **IP66**, **IK09**, stainless steel pressure-equalisation valve.

7-year warranty

Extension to **10 years** (W10 option) — electronics from ENEC-certified series, product-specific EU Declaration of Conformity.

1 /3 CPS

MATERIALS & CONSTRUCTION · THE D-SLS-4 BODY

CPS technical file — 1 / 3: luminaire body materials & construction

Housing	**Die-cast** aluminium housing (high-pressure) — alloy **EN AC-46100 (AlSi11Cu2(Fe))** to UNI EN 1706, EN 10204 3.1 material certificate
LED module	Removable / replaceable — **Zhaga Book 18** standard · under-driven LUSSO-5050AUX LEDs · Zhaga Book 18 sensor socket fitted as standard
Cover	**EN AC-46100** aluminium alloy, high-pressure die-cast — heat dissipation through the top face
Y-arm	Cast aluminium, internal cable routing — **Ø 60 mm** pole-top spigot
Optics	Six LED modules with satin aluminium **indirect reflector** ρ ≥ 98 % — flat tempered glass screen
Sealing	EPDM gasket on the cover, stainless M20 cable gland IP68
Fasteners	A2 stainless steel — tool-free opening
Reflector	High-reflectance aluminium ρ ≥ **98 %** (ISO 7668 / DIN 5036-3), inter-reflection — anti-iridescence textured surface, sealed optical chamber, EN 10204 3.1 material certificate
Sealing	EPDM gaskets · stainless M20 × 1.5 cable gland IP68 — IP66 optical unit
Pressure-equalisation valve	Stainless steel with hydrophobic membrane — lets air through, never water or dust
Anti-corrosion treatment	Housing surface preparation before painting: alkaline degreasing, pickling and **chemical conversion passivation**, then oven-cured polyester powder coating ≥ 70 µm — salt spray 500 h (ISO 9227), C3 corrosivity standard, **C5-M seaside** optional (MAR)
Paint	Exterior-grade polyester powder ≥ 70 µm (ISO 2360), adhesion class 0 (ISO 2409), UV resistant — C5 seaside optional (MAR)
Driver	Programmable DALI-2 / D4i + DT8 electronics — tool-free plug-in, integrated 10 kV / 10 kA SPD

MATERIALS

A fully dismountable luminaire

All wear parts — LED module, driver, SPD, seals — are replaced on site, with the lift in position, without removing the luminaire or returning it to the workshop. A repairable architecture compliant with European Ecodesign Regulation (EU) 2019/2020.

DOCUMENTATION

LED LM-80 files, driver datasheets and material certificates available on request for tender files.

IP66 optical unit sealing	**IK09** impact resistance	**A2** stainless fixings
≥ 70 µm powder coating	**500 h** salt spray ISO 9227	**10 kV** Integrated SPD

D-SLS-4

2/3 CPS

TECHNICAL SPECIFICATIONS · D-SLS-4

CPS technical file — 2 / 3: technical characteristics to compare point by point with the CPS

Applications	Urban public lighting — squares and forecourts, parks and gardens, car parks, pedestrian and cycle paths · classes C and P (EN 13201)
Body / construction	Die-cast aluminium housing (high-pressure) EN AC-46100 — AlSi11Cu2(Fe), UNI EN 1706
Optical block	**Indirect** reflector (inter-reflection) in satin aluminium — total reflectance ρ ≥ **98 %** (ISO 7668 / DIN 5036-3) · LED never seen directly, no PMMA lens · symmetrical 360° distribution
Optical efficiency	≥ **95 %** — TI ≤ 10 %
Screen / bowl	Extra-clear flat tempered glass
Photobiological safety	EN 62471 — risk group 0 (RG0), no UVA emission
Insulation class	Class I (standard) · class II as option
Anti-corrosion treatment	Housing surface preparation before painting: alkaline degreasing, pickling and **chemical conversion passivation**, then oven-cured polyester powder coating ≥ 70 µm — salt spray 500 h (ISO 9227), C3 corrosivity standard, **C5-M seaside** optional (MAR)
Ingress protection	**IP 66** (IEC 60529) · **IK 09** (IEC 62262)
Pressure equalisation	**Stainless steel** pressure-equalisation valve with hydrophobic membrane — no internal condensation, no thermal pumping
Mounting / fixing	Post top Ø 60 mm — mounting height 3.5 to 6 m
Dimensions & weight	Dimensioned drawing and weight per size supplied with every offer
Wiring	Pluggable terminal block · tool-free connectors · M20 × 1.5 stainless IP68 cable glands
Temperatures	Operation −30 °C / +50 °C (ta 50 °C) · storage −40 °C / +80 °C
Power supply	220 – 240 V AC · 50 / 60 Hz — 90 – 305 V AC optional
Driver	**DALI-2 · D4i + DT8** programmable via NFC · efficiency > 94 % · power factor > 0.95 · dim-to-off < 0.5 W
Surge protection	Integrated type II SPD **10 kV common mode / 6 kV differential mode** (10 kA), end-of-life indicator — external 20 kV SPD optional (SP20)
Thermal controller	**NTC-ETM DIGITAL** thermal controller — NTC probe on LED matrix and driver, digital threshold programmable via NFC, automatic current reduction when threshold is exceeded
LED	**LUSSO-5050AUX CSP TECHNOLOGIES** ceramic LED chip, under-driven — source **LED CSP** · luminaire **187 lm/W** (4000 K · CRI 70 · Tq 25 °C)
Power & flux	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 W — up to **22 440 lm** (4000 K · CRI 70 · Tq 25 °C)
Colour temperatures	2700 · 3000 · **4000** · 5000 K — Tunable White 2700 – 6500 K (TW option)
CRI · MacAdam	CRI 70 (standard) · 80 · 90 · 97 — **< 3 SDCM**
Lifetime	**L90B10** ≥ **100 000 h** (IES LM-80 / TM-21) — maintenance factor 0.80 used in studies
Dimming & remote management	DALI-2 · D4i + DT8 · autonomous profiles · **Zhaga Book 18** socket — LiDAR node and LidarMesh CMS TALQ 2.7.1 (LD option)
Warranty	**7 years** — 10 years optional (W10)

RoHS · IP66 · IK09 · EN 60598 · EN 62471 · DALI-2 · D4i + DT8 · Zhaga Book 18 · TALQ 2.7.1

Standards framework

Reference standards: EN IEC 60598-1:2021/A11:2022, EN 60598-2-3, EN 62493, EN 62471, EN 55015, EN 61547, EN 61000-3-2, EN 61000-3-3, EN 61000-4-5, EN 13201, IEEE 1789 — driver EN 61347-1 / EN 61347-2-13. LDT / IES files and DIALux study supplied with every offer.

FEATURES

3/3 CPS

CERTIFICATIONS & STANDARDS

CPS technical file — 3 / 3: certificates, tests and standards framework

Current D-SLS certificates

ENEC	Certificate no. HN 69290740 — TÜV Rheinland InterCert Kft. · EN IEC 60598-1:2021 + EN 60598-2-3
Covered types	443 D-SLS-a-b-cd types — series 03 to 21A and 25
ENEC parameters	AC 220 – 240 V · 50/60 Hz · class I · IP66 · ta 45 °C
TÜV SÜD	Attestation no. N8A 08132 0101 — Low Voltage Directive 2014/35/EU · EN 62493
Families	D-SLS-a-b-cd — series 03 · 05 · 06 · 07 · 09 · 11B · 12A · 13 · 14 · 15 · 18 · 19 · 20 · 21A
TÜV SÜD parameters	200 – 240 V · 50/60 Hz · class II · IP66 · IK09 · ta 50 °C
This product	The D-SLS-4 uses the electronic platform (driver, SPD, LED module) of the certified series; it is covered by its own EU declaration of conformity.

Copies of certificates and test reports supplied with every bid.

Additional tests

- **IP66** — IEC 60529 depending on family
- **IK08 / IK09** — IEC 62262 (impact resistance)
- **EN 62471** — photobiological safety RG0
- **EN 61000-4-5** — surge immunity 10 kV / 6 kV
- **EMC** — EN 55015 · EN 61547 · EN 61000-3-2 / -3-3
- **LM-80 / TM-21** — lifetime ≥ 100 000 h L90B10

Standards framework

Luminaire safety
EN IEC 60598-1 · EN 60598-2-3 · EN 60598-2-5

Photobiology
EN 62471

Electromagnetic compatibility
EN 55015 · EN 61547 · EN 61000-3-2 · EN 61000-3-3 · EN 61000-4-5

Protection
EN 60529 (IP) · EN 62262 (IK)

Application
EN 13201 (street lighting) · UNI 11248 (classes M, C, P) · CIE 150 (light pollution)

Control & interoperability
IEC 62386 (DALI-2 · D4i) · Zhaga Book 18 · TALQ 2.7.1

Lifetime
IES LM-80 · IES TM-21 · IES LM-79 · UNI EN 13032-1

European directives
2014/35/EU (low voltage) · 2014/30/EU (EMC) · 2011/65/EU (RoHS)

RoHS | IP66 | IK09 | EN 60598 | EN 62471 | DALI-2 | D4i + DT8 | Zhaga Book 18 | TALQ 2.7.1

Compliance file

The parameters above are those on the current ENEC certificate and TÜV SÜD attestation; the product characteristics on previous pages correspond to the luminaire's current commercial definition. Compliance with directives 2014/35/EU, 2014/30/EU and 2011/65/EU; EU declaration of conformity, ENEC certificate, IP / IK reports and photometric files attached to each tender file.

Documents supplied with every offer

ENEC certificate
Certificate no. HN 69290740 and test report — TÜV Rheinland InterCert

TÜV SÜD attestation
Attestation no. N8A 08132 0101 — series 03 (cigar-type column)

EU Declaration
EU Declaration of Conformity — directives 2014/35/EU · 2014/30/EU · 2011/65/EU

IP / IK reports
IP66 per IEC 60529 · IK09 / IK10 per IEC 62262, by family

LED lifetime
LM-80 reports and IES TM-21 projection of the LED modules

Photometry
LDT / IES files per reference and per CCT · DIALux / Relux calculation

TYPE TESTS & ROBUSTNESS

TYPE TESTS

Temperature rise	ta 50 °C — EN 60598-1 § 12: driver tc and LED module tp, values corrected to the reference ambient.
Sealing	IP 66 — IEC 60529 (dust · powerful water jets).
Mechanical impact	IK 09 — IEC 62262 (10 joules), on assembled luminaire.
Vibration	IEC 60068-2-6 — depending on mounting: post-top ø 60 mm — mounting height 3.5 to 6 m.
Surges	10 kV / 10 kA — EN 61000-4-5; replaceable type II SPD with end-of-life indicator — external 20 kV SPD optional.
Photometry	EN 13032 / LM-79 — LDT and IES files per reference and per CCT.
Long-term flux	LM-80 + TM-21 — L90B10 ≥ 100 000 h.
Corrosion	Salt spray ISO 9227 — 500 h on coating and fasteners.

ROBUST PRODUCT — DESIGN CHOICES

Construction	Die-cast aluminium housing (high-pressure) EN AC-46100 — AlSi11Cu2(Fe), UNI EN 1706.
Screen / bowl	Extra-clear flat tempered glass.
Fasteners	A2 stainless steel — tool-free opening

Repairability

The D-SLS-4 is designed to be **repairable on site**: LED module, driver and SPD are replaced individually, without removal or special tools. This architecture meets the circular-economy requirements of European ecodesign and extends the installation's useful life well beyond the warranty.

ta 50 °C	10 J	500 h	10 kV / 10 kA
operating ambient temperature	IK09 on assembled luminaire	salt spray ISO 9227	surge immunity

LED MODULE LIFETIME · IES TM-21 PROJECTION

LM-80-21 report · 18 000 h · 180 samples · 0 failures · 55 to 105 °C · 160 mA operation per LED

An under-driven LED, an over-sized warranty

D-SLS luminaires use a high-power ceramic **LUSSO-5050AUX** LED chip driven at only **160 mA**, i.e. 19 % of the test current: the junction works far from its limits, heat to dissipate is reduced and ageing becomes almost imperceptible. The chip manufacturer's LM-80 tests, conducted at 850 mA and up to 105 °C, still give **96 % of initial flux after 100 000 hours**; under real operating conditions, flux loss over ten years of operation is below 2 %. This performance reserve allows D-SLS to commit the company to **7 years parts, labour and travel, extendable to 10 years**, with 90 % guaranteed flux (L90).

PROJECTED LED MODULE LIFETIME

SOLDER POINT TEMPERATURE Ts	FLUX AT 100 000 h	L97	L96	L90	L80
55 °C	97,8 %	≈ 130 000 h	≈ 170 000 h	≈ 418 000 h	≈ 868 000 h
85 °C	97,4 %	≈ 114 000 h	≈ 150 000 h	≈ 372 000 h	≈ 779 000 h
100 °C	96,8 %	≈ 94 000 h	≈ 124 000 h	≈ 312 000 h	≈ 655 000 h

TM-21 reportable values (cap 6 × 18 000 h): L96 · L90 · L80 > 108 000 h at all temperatures; L97 > 108 000 h at 55 and 85 °C. Highlighted row: envelope operating condition used for the warranty — **L96B10 at 100 000 h**. 100 °C obtained by Arrhenius interpolation between the 85 °C and 105 °C datasets.

Reading note

An LED does not 'burn out': it slowly loses light. Its lifetime is therefore measured as the **number of hours after which it still retains a given percentage of its initial light**. That is what the figure after the 'L' indicates:

- **L97** = operating hours before the LED drops to 97 % of its initial light (3 % loss).
- **L96** = 96 % of light remaining (4 % loss).
- **L90** = 90 % of light remaining (10 % loss) — the usual specification reference.
- **L80** = 80 % of light remaining (20 % loss) — the conventional "end-of-life" threshold of an LED.

Ts is the temperature measured at the LED solder point on its board: the lower it is, the longer the LED lasts. A well-cooled luminaire runs at around 55 – 85 °C; 100 °C is the worst case used for the warranty.

Reading example: at Ts 100 °C, after **100 000 hours** (about 23 years at 12 h per night), the LED still delivers **96.8 %** of its initial light; it would take **312 000 hours** (over 70 years) to fall to 90 %.

CALCULATION CHAIN — LUSSO-5050AUX LED + ALUMINIUM REFLECTOR

LED CSP	× 92 %	× 78 %	× 93 %	= 187 lm/W
LED source · 160 mA · Tq 25 °C	thermal factor Ts 85 °C	reflector 86.26 % · tempered glass	driver efficiency	published luminaire · 180 lm/W at ta 50 °C

187 lm/W calculated and published at Tq 25 °C · 180 lm/W at ta 50 °C — 120 W → 22 440 lm · 60 W → 11 220 lm · tolerance ±7 % on flux.

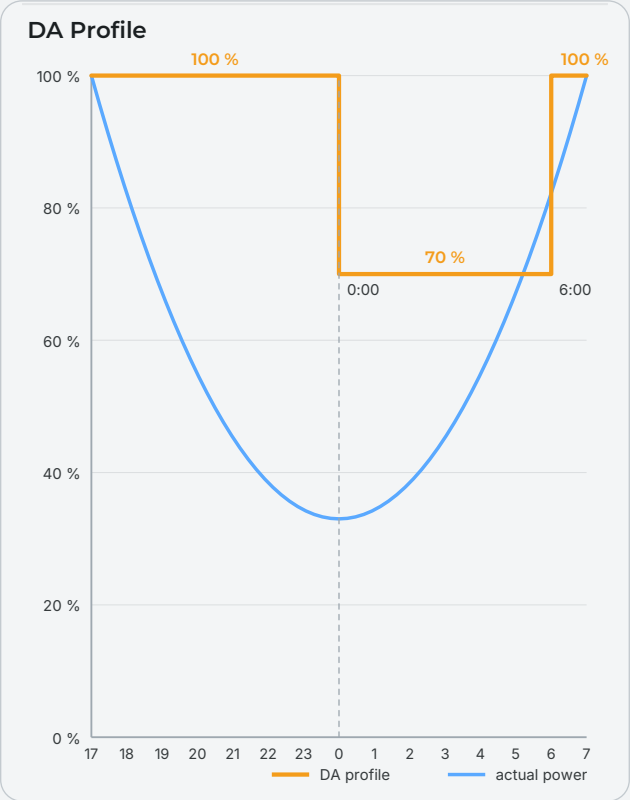
ELECTRICAL SPECIFICATIONS · PROGRAMMABLE DRIVER

Power supply	220 – 240 V AC · 50 / 60 Hz (90 – 305 V AC optional · tolerance ±10 %)
LED current	350 – 1 000 mA — wirelessly adjustable via NFC (AOC: programmable output current)
Power factor	> 0.95 (full load — PLM) | > 0.98 (full load — F, DA, DAC)
Efficiency	> 94 %
Interfaces	**DALI-2 · D4i + DT8** Zhaga-certified · NFC · PWM · 0 – 10 V
Auxiliary supply	24 V DC / 125 mA / 3 W always on (12 V DC optional A12) · integrated 16 V DC bus (DALI-2)
Surge protection	Integrated SPD **10 kV / 10 kA** type II — 10 kV common mode / 6 kV differential mode — LED signal and thermal fuse: load disconnected at end of life · external 20 kV SPD (option SP20)
Lifetime	≥ 100 000 h L90B10 · ≥ 100 000 h L90 (IES TM-21)
Warranty	7 years (10 years with W10 option)

Built-in smart functions

- **Dim-to-off** — smart board standby < 0.5 W
- **3 timer modes** (Timer setup) — scheduled consumption reduction
- **OLC** Output Lumen Compensation — constant flux over lifetime
- **OTP — NTC-ETM DIGITAL** built into driver and LED matrix, programmable digital thresholds
- Thermal sensing and LED module protection
- End-of-life indicator · output light compensation
- Modes **F** (fixed) · **DA** (autonomous dimming) · **DAC** (autonomous + control)
- Astronomical clock and calendar profiles (option LD)

DA profile — autonomous dimming



Example of an NFC-programmed profile: 100 % at dusk, reduced to 70 % from 0:00 to 6:00, back to 100 % before dawn — no control wiring, matched to the actual power curve (blue).

REMOTE MANAGEMENT · LidarMesh CMS & D-SLS LiDAR NODE (OPTION LD)

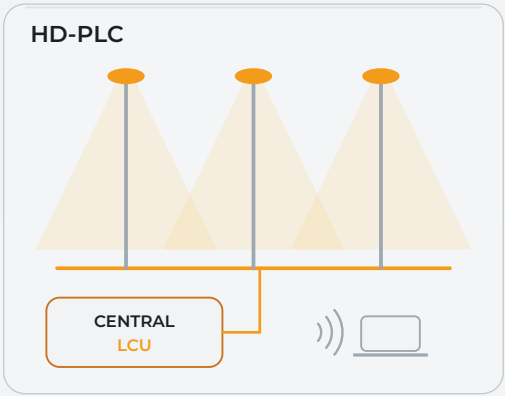
D-SLS smart node — Zhaga Book 18 / D4i

- **LiDAR presence detection** — pedestrians, cyclists, vehicles: switching and dimming on demand
- **GPS location** · astronomical clock · calendar
- **D4i** interface: the node powers, meters and controls the driver (energy, diagnostics)
- **Thread** mesh network (IPv6) · **TALQ 2.7.1** gateway · LoRaWAN 3 – 15 km · HD-PLC 0 – 10 km
- Peripherals: CCTV camera, audio / video, environmental sensors, Internet access
- **DMX / Art-Net** dynamic lighting for façades and ceremonies

Protocols:

D4i · DALI-2 · TALQ 2.7.1 · Thread · LoRaWAN · HD-PLC · PWM · 0 – 10 V · DMX · Art-Net

HD-PLC architecture — powerline



Communication over the existing supply cable to the control unit — no additional network to deploy on the poles.

LidarMesh CMS — D-SLS remote-management platform (D-SLS Cloud Infrastructure)

- GIS mapping of light points and cabinets
- Dimming scenarios by zone, calendar and detection
- Alarms and diagnostics: driver, SPD, temperature, voltage
- D4i energy metering, reports and export
- Predictive maintenance and work-order management
- Open TALQ 2.7.1 API — interoperable with third-party CMS

Role-based secure access, European hosting on the D-SLS Cloud Infrastructure — control from smartphone, tablet or supervision workstation.

Road scenario — four levels, zero intervention

100 %	50 %	20 %	0 %
Evening	**Quiet night**	**Standby**	**Dawn**
from sunset to 11 pm — full level per EN 13201	calendar-scheduled dimming	empty road — instant ramp-up on LiDAR detection	astronomical switch-off, driver < 0.5 W

Implementation

The LiDAR node mounts on the luminaire's Zhaga Book 18 socket — in the factory or retrofitted on an existing installation, without opening the luminaire. The D4i driver powers it and reports energy consumed, operating hours and diagnostics. Each luminaire becomes an individual measurement and control point of the LidarMesh CMS platform.

IPv6	3 – 15 km	0 – 10 km	TALQ 2.7.1
Thread mesh network	LoRaWAN range	HD-PLC powerline	CMS interoperability

NETWORK, UPDATES & SUPERVISION · LD OPTION

Functions of the LidarMesh CMS platform and the D-SLS LiDAR node — optional, not included in the standard supply.

MESH NETWORK & CONNECTIVITY

Architecture	Each luminaire is an identical **TALQ 2.7.1** gateway — exposed TALQ API, DALI D4i functions, IPv6 addressing.
Mesh network	Self-organising, self-healing mesh — sized for over 10 000 nodes: if a node fails, traffic is rerouted automatically.
Internet access	At the owner's choice: WiFi, 4G/LTE, Ethernet or fibre — a single link serves a whole segment, instant failover if it drops.
Network sobriety	A single download per segment: updates propagate node to node across the mesh.
Stand-alone mode	Full offline operation: lighting, DALI dimming, LiDAR detection, astronomical calendar (RTC + GPS) and local log — synchronisation resumes when the network returns.
Network security	End-to-end encrypted link (WireGuard, ChaCha20-Poly1305) to the platform.

REMOTE UPDATES (OTA) — SELF-HEALING

Principle	Firmware update of the entire installed base remotely, without field intervention — dual A/B partition: a healthy version is always available.
Probation	Each new version must prove correct operation (network, DALI, supervision) within 10 minutes — otherwise automatic rollback to the previous version.
Rollback guards	Hardware watchdog, reboot loop, network or routing loss, silent DALI, memory anomaly — every guard triggers rollback.
Canary deployment	In controlled waves 1 % → 10 % → 50 % → 100 % of the installed base — automatic halt and operator alert at the slightest rollback.
OTA security	Images signed and verified by a hardware secure element before flashing — secure boot, encrypted memory, SHA-256 integrity check, anti-rollback.

SUPERVISION & AI COPILOT

Dashboard	GPS map of every luminaire · real-time status, consumption, alarms and history · one-click DALI configuration.
AI copilot	Plain-language fault diagnosis, deployment recommendations and automatic campaign report.
Predictive maintenance	Pre-failure alert for LED module / driver / SPD — optional sensors: light level, temperature, air quality, noise.
Energy budget	Cap set by the operator, never exceeded: self-regulation if spending drifts, per-luminaire monitoring, savings and CO2 report.

D-SLS-4 — the six connected functions

TUNABLE WHITE · LIDAR AI · MESH NETWORK · SECURE VPN · OTA SELF-HEALING · AI ANTI-THEFT

LidarMesh CMS · D-SLS PROPRIETARY REMOTE-MANAGEMENT PLATFORM

D-SLS proprietary cloud platform — no dependence on any third-party supplier.

Each luminaire is a TALQ 2.7.1 gateway. The installed base is managed from a browser, no software to install: multi-user access with differentiated permissions, open API, cloud or on-premises deployment on request.

SMART MESH NETWORK

Technology	Self-organising, self-healing mesh — over 10 000 nodes per network
Protocols	IPv6 SLAAC · Thread · TALQ 2.7.1 · DALI-2 D4i + DT8
Safety	End-to-end encrypted tunnel · secure boot · signed firmware
Connectivity	WiFi · 4G/LTE · Ethernet · fibre — a single link per segment

ENERGY & SOLAR BUDGET

Energy budget	Cap in euros or kWh set by the operator — never exceeded: real-time self-regulation, luminaire by luminaire
Solar integration	Monitoring of PV production, storage and grid injection — adaptive control based on weather and reserve
Savings report	Dashboard of kWh saved / CO2 avoided / euros invoiced — automatic monthly report
Dynamic pricing	Lighting programme matched to grid tariff (off-peak / peak hours)

TALQ 2.7.1 INTEROPERABILITY

TALQ standard	TALQ 2.7.1 API exposed on every node — compatible with any third-party TALQ-certified CMS
DALI D4i functions	The 8 mandatory D4i functions (Part 102/103/251/252/253/304/306/351) + diagnostics
Calendars	True astronomical calendars (GPS sunrise / sunset + RTC) · scenarios · manual override
Autonomy	The operator remains owner of its data · CSV / JSON export · portability to any other TALQ CMS

ACCESS & SERVICE

Client access	Multi-browser web interface · iOS and Android mobile app
Multi-site	Multi-municipality and multi-district management · delegation of rights · full operation traceability
Hosting	D-SLS Cloud Infrastructure (European Union) · 99.9 % availability · 24/7 technical support

10 000+	99,9 %	24/7	0
nodes per mesh network	platform availability	technical support	software to install

Stand-alone mode — no Internet

The fleet remains controllable even without a connection: lighting, DALI dimming, LiDAR detection, astronomical calendar and local log work offline. Synchronisation with the platform resumes automatically when the network returns — no permanent connection is required for daily operation.

OPTIONS · COMBINABLE ORDER CODES

LD — LidarMesh remote management

D4i LiDAR-ATMANI-AI node on Zhaga Book 18 socket: presence detection, GPS, astronomical clock, TALQ 2.7.1 gateway, access to LidarMesh CMS.

M76 — Ø 76 mm adapter

Pole-top adapter Ø 60 → Ø 76 mm — reuse of existing columns.

SP20 — External 20 kV SPD

External surge protection device cascaded with the integrated 10 kV / 10 kA SPD — areas with high storm activity, overhead networks.

W10 — 10-year warranty

Extension of the standard warranty from 7 to 10 years, subject to project registration and compliant operating conditions.

MAR — C5 coastal anti-corrosion

Reinforced surface treatment for marine or industrial atmospheres (ISO 12944 C5), stainless steel fasteners.

RAL — Colour of choice

Custom RAL colour — municipal marking and co-branding on request.

TW — Tunable White

Dynamic white 2700 – 6500 K controlled via D4i + DT8 — circadian and event scenarios.

A12 — 12 V DC auxiliary

12 V DC auxiliary output instead of the standard 24 V DC — powers sensors and third-party nodes.

CAP — Expandable sensors

Air quality, noise, weather — add-on modules on the LiDAR node, data fed into LidarMesh CMS.

S3 — CRI 80 · 90 · 97 · 3 SDCM

Colour rendering above the CRI 70 standard and tighter colour binning — enhancement of historic buildings.

Control

All options are cumulative and declared at the end of the reference, in the order of the coding table — e.g. **D-SLS-4-50-60A-740-LD-SP20-W10**. Mechanical options are delivered fitted; the LD option is installed and configured at the factory or added later on the Zhaga Book 18 socket, without opening the luminaire.

CASE STUDY · 300 LIGHT POINTS IN SQUARES AND PARKS

Metal halide 150 W to replace — indicative example

−78 %	167 MWh	41 682 €
energy with LidarMesh	saved per year across the stock	of bills avoided every year

Existing base — Metal halide 150 W

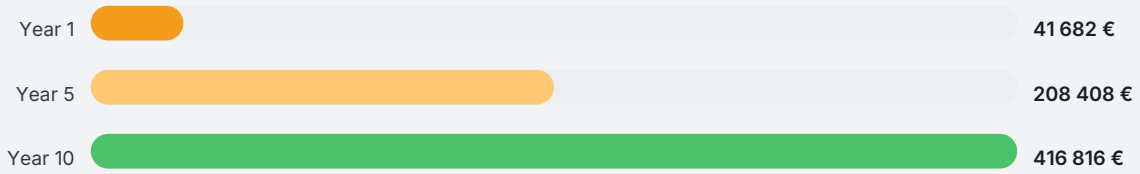
- 300 points · 170 W system per point
- 214 200 kWh/yr · €53 550 billed
- Lamp replacement every 3 to 4 years
- On/off switching, no dimming
- No metering or remote diagnostics

D-SLS-4 60 W solution

- 300 × D-SLS-4-50-60A-740
- 47 474 kWh/yr · €11 868 with LidarMesh
- Zero relamping — L90B10 ≥ 100 000 h
- On-demand LiDAR dimming
- D4i metering per point, monthly report

CASE STUDY

CUMULATIVE SAVINGS — D-SLS-4 + LidarMesh vs metal halide 150 W (in €)



Energy only — excluding avoided relamping. Indicative investment ≈ 195 000 € (luminaires + nodes + platform), excl. installation: payback ≈ 4.7 years · −42 t CO2 per year.

Calculation assumptions

Assumptions: 4 200 h/year · 0.25 €/kWh · 0.25 kg CO2/kWh — the D-SLS-4 60 W achieves the required EN 13201 levels replacing 150 W metal halide lamps. DIALux / Relux study supplied with every project.

PROJECT ROADMAP · FROM ORDER TO OPERATION

01 Survey & study	02 Validation	03 Manufacturing	04 Installation	05 Commissioning	06 Operation
DIALux / Relux · project sheet	sample · RAL colour	factory driver configuration	aerial platform · no special tools	LidarMesh CMS · training	7 → 10 years · after-sales

THE D-SLS-4 & THE ENVIRONMENT

Responsible street lighting — respectful of biodiversity, the night sky and neighbours

Light the useful area — and nothing else.

Every technical choice — optics, spectrum, control — aims to reduce light trespass and impact on wildlife: compliance with European directives, ecodesign (EU) 2019/2020, photobiological group RG0, zero UVA radiation.

INTRUSIVE LIGHT & NEIGHBOURS

Upward flux	Optical block recessed under the opaque cover: no light emitted above the horizontal, symmetric distribution contained on the public space.
Environmental zones	Sizing to CIE 150 and EN 13201 (zones E1 to E4): façade luminance, glare and upward flux verified in DIALux study.
Scheduled switch-off	Astronomical switch-off and dimming, per-zone scenarios: no space lit at full power when empty.

NOCTURNAL WILDLIFE

Adapted spectrum	2700 K and 3000 K versions: warm wavelengths attract far fewer insects than cool white sources or discharge lamps.
Zero UV	LEDs emit no UVA / UVB radiation — insects are not attracted to the source, even at close range.
Controlled dimming	Lighting on demand: when not in use, intensity drops to 10 – 30 %, limiting the attraction effect and preserving nocturnal flight cycles.
Logarithmic dimming	Smooth 0.1 – 100 % transitions compliant with EN 62386 — no flashes or abrupt gradients.

ECODESIGN & LIFE CYCLE

EU ecodesign	Compliant with Regulation (EU) 2019/2020: PstLM ≤ 1 · SVM ≤ 0.4 · light sources and drivers replaceable without tools.
Longevity	L90B10 ≥ 100 000 h: no relamping, zero lamp waste, zero mercury contamination.
CO2 avoided	Case study (300 × metal halide 150 W → D-SLS-4 60 W): about 42 t of CO2 avoided per year.

RG0
photobiological group — EN 62471

0 UVA
no ultraviolet radiation

2700 K
warm “wildlife” spectrum option

References & project study

References: CIE 150 (limiting light pollution) · EN 13201 and UNI 11248 (lighting classes) · Ecodesign Regulation (EU) 2019/2020 · International Dark-Sky Association. Obtrusive light study supplied with every project.

PHOTOMETRY · D-SLS-4 · FROM SOURCE TO LUMINAIRE

Indirect reflector — measurement conditions

Indirect reflector optics by inter-reflection — satin aluminium ρ ≥ 98 %, the LED is never seen directly. The values in the following tables are **complete luminaire** values — driver and optics included — measured at Vin = 230 V AC, modes F / DA / DAC. The **LUSSO-5050AUX** source is under-driven: the luminaire efficacy of **187 lm/W** (4000 – 5000 K, CRI 70, Tq 25 °C) includes thermal, optical (optical efficiency ≥ 95 %) and driver (> 94 %) losses. At operating ambient ta 50 °C: **180 lm/W**. Tolerance ±7 % on flux, ±5 % on power.

LED CSP	187 lm/W	180 lm/W	L90B10
LUSSO-5050AUX source	luminaire · Tq 25 °C	luminaire · ta 50 °C	≥ 100 000 h · TM-21

PHOTOMETRIC DATA

Optics	**Indirect** reflector (inter-reflection) in satin aluminium — reflectance ρ ≥ **98 %** (ISO 7668 / DIN 5036-3), LED never seen directly, no PMMA lens
Photometric files	**LDT** and **IES** per reference and per colour temperature
Photobiological safety	EN 62471 — risk group 0 (RG0), no UVA emission
Flux maintenance	LM-80 + TM-21 — L90B10 ≥ 100 000 h
Colour rendering	CRI 70 standard · 80 · 90 · 97 optional · MacAdam < 3 SDCM
Layout study	DIALux / Relux to EN 13201 (classes M, C, P), supplied with every project

DATA

S Symmetrical photometry

A Road asymmetric photometry

Available colour temperatures

2700 K	3000 K	4000 K	5000 K	TW
727	730	740	750	2700 – 6500 K

≥ 95 %	RG0	±7 %
optic efficiency	photobiological group EN 62471	flux tolerance

PHOTOMETRIC TABLES · 5000 K & 4000 K · CRI 70

5000 K · CRI 70 · Vin 230 V AC · modes F / DA / DAC · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICACY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICACY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-4-40-20A	20	187	3 740	20	180	3 600
D-SLS-4-40-30A	30	187	5 610	30	180	5 400
D-SLS-4-50-40A	40	187	7 480	40	180	7 200
D-SLS-4-50-50A	50	187	9 350	50	180	9 000
D-SLS-4-50-60A	**60**	**187**	**11 220**	**60**	**180**	**10 800**
D-SLS-4-100-80A	80	187	14 960	80	180	14 400
D-SLS-4-100-100A	100	187	18 700	100	180	18 000
D-SLS-4-200-120A	120	187	22 440	120	180	21 600

4000 K · CRI 70 · Vin 230 V AC · modes F / DA / DAC · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICACY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICACY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-4-40-20A	20	187	3 740	20	180	3 600
D-SLS-4-40-30A	30	187	5 610	30	180	5 400
D-SLS-4-50-40A	40	187	7 480	40	180	7 200
D-SLS-4-50-50A	50	187	9 350	50	180	9 000
D-SLS-4-50-60A	**60**	**187**	**11 220**	**60**	**180**	**10 800**
D-SLS-4-100-80A	80	187	14 960	80	180	14 400
D-SLS-4-100-100A	100	187	18 700	100	180	18 000
D-SLS-4-200-120A	120	187	22 440	120	180	21 600

* Power and flux ±5 % · complete luminaire values (driver and optic included) · Tq 25 °C: laboratory; ta 50 °C: operating ambient. LDT / IES files and DIALux / Relux calculation note supplied per project.

PHOTOMETRIC TABLES · 3000 K & 2700 K · CRI 70

3000 K · CRI 70 · Vin 230 V AC · modes F / DA / DAC · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICACY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICACY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-4-40-20A	20	177	3 540	20	170	3 400
D-SLS-4-40-30A	30	177	5 310	30	170	5 100
D-SLS-4-50-40A	40	177	7 080	40	170	6 800
D-SLS-4-50-50A	50	177	8 850	50	170	8 500
D-SLS-4-50-60A	**60**	**177**	**10 620**	**60**	**170**	**10 200**
D-SLS-4-100-80A	80	177	14 160	80	170	13 600
D-SLS-4-100-100A	100	177	17 700	100	170	17 000
D-SLS-4-200-120A	120	177	21 240	120	170	20 400

2700 K · CRI 70 · Vin 230 V AC · modes F / DA / DAC · Rev. 10/2026

Tq 25 °C: laboratory | ta 50 °C: operating ambient

REFERENCE	POWER* W · Tq 25 °C	EFFICACY lm/W · Tq 25 °C	FLUX* lm · Tq 25 °C	POWER* W · ta 50 °C	EFFICACY lm/W · ta 50 °C	FLUX* lm · ta 50 °C
D-SLS-4-40-20A	20	171	3 420	20	165	3 300
D-SLS-4-40-30A	30	171	5 130	30	165	4 950
D-SLS-4-50-40A	40	171	6 840	40	165	6 600
D-SLS-4-50-50A	50	171	8 550	50	165	8 250
D-SLS-4-50-60A	**60**	**171**	**10 260**	**60**	**165**	**9 900**
D-SLS-4-100-80A	80	171	13 680	80	165	13 200
D-SLS-4-100-100A	100	171	17 100	100	165	16 500
D-SLS-4-200-120A	120	171	20 520	120	165	19 800

Tunable White 2700 – 6500 K (option TW): efficacy depends on the programmed colour point. CRI ≥ 80 / 90 / 97 on request — dedicated tables supplied with the offer.

REPLACEMENT EQUIVALENCES · HIGH CRI & TUNABLE WHITE

DISCHARGE LAMPS → D-SLS-4

Existing lamp	System power	D-SLS-4 equivalent	Luminaire flux (4000 K)	Energy saving
Mercury vapour 125 W	137 W	D-SLS-4-40-30A	5 610 lm	−78 %
HPS 70 W	84 W	D-SLS-4-50-40A	7 480 lm	−52 %
HPS 100 W	115 W	D-SLS-4-50-50A	9 350 lm	−57 %
HPS 150 W	170 W	D-SLS-4-50-60A	11 220 lm	−65 %
HPS 250 W	275 W	D-SLS-4-100-80A	14 960 lm	−71 %
Metal halide 250 W	280 W	D-SLS-4-100-100A	18 700 lm	−64 %

Indicative equivalences at maintained illuminance — to be confirmed by a DIALux / Relux study accounting for geometry, mounting height and the chosen maintenance factor.

CRI ≥ 90 / 97 (option S3) & Tunable White (option TW) — 60 W reference

187 lm/W
CRI 70 · 4000 – 5000 K · Tq 25 °C

CRI 80 · 90 · 97
option S3 — tables on request

< 3 SDCM
MacAdam colour binning

2700 – 6500 K
Tunable White · D4i + DT8

High colour-rendering versions keep the same optical chain; indicative values, dedicated tables supplied with the offer. The Tunable White version is controlled via D4i + DT8: efficacy depends on the programmed colour point.

EN 13201
illuminance level maintained

−52 → −78 %
energy on retrofit

DIALux / Relux
study supplied with every project

CODING · BUILD AN ORDER REFERENCE

D-SLS-4 reference structure

D-SLS-4	–	50	–	60	–	A	–	740	–	LD
Series		Size		Power		Photometry		CCT · CRI		Options

Example: D-SLS-4-50-60A-740-LD — 60 W, 4000 K CRI 70, LidarMesh remote management.

AVAILABLE OPTIONS

Power	20 · 30 · 40 · 50 · 60 · 80 · 100 · 120 W
Size	40 (20 – 30 W) · 50 (40 – 60 W) · 100 (80 – 100 W) · 200 (120 W)
Photometry	S symmetrical · A asymmetrical road
CCT · CRI	727 · 730 · 740 · 750 (CRI 70) — 8xx / 9xx for CRI 80 / 90 — TW Tunable White
Finish	Anthracite grey, white, any RAL

Cumulative option suffixes

LD	SP20	W10	MAR
LidarMesh remote management	External 20 kV SPD	10-year warranty	C5 anti-corrosion
A12	TW	S3	RALxxxx
12 V auxiliary	Tunable White	3 SDCM / higher CRI	colour of choice

Quotes & purchase orders

A reference fully describes the delivered configuration: it is carried over as is to quotations, purchase orders and bills of quantities. Options are cumulative and added in this order at the end of the reference.

WARRANTY & SERVICES

1 7-year warranty

Standard **7-year** warranty on the complete luminaire — LED module, optic, driver and SPD — for a compliant installation and an operating ambient temperature ≤ 50 °C.

2 10-year extension (W10)

On project registration at commissioning: warranty extended to **10 years**, including flux maintenance (L90) and spare-part availability.

3 Lighting studies

DIALux / Relux photometric study to EN 13201 / UNI 11248, LDT / IES files, LED LM-80 reports and calculation notes for tender files (LM-79 reports in progress).

4 Factory configuration

LED current (NFC), DA / DAC dimming profiles, DALI-2 addresses, OTP thresholds and D4i parameters factory-set per project sheet — luminaires ready to install.

5 LidarMesh commissioning

Integration of light points into **LidarMesh CMS**, scenario creation, operator training and remote assistance.

6 Spare parts & after-sales

Zhaga Book 18 LED modules, drivers, glass and gaskets available throughout the warranty period — on-site replacement without special tools.

Sales & technical contact

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D-SLS

Digital-Smart Lighting Solutions

D-SLS-4 · 20 – 120 W

D-SLS SRL — Digital Smart Lighting Solutions

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