

Light shapes the city of tomorrow.

PUBLIC LIGHTING · SOLAR · CONNECTED

SMART CITY

WIRELESS MESH NETWORK

DATASHEET

2026

MPPT-ATMANI-AI solar controller · MPPT · storage · D4i driver

D-SLS
Digital Smart Lighting Solutions

MPPT-ATMANI-AI CONTROLLER · OVERVIEW

Smart solar street lighting controller — MPPT · multi-chemistry storage · D4i + DT8 LED driver · TALQ 2.7.1 remote management



Autonomy display readable from the ground — here: 8 h 30 of reserve

18 – 58 V

PV input · bidirectional MPPT (V2G)

16S

Multi-chemistry BMS · supercap / lithium

400 W

CW/WW LED driver · D4i + DT8

TALQ 2.7.1

remote management · LidarMesh CMS

IP66

die-cast aluminium housing · AMOLED

Smart solar street lighting controller

A single device in the luminaire, from solar energy to cloud control: the **MPPT-ATMANI-AI** harvests energy from the panel, manages storage (supercapacitors or lithium) with an **AI predictive reserve**, powers and dims the LED via **D4i + DT8**, and links each light point to the **LidarMesh CMS** platform via **TALQ 2.7.1**.

STREET LIGHTING · THREE DEAD ENDS

Municipal networks facing the energy transition



Energy bill

Lighting accounts for a major share of municipal electricity consumption, on ageing networks and with rising tariffs.



Reactive maintenance

Faults detected by public reports, costly inspection rounds, no remote diagnostics or traceability of interventions.



Off-grid areas

Urban extensions, rural roads and remote sites: connection costs put conventional lighting out of reach.

THE PRODUCT · IP66 ALUMINIUM HOUSING

Designed for the pole top and the installer's hand



front view — circular AMOLED display



underside view — cast body, integrated thermal mass



Circular AMOLED display

Remaining autonomy, state of charge and faults — readable at the pole base, no computer needed.



A single wiring face

Four cable entries grouped on one side: clean installation, accessible cable glands.



IP66 aluminium

Cast body: lasting sealing and heat dissipation through the housing mass.



4-point fixing

Through-lugs — pole top, wall bracket or inside the luminaire.

D-SLS industrial design — marking cast into the body, no labels to peel off.

THE SOLUTION · ONE CONTROLLER, FOUR ROLES

A single device in the luminaire — from solar energy to cloud control



MPPT solar harvesting

High-efficiency bidirectional converter, PV input 18–58 V, V2G management: the luminaire can return energy.



Multi-chemistry storage + AI

16S BMS with active balancing, supercapacitors or lithium. AI predictive management: reserve adapted to upcoming weather.



400 W LED driver

Tunable white CW/WW, three-level D4i + DT8 dimming, thermal derating via probe in the LED matrix.



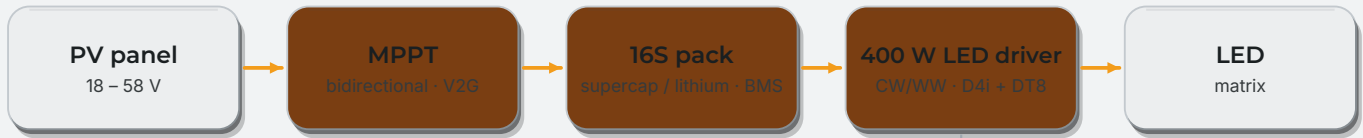
Connected node

DALI-2 / D4i, Zhaga Book 18 receptacle, TALQ 2.7.1 remote management, GPS, NFC maintenance, AMOLED diagnostic display.

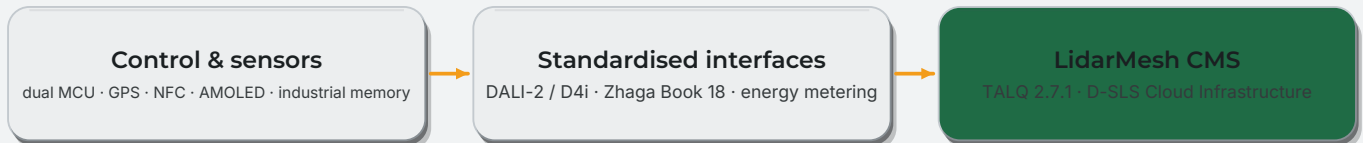
SYSTEM ARCHITECTURE

Complete energy chain and on-board control

ENERGY CHAIN



ON-BOARD CONTROL



monitoring & dimming

All energy, from PV cell to LED, flows through a single board: measured, protected and controlled — and reported to the CMS in real time.

WHAT SETS US APART

Technical choices rarely found on the market



Multi-chemistry, same board

Supercapacitors for extreme climates (–40 °C, exceptional cycle life) or lithium for long autonomy: a software profile, not new electronics.



Bidirectional V2G

The converter returns stored energy to the grid or a microgrid — the streetlight becomes an energy asset.



Native D4i + DT8

Tunable white, standardised diagnostic and energy data, Zhaga Book 18 receptacle for sensors and nodes.



TALQ 2.7.1 interoperable

Remote management speaks the market standard: the city is never locked into our platform.



Field maintenance

AMOLED diagnostic display, NFC configuration without opening, replaceable fuse: designed for municipal teams.



Controlled chain

Electronics, firmware, IP66 mechanics and cloud platform designed by D-SLS — a single accountable contact.

FEATURES · OVERVIEW

Everything the system can do today



ENERGY & AI

- Bidirectional MPPT 18–58 V (V2G)
- Predictive AI: reserve adapted to rain and cloud
- Autonomous / hybrid / backup scenarios
- Panel I-V scan: soiling, shading, theft detected remotely



STORAGE

- 16S multi-chemistry BMS (supercap / lithium)
- Lossless active balancing
- SoC / SoH, controlled safety cut-off



LIGHTING

- 400 W CW/WW 2700 – 6500 K, D4i + DT8
- GPS astronomical calendar + night profiles
- Adaptive dimming with LiDAR-ATMANI-AI



CONNECTIVITY

- WiFi 6 · BLE · native IPv6
- Self-healing MESH between luminaires
- External 2.4 GHz + GPS antennas



SAFETY & ANTI-THEFT

- Permanent WireGuard VPN, keys in secure element
- Signed OTA with automatic rollback
- GPS + accelerometer anti-theft, alarm and geolocation



MAINTENANCE

- TALQ 2.7.1 + standardised D4i diagnostics
- On-site AMOLED, NFC without opening, USB-C
- Preventive ageing alerts

FOUR POWER SUPPLY SCENARIOS, ONE PRODUCT

The operating mode is configured — not wired



Stand-alone — off-grid

PV + storage only: zero grid connection, zero trenching. Weather AI sizes the reserve to last several nights without sun.

Pitch: Rural roads, isolated sites, urban extensions



Hybrid solar + grid

Solar first, seamless grid back-up: the bill melts away, continuity is absolute.

Pitch: Urban renewal on existing network



Backup on power cut

The grid supplies power; at the slightest outage, the pack takes over seamlessly — street lighting remains a safety service.

Pitch: Main roads, pedestrian crossings, sensitive areas



V2G — discharge

Surplus energy flows back to the grid or a local microgrid: the lighting stock becomes an energy asset.

Pitch: According to the country's regulatory framework

SCENARIOS & SOLAR

CLEAN PANELS, GUARANTEED OUTPUT

From detected dust to a scheduled cleaning round

1

Periodic I-V scan

The controller traces the panel's current-voltage curve — automatically, without intervention.

2

AI analysis

The signature is compared with the site reference, corrected for weather and season.

3

Soiling index

Each light point reports its soiling rate and estimated yield loss.

4

Optimised cleaning

The CMS maps the panels to clean and schedules grouped rounds — no more wasted trips.

In dusty areas, soiling can cost more than **20 %** of solar output. Here it is measured from the office — and cleaning becomes a **quantifiable maintenance contract**.

LiDAR-ATMANI-AI · LIGHT THAT FOLLOWS LIFE

Our Zhaga Book 18 sensor node, the luminaire's natural companion



LiDAR detection

Pedestrians, cyclists and vehicles detected in real time, in all weathers — where conventional PIR sensors fall short.



Adaptive dimming

Light rises on approach and dims after passage — the section lights actual use and saves for the rest of the night.



Privacy by design

The LiDAR captures NO images: distance measurement only. Anonymous traffic counts provided to the local authority.



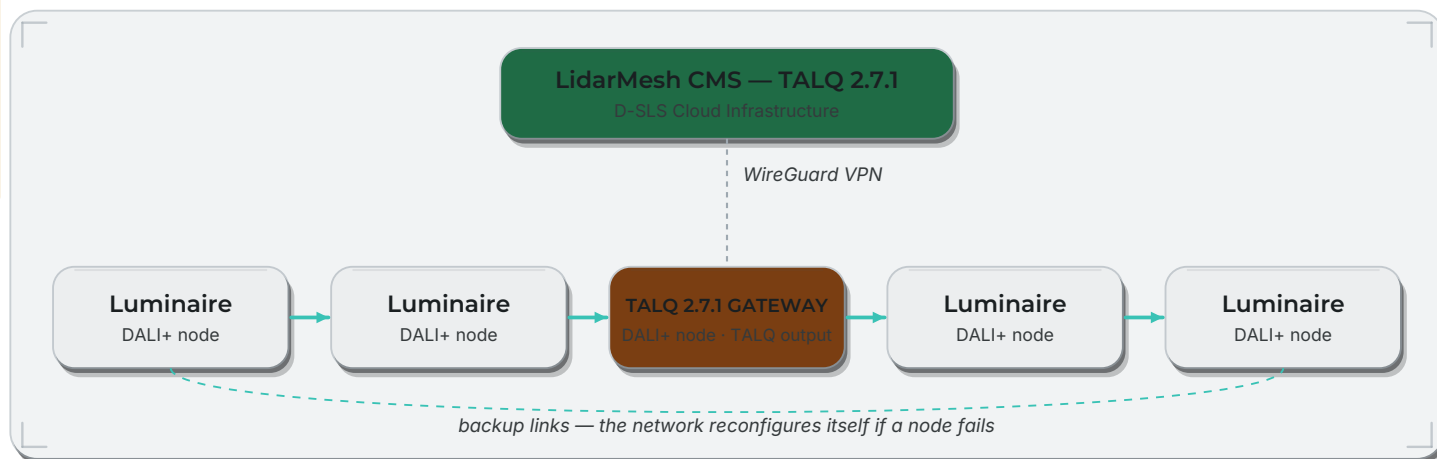
D4i plug & play

Plugs into the luminaire's Zhaga receptacle, powered and managed via D4i — installed in seconds, tool-free.

Same DNA as the controller: D-SLS firmware, WireGuard security, TALQ remote management, MESH network.

CONNECTIVITY · DALI+ OVER MESH NETWORK

The lighting standard, carried on a self-healing wireless network



DALI+: the standard, without cable

DALI commands travel over wireless IP between poles. Inside the luminaire, wired DALI-2 / D4i serves the driver and Zhaga receptacle.



Self-healing MESH

Each luminaire relays its neighbours. A node down? Traffic reroutes — the operator is alerted, the street stays controlled.



A single access point per section

One gateway connects dozens of points: a single subscription, a single SIM card or fibre line.

THE D-SLS ECOSYSTEM

Three integrated pillars, from silicon to cloud



Hardware

- MPPT-ATMANI-AI controller
- D-SLS road luminaire platform
- D-SLS-CORE™ system module for OEMs
- IP66 aluminium housing, integrated thermal design



Proprietary firmware

- Full DALI-2 / D4i + DT8 stack
- Energy management: MPPT, BMS, V2G, derating
- Secure remote updates
- Encrypted provisioning via secure element



LidarMesh CMS platform

- Multi-site TALQ 2.7.1 remote management
- Real-time mapping, alerts, metering
- Sovereign D-SLS Cloud Infrastructure
- White-label offer for operators

STANDARDS & DESIGN FRAMEWORK

Designed for public procurement from the first line of the schematic

Interfaces & interoperability

- DALI-2 / D4i + DT8 — DALI Alliance test benches
- DALI+: wireless DALI over IP
- Zhaga-D4i (Book 18) — sensor interchangeability
- TALQ 2.7.1 — embedded gateway and CMS platform

Electrical safety & EMC

- Safety EN 61347 · EMC EN 55015 / EN 61547
- RED radio: WiFi / BLE, GNSS, NFC
- RoHS · ecodesign (flicker, efficiency)

Solar & storage

- IEC 62109 — PV converter safety
- IEC 62619 (lithium) · IEC 62391 (supercap)
- EN 13201 — road lighting performance
- IP66 · IK · IEC 60068 tests (climate, impacts)

Cybersecurity & international

- ETSI EN 303 645 — IoT security by design
- IEC 62443 — critical infrastructure
- CB Scheme (IECEE) · national deviations

TECHNICAL SPECIFICATIONS

MPPT-ATMANI-AI — DATASHEET

Function	Smart solar street lighting controller: MPPT · storage · LED driver · connected node
PV input	18 – 58 V · high-efficiency bidirectional MPPT · V2G (grid / microgrid feed-back)
Storage	Multi-chemistry 16S BMS — supercapacitors or lithium · lossless active balancing · SoC / SoH
AI management	Weather-based predictive reserve · autonomous / hybrid / backup scenarios · panel I-V scan
LED output	400 W · tunable white CW/WW 2700 – 6500 K · D4i + DT8 dimming · thermal derating via LED sensor
Interfaces	DALI-2 / D4i + DT8 · Zhaga Book 18 receptacle · energy metering
Connectivity	WiFi 6 · BLE · native IPv6 · self-healing MESH · external 2.4 GHz + GPS antennas
Remote management	TALQ 2.7.1 · LidarMesh CMS · WireGuard VPN · signed OTA with rollback
Safety	Keys in secure element · GPS + accelerometer anti-theft, alarm and geolocation
Maintenance	Circular AMOLED display · NFC without opening · USB-C · replaceable fuse
Housing	Cast aluminium IP66 · four cable entries on one face · 4-point fixing
Mounting	Post top, wall-mounted or integrated in the luminaire

MPPT

V2G

16S BMS

D4i + DT8

Zhaga Book 18

TALQ 2.7.1

IP66

AMOLED

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MPPT-ATMANI-AI CONTROLLER

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