# I-TRON
# STREET LIGHTING

AEC ILLUMINAZIONE

light life

## NEWS 2017
## STREET LED LIGHTING

Designed for more performance,
functionality and energy savings.


AE
ΦC
ILLUMINAZIONE
light
life

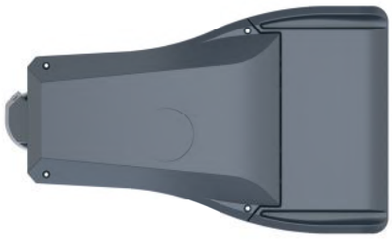
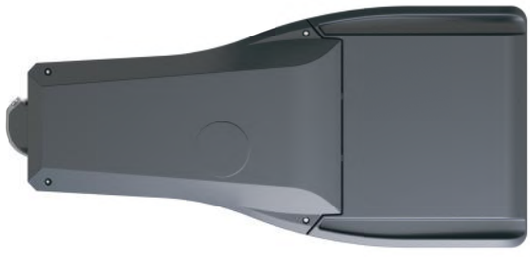

I-TRON

Modello depositato | *Registered model*



Performance and high reliability features I-TRON series, the street fixture designed by AEC to guarantee high performance and positive results for energy savings.
I-TRON series is available in two different dimensions: I-TRON Zero and I-TRON 1.
Both the luminaires are provided with specific high pure aluminium optics, which assure excellent lighting levels for street applications.
I-TRON Zero and I-TRON 1 are part of AEC Green Light products.

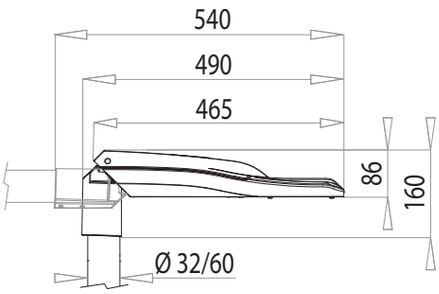


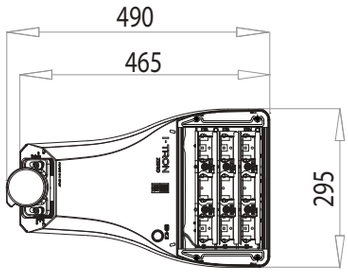



# *Technical drawings*

## I-TRON ZERO

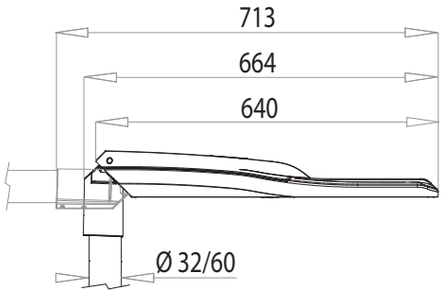
*From 1 to 3 modules- Up to 57W*

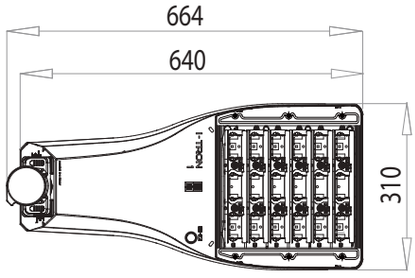



## I-TRON 1

*From 1 to 6 modules - Up to 107W*




# Characteristics

Modular optical system.
Efficiency up to 128 lm/W.
LED light source colour temperature 4000K *(3000K for option).*
Aluminium reflector optical system PIXLED.
Glass protection screen.
CRI ≥70.
Protection degree IP66.
Mechanical resistance IK08.
Power supply 220÷240V - 50/60Hz.
LED current: 525/700 mA.
Power factor: > 0.95 (at full charge).
Overvoltage protection up to 10kV
Optical unit lifetime >100.000hr L80B10

***Please download the updated product sheet at AEC website.***

# Optics

I-TRON Zero
I-TRON 1


GWT 750

A++ ENERGY CLASS

# *Mechanical characteristics*

**Materials**
Die casting aluminium body with low copper content for high protection against aggressive marine environment.
Flat tempered glass.
Gaskets without any discontinuity or glued points.
Stainless steel external screws.

**Installation**
Post top / bracket mounting in die-cast aluminium with low copper content.
Post-top / bracket D=60mm
Bracket inclination: +5°/-20° (step of 5°)
Post top inclination: 0°/+20° (step of 5°)
***Adapter fixing accessory option for pole/bracket D=32-42-48mm***
***Post-top option D=76mm***

**Maintenance**
Gear tray compartment separated from optic compartment.
Removable LED modules.
Easy opening of gear tray compartment and optic compartment with common tools.
***Option: assembled components on removable gear tray.***

**Weight and dimensions**
I-TRON Zero: 465x295x86mm 4.5kg (approx.)
Lateral surface 0.03m$^2$ - Surface 0.11m$^2$
I-TRON 1: 640x310x86mm 7kg (approx.)
Lateral surface 0.05m$^2$ - Surface 0.16m$^2$

**Finishing**
Polyester powder painted RAL 7016 Satinized opaque cod. AEC 3-O.
Corrosion protection 1500hr according to ISO 9227 salt fog test.
***Other colours on request.***

**Temperature**
- 40°C + 50°C

**Power supply**
Double insulation power supply.
Short circuit, open circuit, overload and overtemperature protections.
Interface 1/10V (DALI option)
FLC constant luminous flux (optional).

**Cable entry**
Screw terminal block for mains cables max. section 4 mm$^2$ with cable clamp.
Optional on-load switch.
Cable entry protected cable gland IP66/68 M20.

**Standards**
EN 60598-1, EN 60598-2-3, EN 62471, EN 55015, EN 61547, EN 61000-3-2, EN 61000-3-3

**Undervoltage protection**
Pulse withstand CL. I 10/10 kV CM/DM
Pulse withstand CL. II 9/10 kV CM/DM ( F, DA, DAC)

**Inrush current**
Max. 62A pk (th = 300 µs)

**Optical unit lifetime**
>100.000hr L80B10, Ta=25°C, 700mA
Inclusive of glass and reflector losses
***Please download the updated product sheet at AEC website.***

# *Undervoltages protection*

The level requested by EN 61547 Standards (related to immunity tests) are very low and inadequate for public lighting project.

**PULSE LEVEL**
-1000Vac Line-to-neutral (Differential mode - DM)
-2000Vac Line-PE / Neutral-PE (Common mode – CM)

**PULSE NUMBER**
5 positive pulses + 5 negative pulses synchronized at 90° and 270° sine wave mains voltage

**PULSE FREQUENCY**
1 pulse/minute.

**PASS CRITERIA**
no any damage during the test.

AEC products are provided with high protection levels, excellent for typical street lighting conditions.
In particular, it's possible to reach protection levels up to 10kV in common and differential mode.

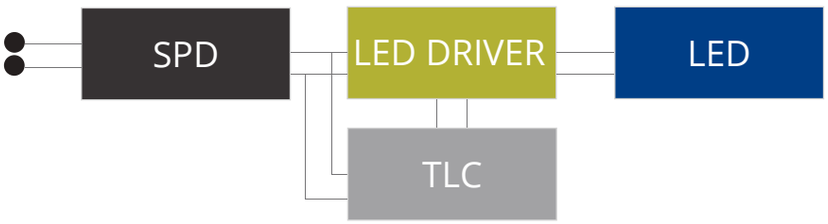
***Please download the updated product sheet at AEC website.***

Such important results has been obtained thanks to a continuous research of the right components and the design of LED modules, the most critical component subject to overvoltage effects.
The constant effort to improve the reliability and the protection of the luminaires has lead AEC to design a dedicated **SPD** to maximize the coordination of protection with the power supply and LED modules.
**AEC SPD** is able to maintain high protection levels and to disconnect the luminaire in case of damage or end of life of the component.
**AEC SPD** is provided with signalling LED, ready to be turned off in case of damage, advising about the need to replace the **AEC SPD** itself.

**AEC SPD** has the following characteristics:
Type II
In=5kA
Imax=10kA
Uoc=10kV
Up=1,5 / 2,5 kV

I-TRON Series for standard version is equipped with integrated SPD.

**TYPICAL CONNECTION DIAGRAM OF COMPONENTS INSIDE THE LUMINAIRE**

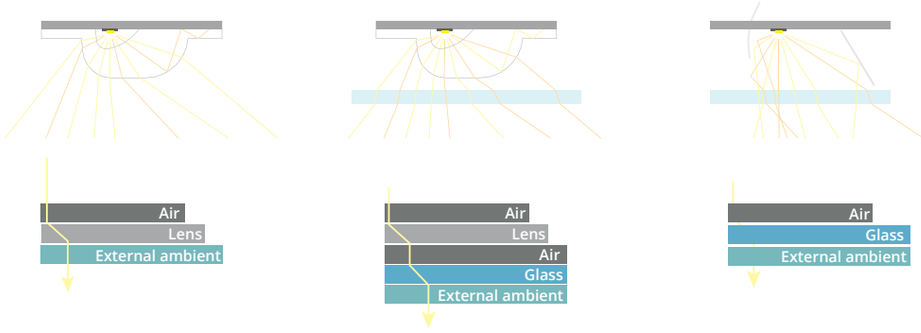



SPD
***Designed by AEC***

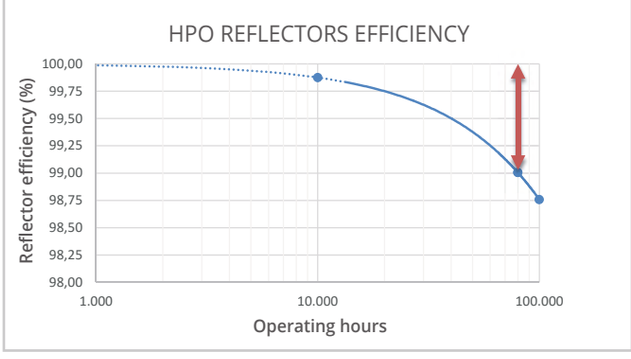
# *Optical design*

Advanced software systems, modern photometric laboratories and sophisticated production cycles have allowed AEC to design *high performance lighting system* for all the market requests.
AEC optical project is supported by important *Research & Development activities* and the company decided to take advantage from different optical system solutions. AEC doesn't use the traditional plastic lenses, adopting a different solution to distribute the light. AEC has chosen aluminium reflectors which allow to obtain *excellent performance, reduction of glare effects and high visual comfort*. AEC test reports have ensured high-performance reached with these reflectors, which have pure alloy finish surface.
Moreover the optical system is protected by high transparency and high resistance glass. This glass allows a perfect protection to the optical system and an easy cleaning of the product, maintaining the high performance and efficiency over time. PIXLED modules are based on "multilayer" philosophy, where every single optic works for lighting the street surface.

*The comparison between AEC optical systems and other available technologies on the market based on plastic lens PMMA or polycarbonate.*

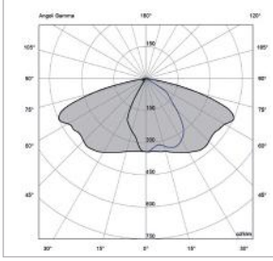



Aluminium reflector optical system allows maintaining the photometric characteristics constant over time without *any irreversible degradation.* The reflector is made by aluminium with efficiency 99.85% and it's placed inside IP66 compartment. The screen maintains its transparency over time and it makes the cleaning activities easier.
AEC PIXLED technology is based on high efficiency aluminium reflectors, designed for LED technology. The lifetime of these components and light source, determine the total lifetime of the optical group. The materials used by AEC have been tested for proving the high reliability and performance of components inside the luminaire over time. The maximum lost of efficiency of AEC PIXLED reflector is < 1% within 80.000hr of operation in the worst conditions (Ta= 50°C).

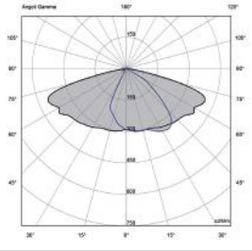


# *Available optics*

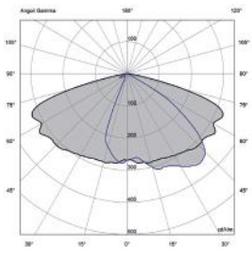
I-TRON Series has three different optics for street, urban and suburban applications featured by low glare degree.

**STU-S**
STREET URBAN AND SUBURBAN OPTIC
Asymmetrical optic.
Street and cycle-path lighting,
specific for streets where the width
corresponds to 0.75 times the pole height.



**STU-M**
STREET URBAN AND SUBURBAN OPTIC
Asymmetrical optic.
Street lighting specific for street where the width
corresponds to 1 time the pole height.



**STU-W**
STREET URBAN AND SUBURBAN OPTIC
Asymmetrical optic.
Street lighting specific for street where the width
corresponds to 1.25 times the pole height.

# AEC Laboratories

**DEKRA, UL and Analytical Cetace** guarantee the conformity of AEC Laboratories in accordance with International Standards, through specific and periodic controls in the company. AEC laboratories are recognized by **DEKRA** for **ENEC certification.**
AEC is able to provide clients with reports related to photometric, colorimetric and electrical characteristics of its luminaire. Photometrical data are warranted by the ***UL Certification.***

**Production line test**
AEC verifies all the production quality with specific automatic controls at the end of production lines. In the production lines, line test phase is integrated. All the main functionality of LED luminaires are completely tested (absorbed power measurement, LED current, dimming test, running with different AC main voltage). In the production line, also the electrical safety is tested (dielectric strength, insulation resistance, ground continuity).
100% of AEC production is tested before packaging phase and every single test report is saved in AEC management system software, which is always available for the traceability of products.

*Safety Test laboratory, Photometric laboratory and EMC laboratory are under surveillance of **DEKRA, Analytical Cetace** and AEC is a **UL Client Test Data Program participant.***

*AEC Headquarters is provided with a recognized and certified laboratory, where the entire test are carried out in accordance with the main reference Standard and for **ENEC certification.***

***Certified Photometric Data***

EN 13032 IES LM-79 IES LM-82

## Photometric laboratory test

**Photometric measurement**
AEC has two photometric laboratories, which allow to measure the lighting flux of the fixtures and to reveal the photometric distribution of the emission.
AEC laboratories are installed inside two dark rooms, made by special material to maximize the reduction of optical disturbances. The dark room is also provided with air-conditioner in order to control temperature and humidity, critical factors for LED luminaires measurement.
Photometric data are measured in accordance with **EN 13032, IES LM-79, IES LM-82.**

**PHOTOMETRIC LABORATORY**

**Integral radiometric measurement**

One of the most important tools inside AEC photometric laboratory is the sphere, which is installed inside a room with air-condition in order to control temperature and humidity. The sphere allows to reveal all the radiometric and colorimetric parameters, with constant ambience parameters. The sphere works according to **IES LM-79** Standard. It's possible to provide integral radiometric measurements at different operative temperature in accordance with IES LM-82 Standard. AEC laboratory is also able to perform angular radiometric measurements. This method includes a gonio-photometer and a radiometric instrument, allows to measure:

Photopic luminous flux.
Scotopic luminous flux.
CCT.
CRI.
Spectral distribution from 350nm - 1000nm (for specific angles).

With this specific method it's possible to measure the main parameters, which features the IEC EN 62471 Standard (Photobiological safety of Lamps and Lamp system).
In the laboratory, it's possible to test accelerate life and flux depreciation, CCT, CRI, for LED of last generation.

**PHOTOMETRIC SPHERE -** ***AEC Photometric Laboratory***

**Pre-burning**

For the correct measurement of LED luminaires , AEC laboratory is equipped with a special pre-burning area where LED luminaires are switched on before the measurement in order to achieve the thermal electrical stability.
The room is featured by the same environmental characteristics of the measuring room where a gonio-photometer guarantees constancy also in the stabilization phase.
Each LED photometry provided by AEC is performed after the Pre-Burning phase.

***AEC photometric data are guaranteed by UL International Italia Srl certification.***

# *AEC Laboratories*
## *Safety and performance test*

AEC safety and performance laboratory test includes:

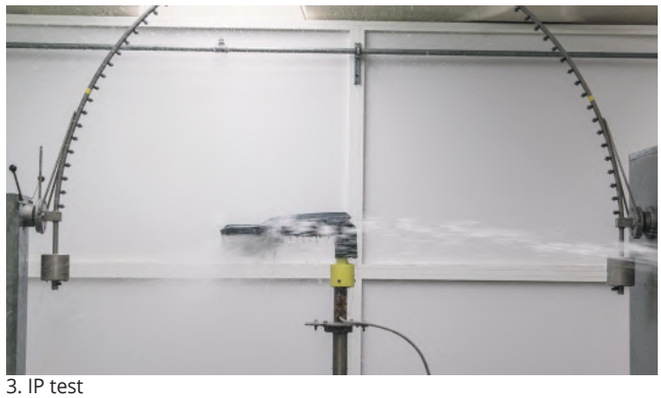
- Mechanical resistance
- IK Degree
- Breaking glass test
- Static load test (wind) for mounting and fixing accessories
- Duration test
- Thermal test up to 50°C
- IP water and dust test
- Climatic test at controlled temperature and humidity
- Insulation resistance
- Dielectric strength
- Ground continuity
- Touch current
- Power measurement
- Dimming luminaires characteristics
- Resistance of finishing and materials to corrosion (salt fog)
- Functional test at extreme temperatures
- Verification of luminaire and LED module lifetime
- Turn-on cycles

AEC safety laboratories are recognized by DEKRA in accordance with:

IEC/EN 60598-1
*Lighting luminaires*
IEC/EN 60598-2-3
*Luminaires for street lighting*
IEC/EN 60598-2-5
*Floodlighting*
IEC/EN 62031
*LED Modules*


1. Breaking glass test


2. Aggressive atmosphere (salt fog - corrosion test)


3. IP test


AEC carries out tests in accordance with the reference Standard recognized are:

UL1598
*Lighting luminaires*
CSA C22.2 No. 250.0-08
*Lighting luminaires*
UL8750
*LED modules*
CSA C22.2 No. 250.13-12
*LED modules*

# *AEC Laboratories*
## *Electromagnetic compatibility test*

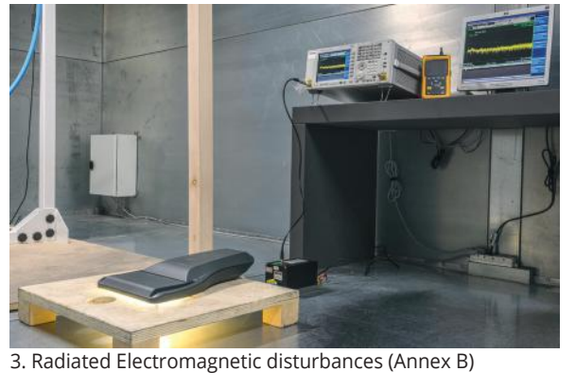
EMC laboratory tests are carried out in accordance with:
**IEC/EN 61547**: Immunity conducted disturbances (Electrostatic discharge, Surges, Fast transients, Voltage dips and short interruptions, conducted disturbances at high frequency)
**CISPR15/EN 55015**: Conducted disturbances Emission, Radiated electromagnetic disturbance (magnetic field), Radiated electromagnetic disturbance 30Mhz-300Mhz.
**IEC/EN 61000-3-2**: AC-Mains Harmonics.
**IEC/EN 61000-3-3**: AC-Mains Voltage fluctuations and flicker.

**Analytical Cetace Testing and certification** assures the conformity of EMC laboratory and all the tests carried out according to the reference Standard.


1. Radiated Electromagnetic disturbances


2. Conducted disturbances emission

AEC LAB analytical CETACE


3. Radiated Electromagnetic disturbances (Annex B)

Smart System
*Designed by* **AEC**

The demands of modern cities are creating more and more innovate **Smart technologies** for urban solutions. Citizen well being as well as environmental sustainability, energy and cost savings are all influencing municipal design.
Cities continue to grow as economies evolve and people seek more opportunities. Thousands of commuters pass through urban areas and as pollution and crime levels rise, city designers are looking for solutions for making ***cities desirable, safe, clean and sustainable.***

A city is really SMART when it proves to be able to satisfy citizens request, improve their life quality and make cities safer and efficient. A Smart city must be able to guarantee advanced services and to safeguard the environment through important plan of energy savings and maintenance costs.

Public outdoor lighting represents an important factor for Municipalities and this is the reason why they really need to adopt energy savings plan for optimizing the lighting managing and with AEC's integrated smart LED lighting systems LED technology, they can reach important results.

At the same time, the lighting installation represent an important infrastructure that can convey information related to services for Smart Cities.

***AEC offers integrated Smart systems designed to optimize the energy resources, safety for citizens, environmental respect and connectivity.***

City
SmartWay
*Designed for Smart lighting control*

City SmartWay is the software able to monitor, manage and analyze *your public street lighting infrastructure.* City SmartWay is a street lighting management system integrated with connected devices. The system allows to manage and monitor the public outdoor situation as energy consumptions using a *map-based view* on a simple and standard browser with workflow management tools, allowing you to be connected to your city at any time.

## ENERGY SAVINGS

AEC luminaires are developed with the best in LED technology and are integrated with ***City SmartWay*** for increasing energy savings. AEC luminaires minimize environmental impact reducing energy consumptions and costs for civil authorities.

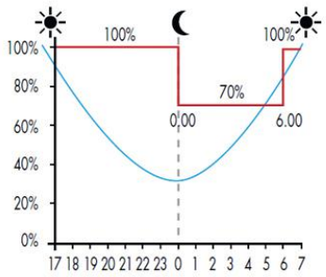
## MAINTENANCE COST REDUCTIONS

The possibility to integrate remote tele-management system allows municipalities to remotely monitor lighting installations in order to optimize maintenance activities and civilian safety. In the event of a fault, the automatic alarm allows maintenance to be planned in advance, *minimizing any waste of resources.*

## CITIZENS SERVICES AND SMART CITY

***City SmartWay*** allows to remotely integrate possible luminaire fault warnings that can be dangerous to the lit area. Thanks to *traffic and street weather sensors,* light can also be regulated in order to guarantee users' safety
***City SmartWay*** can easily communicate with *motion, traffic and weather sensors* and supply lighting "on demand". The solution can also be used along with existing systems and there is the possibility to integrate lighting columns with surveillance cameras for added public area safety and security.

# STAND-ALONE OPTIONS



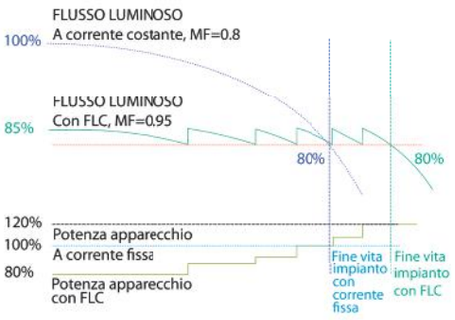

## DIM-AUTO option (DA / DAC)

*Automatic light flux regulation*

The power supply unit is pre-configured using an automatic dimming profile with 2 levels which allows to fully exploit the maximum light intensity during the first and last few hours of system operation, reducing the energy consumption in the middle of the night when a lower lighting level is enough.
The reduction profile automatically fits with the duration of the night-time period during the year.
Custom profile (DAC) up to 5 levels on request.

## PHOTOCELL Option (FC)

When lighting installation doesn't have a general dedicated switch, luminaires can be provided with a crepuscular integrated switch in order to manage the switching on in function of the external lighting level.




## FLC OPTION

*LED light flux recovery*

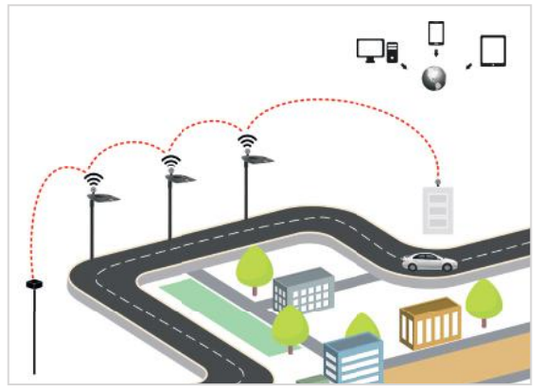
The natural deterioration of the light flux produced by LEDs, can be offset by progressively increasing the input current of the LEDs during operation. This option guarantees a virtually constant light flux output. The lighting system can be designed taking into account higher maintenance factors than the one which it's usually used with the standard products, offering instant savings in terms of energy consumptions and/or the initial cost of the system. The FLC option also allows to extend the useful life of the system.

# POINT-POINT OPTIONS

With **point-point solutions**, it is possible to control and monitor in remote mood every single luminaires in all their work conditions, being informed about their operations status and energy consumptions. Through conveyed waves (power line communication) and wireless waves, it's possible to create customized lighting scenario, associating luminaires to multiply groups of functioning. Control panels allow monitoring panel consumptions, integrating photocell or astronomical switches. Moreover it's allowed to receive the signal about any failures without any programmed check intervention on field.

CONVEYED WAVES Option (PLM)

WIRELESS Option (WL)



# NEMA SOCKET

I-TRON series is available with **NEMA socket** at 7 pin for its connection with external tele-management systems.
**NEMA socket** allows installing tele-management modules in a very *reliable and simple way*, so it's not requested to access to the internal part of the luminaire, also with the passage of time from the first installation.
The socket, provided with removable cap, is mounted over the body and its gasket is specifically designed to guarantee **IP66.**
I-TRON series with **NEMA socket** is **ENEC** certified**.**
The tele-management modules wireless **NEMA AEC SMART SYSTEM**, integrates all the necessary electronic parts requested for the luminous flux control (with DALI interface) and for the radio transmission (with an integrated antenna). Inside the module, these is an integrated clock which allows to control the switching on and switching off of every luminaire during the night in case of a missed transmission from gateway.

Luminaire with **NEMA SOCKET**

Luminaire with connected **NEMA SOCKET**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