

LEADSUN[®]

2.0

OFF-GRID
Intelligent
Lighting
Systems

2018

Technology
Overview

INTRODUCTION

History Of Leadsun

Established in 2005, Leadsun is a globally recognised provider and integrator of smart renewable energy systems, specialising in a wide-range of Off-Grid Intelligent LED Light and Power solutions.

With a production capability of 30,000 units per month, and a world-wide distribution covering more than 30 countries, we are well placed to service all parts of the globe with our state-of-the-art production facilities in Zhuhai, China, together with our Design & Testing facility located in Melbourne, Australia.

Leadsun continually strives to provide its customers with the most up-to-date, cost-effective, sustainable and easy to install solar powered lighting products. Our core focus is on technical innovation and quality, providing our business with a future-proofed direction and platform for growth that can bring on real and sustainable change to this world.

Combining renewable energy with next-generation lighting and IoT technology, our mission is to make our solutions as cost-effective, practical and functional as possible. As consumers become more environmentally aware, more conscious of their hip pocket, and begin to steer away from grid connected lighting, our goal is to plug the world into an infinite source of green and free energy, coupled with intelligent and autonomous technology.



From the Managing Director:

Thank you for your interest in LEADSUN – Our company was ambitiously created in 2005 where our patented All-In-One design technology has revolutionised traditional solar lighting systems from its development 30 years ago, to the next generation Off-Grid Intelligent Lighting technology that we create today. LEADSUN is now the leading developer of the most reliable and advanced solar-powered lighting systems in the world and I'm now proud to introduce LEADSUN 2.0, which represents new aspects of our dreams, ideas and passion along with a new look and feel for the company.

Right here, right now - we are committed to ongoing growth and innovation and continually challenge our R&D team to advance both renewable power and intelligent lighting technologies. Our goal is to ensure people all over the world have access to cost-effective Off-Grid Intelligent lighting systems powered by the limitless energy of the sun.

Sincerely,



Matt Pollard / MD of LEADSUN Australia

World Class Quality

Leadsun is committed to offering its clients the highest level of quality, sustainability and customer satisfaction, which is reflected in our Quality and Environmental Management accreditations. Furthermore, we have nationally accredited lighting IES files to verify how effective our technology performs in the real-world.

At Leadsun, we use the ISO 9001:2015 Quality Management System to ensure that we maintain operational effectiveness and efficiency, maintain consistency in our processes, and achieve ongoing compliance with international statutory and regulatory requirements.

Our ISO 14001:2015 sets out the benchmark for environmental compliance, allowing us to manage our environmental responsibilities, and measure and improve any immediate and long-term environmental impacts relating to our products, services and processes.

Leadsun aims to exceed customer expectations through ongoing research and development, and continuous improvements to products, services and processes.



Industry Evolution of Solar Lighting

Traditionally associated with environmentalists, the usage of solar lighting has changed dramatically over the last few decades. This change has largely been driven by the evolution and uptake of solar panel and battery technologies meaning increased affordability, practicality and ease of installation in areas where grid-power can't reach, and most importantly, the growing realisation that our non-renewable resources have a limited lifespan.



Traditional or conventional street lights draw their power from standard electrical grids, which generates energy from fossil fuel (non-renewable) sources. The use of electricity to drive conventional outdoor lighting is one of the root causes of global warming and puts extreme pressure on our existing grid-powered infrastructure at peak demand times.

While Grid-Connected electricity has historically been a reliable and dependable source of power, this has progressively been replaced by more efficient types of lighting such as CFL and LED lighting which delivers phenomenally brighter levels of light for significantly less energy, compared to traditional lighting. Since 2010, these technologies have advanced considerably, enabling both Lighting & Renewable technologies to merge into what we now know as Solar Powered Lighting.

Since 2008, Leadsun have played a significant role in the evolution of solar powered lighting and have been a shining story of success in the industry. Having pioneered All-In-One (AIO) solar lighting technology design, Leadsun's AIO solar powered system integrates a highly efficient slim-line solar panel, compact & powerful Lithium-ion LiFePO4 batteries and adaptive LED lighting technology; all working in synergy to create a new standard in Off-Grid Intelligent Lighting Systems.

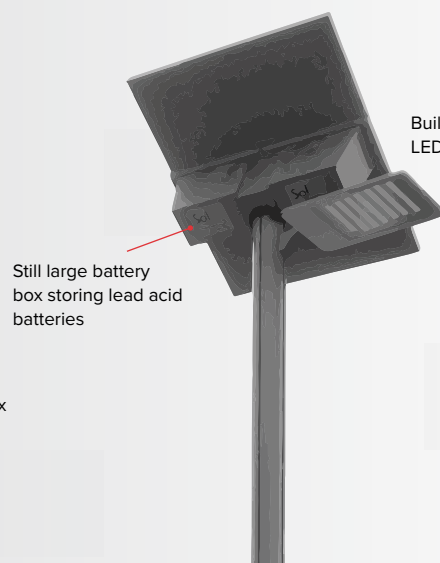
1980's

Big And Clunky



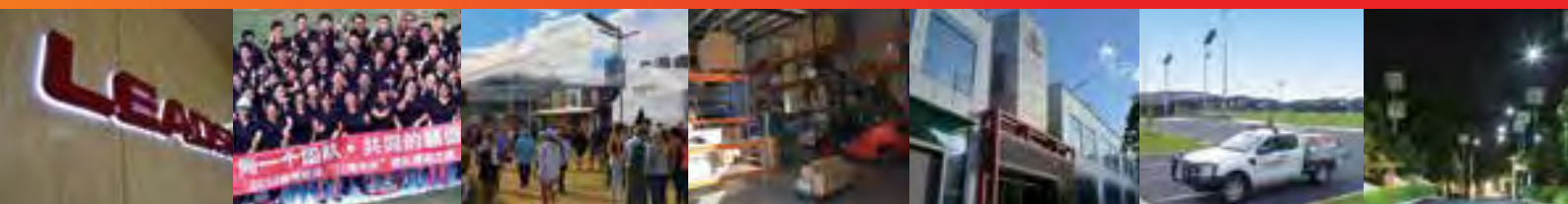
2000's

A Little Better



LEADSUN 2.0

Ultra Modern All-In-One System



Why we are different?

Using world-class engineering, combined with wireless SMART control technologies, modern and contemporary designs, and a focus on clean and green energy, Leadsun leads the new-wave of global clean-tech companies that are committed to improving energy efficiency for communities around the world.



World-Wide Distribution

Leadsun is one of only a few companies worldwide that offers end-to-end solutions - responsible for fully developing, manufacturing, and providing system design engineering support, in addition to a range of innovative installation solutions. Our aim is to make the entire sales experience simple, professional and to ensure our product solution is always fit for purpose.

Currently leading the way with solar powered technology, Leadsun has international patents for its All-in-One solar lighting technology, which has revolutionised the industry, transforming it from 'simple lighting' to now 'intelligent lighting'.

Our cutting edge designs feature compact, modular All-In-One technology that integrates a highly efficient and slim-line solar panel, powerful Lithium-ion LiFEPO4 battery packs and a smart power management and adaptive lighting control system – all bundled together into an easy to install Off-Grid solar powered lighting package.

The Lithium-ion LiFEPO4 battery is a new generation system, where power is packed into one third of the space and weight of traditional Lead Acid batteries, enabling our systems to remain compact and slender with all core components fully integrated into the one module at the very top of the light pole.

Leadsun now also offers an optional wireless control system called 'Leadsun EDGE' to remotely operate and monitor each solar light, through a wireless network system. Additionally, the highly efficient SMART controller can regulate and adjust charging power, switch different working modes, and provide a failure warning system in the event that a light malfunctions.

Our solar powered lighting system incorporates an Advanced LED lighting solution, which not only optimises luminosity, but delivers outstanding lighting distribution performance for a wide range of small to medium lighting applications for pedestrian and vehicle areas.

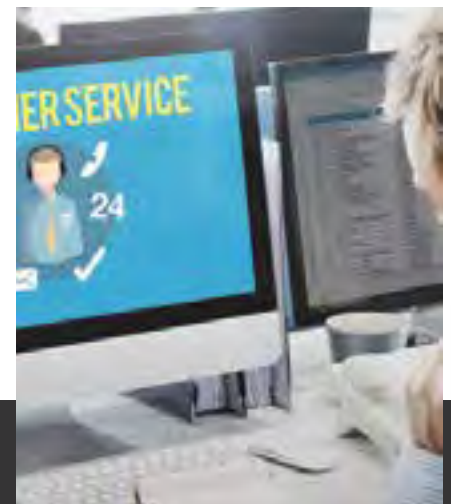
At Leadsun, we are passionate about everything we do and our promise is to continue to develop the world's most technically innovative range of Off-Grid Intelligent solar-powered LED lighting & power solutions.



CONSULTATION



SALES ENGINEERING



SERVICE AND SUPPORT

Leadsun Product Evolution

Leadsun's first entry point into solar lighting occurred more than ten years ago, when traditional solar panels were chunky, battery charge was limited to a few hours of continuous operation, and solar technology was an expensive commodity that very few could afford. Since then, Leadsun has modernised the market for renewable energy, and has pioneered the development of the very first 'All-in-One' solar lighting system, with Adaptive Control. Using cutting-edge technology, we have managed to combine all our core components into a compact, slim-line, All-In One module that is both contemporary and functional, using batteries that are one third the size of traditional offerings. Our innovative, flexible and easy to install designs are appreciated (and imitated) by many manufacturers across the globe.

Leadsun are proud to have played a pivotal role in redefining the way in which solar power is utilised; over the last 10 years, we have significantly changed the way in which people perceive renewable energy when combined with intelligent lighting. With a diverse product range that is 'fit-for-purpose' and covers all the market gaps, including small, medium and large solar and battery configurations we have transformed solar energy into a much more accessible commodity that is beneficial to people and communities world-wide.



2008 AE1 Series

World's first All-In-One compact solar lighting system featuring a 15W solar panel and 5W LED light and motion sensor with dimming



Today AE6 Ultron Series

New-Generation All-In-One solar lighting system featuring dual-layered solar panel, 60W LED adaptive lighting and wireless IoT technology



2018
AE6 Ultron Series
Solar Powered
CCTV & Wireless
Control



2012
AE6
(All-In-One,
Split)



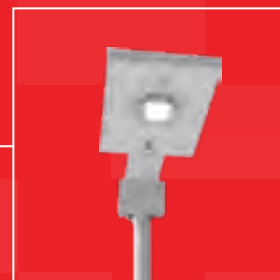
2014
AE3C
(All-In-One,
Swivel, Split)



2010
AE2
(All-In-One,
Swivel, Split)



2008
World's first
All-in-one
solar street
light



Diverse Product Offering

Leadsun has revolutionised the industry through the development of its technically innovative range of 'All-In-One' solar powered LED lighting and power solutions.

Tailored to your needs, our diverse product range is unlike anything else on the market, and covers a variety of fit-for-purpose solar panel and battery sizes that combine functionality and compactness with a modern and contemporary design.

- ✓ Lithium LiFePO4 Battery (3rd Generation)
- ✓ Dusk to dawn automatic operation
- ✓ Sleek, compact and modular design
- ✓ Quick connect wiring system
- ✓ 12Vdc regulated output
- ✓ IP66 rated components
- ✓ Optional Wireless Connectivity



Solar Engines



AIO (All-In-One)

AE2 Series

Solar Panel Sizes
15W / 30W

AE3 Series

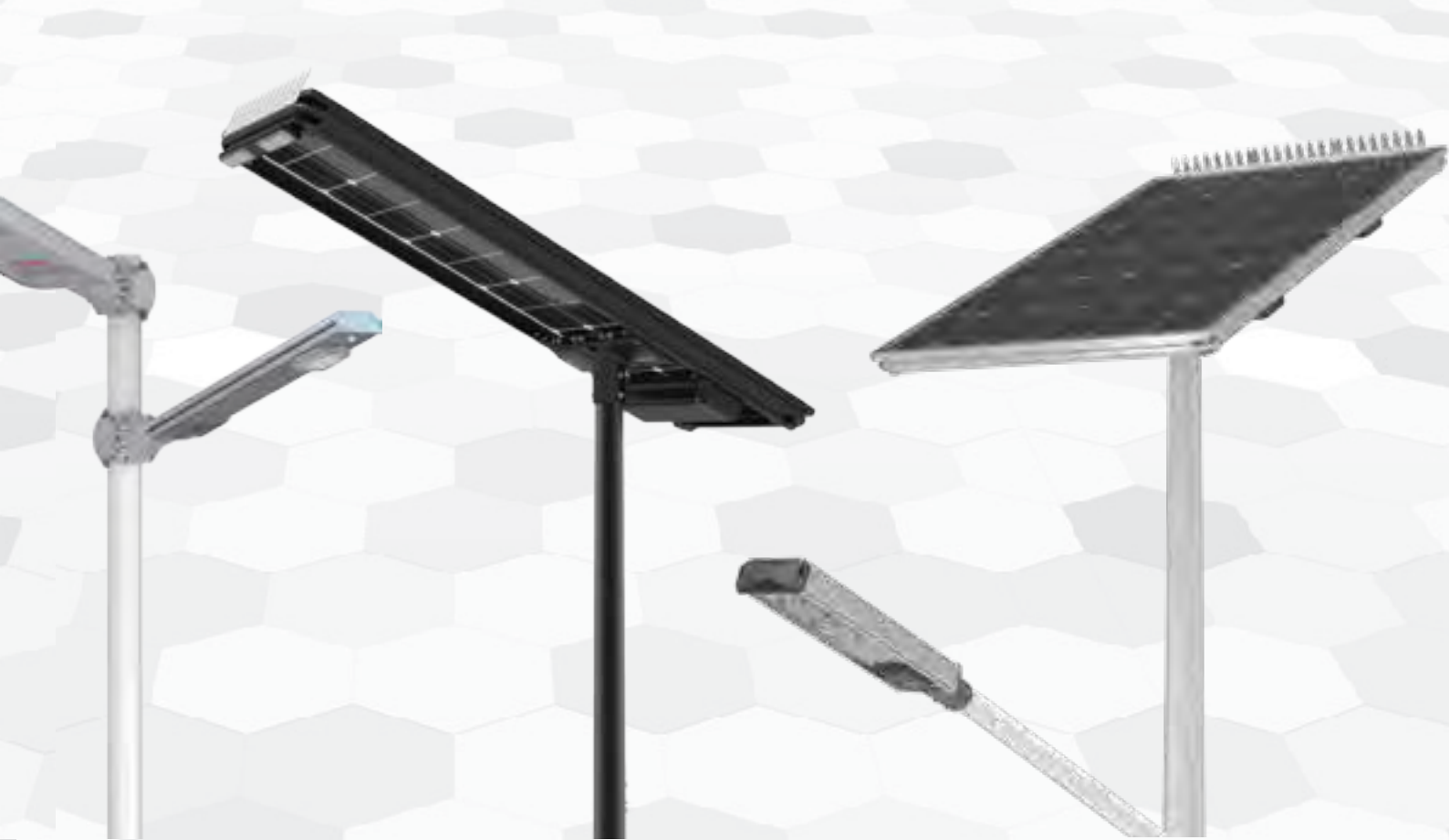
Solar Panel Sizes
55W / 80W

AE6 Series

Solar Panel Sizes
130W / 260W / 390W

Solar Lights





Ultra-Efficient LED Light Fixtures

NEW PRODUCT



FREEDOM Series

Off & On Grid Connection
with built-in battery
Light Output
15W-80W



STANDARD Series

Light Output
10W-30W



ULTRON Series

Light Output
30W-120W

**NEW
PRODUCT**



EDGE Bollard

Off & On Grid Connection
Light Output
2W-10W



TRINITY Series

**WIRELESS SECURITY
OFF-GRID CCTV SYSTEM**

NEW PRODUCT

CORE TECHNOLOGY

Leading Technology, Designed for the Future

Leadsun is continually striving to provide our customers with the most intelligent, contemporary and easy to install solar powered products. Our ongoing focus and commitment to technical innovation and quality makes us stand out from our competitors. With unrivalled attention to detail and a commitment to sustainability, we work in accordance with the highest standards demanded from our relationships with customers, the environment and the community.



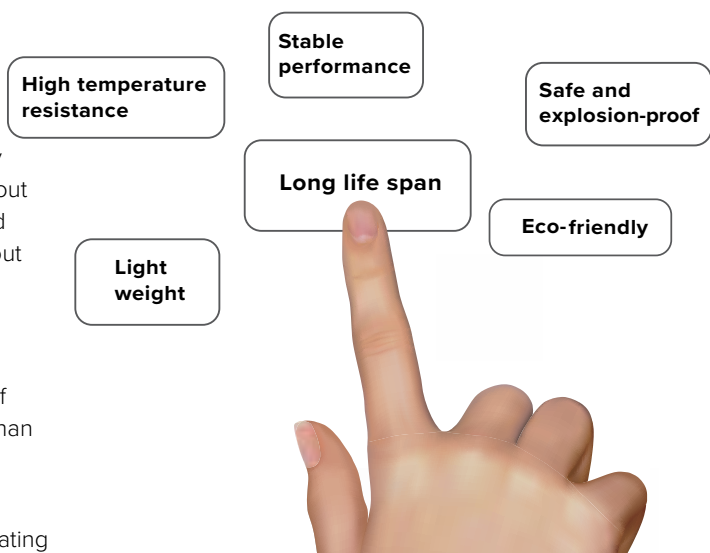
#1 Lithium-Ion Battery System Ultra-Powerful

LiFePO4 Battery System

Leadsun uses new-generation Lithium LiFePO4 batteries which are the heartbeat of all our Off-Grid lighting systems. The custom-built design provides **three times** more storage and power capacity compared to traditional Lead Acid batteries enabling maximum performance, reliability and longevity, all within a limited space. Delivering sustained power without excessive heat output, our battery system is eco-friendly, safe to use, and can tolerate extreme temperatures from -20 to 60 degrees Celsius without decomposition.

Unlike Lead Acid batteries, which have a limited capacity to store power, Lithium-ion batteries require little maintenance, and are more resilient to irregular discharging. These batteries have about six times the number of cycles compared to Lead Acid batteries, with a life expectancy of more than 2000 cycles, compared to 300 to 500 cycles.

With its stand-out features, the lithium-ion battery is a far more appealing option, and has essentially revolutionised the cost and efficiency of operating and maintaining an Off-Grid solar powered energy system.

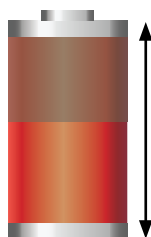


Batteries: Off-Grid Storage

Lead Acid



50% Usable Capacity

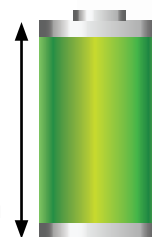


Lead Acid Rated Capacity

VS

Lithium Ion

Lithium Ion Rated Capacity



100% Usable Capacity at any discharge C-Rate



#2 SMART Controller

Ultra-Intelligent

Leadsun's SMART Controller offers flexible accessibility, as the intelligent power adjustment function automatically modifies power discharge according to the remaining energy, allowing it to prolong the lighting time. This in turn provides a more effective method of lighting control, which minimises energy consumption and provides greater battery autonomy and operational reliability.

With a sleek, modular design, the convenient 'plug and play' design of the SMART Controller is easy to change over, if ever required. With smart mode control and intelligent power adjustment, the power supply can be configured using a high precision DAC custom dimming profile, which can be fully customised to various levels depending upon the user's requirements.



Wireless Networking Option

LEADSUN's wireless networking option makes the outdoor light smarter with ease of control, monitoring and management remotely.

Modular plug & play design makes for easy maintenance or replacement

External USB programming port provides easy configuration for the working modes



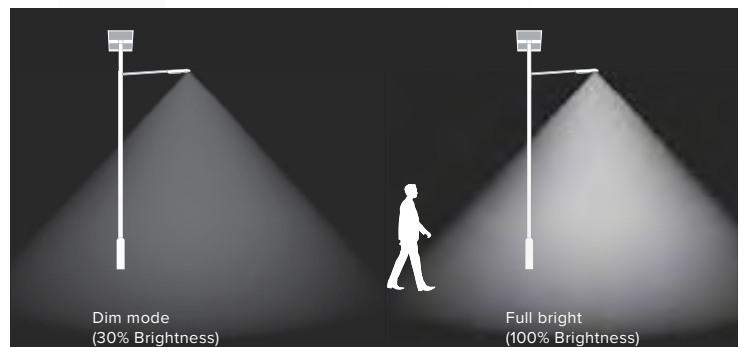
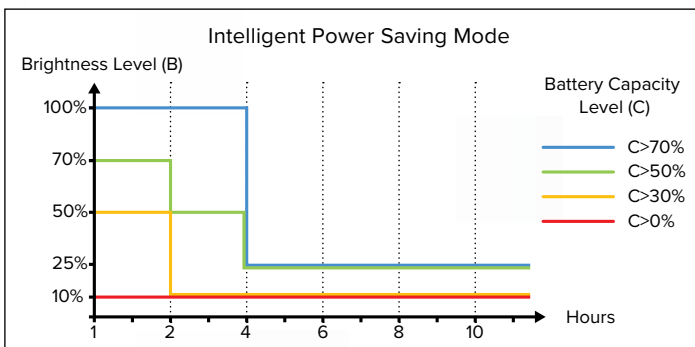
Adaptive Intelligent Lighting Control

Featuring the 'Smart-Eye' PIR motion sensor, a new wave in adaptive intelligent lighting control, Leadsun uses the latest Panasonic passive-infrared motion sensor technology to detect movement within several feet of the unit. When the sensor is tripped, the unit automatically regulates the output of the LED lamp, shifting it from 'dim mode' to 'full-brightness' until the motion is no longer detected.

This smart feature not only preserves battery power, but is the cornerstone of the security system, enhancing visibility at night and allowing passive security within the area of the lights.



SMART EYE MOTION SENSOR



Powered by **Panasonic**

#3 Monocrystalline Solar Module

Ultra-Performance

Generating more energy than conventional modules, due to its superior performance cells with EVA layers and anti-reflective coated glass, our traditional solar module has superior spectral response, is highly reliable, and provides maximum efficiency in a minimum unit area. The All-In-One solar module is made from the highest grade crystalline silicon. We recognise that mono-crystalline solar modules have high efficiency rates and a prolonged life span, and we choose to only use the best materials in our designs.

With superior mechanical performance and durability in all types of weather and environmental conditions (ie. high temperatures, high humidity, salt mist and ammonia resistant dust), this solar module is highly versatile and suitable for use across a wide range of applications.



High Energy Yield

- Generates more energy than conventional modules due to superior performance cells with EVA layers and anti-reflective coated glass
- Outstanding and efficient energy production, more watts per connection



Maximum Value

- Provides maximum performance & reliability with minimum materials and labor
- 25-Year linear performance warranty
- 10-Year limited product warranty



All Weather Solution

- Reliable performance in high temperature, high humidity, salt mist and ammonia resistant dust and sand resistant
- Superior mechanical performance, 5400Pa snow load
- 2400Pa wind load



Glass

Anti-reflective coated glass, high tensile strength, no optical degradation, prolonged life span, PID free and no snail trail effect, temperature and humidity resistant.

Solar Cell

Superior spectral response and provides maximum efficiency in minimum unit area.

EVA

Intensify light transmission prevents humidity and dirt, provides excellent durability in all weather conditions.

#4 Advanced LED Lighting System

Ultra-Efficient

The ultra-efficient and advanced LED lamp module from Leadsun is an intelligent lighting solution and utilises highly effective and powerful 'CREE' XT-E series LED chips, which are renowned for providing industry leading 'bright & crisp' illumination for more than 50,000 hours.



Superior Outdoor LED Chps



Luminous efficacy can reach up to **180lm/W(@25°C)**



Combined with the outstanding heat dissipation design, the pure aluminium lamp base with sealed lens makes the lighting more effective and aids in the longevity of the LED chips.



Actual product luminous efficacy over 150lm/W



3mm thick 6030 aluminium substrate provides excellent heat dissipation.

Our newly designed LED module base uses a unique CNC production technique and is fabricated from aluminium extrusion, which significantly improves LED thermal heat dissipation by up to 115%. This improve the longevity of the LED's, guaranteeing greater long term system reliability.

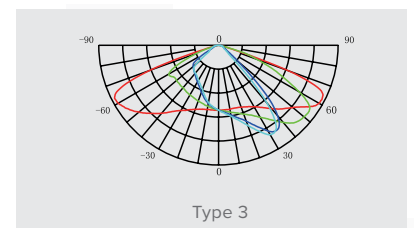
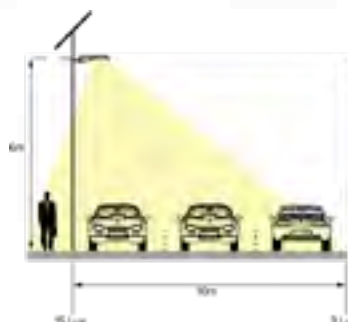
Dimension : 11.2mm×11.2mm Thickness : 16mm Weight : 350g



The LED lens uses the highest quality UV stabilised and polished Polycarbonate transparent material, a substance which is durable, has exceptional impact resistance. This provides ultra-efficient output through optimised luminous efficacy and uniformity, providing the ultimate in design flexibility.

The beam pattern is perfect for lane ways, pedestrian promenades, bicycle paths as well as minor roads and parking lots.

High Strength | High Luminous Efficacy | Excellent Anti UI Performance



Precision build, Precision care.

Did you know, Leadsun was the first in the world to design and manufacture the All-In-One Solar Light? This ground-breaking design is now part of our DNA, and always will be!

We believe thoughtful design drives innovation, so when it comes to installing pole mount solar lighting systems, our R&D team endeavors to design sleek, compact and aesthetically pleasing systems that are built tough to withstand the harshest of environments in the world.



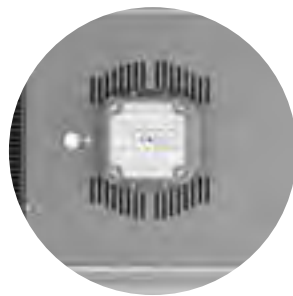
Thoughtful Design

Our clever design engineers turn innovative, attractive design concepts into reality. We take care and have pride in our craftsmanship, always ensuring our All-In-One solar lighting systems remain streamlined and modular in appearance and blend in well with urban landscapes. In fact, our newly developed 3rd generation All-In-One solar lighting systems are now sleeker in appearance, and even more feature packed than ever before.

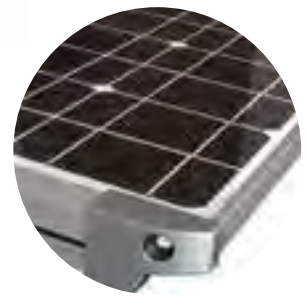
New Mechanical Structure: The construction of our main frame now uses extra light-weight aluminium alloy with stainless steel 316 grade fastening parts all in a serviceable and user-friendly body. Our build quality guarantees IP65 weather resistance and IK08 impact protection to the LED module.



Robust, strong and easy to assemble out of the box



Interchangeable 'plug & play' modules allow for easy replacement

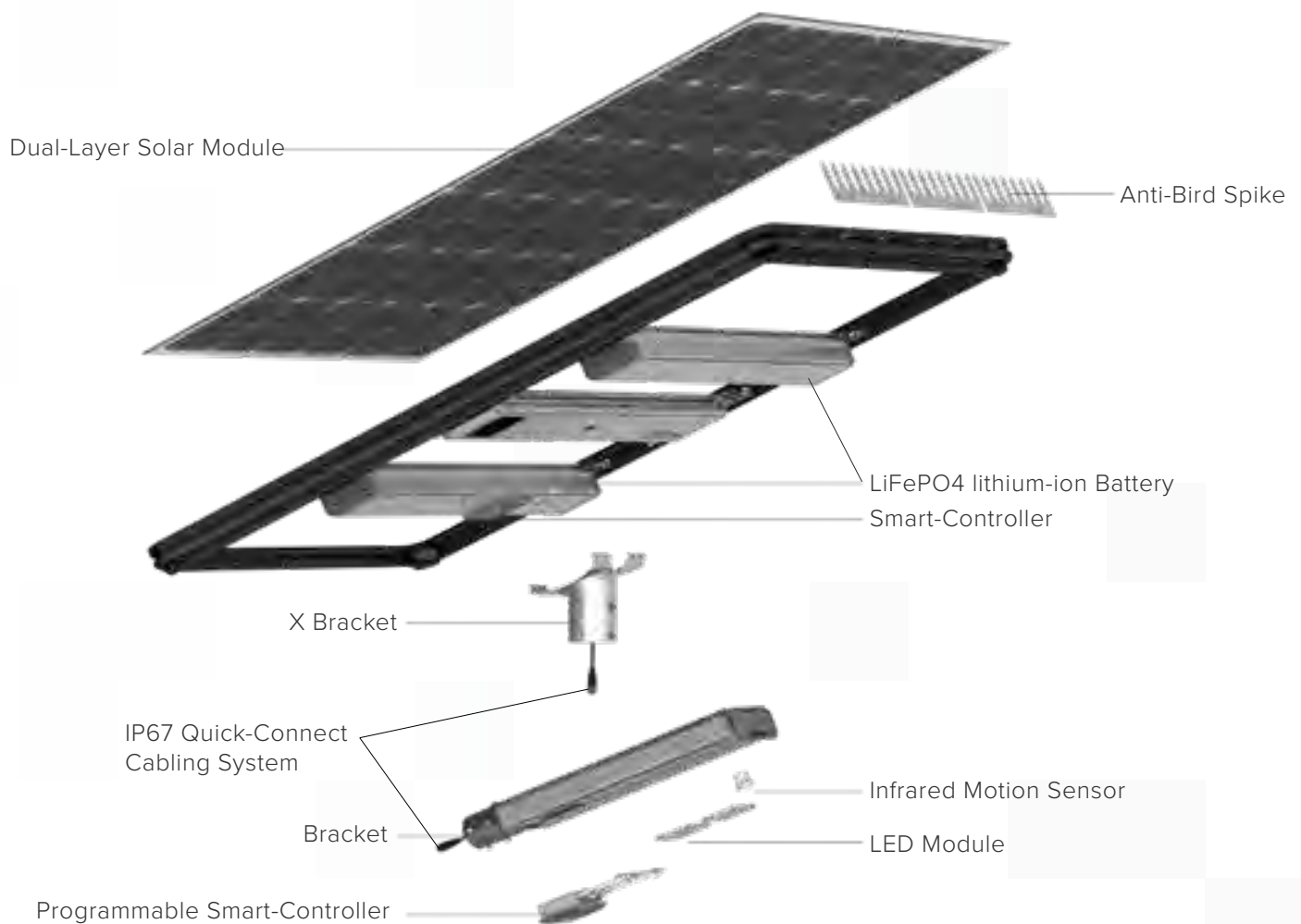


Sleek, compact and modular design



The 'Leadsun' All-In-One Difference

ULTRON Series



2.0

New Technology

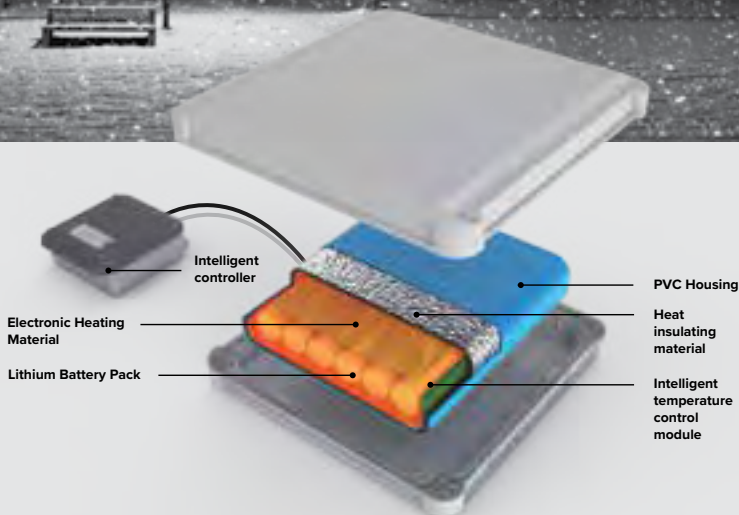
Making rapid advancements in technology, Leadsun has set the gold standard for innovative and easy-to-install products within the Solar Lighting industry. Leadsun continues to invest a significant amount of R&D into adapting and fine-tuning their products, including pioneering new intelligent, autonomous technologies such as IOT wireless systems, battery and solar panel innovations and Off-Grid CCTV systems.

Battery Heating

A long standing issue with all types of battery technologies is that they do not perform optimally at subzero temperatures. Extreme temperatures can result in sudden or severe capacity loss, slow charging rates, and can render the battery unreliable.

Using advanced battery technology, the newly developed battery heating system from Leadsun, automatically heats cold batteries within freezing environments to temperatures as low as -40°C.

No Worries on Freezing Weather



ULTRON Series Bi-Facial Solar Module

Leadsun's newly developed dual layered (top & bottom) solar module is a revolutionary and game-changing innovation now available as part of Leadsun's updated range of All-In-One solar panels. The double-sided solar cells absorb reflected sunlight from the underneath side of the solar light and generates up to 15% more energy than conventional solar lighting systems of the same physical size.



The superior performance cells with EVA layers and anti-reflective coated glass act to intensify light transmission, in turn providing excellent durability in all weather conditions. These EVA layers also play an important role in preventing Potentially Induced Degradation (PID) - a detrimental aspect of some solar modules, that can cause degradation of the power output capacity.



Mono-crystalline silicon solar panel



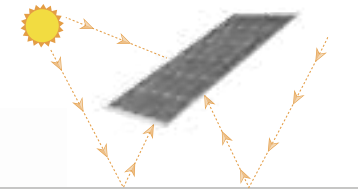
Over 20% transfer efficiency



25 years life span

Double-sided solar panel

- Generate power from the dual sides
- Maximise power in limited space
- Energy generation increase by **8%-15%**



Double sided glass is also designed to reduce micro-cracking, UV aging, degradation and corrosion, and its high transformation efficiency means that maximum watts per connection are achieved.

Whilst not available on the entire Leadsun range, the Dual Layered All-In-One solar module has been trialled and thoroughly tested, and proven to provide maximum performance and reliability all year round.

Leadsun Edge Wireless Technology

Leadsun's Internet of Things (IoT) connected Off-Grid Intelligent Lighting Systems enables our solar powered street lights to be interconnected via long-range 915MHz wireless LoRa radio mesh technology. Delivered through Cloud Technology, users can remotely monitor or configure lighting, manage energy consumption, and detect failure warnings from any place in the world, and at any time.



Remote On/Off Control and Lighting Adjustment



Remote Switch for different working modes



Failure Warning



GPS Map



Cloud Operation Monitoring



Big Data Analysis

Other significant features include the working mode function switch, which helps to save energy consumption and prolong the LED's effective life span and battery autonomy, as well as the GPS feature, which allows users to pinpoint lights on a Map in real time in order to obtain lighting and location information.

This wireless technology is fully supported and maintained by Leadsun, with easy monitoring and management of lighting features achieved through the custom-designed Leadsun EDGE app available on Android OS.

For added security, a unified login password through the system permission settings prevents unauthorised access, ensuring greater safety and system reliability.

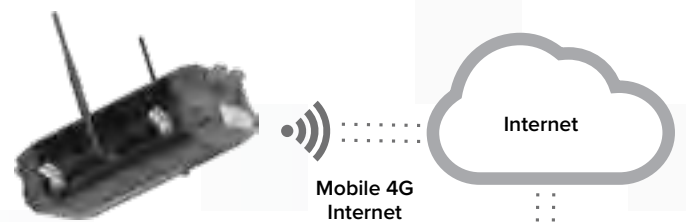
Off-Grid CCTV

Our state-of-the-art solar powered CCTV system is packaged in a neat modular structure – perfect for protecting the essential parts of the system against extreme cold and hot weather. With its waterproof and anti-dust design, certified to IP65 requirements, the CCTV system is well equipped to withstand the harshest of weather conditions.

TRINITY Series

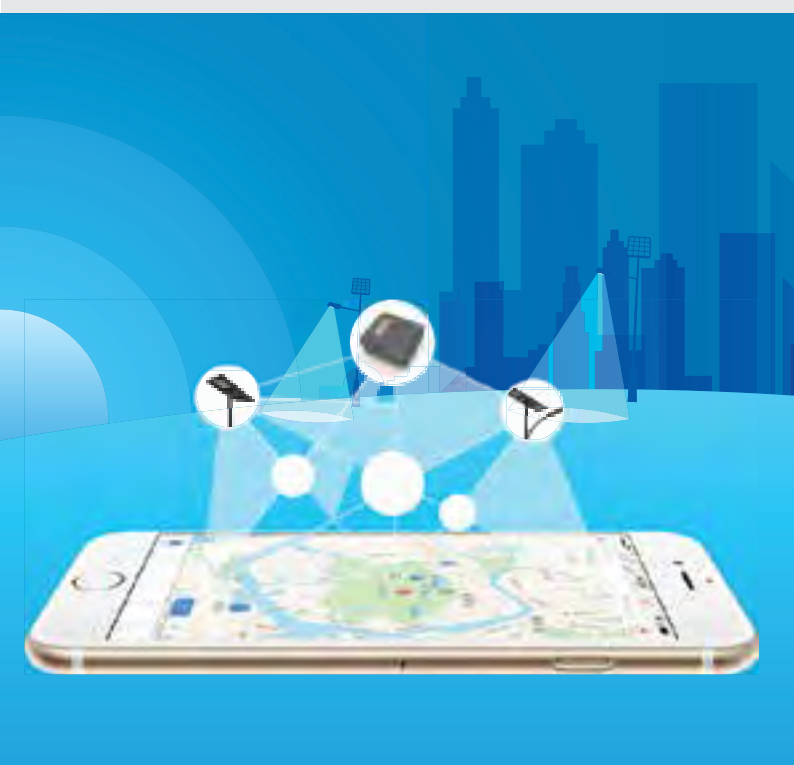


- Maintains high brightness levels with minimal video capture fading
- Increased storage space via Micro SD card port
- Sealed lenses made from strong UV protected PC, providing superior durability and shock resistance.



GPRS 4G Router

High-performance industrial 32-bit CPU and industrial cellular module, embedded real time operating system with software support platform. Supports Rs232 (or RS485/RS422) and Ethernet port that can conveniently connect Serial and Ethernet devices, achieving data transmission and routing functions for a wide range of IoT devices.



FREEDOM

Hybrid LED Street Light

The FREEDOM series from Leadsun features our internationally patented All-In-One design, comprising of compact lithium-ion battery packs, Ultra-Efficient LED module, PIR motion sensor and intelligent wireless controller with plug & play wiring. Working with any new or existing 18V DC PV solar panel up to 130W.

With three models to choose from, The FREEDOM series lights are resistant to grid blackouts due to the built-in lithium battery storage system which stores energy during the day (when power is cheapest) and releases it at night, to operate the LED light, during peak load period.

Can be used with locally manufactured 3rd party solar panels

Fully integrated Lithium Battery

- ✓ **FREEDOM Plus**, includes both a solar light and battery, which is ideal for retrofitting onto existing grid-connected lighting systems. This may also be used on existing off-grid Solar Lighting systems, where the existing battery system has failed and rendered the system inoperable or unreliable.
- ✓ The **FREEDOM Hybrid** series integrates both AC & Solar power together to create a simple and compact clean energy-generator that is totally dependable all year round regardless of weather conditions or power failure
- ✓ **FREEDOM Lite** includes AC and Battery, without the solar panel connection.

Product Features And Benefits

- ✓ CREE 'Ultra efficient' and high power LED with luminous efficacy of 150lm/W
- ✓ Optimised lighting distribution for roads and public pathways
- ✓ Compact and powerful Lithium LiFePO4 battery system
- ✓ IP65 weather proof rating
- ✓ Boosts electrical grid supply reliability by relieving stress on the grid during periods of peak demand
- ✓ Immune to grid blackouts ensuring continuity of lighting all night long
- ✓ Wireless smart lighting control monitors and automates the lighting output as required





LiFePO4 Battery

High efficient LiFePO4 Battery with 8+ years' life span



Adaptive Lighting with PIR Sensor

The Panasonic PIR motion sensor delivers reliable performance and automatically regulates LED output power.

Easy retro-fit installation

Simple plug and play installation



High Efficiency CREE LED 150lm/W

Sharp Cut-off Light Distribution

Full cut-off light distribution designed especially for street lighting and complies with the most demanding lighting regulations

Excellent heat dissipation design

High tensile aluminium alloy case improves heat dissipation to increase battery and LED longevity

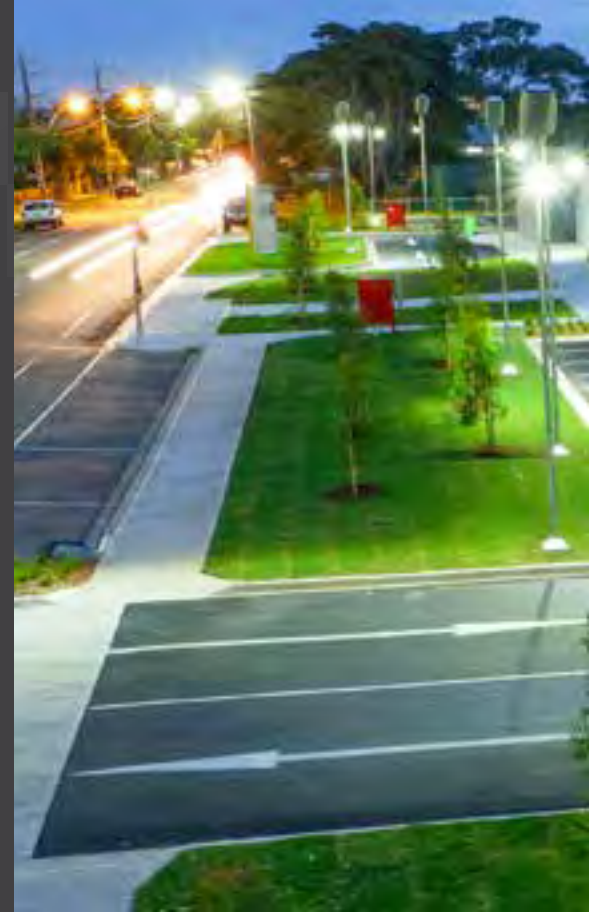
IP65 Protection

Compact and sealed design with excellent outdoor weatherproof protection

Battery & Controller Module

Modular and Integrated battery case is interchangeable

FEATURE PROJECT
12 Solar Lights Fully
Installed and Operational
in only one day!



Angliss Car Park

Leadsun was awarded a project involving the installation of a fully compliant Off-Grid solar powered lighting system featuring 12 AE3 series solar lights, EZYfoot concrete-less footings & EZYlift lowerable poles throughout a newly constructed carpark.

The challenge was that the entire project had to be completed within 2 days and with minimal disruption to car park access. The Leadsun projects team was up to the challenge and successfully installed all 12 Solar Lights from 'start to finish' in just one day!

See below how we do it in a 3-Step installation procedure that is Easy, Fast and Safe.

Leadsun & EZYpole's 3-Step Installation...Easy as 1-2-3



Concrete-Less Footing

The EZYfoot concrete-less footing system offers a quick and environmentally friendly installation, via a unique steel tube anchoring system that is embedded into the ground using a jack hammer. As there is no concrete curing time, the rest of the installation can continue without any down-time.

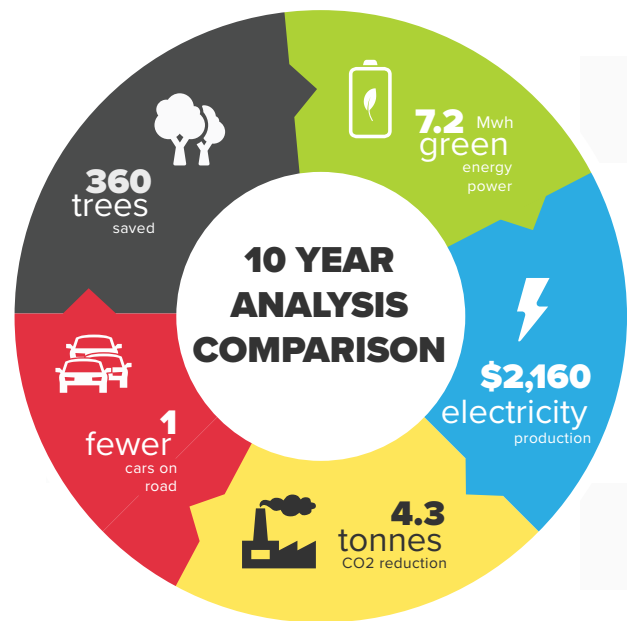


Install Pole & Solar Light

The EZYlift series lowerable-poles can then be immediately fixed to the EZYfoot via a unique hinged base plate and removable pivot pin. The pole is then ready to work on safely at ground level where the AE3 series solar light system attaches to the top of the pole via the Quick-Connect cabling system.



Melbourne, Australia



Raise Pole & FINISH

Once the solar lighting system has been fully installed and orientated correctly, two men are then able to comfortably lift the pole up from ground level to its vertical upright position. The final process is to lock the hinged base plates together and then fix a cover shroud over the base section to hide the base section of the pole from the public.

Energy Savings

Compared to conventional Grid-Power lighting, the cost of installing and maintaining an Off-Grid solar power solution is significantly more economical and has far less impact on the environment.

Over a 10 year period, the value proposition for this lighting project compared to Grid-Powered lighting = \$35,000 in savings.



OFF-GRID

Intelligent
Lighting
Systems

LEADSUN[®]
2.0



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