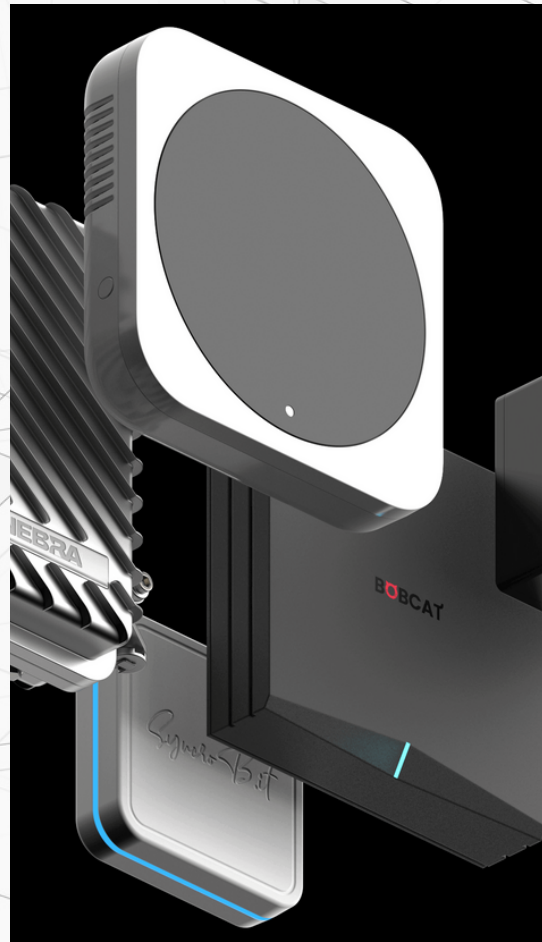


IoT Off-Grid



User Manual - Special Instructions

NEMA 4X Certified Outdoor Solar Helium Enclosure
Steel Pole Ties

www.IotOffGrid.com

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Preface

This document details the user instruction to set-up IoT Off-Grid products. Users should read this document thoroughly and completely before setting up the products. Ignoring the instructions of this document may result in device failure or even injury. This document is geared towards the users of outdoor solar helium enclosures, IoT Off-Grid electronic peripherals or IoT sensor devices. Instructions should be followed as mentioned and in a case of difficulty following the instructions or setting-up, reach out to user@iotoffgrid.com.

User Manual Version - V2.10 (November 2021)

Intellectual Property Rights

We, our affiliates and our licensors will own all right, title and interest in and to all Products. You will be and remain the owner of all rights, title and interest in and to Customer Content. Each party will own and retain all rights in its trademarks, logos and other brand elements (collectively, "Trademarks"). To the extent a party grants any rights or licenses to its Trademarks to the other party in connection with this Agreement, the other party's use of such Trademarks will be subject to the reasonable trademark guidelines provided in writing by the party that owns the Trademarks.

Symbols and Conventions Used in the Documentation

The following symbols and conventions are used throughout this document. Please pay attention to each of the conventions to understand this documentation clearly.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injuries.



Prohibition icons indicate actions that must not be performed.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injuries.



Sharp icon indicate this action or item should be carried out with care due to the presence of sharp corners.



Fire Hazard icons alert you to the possibility of a fire.



Electrical Hazard icons alert you to possible electrical shocks.



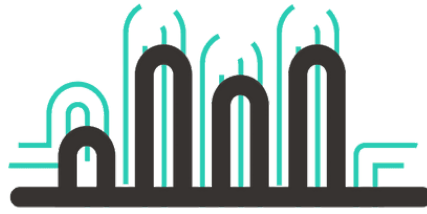
Require two people to carry out the instructions.

IMPORTANT

IMPORTANT indicates a potentially hazardous situation which, if not avoided, may result in damage to property or loss of product functionality.

NOTE

NOTE specifies the operating environment, conditions for installation, or special conditions of use.

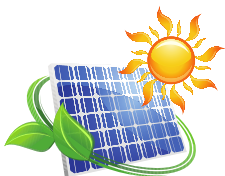


IoT Off-Grid

We are a technology company that produce IoT(Internet of Things) applications focused on renewable energy implementations. During recent years, there have been a large interest in IoT devices and the capabilities they have to facilitate a number of very important tasks with high efficiency and low cost. Early detection of forest fires, remote monitoring of water bodies, health and wellness monitoring devices and the list goes on. However, while there are a number of applications, these systems achieving the wider adaptation into common use have been slow due to certain network and coverage limitations. However, the emergence of the Helium network has renewed interest on the capabilities of IoT devices.

The Helium network is a decentralized LoRaWAN(Low-Power Wide Area Network) which uses radio waves for communication. Due to the low power of the communication signals, the devices that can be used in this network can be both small in profile and less power intensive. Currently, thousands of Helium HotSpots are being deployed all over the world at a rapid pace, which would provide a thorough and dependable network for IoT devices. In addition, the Helium network is built on their Blockchain technology which can provide great versatility.

At IoT off-Grid, we research and develop IoT applications based on the Helium Network coverage that are suitable for off-grid applications. The initial products we have developed are the off-grid Helium Miner enclosures that are powered by solar energy and can be used to deploy anywhere in the world that has at least 5 hours of adequate sun light. In the expansion of the Helium network there will be more and more need for the deployment of miners to hard to reach places that have no infrastructure. Further, the density of the miner increase it will be less profitable to deploy miners in densely populated areas and it would be an added incentive to deploy miners into rural areas with less coverage, maximizing the profits in the process for the hosts. More over, inline with our company's goal of facilitating wider real world application driven IoT devices, the expansion of Helium network to rural areas is vital. Thus, we hope our devices would provide much needed tools to facilitate the LoRaWAN coverage, further increasing potential for our own success.



helium



Warranty

This device comes with an one year limited warranty which covers manufacturers defects of the modules in the system. The users are responsible for the proper assembly and use of the device to claim the warranty, and any misuse that may result in damage to the system or malfunctioning of a module may void the warranty.

One Year Limited Warranty*:

- NEMA 4X enclosure Module
- Charge controller Module
- Power regulator Module
- Solar Panel Module
- Battery Module (*Limited Warranty of six months only)

Warranty will be void in following instances:

- Intentional physical damage to the system.
- Defects due to accidental falls or drops.
- Defects due to the incorrect assembly.
- Use of outside components within the current carrying circuitry.

Product Liability Disclaimers

In no event shall our company be liable for any direct, indirect, punitive, incidental, special consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of our products.

Safety Instructions

This product is made with industrial grade material and can cause serious harm when handles incorrectly. Please wear proper protective equipment such as working gloves, eye-protection, closed-toe shoes and suitable working garments when working with the system.

Solar Panel Module



This part contains sharp corners that can cause serious damage if not handled with care and caution. Produce high current that can give shock or create sparks that can start fires.



Structure Module



This part contains sharp corners that can cause serious damage if not handled with care and caution.



Battery Module



This part contains Li-Ion battery components and should take utmost care not to damage or short circuit. Improper use may cause electric shock or even fires and explosions.



Power Regulation Module



This part carry significant current through the device. Misuse may result in electric shock and fires.

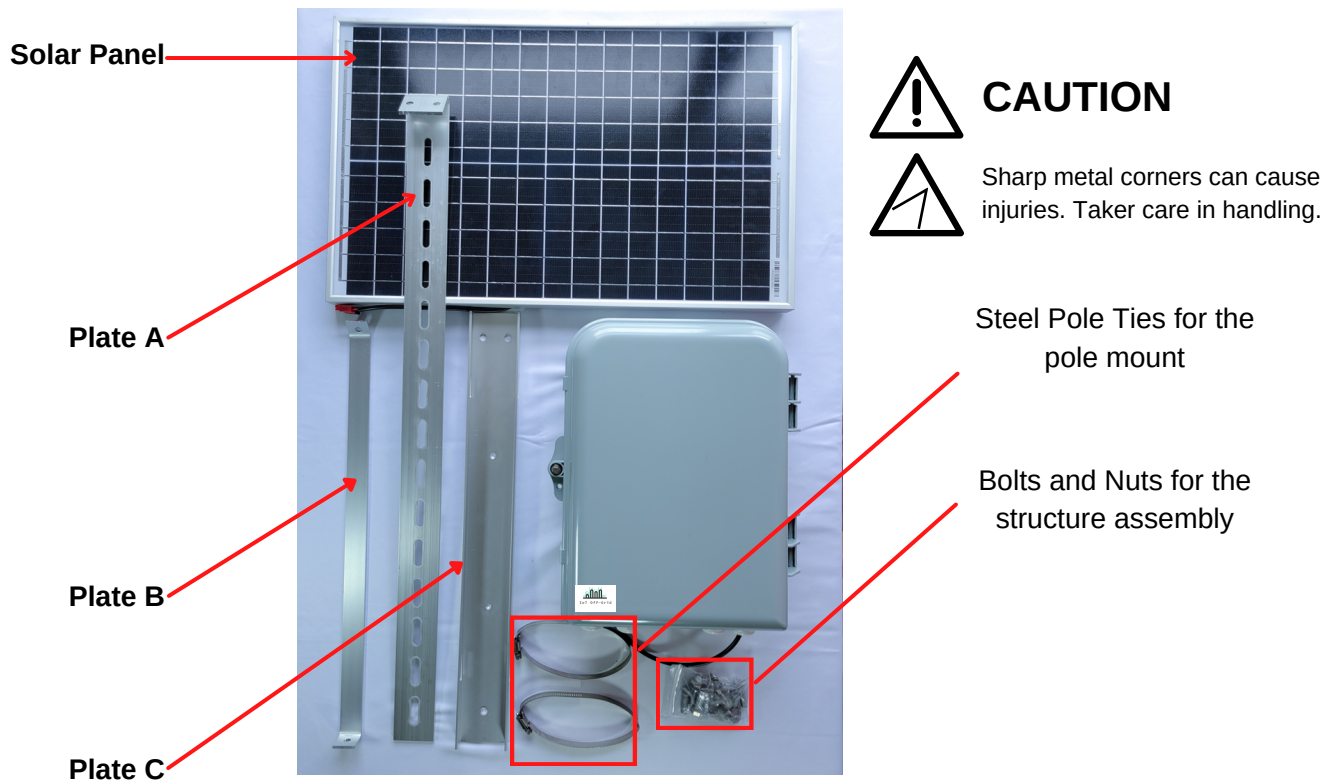


IMPORTANT

NEMA 4X certified outdoor solar Helium enclosure is a device that generates and stores electricity, when working with such types of devices it is important to work at a dry environment and prevent contact of water with the electrical components. Failure to prevent contact of water with electrical components may cause electric shock or fires.

Package Includes

- 1x IP66 NEMA 4X PC+ABS Weatherproof Miner Enclosure or Weatherproof Enclosure
 - Solar Charge Controller
 - DC Regulator
 - Battery Module
 - Door Locking Key
 - Velcro
- Solar Panel Module
 - Solar Panel
 - 2x Bolts
- Structure Module
 - Two Aluminum Panel
 - 2x Steel cable ties
 - 6x Bolts, Nuts and Washers



Update on the New Version

New version of the solar enclosures carry the Renogy Wanderer charge controller. The instructions on the manual **may refer to the older charge controller but is still applicable for the new Renogy charge controller.**



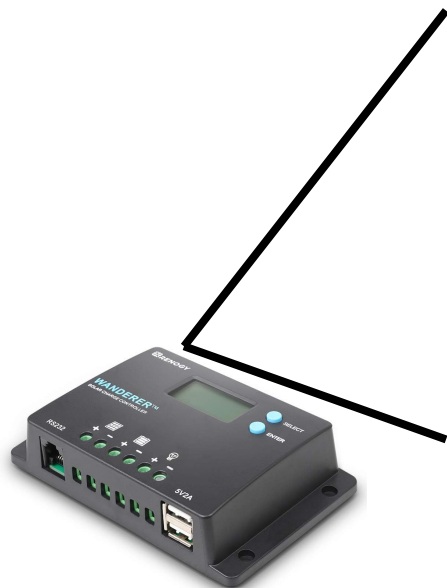
Old Version
White Charge Controller



New Version
Black Renogy Charge
Controller

Charge Controller Instructions

There are two charge controllers included with the package, which are PG and TM. If you want to switch between charge controllers, please remove the pre-connected cables from the charge controller, detach the metal back-plate and replace the charge controller.



PG

Compatible with Deep Cycle Sealed, Gel, and Flooded Battery

TM

Compatible with AGM, Gel, Flooded and Lithium Battery



Solar Panel cables (pre-connected)

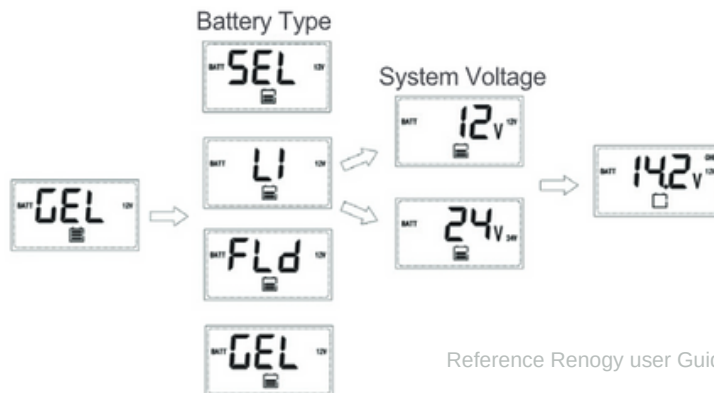


Battery Connection
(Connect to a compatible battery)

Power-out (pre-connected to the power regulator)

Programming Battery Type

To enter the battery programming settings hover over the Battery Voltage screen and press down the Enter button. When the battery type starts to flash press the Select button to cycle through the battery types and press Enter to finalize selection. When selecting the Lithium setting the user can change battery voltage from 12V to 24V and select the charging voltage.



Reference Renogy user Guide

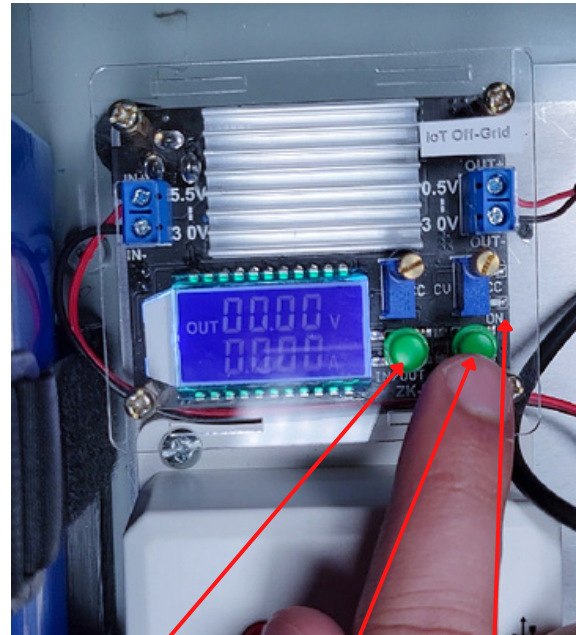
Charge controller power-out provides a voltage equal to the battery voltage. This is recommended to be used directly if the application uses over 35 W of power.

Power Regulator Settings

When the battery is connected to the charge controller, the Power Regulator turns **ON** and **receives power**, at this point perform the Power Out Test.

Power Out Test

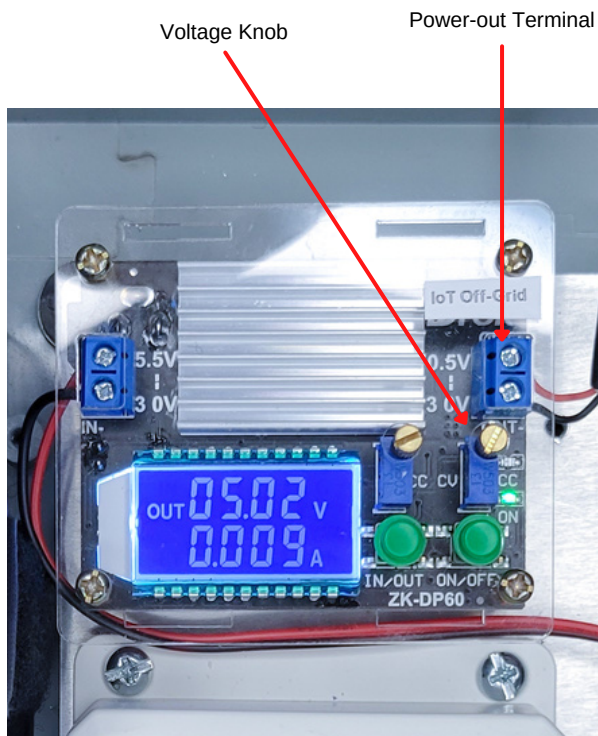
- Press the **ON/OFF BUTTON** on the Power Regulator.
- Check for the **GREEN LED** that indicate **ON-state**
- **Verify** the **ON-state** indicate **correct voltage** for your device (this voltage is preset to 5V for safety).
- After verifying, keep the device in **OFF-state**.



Voltage/Temperature Switch

ON/OFF BUTTON

GREEN LED



Voltage Knob

Power-out Terminal

Voltage can be changed by the voltage knob on the power regulator.

Voltage Change

- Press the **ON/OFF BUTTON** on the Power Regulator.
- Check for the **GREEN LED** that indicate **ON-state**
- **Rotate the voltage knob** gently to see the display voltage change to the desired value.

Power regulator provides a steady **DC voltage** out of 0.5-30 V and **maximum current** of 4 A (with **maximum power** out of 35W).

If you wish to draw more power, **connect to power-out on the charge controller directly**. It provides a **voltage equal to the battery** connected to the system (either 12 or 24 V) and can supply **up to 120 W of power**.

In doubt, please contact info@iotoffgrid.com.

Do not experiment if you are unsure!

For Best Performance

- Keep the **panel facing South**.
This provide maximum possible solar radiation to the panel.
- Make sure there's **no shade on the solar panel**.
- Optimal scenario is panel **overlooking sky from East to West**.

For Support

For any questions related to support, please reach out to us at
info@iotoffgrid.com.

Troubleshooting Guide is available online at
www.IoToffGrid.com