

CHIARA H4

THE EVOLUTION IN THE INDUSTRIAL LIGHTING



MADE IN ITALY



www.luxled.it

lux LED



COMPANY PROFILE



Lux LEDlighting is a new company that specializes in industrial lighting. Despite the recent birth **Lux LEDlighting** has its roots in companies and people who lived the history of LEDs; including technicians who during thirty years have grown an experience that led them to mark significant milestones in the evolution of this technology. Starting from the first display, built in 1981; up to backlit signs of 1996; not to mention the large screens used in sports and entertainment events.

The story of LEDs is our history; started in 1981, when personal computers were still the interest of a few, while LEDs were already 19 years old. At that time the only available colours were red and green and with these we realized the first signs for promotions in supermarkets and the first electronic displays for bus stops. With the evolution of technology we then arrived to large screens, especially for television sets and then, in the late 80's, with the appearance of the yellow LED, we developed the first information panels for urban and motorway traffic. At the beginning of the 90s, a company until then only known for Phosphorus, that is NICHIA, created the technology of high-brightness blue LED. The arrival of the blue has revolutionized the LED market because, together with the red and the green, it made it possible to create the full colour pixel, crucial to manufacture large video screens. Moreover, we, probably first in the world, had already done it a few years earlier, using red and green LEDs and a gas discharge blue lamp.

The blue LED has laid the foundations for the development of the white LED, which is nothing but a blue LED on which phosphors are deposited.

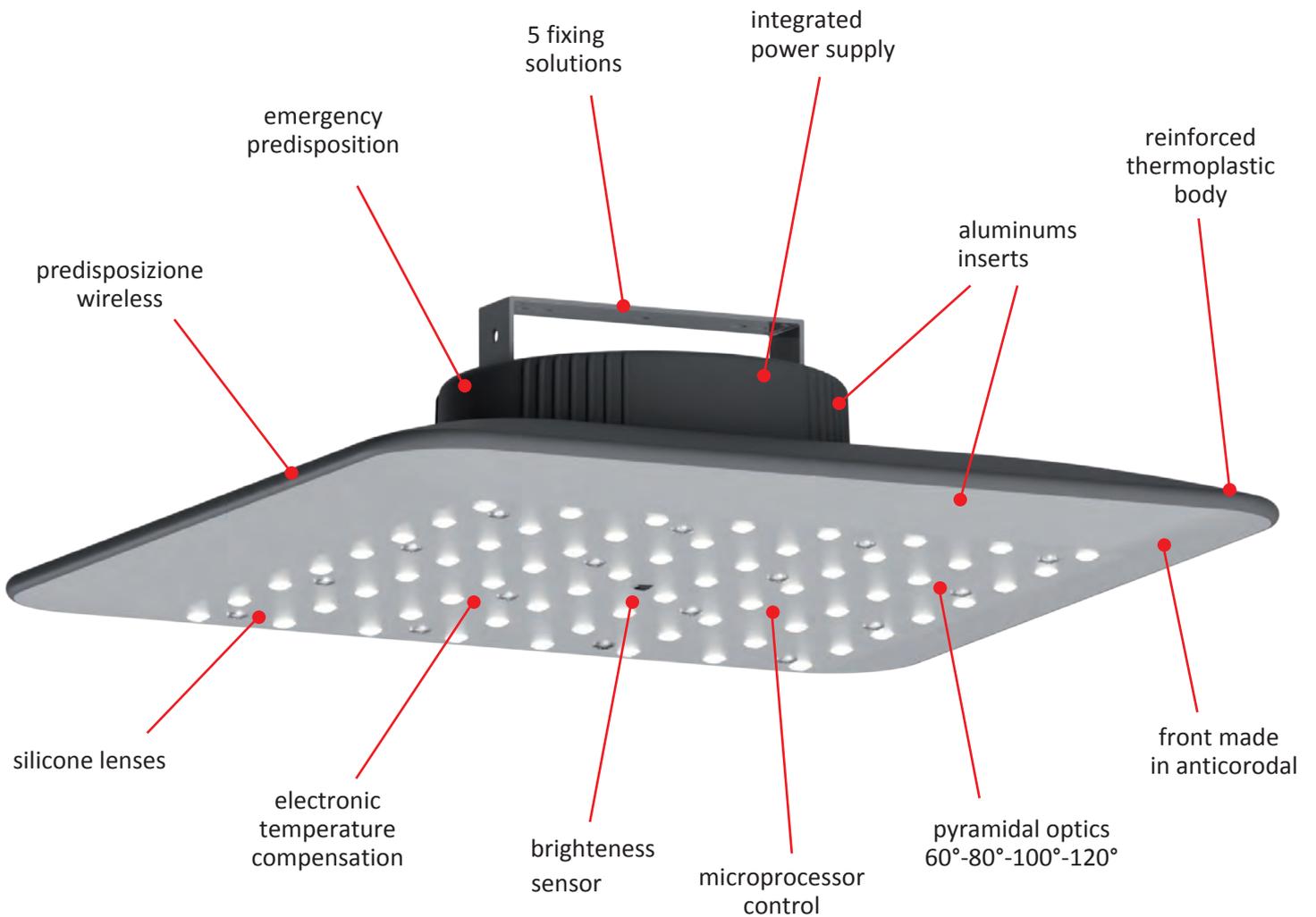
Here too, probably first in the world, we had already realized in 1996 road sign panels backlit with white LED light, of course, obtained using RGB LEDs; those curious can see them today in Brescia, still functioning after more than 160,000 working hours. From these experiences and after handling hundreds of millions of LEDs finally the concept of the **Lux LED lighting** was born.

Lux LEDlighting is therefore not an improvisation, but arises from the opportunities that today's market offers in the field of LED lighting, but is in any case the evolution of a project that began over thirty years ago.

Our constant interest for research continues: with the introduction of the current microprocessor control, with the self dimmer, with the constant flow control with variable power (rather than the opposite, as all do since Edison invented the light bulb).

Then again we introduced the current/temperature compensation, the wireless control and the silicone lenses, the front and not rear dissipation, like everyone still use to do! Our work in the field of LED lighting is still growing, but we have already exceeded 10,000 items in road appliances and the same amount in industry, in addition to several thousand items in pools/gardens, all with a remarkable growth trend.

A CONCENTRATE OF TECHNOLOGY





CHIARA H4 VERSION 170W

Potenza media (Average Power/Mittl. Leistung/ Med. Puissance)	170 W
Tensione di Alimentazione: (Voltage/Spannung/Tension)	100 ÷ 280V AC- 50/60 Hz
PFC (PFC/PFC/PFC)	≥ 0.99
Fonte luminosa (Lightsource/Lichtquelle/ Source)	64 power LED
Flusso nominale dei LED (Nominal LED Flux/Nominal LED Fluss/Nominal LED Flux)	26880 lm
Temperatura colore (Color Temperature/Temperaturfarbe/Coleur temperature)	5000K
Resa cromatica (R.A.)	≥ 80
Lenti (Lenses/Linsen/Lentilles)	Sylicon
Dimensioni (Dimensions/Abmessungen/Dimensions)	560 x 560 x 116 mm
Materiale (Material/Material/matériel)	Tecnopolimero/Alluminio
Classe di isolamento (Insulation Class/Isolierungsklass/ Classe électrique)	I
Peso (Weight/Gewicht/Poids)	6,5 Kg
Grado di protezione (IP Grade/ IP Schutz/IP Protection)	IP65
Temperatura operativa (Workingtemp./Funktionstemp./temp. de fonctionnement)	-30°C+60°C
Grado di resistenza IK (Resistance grade IK)	9
Umidità operativa (Working humidity/Operativfeuchtigkeit/Humidité de fonctionnement)	0÷98%R
Vita dell'apparecchio (Lifetime/Lebensdauer/Duree de vie theorique)	>60.000 h

VERSION 170W	
REFERENCE FLUX	24394 lm
CONSTANT FLUX 0-60.000 h	19500 lm

VERSION 150W	
REFERENCE FLUX	22100 lm
CONSTANT FLUX 0-60.000 h	17680 lm

VERSION 130W	
REFERENCE FLUX	19370 lm
CONSTANT FLUX 0-60.000 h	15196 lm

Accessori (di serie)

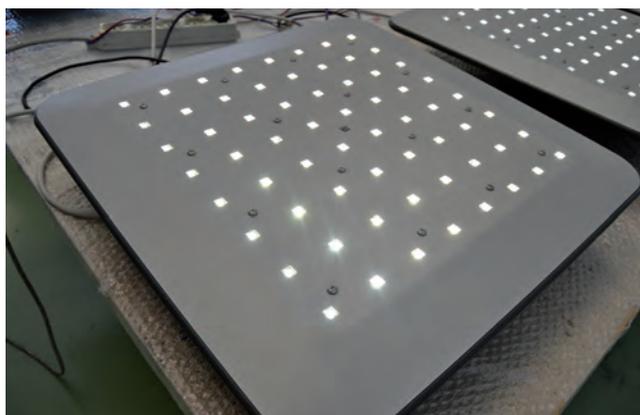
Standard Accessories/Standard Zubehörteile/ Standard Accessoires

- Controllo flusso costante
(Constant flux check/ Konstantflusskontroll/costant flux controle)
- Ottiche differenziate
(Differentiated optics/ Differenzierte Linsen/ lentilles diversifier)
- Autodimmerazione
(Autodimminger/ Autodimminger/ Autodimmerable)

Accessori (opzionali)

Optional Accessories/ Optional Zubehörteile/ Optionel Accessoires

- Controllo Wireless
(Wireless control/ Wireless Kontrol/ Wireless controle)
- Emergenza
(Emergency function/Notfallfunktion/ fonction d'urgence)



HIGH EFFICIENCY IN LED LIGHTING

The efficiency cannot be invented, it must be build!

Variables for a conventional LED appliance are not many. LEDs, at least for the 3-4 best producers worldwide, are more or less of the same quality, the same can be said for power supplies. What to do then to improve efficiency? The easiest way is just to write it on catalogues, as many do, reporting efficiencies equivalent to 140 or 150 lumen W that actually only refer to LEDs, regardless of the losses for temperature, for lenses, for glasses and for power supplies. Losses which, added together, range from 20%, for simple devices, without lenses and with direct power supplies, to 32-33% for appliances with lenses, glass and power supplies with primary/secondary insulation (like common sense recommends). Another solution is to use small power plastic LEDs, which are the most efficient but provide short service life (20-30,000 hours with flow losses amounting to 30%). The third way is to create innovative products, such as **Lux LEDlighting**.

Silicone Lenses

Silicone, rich in remarkable features, such as lack of yellowing and high temperature resistance, has a transparency of 94%, compared with 92% of the glass and 87-88% of PMMA (Polymethylmethacrylate). Moreover, since also the primary lens of LEDs is made of silicone, improves the LED-lens pairing and thus efficiency. Result: silicone lenses lose 7-8% less than normal screens or lenses in PMMA and 15-16% less than products with lenses and protective glass.

Variable power and steady flow

All lamps, both traditional and LED, lose efficiency over time. To compensate for this loss the power of installed equipment is increased by 20-30%. In **Lux LEDlighting** products the initial power of the device is reduced by 18-20% and is then automatically incremented as the LEDs lose efficiency. With this solution you get a constant luminous flux throughout the service life of the appliance and, above all, power savings and extended life of the LEDs by 9-10%.

Self-dimming

Each **Lux LEDlighting** device for interior use is equipped with an ambient light sensor, controlled by a microprocessor, which reduces the power of the device itself when the daylight exceeds the set threshold. This solution allows a remarkable reduction of consumption throughout the year, with an average savings of 20-25%.

Wireless control

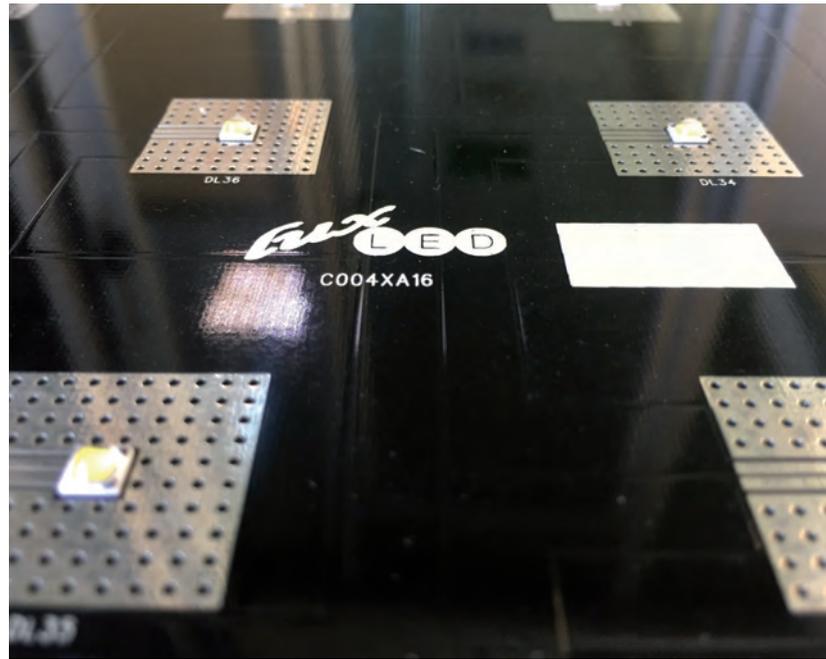
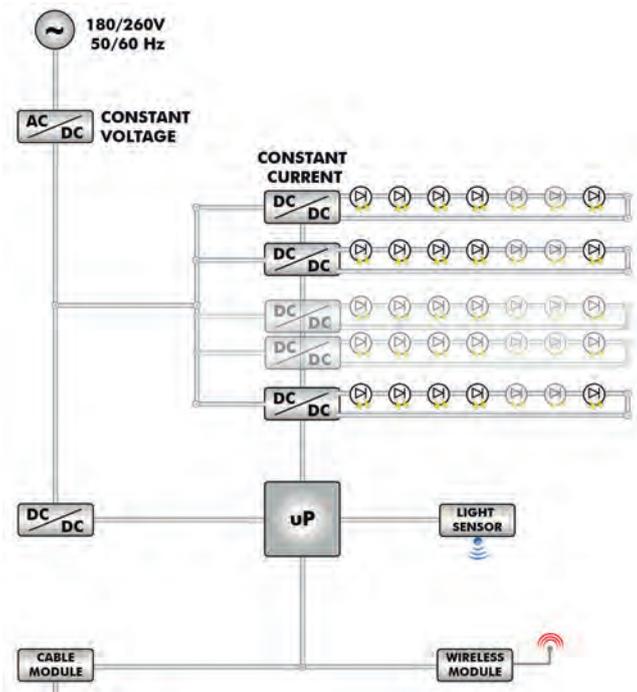
The latest born in lighting technology, the wireless control allows to optimize the operating time and the power of each individual device, improving lighting quality with a consumption reduction that can even reach 75%. Innovative, but also practical, intuitive to use and easy to install, since it doesn't need cables, this system, besides significant savings, allows to plan, control and monitor every part of any lighting system, from small business to large industrial premises.

Results

By applying these technologies to a 200 W LED device, which normally replaces a traditional 400 W lamp, the average consumption falls to less than 100 W. Not using the wireless control, in any case, the average power consumption is less than 135 W. In practice, though with a 200 W LED device the saving amounts to 200 W, by applying the **Lux LEDlighting** technologies savings amount to 265 W, for a device without wireless control and to 300 W in the case of a 100% LED technology device (silicone lenses; variable power; self-dimming, wireless control). Basically, if the technological equipment cost 50% more than a traditional LED appliance, the payback would be the same, but the subsequent gains much more. We recall that 100 W less consumption means, during the service life of an appliance, a saving of about 1,000 Euro. All this at a price slightly higher than conventional LED fixtures.



SMART DRIVER (WITH MICROPROCESSOR)



To turn the LEDs on there are various solutions, but the vast majority of lighting fixtures is fitted with a single power supply / constant current driver. It is the simplest and most cost-efficient solution because a single driver powers all LEDs, but, in professional applications, it has many limitations.

In **Lux LEDlighting** products the power supply is only required to turn the mains voltage, AC, in stabilized continuous DC voltage. The AC/DC power supply is located, depending on equipment, inside or outside the lamp body; in any case it does not interfere with the LEDs. Downstream of the power supply there is an actual electronic driver; this consists solely of solid-state components, with a service life next to one million hours. The heart of the driver is a microprocessor, born specifically for this application, capable of handling various branches of LEDs, with a much higher precision than traditional drivers. The intelligent driver consumes 2-3 W more than traditional one, but provides many advantages:

- Ability to provide any current value to the LEDs, from 0 to 1000mA;
- Ability to self-adjust the luminous flux as a function of time;
- Ability to self-adjust the the flux depending on the ambient light;
- Ability to adjust the luminous flux and thus the power, to the exact value required for a given application;
- Ability to receive commands from the outside, via cable or wireless, and provide data on the operation of the appliance;
- Ability to adjust as desired the current in individual branches, even with different values from branch to branch, to make more balanced LEDs temperature and therefore their service life;
- Ability to self-adjust the power according to the life of the LEDs;
- Greater reliability because the accurate control of the current and very low voltage reduce LEDs failures; also, with multiple drivers, if a single LED or branch fails, the others continue to operate.

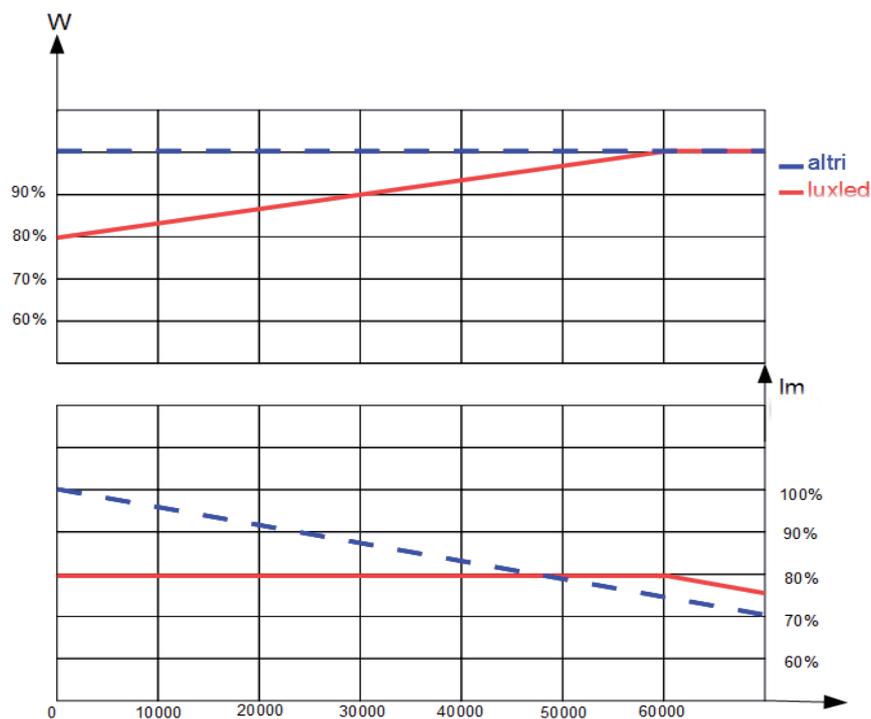
VARIABLE POWER / STEADY FLOW

Traditional lighting fixtures, including first generation LED technology ones, work at constant power and variable flow; over time, the luminous flux decreases and the lamp must be replaced. To compensate for this decrease traditional lamps should deliver, when brand new, a flow higher by 25-30% than necessary.

In **Lux LEDlighting** lamps the initial flux is set to the exact value requested by the project or by the customer and is kept constant throughout the entire life of the appliance. This is ensured by the microprocessor that initially supplies a current 20-30% less than normal, then increases it over time depending on the loss of efficiency of the LEDs.

This solution provides many advantages:

- Constant flow throughout the service life of the lamp.
- Initial consumption reduced by 20-30%.
- Lower average consumption, by 10-15%.
- Longer service life since the LEDs on average work with lower currents.



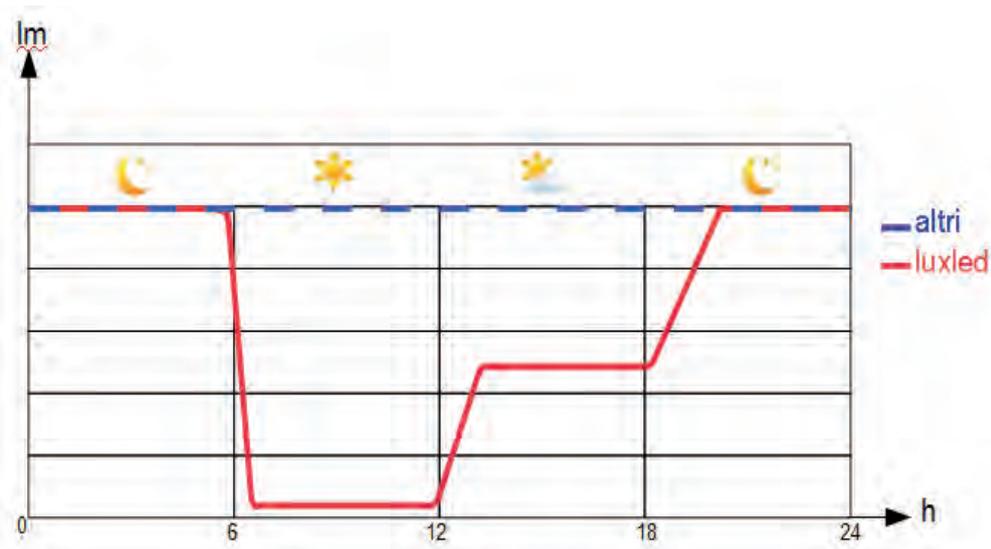
SELF-DIMMER (WITH DIGITAL SENSOR)

Even in indoor applications natural lighting is nearly always present. If we exclude the night time and the premises without windows or skylights, natural light contributes, to a greater or lesser extent, to environmental lighting. In some environments, at certain times and for certain hours a day, this light is strong enough to not require artificial lighting and then, manually or automatically, the appliances are switched off.

The self-dimmer is not limited to this function, it performs a continuous and constant control over the entire area of the room, in every season and in every minute of the year.

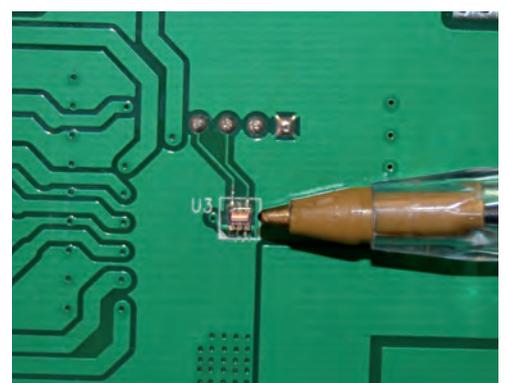
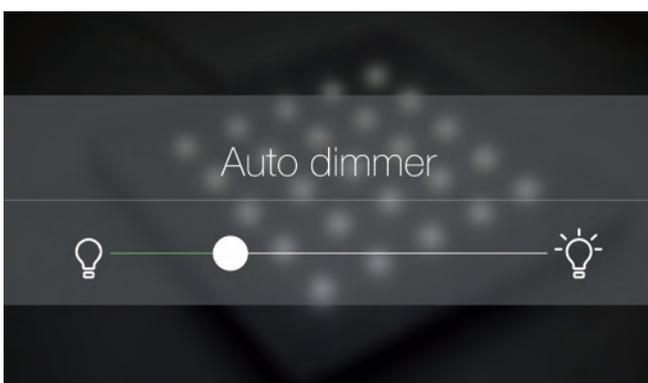
When in the room or in a certain area (just because of a door open) the sunlight enters, the power of all units concerned is reduced so as to maintain the lighting as uniform as possible.

The setting is so accurate that even looking closely at the lamps, it cannot be detected by the staff. However, it is continuous and constant and the average energy savings may arrive up to 40-50% when compared to a traditional LED device. This is not just an immediate economic benefit, since the service life of the device is extended by 40-50%.

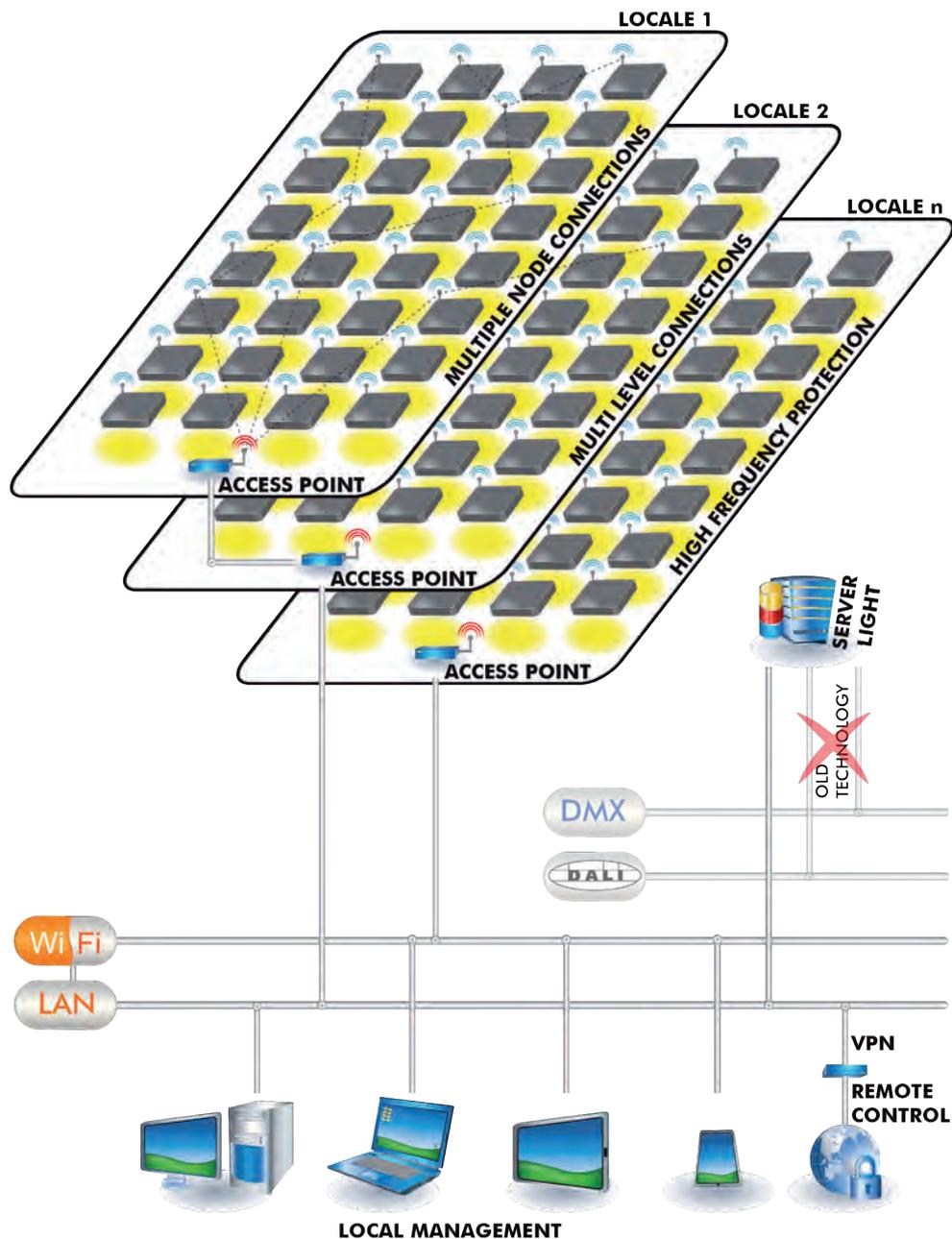


The sensor in the photo is not a common phototransistor but a concentrate of technology !

It is composed by two detectors, in the visible spectre and I.R.; two converters A/D at 20 bit and a microprocessor to process measures; memory, comparison of results with the human visible spectre; bus I²C for data exchange.



WIRELESS CONTROL



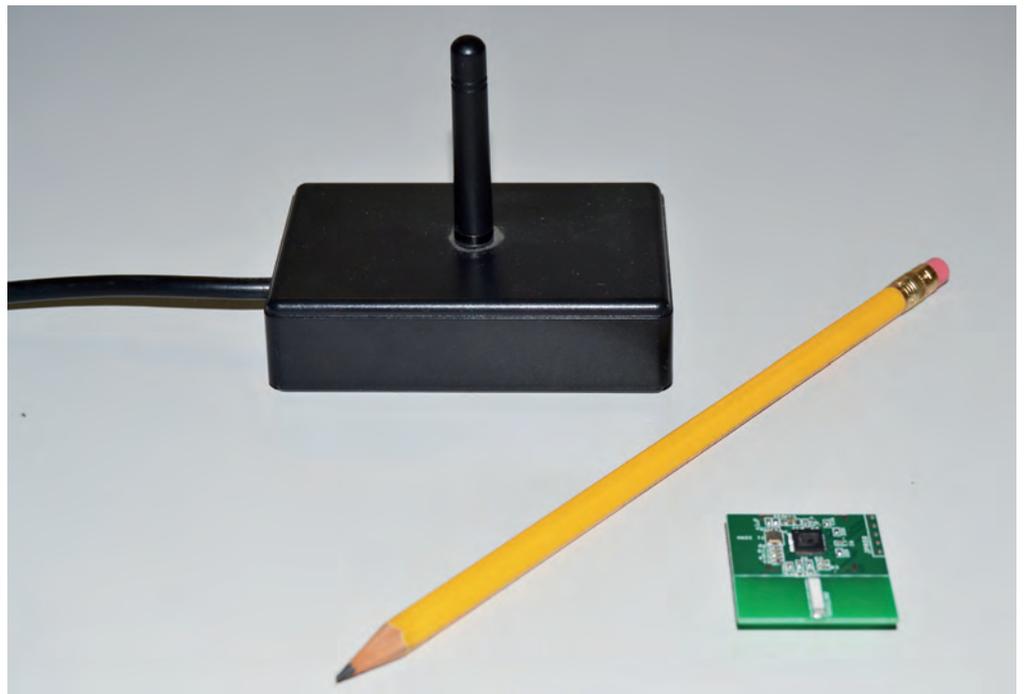
In the industrial sector there are environments that require different lighting levels; for example: warehouse areas; packing areas; areas in which precision operations are carried out; transit areas or areas working on two or three shifts and other on daytime only. These situations can vary and change over time, so optimal lighting should allow to switch from 300 lux, for certain processes, to 100 lux if the area is a warehouse, to 5 lux if, at certain times, lighting only serves for security or occasional transit.

Very few LED appliances allow for a linear and continuous control of the luminous flux from 0 to 100%; the units by **Lux LEDlighting** are among them, for this reason we decided to give the Customer the opportunity to optimize lighting even after the devices were installed.

The reason is not only aimed at improving the quality of the environment, but also improve power efficiency. A facility designed for 300 lux, if optimized for individual areas, uses on average 200 lux, then consumes 35% less power. For a 200W LED device, means a saving from 30 to 80 Euro per year, depending on the applications.

WHY WIRELESS ?

Wireless because it is the most technologically advanced and versatile system, and it is easy to install. It only requires an access point for each room (basically a router with antenna connected to the corporate network), and a management program.



HOW IT WORKS

Each device **CHIARA H4** is equipped with a communication module set to the 2.4 GHz radio frequency band. The module is connected to a microprocessor which comes as standard with each **Lux LEDlighting** device. The devices connect to each other, to the router and then to the network. Each device has its own address code and is recognized and managed individually. It sends information about its status (current in LEDs, ambient light, power consumption, operating hours, failures, etc...) and receives instructions on the level of luminous flux to be maintained. If necessary, the system can be connected and operated through the old DALI and DMX technologies.

THE SOFTWARE

The control program can be installed on a normal laptop, desktop PC or virtual PC the company makes available. The management program can be installed on any PC, even remote if connected to the Internet. The software provided by **Lux LEDlighting** has been specially designed for industrial environments and it is easy to use and intuitive; this provides for three programming levels.



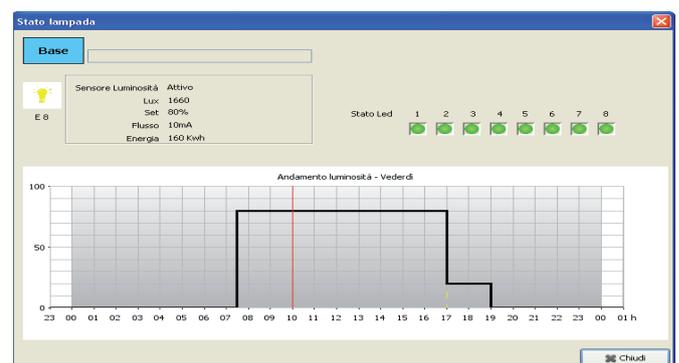
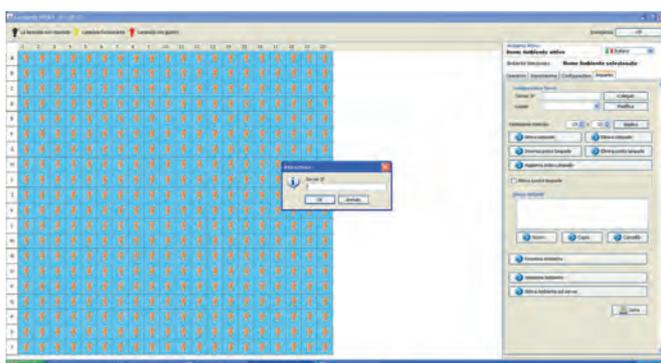
Requirements for PC client and PC server:

- S.O. WINDOWS
- Java 1.8
- Connection to the local or geographical net

The Parameters Setting Menu serves to enter and place each lamp in its correct position, so that you have a map of lamps corresponding to their real position in the environment; it assigns each competent areas (example: warehouse, production, packaging, etc...), allocates time spaces (example: work schedules; days or downtime periods).

The Settings menu assigns to each the lighting levels that the appliance must provide during the various time periods. Example: 30% at the warehouse; 70% at packaging shipments; 100% to the production area; 1% outside working hours.

The Operating Menu provides for the automatic management of the plant, following what has been configured and set up. If needed you can manually intervenes to increase or decrease or disable certain areas or to monitor the condition of the system (operation; consumption; lighting levels).



SILICONE LENSES

All traditional lighting products are equipped with a glass or other protective material and also many LEDs appliances use this solution; in other products are actually the lenses that protect the LEDs; others then are fitted with both glass and lenses; in each case one or both are present in all LED appliances.



Almost all manufacturers that use the lenses make them with PMMA (Polymethylmethacrylate); a good quality thermoplastic polymer that has a transparency of 86-88%, even polycarbonate or methacrylate diffusers do not exceed 85%. Even the extra clear glass does not exceed 92% transparency and anyway, for reasons of glare, it should be satin finished or paired with reflectors, with further losses.

Whatever the solution all result in losing efficiency; from 15% in the best cases up to 20-22% of the glass-lens combination. Continuing applying the philosophy of high quality **Lux LEDlighting** reduced such a loss by adopting silicone lenses. The liquid silicone, LSR, is already used by many years in contact lenses and provides unique and unsurpassed features: it resists to heat, it does not turn yellow, it cannot be attacked by solvents, it can be modelled with precision in thin thicknesses and, especially, has a 94% transparency.

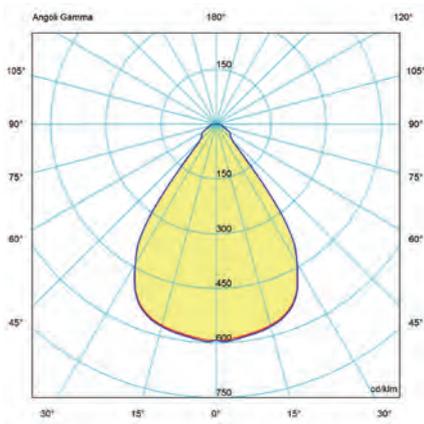


FLUIDDYNAMIC AND ELECTRONICS IN HEAT DISSIPATION

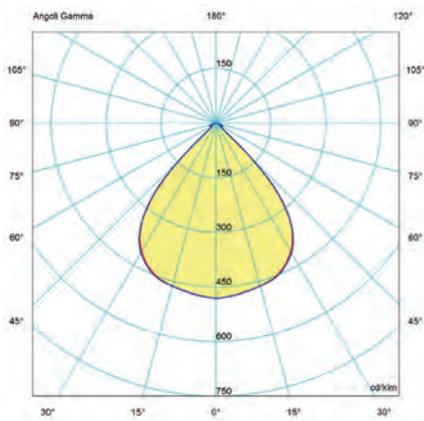
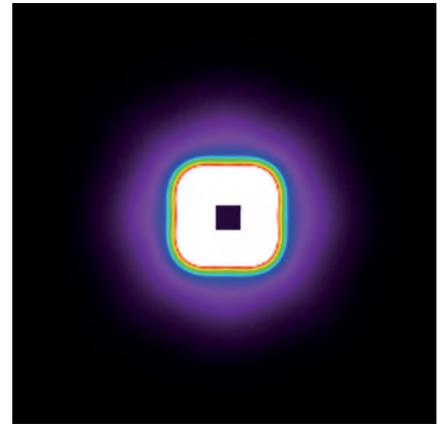
In a typical construction of a lighting apparatus LEDs are installed at the bottom of a printed circuit, whose upper side is in contact with a heat dissipater, usually made with finned aluminium. This solution has many disadvantages: dust deposits, minimum air circulation, less irradiation, difficulty in cleaning. The result is a reduction in heat dissipation; overheating; reduced service life of the LEDs.

In **Lux LEDlighting** devices heat dissipation occurs through the entire body of the appliance and on all surfaces; in particular the lower one, which does not get dirty; ensures more air circulation; has no ceiling obstacles and is in direct contact with the LEDs. This, together with the fact that LEDs are far apart and spread over the entire surface, ensures an excellent heat dissipation and a uniform temperature. Here too the electronics is the main character. In all units, in particular those circular or square shaped, central LEDs are more prone to overheating. **Lux LEDlighting**, besides having outdistanced LEDs, has implemented the electronic temperature compensation. In practice, the central LEDs, hotter, are fed a slightly less power than the average current given to the outermost, that, being colder, are fed a higher current. This solution guarantees all LEDs an equal service life and uniform wear.

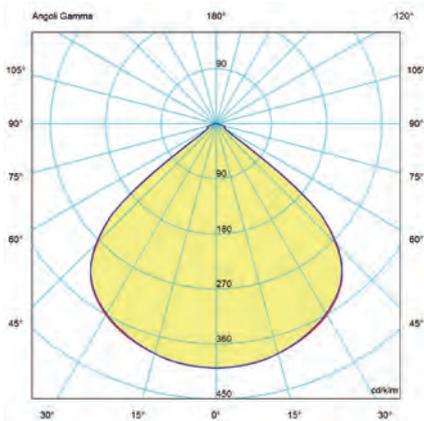
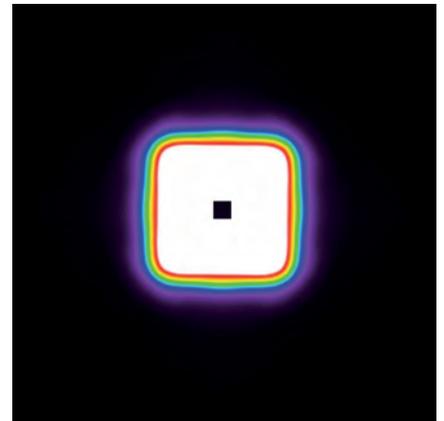
PHOTOMETRIES



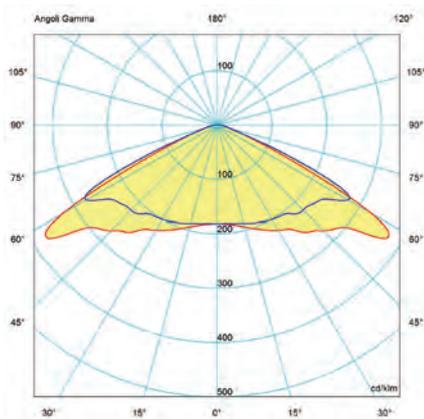
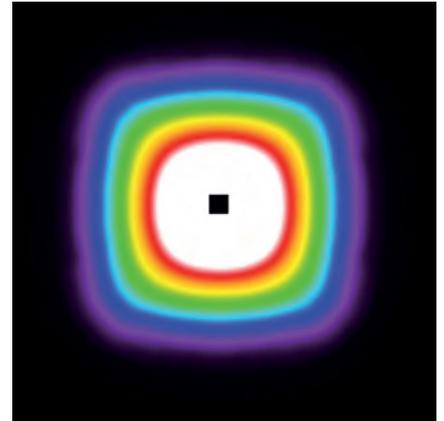
TIGHT LENS 60°



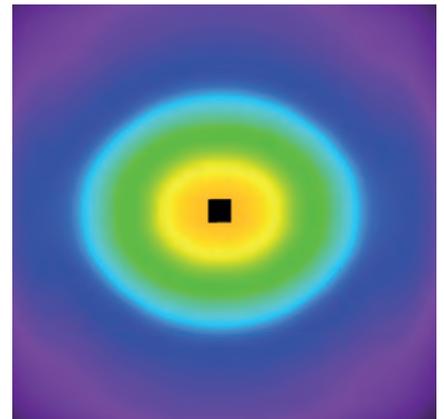
MEDIUM LENS 80°



LARGE LENS 100°



EXTRA LARGE LENS 120°



FIXING SOLUTIONS

CHIARA H4 is a lighting fixture, suitable to normal indoor industrial use or outdoor ceiling installation; in adherence or suspended; in horizontal position or inclined not over 20°; at an height from 4m to 25m from the ground; in a position reachable from qualified technicians.

For the installation of **CHIARA H4** are foreseen the following solutions.

HUNG ON BUSBAR

To fix the fixture **CHIARA H4** on a busbar is necessary to provide 2 hooks supplied by the same supplier of the bus, suitable to the use and the weight, to be fixed with the standard clamp. (fig. 1).

HUNG ON A BEAM OR PERFORABLE SUPPORT

To fix the fixture **CHIARA H4** on a beam or other support is required that these elements would be suitable to support the appliance and be possible to make the holes described in the installation manual for the best stability of the fixture (standard clamp fig. 1).

HUNG WITH CHAINS OR CABLES

To fix the fixture **CHIARA H4** through chains or cables use two holes in the top side of the standard clamp, inserting in each hole a male ringbolt M6 fixed with locknut or 2 male ringbolts M8 fixed with locknut on the two lateral side of the clamp.

HUNG ON BEAM OR OTHER SUPPORT THROUGH SHORT COUNTER- CLAMP (50 mm)

To fix the fixture **CHIARA H4** on a beam or other perforable support and having the possibility to incline it on the horizontal side, use the short counter-clamp (fig.2) that must be always combined with the standard clamp (fig.1).

FIXED ON A VERTICAL OR OBLIQUE WALL, THROUGH LONG COUNTER- CLAMP (300 mm), ADJUSTABLE

To fix the fixture **CHIARA H4** on vertical or oblique wall or even to distance it from the ceiling or other element, use the long counter-clamp (fig. 3). The long counter-clamp (to be combined always with the standard clamp) must be fixed to the support material using at least 2 of the present holes on the counter-clamp for this purpose. .



Figure 1 - standard clamp



Figure 2 - short counter-clamp

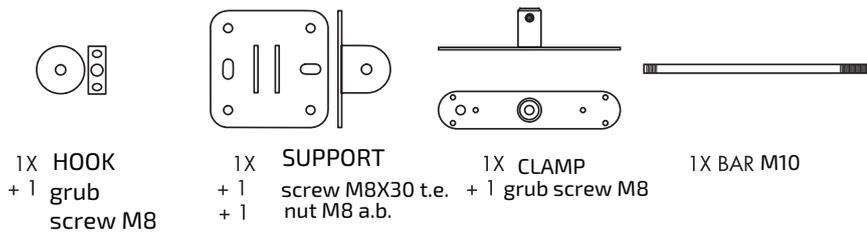


Figure 3 - long counter-clamp

HUNG ON CEILING, VERTICAL OR OBLIQUE WALL OR OTHER SUPPORT THROUGH APPENDINO

For suspended installation that requires an aesthetic beyond technical results we suggest to use the accessory APPENDINO, that will be supplied separately. The APPENDINO allows to hang the fixture **CHIARA H4** fixing it on the ceiling or other oblique walls on condition that such walls would be able to support the fixture weight and relative stress.

Kit APPENDINO composition



NOT ONLY CHIARA H4

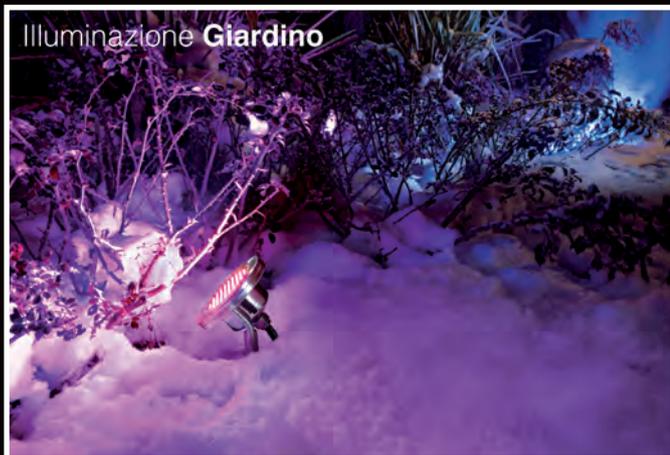
Illuminazione **Industriale Esterna**



Illuminazione **Stradale**



Illuminazione **Giardino**



Illuminazione **Piscine, Wellness & Spa**



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