

The WRND WDB1220LSM is a single unit (the unit) which includes both a dual-battery-system charger and maximum-power-point-tracking (MPPT) solar controller. The purpose of the unit is to charge a secondary auxiliary (aux) battery and supply power to the connected aux equipment. The unit automatically supplies power from either the vehicle or a solar panel when available. In addition, the unit also isolated the vehicle starter battery from the aux equipment. This product was designed with off-road vehicles in mind, taking every caution to ensure it withstands the vibrations, heat and moisture associated with these harsh environments.

The unit **fully charges** the aux battery. If sufficient input power is supplied, the unit will start charging the aux battery at 20A while measuring below 14.4V. The unit will charge both **Lead Acid (LA) and Lithium (LiFePO4)** batteries. After careful consideration and examination of the charge specifications for Flooded, Gel, AGM, Lead Crystal and LiFePO4 chemistry's, and the temperatures involved, it was concluded that boost charging to 14.4V for up to 2 hours and then float charging the battery at 13.7V is the best suited for all. If the battery voltage drops below 13.5V the unit will revert to boost charging. A comprehensive source of information regarding batteries may be viewed at batteryuniversity.com/learn

The unit **isolates** the vehicle battery from the aux battery, and aux equipment, by discontinuing to supply power after the engine is turned off. In essence, the unit takes power from the alternator and leaves the vehicle battery charged. This is done by not loading the vehicle battery below 12.8V for more than 5 minutes. After 5 minutes, if the vehicle battery is below 12.7V, the unit will enter 'sleep mode' with all LEDs off. This allows the unit to remain permanently connected without draining the vehicle battery. The unit resumes charging once power is supplied from the alternator.

Vehicles fitted with **regenerative-braking (smart) alternators** only charge while braking or when it senses a voltage drop across the vehicle battery. To ensure continuous charging, the unit creates a voltage drop to signal the alternator to supply power while the engine is running.

A 30W to 300W **solar panel (PV)** may be connected to the unit when camping or as part of a permanent installation. With the panel exposed to direct sun light, the unit will charge the aux battery using the MPPT function. At night the unit will power down and only power up once the solar input exceeds 13.6V. **WARNING:** to avoid damage to the unit the open-circuit voltage (Voc) of the panel may **not exceed 40V**.

If **power is available from both** the alternator and solar panel, the unit will automatically select which source to charge from. The **blue LED** indicates charging from the vehicle and the **green LED** charging from the solar panel. The unit will also operate from only one source without the other being present. All the above-mentioned functions are performed automatically and therefore there is no need for manual intervention by the user.

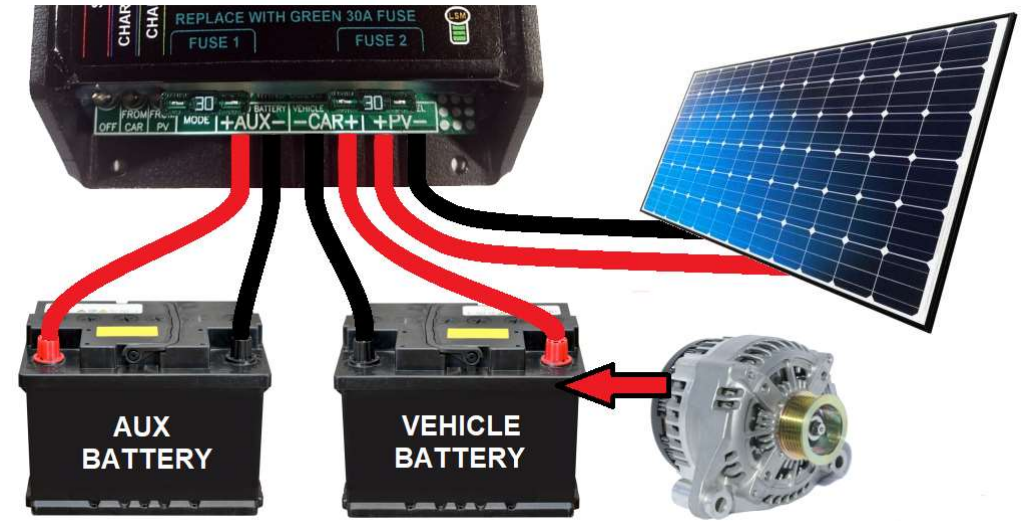
The unit can be configured to **perform a chargeback** function. In the event that the vehicle battery was drained by the headlights, winching, excessive starting, the audio system, a cabin light or other means, the unit can be used to **charge the vehicle battery from the aux battery or solar panel**. This is a manual process and needs to be planned for during installation. By having the same type of Anderson or Brad Harrison connectors on the unit for both the vehicle and aux batteries, these connections may be swapped around. Unplug the solar panel, aux battery and vehicle battery from the unit. Plug the vehicle into the aux connection. Then plug the aux battery into the vehicle connection with the solar panel disconnected. If the aux battery has sufficient charge, the unit will charge the vehicle battery from the aux battery. The chargeback will stop after 5 minutes and may be repeated by disconnecting the aux battery from the vehicle connection then reconnecting it after 30 seconds. This will initiate a new 5-minute chargeback cycle. If the solar panel is connected, then power will only be taken from the solar panel and not the aux battery. Solar charging will continue as long as the solar panel supplies power or until the battery is fully charged. Switch the connections back to the original configuration when done.

Parameters:

Vehicle (CAR) input voltage range:	12.8V – 14.7V
Solar panel (PV) input voltage range:	13.6V – 40V
Maximum solar panel open-circuit voltage (Voc):	40V
Maximum charging current:	20A
Recommended solar panel power:	30W – 300W
Electronic protection:	Short circuit, Overload and Over temperature
Current drawn during sleep mode (all LEDs off):	0.01A
Internal temperature at which current will be reduced:	60°C
Dimensions in mm (W x L x H):	130 x 105 x 40
Weight:	0.5kg

Installation notes:

- The **unit is water-resistant** if mounted upright. **Do not submerge** the unit.
- **DO NOT REVERSE THE POLARITY OF CONNECTIONS.** THIS MAY CAUSE PERMANENT DAMAGE TO THE UNIT! Replace fuses with **30A (green) ATO automotive blade fuses** only!
- **Plugs** may be soldered to the unit's leads or **direct wire** connections can be made.
- **All connections should be soldered** to prevent excessive heating and eventual failure.
- At 20A a 4mm² cable (two wires) will have a voltage drop of 0.2V per meter, a 6mm² will have 0.133V/m drop and 8mm² will have a drop of 0.1V/m. As a rule of thumb, the voltage drop should be less than 0.6V between the vehicle battery and the unit. Given these parameters, a **maximum length of 3m is recommended when using 4mm² cable or 4.5m for 6mm² or 6m for 8mm²**. A thicker cable should be used for longer cable lengths. If possible, the body of the vehicle could be used as a common negative to lower the resistance path. Cable (two wires) voltage drop formula: **Volt drop = 0.04 x Amps x Length in meters / mm² printed on the cable**. Divide the answer by 2 if using a single wire and the vehicle body as common.
- The cable between the unit and the aux battery **should be as short as possible** for the best charging performance. Using the formula mentioned above try to achieve a voltage drop of less than 0.1V. A higher voltage drop will still work perfectly well but charging performance will somewhat decrease. Suggestion: **0.5m long 4mm² cable works well.** (0.04 x 20A x 0.5m / 4mm² = 0.1V drop)
- Make sure the unit is mounted **upright with at least 50mm clearance** on all sides for ventilation. Less ventilation will not damage the unit but charging performance could decrease in hot climates.
- **Tie down wires** using cable ties to ensure better vibration dampening.
- It is good practice to install an **inline fuse** close to the positive battery terminal **if the cable in question could wear through and short out to the vehicle body**.



WRND 2 years limited warranty:

WRND Manufacturing cc ("WRND") provides a two-year (2) limited warranty ("Warranty") against defects in materials and workmanship for its WDB1220LSM Dual Battery Charger with MPPT Solar Controller ("Product"). The term of this Warranty begins on the Product(s) initial purchase date, or the date of receipt of the Product(s) by the end-user, whichever is later. This must be indicated on the invoice, bill of sale, and/or warranty registration submitted to WRND. This Warranty applies to the original WRND Product purchaser and is transferable only if the Product remains installed in the original use location. The warranty does not apply to any Product or Product part that has been modified or damaged by the following: Installation or Removal; Alteration or Disassembly; Normal Wear and Tear; Accident or Abuse; Corrosion; Lightning; Water damaged; Repair or service provided by an unauthorized repair facility; Operation or installation contrary to manufacturer product instructions; Fire, Floods or Acts of God; Shipping or Transportation; Incidental or consequential damage caused by other components of the power system; Any product whose serial number has been altered, defaced or removed; Any other event not foreseeable by WRND.

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