

## ECO-DISTRICT: AUTONOMOUS SOLAR LED LIGHTING

This didactic solution makes it possible to understand, in a context of sustainable development, autonomous public lighting in an eco-district. Simulates urban (road, sidewalk) or rural (bus shelter) lighting.

Completely autonomous and entirely at low voltage 12Vdc, the assembly operates on solar energy thanks to a set of photovoltaic components. Indoor use (halogens attached to the frame) or outdoor, under certain conditions.

### EDUCATIONAL OBJECTIVES

- Study street lighting with LEDS lamppost and solar energy.
- Commission a solar system.
- Demonstrate the ecological functioning of LED technology.
- Discover the different solar panel technologies.
- Wiring photovoltaic components
- Mechanically install public lighting.
- Perform electrical and mechanical maintenance on the lamppost.
- Identify the different electrical quantities of a solar energy production chain.
- Calculate the efficiency of the installation.
- Configure communication on a Bluetooth network.
- Configure a photovoltaic installation from a tablet or smartphone.

### PROPOSED PRACTICAL WORK

- Course with theoretical labs on different solar panel technologies (Monocrystalline, Polycrystalline, amorphous), on solar radiation (Direct, Diffused and Reflected), on solar irradiation.
- Study of the positioning of solar panels for maximum efficiency.
- Mechanical fixing of the mast, the panel and the lamppost on the frame.
- Study and realization of the cabling of the solar energy chain on an isolated site.
- Reading of currents and voltages at different points of the wiring.
- Interpretation of measurements and calculation of yield.
- Calculation of the battery discharge time as a function of the load.
- Configuration of the application from a touchscreen tablet.
- Mechanical and electrical maintenance.

### COMPOSITION

- 1 wheeled frame with brakes, very stable. Sized for doorways.
  - 1 monocrystalline photovoltaic panel of 90Wp fixed on an aluminum mast. The panel is adjustable for outdoor use.
  - 3 halogens to be connected to a 2P + E mains socket to simulate solar radiation for indoor use of the model.
  - 1 MPPT (Maximum Power Point Tracking) load regulation system and electronic control of the device with twilight detection and programming by voltage level directly editable from a smartphone or touchscreen tablet. A recording of voltages, currents and powers of the solar panel, battery and LEDs, in the form of data, can be retrieved by an application via a Bluetooth link (display in the form of a bar graph).
  - 1 screen connected to the regulator to retrieve information from the MPPT locally.
  - 1 solar battery 12V / 14Ah
  - 1 40W lantern equipped with latest generation ultra powerful LEDs with high light output.
  - 1 electronic LED power management device integrating a management system reduction of luminous flux and detection of people.
  - 1 set of photovoltaic fuse holders.
  - 1 surge arrester.
- Component connection made on industrial terminals to prevent component wear.



Dimensions: 710 x 800 x 2000mm. Weight: 65kg.

ref. SOL-EQ1  
FREE TELEPHONE ASSISTANCE ON 05 56 89 91 07

DELIVERED WIRED  
AND CONFIGURED

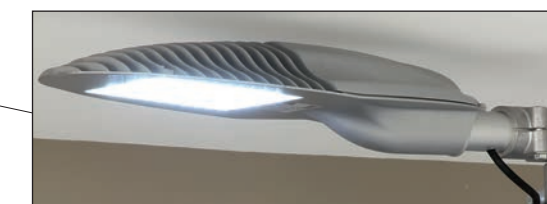
TEACHING RESSOURCES  
STUDENTS / TEACHER



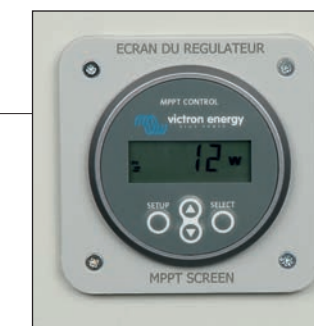
90Wp monocrystalline panel swivel for use interior with the 3 projectors supplied, outdoor with a natural solar source.



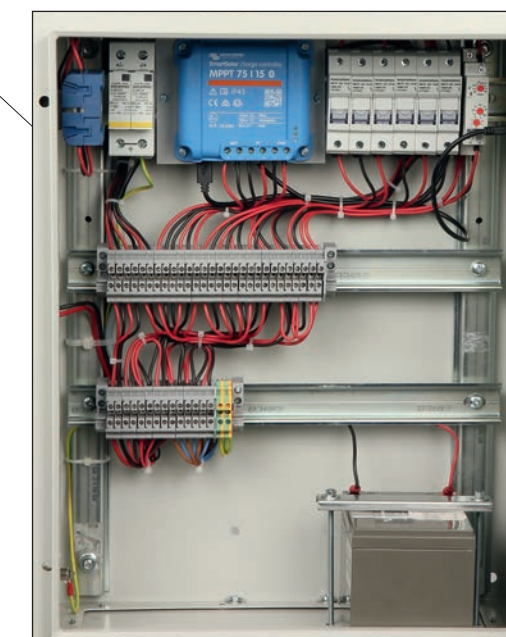
Dimensions: 710 x 800 x 2000mm. Weight: 65kg.



Ultra powerful LEDs with high light output



Controller screen attached to the side of the cabinet



Battery box + charge regulator. Bluetooth.



Requires download from Play store or Apple store of the free Victron Energy app.  
Allows reading on tablet or smartphone:  
- Voltage - Panel current / Power (W)  
- Voltage - Battery current / Load current  
- State On-Off charge