SMART CITY LIGHTING CONTROL SYSTEM

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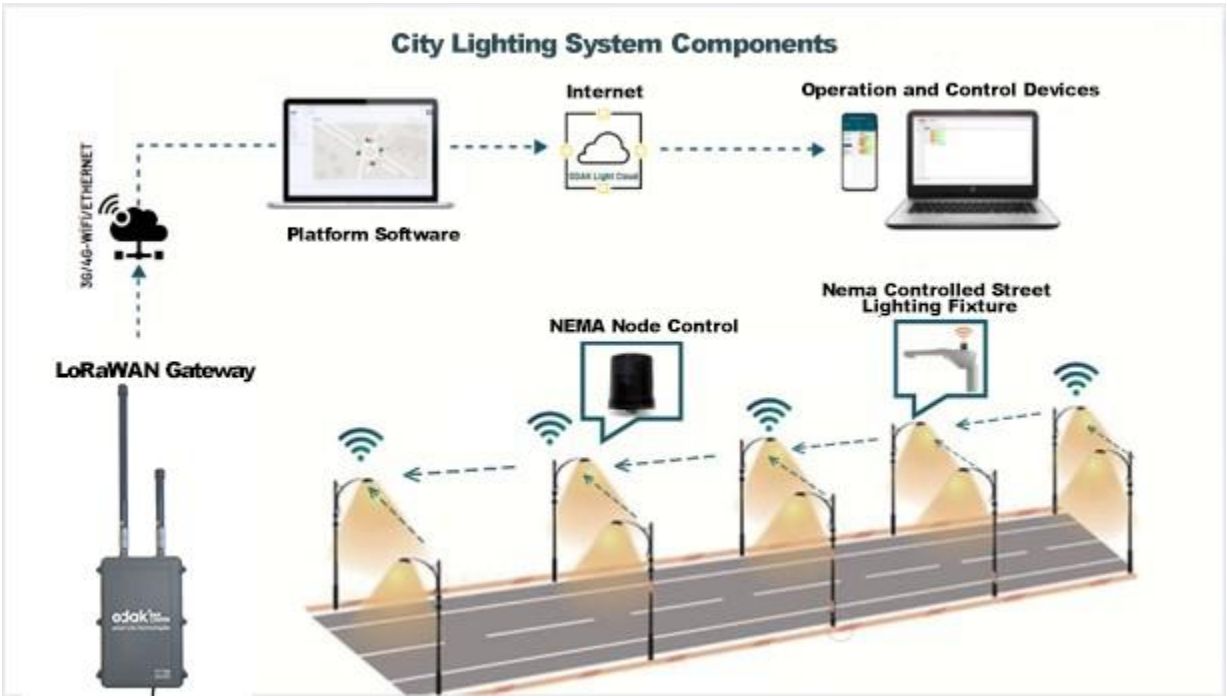
With the smart city concept, smart transformations are also demanded in street and street lighting in cities. Within the scope of the Paris Agreement, countries have responsible consumption, sustainable smart city and climate actions. A control system that will serve these actions will contribute to realizing multiple goals. For this reason, IOT-based lighting control systems have become increasingly popular and in demand all over the world.

The technologies used in wireless infrastructures that will serve all Smart Cities are Bluetooth, Zigbee, GSM or LoRaWANWAN. Zigbee solution is not preferred due to its high cost per luminaire, Bluetooth communication method cannot provide service throughout the city and is generally preferred indoors, and GSM-based systems are not preferred due to the monthly subscription costs to service providers per luminaire.
LoRaWANWAN Wireless technology, named after the initials Long Rage, which provides long distance communication in urban lighting in the world, has become popular. Our system is equipped with LoRaWAN wireless technology.

In street lighting luminaire control, the American NEMA and Zhaga Socket, which is still very young, have entered our lives. In our system, more widely preferred NEMA socket compatible RF receivers are used. In this way, you can use it with all NEMA socketed luminaires compatible with ANSI C136.41.



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Advantages of the System

- SDG 11,12,13 (Responsible consumption, sustainable smart city, climate action)
- Contributing to Energy Saving and Carbon Emission Reduction
- IEC Adaptive Adaptation-Dynamic Lighting
- Enabling long distance communication (LoRaWANWAN)
- Remote troubleshooting, saving maintenance and labor costs
- Interoperable technology with LoRaWANWAN
- Lighting Fixture control and asset management,

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LoRaWAN Based Urban Lighting Control System
LoRaWAN Gateway

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General Information

- LoRaWAN Data Collector providing individual communication with nodes using a 470/868/915 MHz wireless interface.
- In addition to its main functions, the LoRaWAN data collector controls all electrical equipment in the cabin, collects data from the electricity meter and other connected devices and sends the live status of the entire LoRaWAN system to the server via GSM/GPRS/3G mobile network. LoRaWAN data collector programming and light level programming is performed remotely from the software.

LoRaWAN Gateway Özellikleri

Input Voltage	: 100 – 240 VAC 50 Hz
Power	: 9W
Protocol	: LoRa
RF Frequency	: 470/868/915 MHz
RF Tx Power	: 17 dBm
Control Capacity	: 200 Luminaires
Protection Class	: IP66
Operating Temperature	: -20°C / +50°C
Body	: Aluminum
Voltage Protection	: 10 kV
Weight	: 2.9 kg
Dimensions	: 230x 200.5 x 85

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SMART CITY LIGHTING CONTROL SYSTEM
ORION-NEMA-868 Socket Compatible LoRaWAN RF Smart Lighting Controller

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General Information

The ORION-NEMA-868 is an intelligent luminaire controller for lighting fixtures with NEMA standard sockets, offering remote monitoring and control. Thanks to LoRaWAN communication technology, this device ensures that the data of the luminaires is transmitted reliably to the remote server via a gateway.
Controller; Compatible with 1–10 V assisted drives, it is designed for use in different street lighting applications, such as residential, urban, and road lighting. While the on/off and dimmer control of the luminaires can be carried out remotely through the system; Measurement parameters such as current, voltage, power, energy, temperature, humidity, and dim level can be monitored and reported periodically.

LoRaWAN CERTIFIED

Key Features

- Compatible with NEMA-5 and NEMA-7 standard sockets, plug-and-play mounting,
- Wireless communication feature in accordance with LoRaWAN® 1.0.2 standard, LoRa Alliance certified, capable of operating in EU868 frequency band, Class A and Class C classes, multicast, OTAA (Over-The-Air Activation) and adaptive data rate (ADR) support,
- Remote fixture on/off and dimming control with relay output and 1-10V support,
- Internal electronic measurement circuits for the measurement of electrical quantities,
- Built-in temperature, humidity and light sensor,
- Configurable periodic data reporting with remote control and configuration linked to server commands.

Communication

Frequency Band	868 Mhz
Transmission Power	+16 dBm
Buyer Sensitivity	-138 dBm
Compliance	LoRaWAN 1.0.2
Antenna Connection	Internal (PCB)

Dimming Interface

0-10V/PWM	Available
DALI-2	Not available

Electrical Specifications

Operating Voltage Range	100-240V AC
Maximum Voltage	240V AC or 340V DC
Maximum load current	4.8 A
Power Consumption	< 2 W
Over-voltage protection	6 kV
Maksimum yük gücü	1 kW

Mechanical Properties

Socket connection	NEMA7-ANSI C136.41
Dimensions	98 mm height and 84 mm diameter
Weight	< 200gr
Material	Polycarbonate Enclosure

SMART CITY LIGHTING CONTROL SYSTEM
ORION-NEMA-868 Socket Compatible LoRaWAN RF Smart Lighting Controller

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Functional Properties

Measurements	Voltage, current, temperature, humidity, amount of light
Calculations	RMS voltage, RMS current, frequency, active, reactive, apparent power, power factor, active energy
Accuracy	< 1%

Environmental Operating Conditions

Operating Temperature Range	-20 °C to +50 °C
Protection Class	IP66 , IK08
Lifespan	5 years

MECHANICAL AND ELECTRICAL CONNECTIONS

Mains supply and control signals are transmitted to the luminaire driver via the NEMA socket in accordance with ANSI C136.41 standard. In addition to the phase (L) and neutral (N) lines, the 1-10 V dimming line (DIM+/DIM-) is supported.
This structure enables standard and direct integration of NEMA-compliant smart lighting controllers into the fixture.

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SMART CITY LIGHTING CONTROL SYSTEM
ORION Zhaga 868

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General Information

ORION Zhaga 868 is a plug-and-play smart lighting control unit developed for Zhaga Book 18 compatible LED luminaires. Thanks to its socket-type mounting structure, it can be integrated quickly and safely onto the luminaire.
Device; DALI controls the luminaire driver via the communication interface and provides remote management depending on the selected communication infrastructure.

Key Features

Zhaga Book 18 compatible mechanical and electrical interface
DALI and 0-10V dimming interface
LoRaWAN communication
Photocell and GPS support
OTA (Over-The-Air) firmware update support
Built-in high-precision RTC (with backup battery)
Time-based auto-dimming scenarios
Manual / Sensor / Timer modes
Support for customizable dimming profiles
OpenAPI integration support

LoRaWAN Network Parameters

Class: C
Activation: OTAA
Link Budget : 187 dBm
Supported Regions: EU868

Cellular Network Parameters

GSM: 850/900/1800/1900 Mhz

Product Specification

Power Supply	12 Vdc – 24 Vdc	**Size**	80.15mm*80.15mm*55.56mm
Power Consumption	< 0.5W @ 24 Vdc input	**Weight**	85g ± 5g
Socket interface	Zhaga book 18 compatible	**Operating Temperature**	-30℃ ~ 60℃
Dimming Interface	DALI/0-10V	**Storage temperature**	-40°C ~ +70°C
Network communication	LoRaWAN	**Protection class**	IP66
Dimming mode	Manual mode, sensor mode, planning mode	**Body material**	PC (Polycarbonate)

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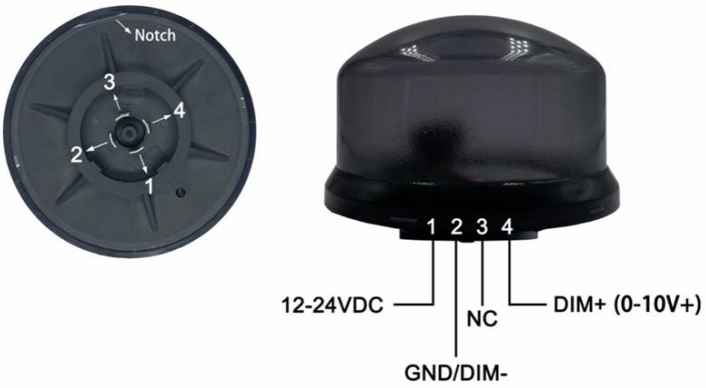
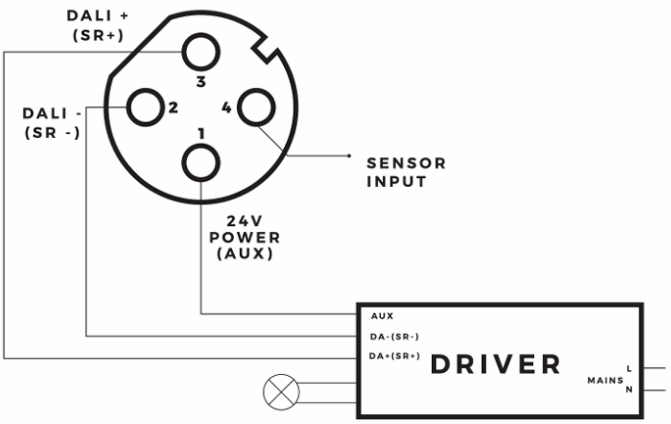
Wiring Diagram and Pin Descriptions



Pin Sayısı	0-10V/PWM Type	DALI Type
1	Power input (12Vdc – 24Vdc)	
2	DIM- (GND)	DALI- (GND)
3	RFU	DALI+
4	DIM+ (0-10V/PWM)	RFU

- Pin 1: It is a 24V auxiliary supply input (24V POWER – AUX). It is used to supply external devices.
- Pin 2: DALI negative line (DALI – /SR–).
- Pin 3: DALI positive line (DALI + / SR+).
- Pin 4: Together with Pins 1, 2, and 3, it forms the sensor input section and is used for receiving sensor signals.

Wiring Instructions



- During wiring, it is imperative that the conductors of external devices are connected to the relevant pins correctly and completely.
- The auxiliary supply (AUX), DALI negative (DA– / SR–) and DALI positive (DA+ / SR+) terminals on the controller must be correctly connected to the corresponding inputs on the driver (DRIVER).
- The LED driver (DRIVER) also has L (Line/Phase) and N (Neutral/Neutral) terminals for mains connection, which must be connected directly to the mains (MAINS) line.
- During the connection process, attention should be paid to the correct polarity and pin matching.

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- **Wide Control**
- **Analysis Report**
- **Easy Installation and Deployment**
- **Energy Saving**
- **Lighting Failures and Maintenance**
- **Dimming and Time Control**
- **Group Management**
- **Different Scenario Settings**

Central Control System (CMS)

Mobile Application and Control via PC User Interface

CLOUDSYSTEMS

Control with Cloud System

Local Communication Control

LoRaWAN GATEWAY

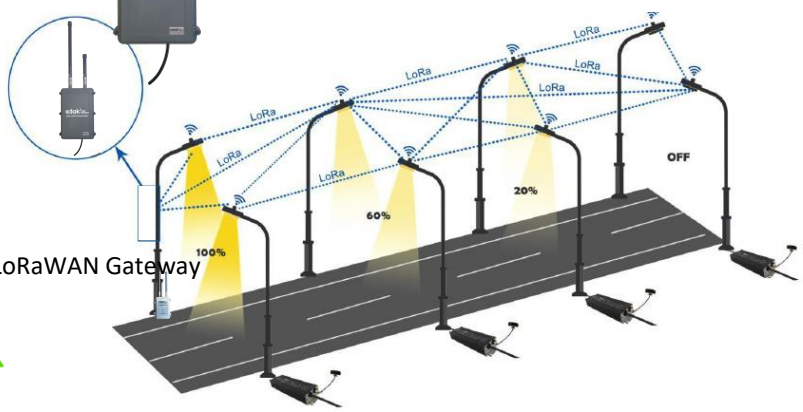
LoRaWAN Gateway

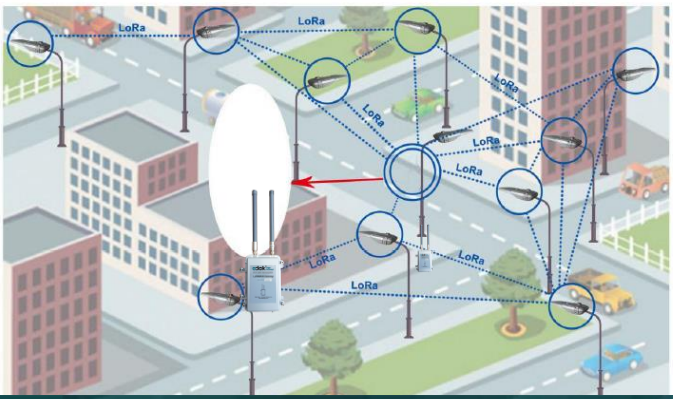
GPRS Link

LoRaWAN LUMINAIRE NEMA SOCKET AND SMART LED DRIVER

3-5-7P Luminaire Controller ve Nema Socket

LED Driver





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LoRaWAN Based Urban Lighting Control System
Nema Socket (ANSI C136.41)

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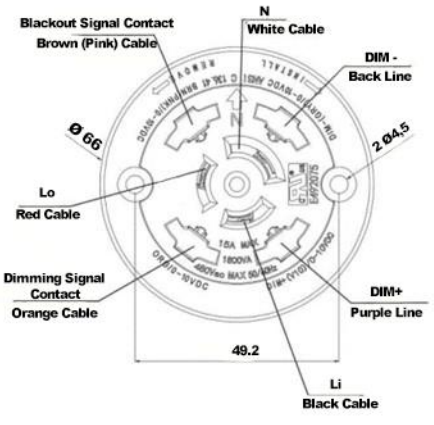
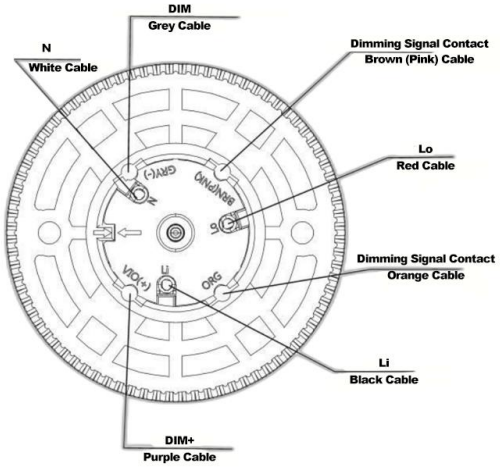
General Information

Nema Sockets provide the electrical and mechanical connection between the control cell and the luminaire. ANSI C136.41 and UL773 clearly define the dimensions, locking type and other details of the standard socket. NEMA Socket is a standardized connection type throughout the lighting industry. NEMA Socket is easily removable and installable.

This makes installation, maintenance and repair easier. NEMA Socket provides a reliable power connection with robust twist lock contacts. In lighting fixtures, NEMA Socket can be 3 pin 5 pin or 7 pin. 3-pin NEMA Sockets can have on/off control, 5-pin NEMA Sockets can have 1-10 VDC control, and 7-pin NEMA Socket versions can have both 1-10 VDC and DALI (digital addressable lighting interface) dimming options.

Technical Drawing (Top and Bottom View)





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LoRaWAN Based Urban Lighting Control System
Nema Soket (ANSI C136.41)

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Technical Specifications

Input Voltage (AC)	: 480 VAC max.
Dimming Voltage Input (DC)	: 30 VDC max.
Input Current	: 15 A max.
Dimming Current	: 250 mA max.
Operating Temperature	: -40 °C - +70 °C
Moisture	: %99
Max. Voltage withstand	: 3 kV / 60 Hz
3 Pin Socket	: 3 power input contact
5 Pin Socket	: 3 power input contact 0-10 VDC Signal Input
7 pin Socket	: 3 power input contact 0-10 VDC Signal Input DALI Signal Input
Cable Types	: power input contact (3x2,5 mm2) Signal Input Cable (2x0,75 mm2 veya 4x0,75 mm2)
Body	: Bakelite
Additional Accessory	:SiliconeConta
Standards	: ANSI C136.41 - UL773

Product Variations

Product Code	Description	Input Voltage	Input Current	Dimensions	Cable Length
NM01-6603	3 pin Nema Socket (On-Off)	480 VAC 50-60 Hz	15 A	Ø = 66 mm	20 - 40 - 60 cm
NM01-6605	5 pin Nema Socket (1-10V)	480 VAC 50-60 Hz	15 A	Ø = 66 mm	20 - 40 - 60 cm
NM01-6607	7 pin Nema Socket (DALI)	480 VAC 50-60 Hz	15 A	Ø = 66 mm	20 - 40 - 60 cm

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