ISOpwr +

WEST MOUNTAIN RADIO

www.westmountainradio.com
1020 Spring City Drive
Waukesha, WI 53186
262-522-6503
sales@westmountainradio.com

©2018 West Mountain Radio, All rights reserved. All trademarks are the property of their respective owners.

INTRODUCTION

Thank you for choosing the West Mountain Radio ISOpwr+. The ISOpwr+ will isolate and permit charging of an auxiliary battery.

The ISOpwr+ is a fully automatic automotive ON-OFF switch that will permit the vehicle's charging system (i.e. alternator) to charge an auxiliary battery and run mobile radio equipment. The ISOpwr+ will turn ON when the vehicle's alternator meets or exceeds the programmable minimum alternator threshold voltage (default 14.0V DC). The ISOpwr+ turns OFF when the alternator is not running and the vehicle's battery has fallen below 13.4 volts.

Equipment connected to the ISOpwr+ will be powered solely from the auxiliary battery when the vehicle's ignition is OFF. When the vehicle's ignition is ON, connected equipment will be powered by a combination of the auxiliary battery, the vehicle battery and the alternator.
Note: The vehicle's battery will never be drained by leaving the equipment turned on. The vehicle will always start.

The ISOpwr is ideal for use in all vehicles utilizing an auxiliary battery for diverse purposes such as a radio command set up for ARES, RACES, FEMA, contest VHF/UHF rover, moderately powered ham equipment, a re-charging station for electric model airplanes, boats and cars, and for RV's and campers.

The ISOpwr may be used without a battery to automatically turn a radio on whenever the vehicle is running. The radio will turn off with a short delay after the vehicle is stopped.

ISOpwr+ Features

- Properly charges a Lead-Acid (AGM or Gel) battery
  Note: Will not work with Lithium batteries unless they are designed to be lead-acid drop-in replacements (i.e. have protection circuitry to control charging
- Operates at a considerable lower temperature than ISOpwr, thus eliminating the large heat sink
- Continuous output current of up to 40A fully supported
- USB port for monitoring the system or to program specific parameters
- Complete LED status indicators of unit status
- PWRguard feature to shut off equipment when voltage is too high or too low

Please read the following instructions BEFORE installing the ISOpwr+

Powerpole® is a registered trademark of Anderson Power Products, Inc.

Package Contents

- ISOpwr+ Unit
- Micro USB Cable
- 3 Retention Clips
- User's Manual

WARNINGS

The following may damage the unit:

- Supplying over 20V to any port
- Operating in an environment over 110 degrees F
- Drawing more than 40A on the output jack for more than a short time

SAFETY PRECAUTIONS

Auxiliary Battery Choices:

- When using an automotive battery, it should be mounted in the trunk or under the hood. Do not place it in the passenger area of the vehicle. These unsealed batteries will emit gases that are dangerous in a closed area.
- If using a sealed lead acid battery, it can be placed internally. The AGM, glass mat type is a good choice. It has a charging voltage that is similar to the car's alternator voltages.
- If using a GEL type battery, it also can be placed internally. However, confirm that the alternator voltage does not exceed 14.5 volts (at 70 degrees F). This will ensure full life for the GEL cell.

Fuses:

A fuse must be placed in the wire at the battery terminals connecting to the car's battery. A 40 ampere fuse is recommended. This safety precaution is necessary because the battery is a large power-storage device that, if shorted, would release a massive amount of energy, sometimes causing the battery to explode.

INSTALLATION AND SET-UP

Choosing a Mounting Location

Pick a location that is central to the vehicle battery, auxiliary battery, as well as the load or 12V distribution panel. Radios and many 12V devices draw large amounts of current. All wires have resistance, so it is good practice to keep them as short as possible and to use a larger gauge wire to minimize voltage drop. The engine compartment of a vehicle is <u>not</u> a suitable location for mounting.

The **ISOpwr+** can be installed in any orientation. It is recommend to use in a cool dry location and preferably well ventilated. If placed in direct sunlight, it will absorb heat and get unnecessarily hot.

The **ISOpwr+** can be mounted using #8 hardware in the mounting holes.

Powerpole® Connectors

Powerpole® connectors can be installed by soldering or crimping. Crimping is recommended for the best connection. Be sure to make good connections. For detailed Powerpole® connector installation tips see RIGrunner support pages at http://www.westmountainradio.com/ppinfo.

Power loss is minimized by using short cables of a high (lower number) gauge (AWG) cable. Go to the following website: www.westmountainradio.com/calculators to determine the trade-offs with cable loss. Select the "Find Cable Size" option and fill in the information. The calculator will show the percentage of power loss in the cable. For example, at 100W, a 6 foot 10 AWG cable will have a 2% loss; whereas a 16 AWG cable will have 8% loss.

Connecting the vehicle

The cable to the vehicle's 12V battery should be 10 AWG and the length should be as short as practical. Note that West Mountain Radio carries 3, 6 and 10 feet long supply cables, 10 AWG red and black insulated cable with ring terminals on one end and Powerpole® on the other.

Be sure the RED Powerpole connects to the RED wire and connect to the PLUS terminal on the vehicle battery. Similarly, make sure that the BLACK Powerpole® connects to the BLACK wire and connect to the NEGATIVE terminal on the battery. Check that the connections at the vehicle are well tightened.

Plug this cable from the vehicle into the **ISOpwr+** connector marked VEHICLE. Confirm that the Powerpole® are plugged together securely, and that the wire is straight at the connection point and is not under strain or bent over.

Connecting the Battery

Note, any short in the battery wire, connector, or load could result in fire and battery explosion.

Caution: Handle batteries with knowledge and appropriate care. Batteries have dangerous chemicals that can seep out. Batteries can emit extremely explosive hydrogen gas. It is recommended to use sealed lead acid batteries which are much safer, but must be correctly handled with care.

NEVER make the last connection directly to a battery causing a spark that could cause the battery to explode, sending debris and acid in all directions. Batteries can get very hot when improperly charged or if a cell gets shorted. Batteries will explode during charging or discharging for a variety of reasons. Batteries are safe when handled properly.

Choose a 12V battery with an ampere-hour rating according to your power needs. Batteries should be sealed for safety reasons. Additional assistance may be found:
http://www.westmountainradio.com/capacity_calculator.php

West Mountain Radio carries size 24 Gel and AGM batteries, as well as smaller and larger batteries.

Large batteries have side, post, or threaded terminals. Deep cycle, marine, AGM, and others usually have 3/8 inch and 5/16 inch studs. Therefore, it is recommended to use a short 3 feet #10 wire, Powerpole® on one end, an in-line fuse (40-50A), and ring terminals for the battery end. West Mountain Radio carries a battery fuse kit, wire, and Powerpole®.

Connecting the Load or Power Strip

Output - Connectors are intended to power equipment. It may go to a single piece of equipment or to a distribution panel (i.e. RIGrunner). Expect this voltage to be about 0.05V lower than the input voltage from the vehicle or voltage from the battery; whichever is higher.

Plug the wire from the power strip or equipment into the **ISOpwr+** connector marked **OUT** (output). Confirm that the Powerpole® are plugged together securely, and that the wire is straight at the connection and is not under strain or bent over.

System Checkout

After installation, verify the **ISOpwr+** for proper operation.

1. When the engine is OFF, make sure the ISOpwr+ CHG LED is OFF.
2. Start the engine. After a few seconds, the CHG LED will illuminate showing the vehicle is connected to the auxiliary battery and/or the radio equipment. Make sure that the radio also turns on.
3. Turn OFF the engine. The CHG LED will stay on for a while because the vehicle's battery may be above the minimum alternator voltage (typically 12.6V DC). After a few minutes, the vehicle's battery will have dropped to less than the minimum alternator voltage and the ISOpwr+ will turn off. *NOTE: To rapidly drop the vehicle's battery, switch on the car headlights.*

ISOpwr+ OPERATION WITHOUT AUXILIARY BATTERY

The ISOpwr+ may be used without a battery. It will automatically turn ON and apply the vehicle's charging voltage to any load whenever the vehicle is running. It will turn OFF with a small delay after the car is no longer running. This is useful to prevent items from discharging the vehicle's battery when they are inadvertently left on.

To use without an auxiliary battery, connect the ISOpwr+ input (VEHICLE) to the vehicle's battery. Then plug the radio (or any item) into the ISOpwr+ output (OUT). The radio will be powered whenever the car is running.

Many times a radio is left on in a vehicle. However, the ISOpwr+ will automatically turn off the equipment, thereby preventing a drained vehicle battery.

LED Status Indicators

Output LED	
Green Solid	Output is active
Red Solid	Output was shut off due to over/under voltage
Green Slow Blink	Output is ON, but about to shut off due to over/ under voltage
Red Slow Blink	Output is OFF, but about to turn on because voltage is now good
Green Fast Blink	USB port is connected
Vehicle LED	
Green Solid	Alternator is detected and connected to auxiliary battery
Off	Alternator is not detected

USB Port

The USB port may be accessed by removing the plastic plug on the upper left of the unit. A COM port terminal program may be used to see the data or the **WMR Device Diagnostics Utility** program for RIGblasters may be used. Drivers are not needed for Windows 10. If using an older version of Windows, download and install the drivers before plugging the cable into the USB port on the PC.

Download the FREE WMR Diagnostics Utility software at:
http://www.westmountainradio.com/diagnostics

When the USB port is connected to the **ISOpwr+**, the device status is shown. This includes the voltages on each port, the charger status, and the charge current. Press "S" to set the parameters.

USB Settable Parameters

Prompt	Range	Description	Default
Enable PWRguard	Y or N	Enable/Disable the over/under voltage disconnect	Y
High Trip	9V to 20V	Turns output off when the voltage exceeds this voltage	15V
High Restart	9V to High Trip	Turn output on when the voltage was shut off due to over voltage and the voltage drops below this voltage	14.85V
Low Trip	7V to 20V	Turns output off when the voltage drops below this voltage	11V
Low Trip Delay	Range: 1 to 65535 seconds	When voltage stays below the low trip point for this length of time. The output will shut off	5 sec
Low Restart	Low Trip to 20V	Turns output on when the voltage was shut off due to under voltage and the voltage goes over this voltage	13V
Minimum Alternator Voltage	Low Trip to High Trip	Connects the vehicle to the auxiliary battery (and output) when the voltage is over this voltage at the vehicle	14.0V

USB Monitor Example

```
Output=ON   Charge=ON (Trickle)  Car= 13.76V  Bat=13.76V
Output=ON   Charge=ON (Trickle)  Car= 13.76V  Bat=13.72V
Output=ON   Charge=ON (Trickle)  Car= 13.76V  Bat=13.74V
Output=ON   Charge=ON (Trickle)  Car= 13.76V  Bat=13.76V
```

Output = output ON or OFF
Charge = vehicle connected to auxiliary battery
(. . .) = size of the charge or drain current
Car = vehicle voltage
Bat = battery voltage

SPECIFICATIONS

Maximum Voltage:	20V
Maximum Current:	40A
Maximum Charge Current:	40A
Voltage Drop:	0.05V
Connectors:	Anderson Powerpole®, 45A
Size:	4.5 x 3.4 x 1.4 in
Weight:	0.35 lbs
Mounting Holes:	Four - 0.175 d, #8 hardware

ACCESSORIES

Powerpole® to Batt Ring Term with 30A Fuse Cable, 6ft #58257-1068

ISOpwr+ Warranty

ISOpwr+ is warranted against failure due to defects in workmanship or materials for one year after the date of purchase from West Mountain Radio. Warranty does not cover damage caused by abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation, alteration, lightning, or other incidence of excessive voltage or current. If failure occurs within this period, return the *ISOpwr+* accessory to West Mountain Radio at your shipping expense. The device or accessory will be repaired or replaced, at our option, without charge, and returned to you at our shipping expense. Repaired or replaced items are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the *ISOpwr+* or accessory made after the expiration of the warranty period.

West Mountain Radio shall have no liability or responsibility to customer or any other person or entity with respect to any liability, loss, or damage caused directly or indirectly by use or performance of the products or arising out of any breach of this warranty, including, but not limited to, any damages resulting from inconvenience, loss of time, data, property, revenue, or profit, or any indirect, special incidental, or consequential damages, even if West Mountain Radio has been advised of such damages.

Except as provided herein, West Mountain Radio makes no express warranties and any implied warranties, including fitness for a particular purpose, are limited in duration to the stated duration provided herein.

www.westmountainradio.com
1020 Spring City Drive, Waukesha, WI 53186
tel 262-522-6503 fax 262-522-6504