

# HULK

PROFESSIONAL SERIES



## User Manual

Dual Battery System & Solar Charger

# 12V

## In-Vehicle DC-DC Charger

### HU6525/HU6540

Max Current

**25A/40A**

Solar MPPT

**12/18/24V**

12/24V Alerntor

**11-32V**

Max Temperature

**85°C**

Congratulations on your purchase of the **HULK Professional HU6525 /HU6540 DC-DC Charger** 7-Step fully automatic switch-mode battery charger, designed for charging a variety of lead-acid rechargeable & Lithium auxiliary batteries by providing a proprietary algorithm to each specific battery type.

**HU6525 /HU6540** chargers include all the features needed to achieve and maintain the auxiliary battery to its optimum condition at all times. **HU6525 /HU6540** chargers also feature MPPT (Maximum Power Point Tracking) solar regulator technology, allowing you to deliver maximum amount of power from the solar panels to the auxiliary battery.

## For Your Safety

Do not operate the battery charger unless you have read and understood this manual and installed the charger as per instructions.

Keep this manual in a safe place for future reference.

# Index

<b>Safety Information</b> .....	<b>3</b>
<b>Product Package Contents</b> .....	<b>4</b>
<b>Wire Size Recommendation</b> .....	<b>4</b>
<b>LED Indications</b> .....	<b>5</b>
<b>Automatic Input Selection</b> .....	<b>6</b>
<b>Removing the Cover</b> .....	<b>7</b>
<b>Parts of the Charger</b> .....	<b>7</b>
<b>Mounting the Charger</b> .....	<b>8</b>
<b>Connecting the Charger</b> .....	<b>9</b>
<b>Connecting the Charger using the Terminal Block</b> .....	<b>11</b>
<b>Temperature Sensor and Ignition Sensor Connection</b> .....	<b>13</b>
Ignition Sensor Installation.....	14
Temperature Sensor Installation.....	14
<b>HU6526 Remote Display</b> .....	<b>15</b>
Remote Display Installation.....	16
Remote Display Interface.....	17
Remote Display Warning Messages.....	18
<b>Trouble Shooting</b> .....	<b>19</b>
<b>Electrical Specifications</b> .....	<b>21</b>
<b>Charging Algorithm</b> .....	<b>22</b>
<b>Applications</b> .....	<b>23</b>
<b>Dimensions</b> .....	<b>25</b>

## Safety Information

1. **HULK Professional HU6525 /HU6540 DC-DC Chargers** is designed for charging one 100-1000Ah 12V Standard Automotive Lead-Acid, GEL, AGM, Calcium, SLI, Deep Cycle type or one 25-1000Ah Lithium rechargeable battery. The charger is not intended to supply power to a low voltage electrical system other than to charge a battery. **Do not** use it for any other purpose.
2. **DO NOT ATTEMPT TO CHARGE A NON-RECHARGEABLE BATTERY (PRIMARY CELLS).** They may burst and cause injury to people and damage to property.
3. **Never** charge a frozen battery. Never charge a damaged battery.
4. **Explosion hazard!** A battery being charged could emit explosive gasses. Avoid smoking or open sparks or flames near the battery. Explosive and flammable substances such as fuel or solvents should not be kept near the charger or the battery.
5. **Danger of chemical burns!** Battery acid is highly corrosive. If your skin or eyes are exposed to acid, immediately rinse the affected part of the body with excessive water and seek medical advice.
6. **DO NOT** alter or disassemble the Battery Charger under any circumstances, incorrect reassembly may result in electric shock or fire. Unauthorized disassembly, repairs or modifications will void the official warranty.
7. **Never** place the charger above the battery being charged, gases from battery will corrode and damage the charger.
8. During charging, batteries must be placed in a well ventilated area.
9. Children or people with reduced physical, sensory or mental capabilities or lack of experience and knowledge should not use this appliance.

## Product Package Contents

**HU6525** or **HU6540** Battery Charger

Battery Temperature Sensor 3.5m cable

Ignition Sensor M3 Ring Terminal

Remote Display **HU6526** (optional)

User's Manual

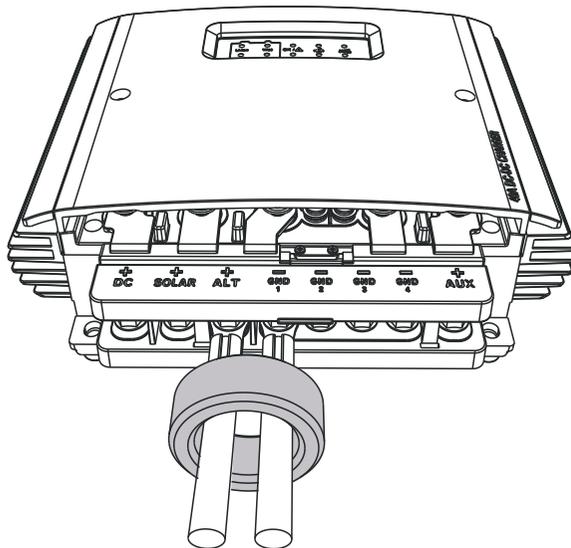
**HU6525** or **HU6540** Terminal Block (optional)

Ferrite Clamp (for **HU6540** only)

Mounting Screws

## Using the Ferrite Ring (HU6540 only)

For optimum EMI results, put the pair of input cables through the ferrite as per below diagram.



## Wire Size Recommendation

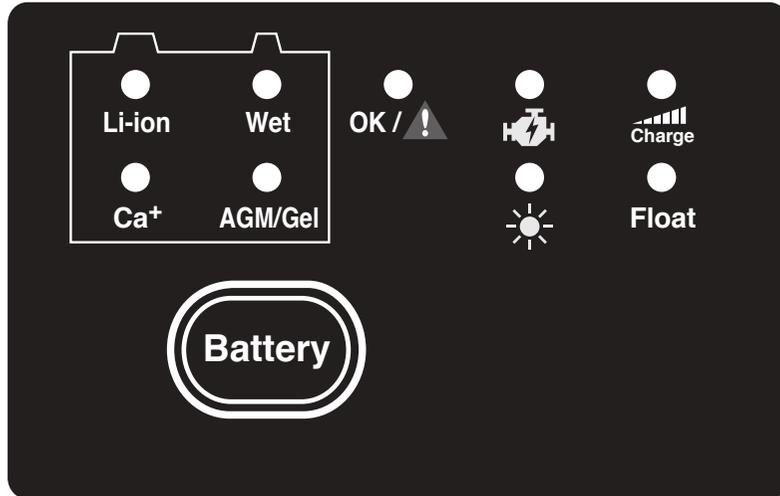
Use the recommended minimum cable cross section area (mm<sup>2</sup>) to avoid significant voltage drop (approx. 0.35V). Note: Radiated Emission was tested using 1m cable.

### Cable mm<sup>2</sup> @ 50°C Cable Temperature

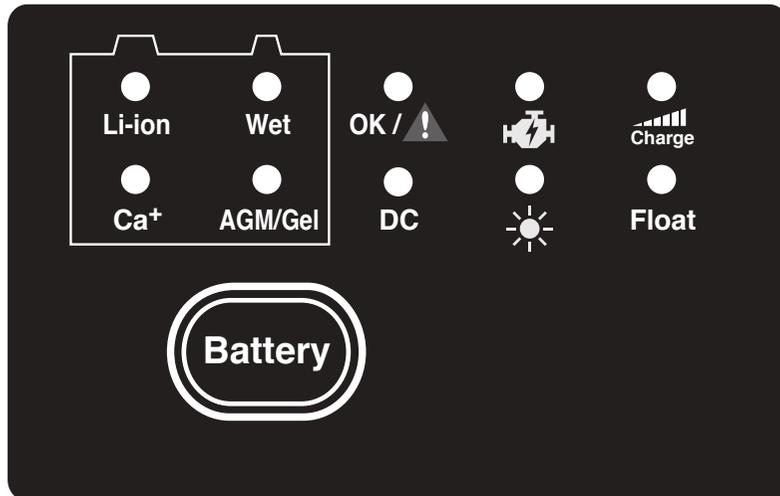
Cable Length	Current	
	25A	40A
1m	4 mm <sup>2</sup>	5 mm <sup>2</sup>
2m	7 mm <sup>2</sup>	10 mm <sup>2</sup>
3m	10 mm <sup>2</sup>	15 mm <sup>2</sup>
4m	13 mm <sup>2</sup>	20 mm <sup>2</sup>
5m	16 mm <sup>2</sup>	25 mm <sup>2</sup>

## LED Indications

### HU6525



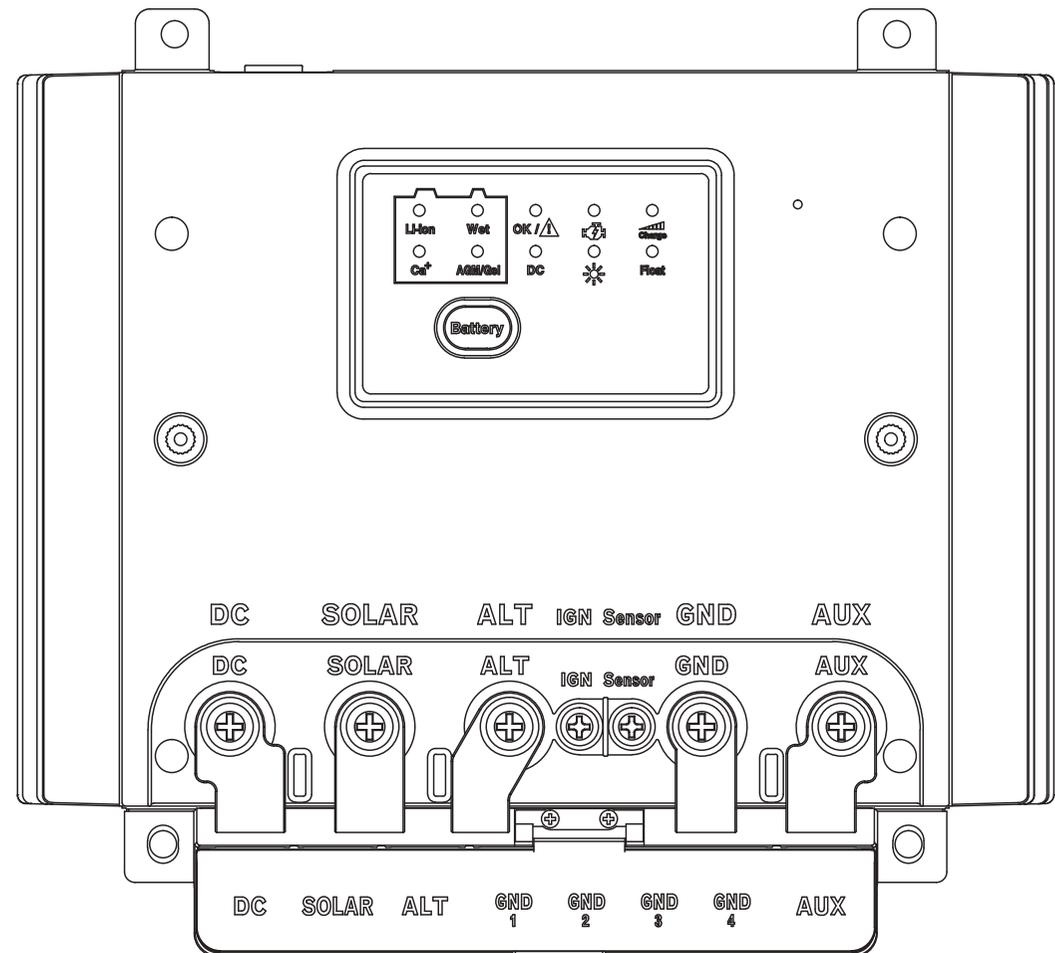
### HU6540



Item	Indication	LED
AGM/Gel	Battery Type Selection (default)	ON: <b>Blue</b>
Wet	Battery Type Selection	ON: <b>Blue</b>
Ca+	Battery Type Selection	ON: <b>Blue</b>
Li-ion	Battery Type Selection	ON: <b>Blue</b>
OK/Error	Battery OK.	ON: <b>Green</b>
OK/Error	Battery Bad/Charging Error/Fault	ON: <b>Red</b>
Alternator	Active Input Indication	ON: <b>Yellow</b>
Solar	Active Input Indication	ON: <b>Yellow</b>
DC (DX-40)	Active Input Indication	ON: <b>Yellow</b>
Charge	Bulk Charging Stage	<b>Blinking: Blue</b>
Charge	Absorption Charging Stage	ON: <b>Blue</b>
Float	Battery Analysis	<b>Blinking: Blue</b>
Float	Float Stage	ON: <b>Blue</b>

## Automatic Input Selection

- No external relays needed.
- By default, when there are multiple inputs available, the charger chooses which input should be active according to priority.
  1. Alternator linked to starter battery
  2. Unregulated solar power using built-in Maximum Power Point Tracking (**MPPT**) Solar Controller
  3. DC Supply (**HU6540 only**)
- **HU6540** has one more input terminal for DC voltage source i.e. ACDC power supply, wind turbines, etc. The charger tracks and utilizes the power capacity of the source.



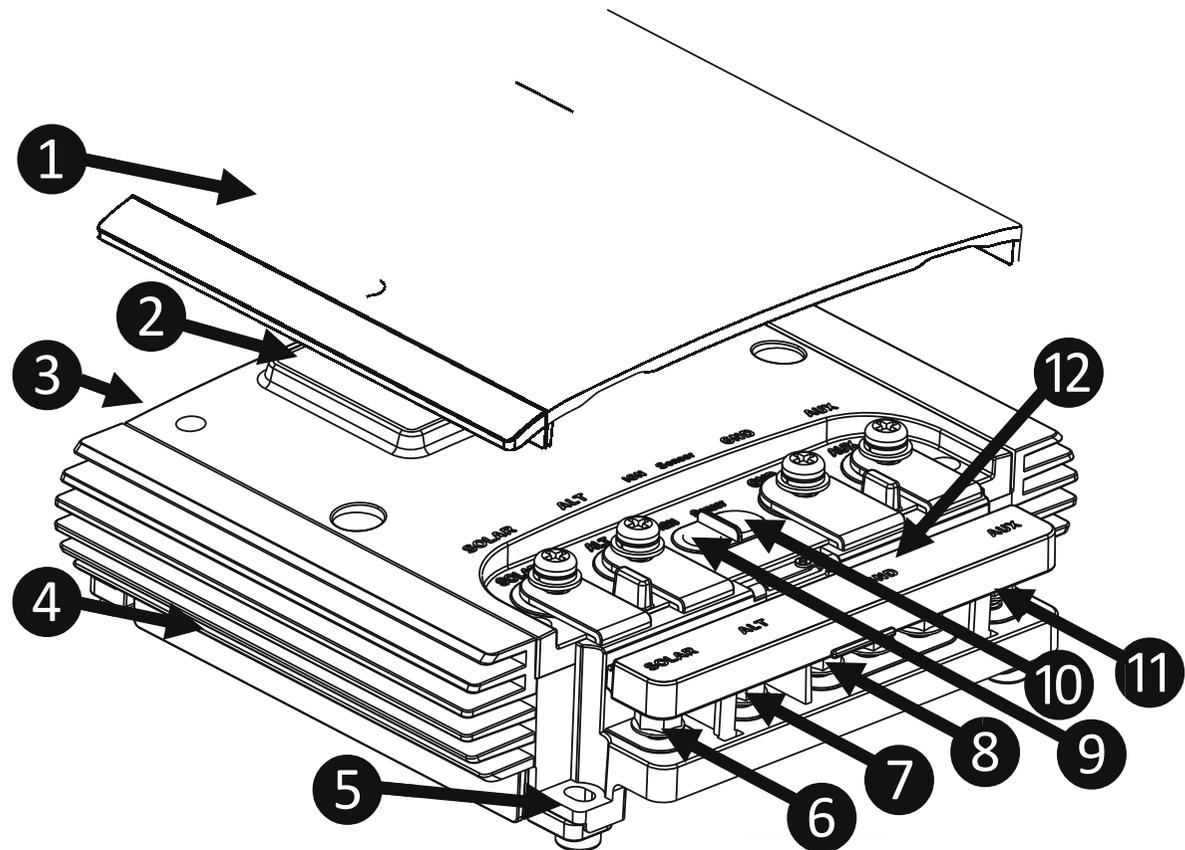
## Removing the Cover

In order to access the charger terminal, select the battery type and to install the temperature compensation & ignition over-ride cables, the top cover needs to be removed.

Loosen the two screws as indicated to release the cover.

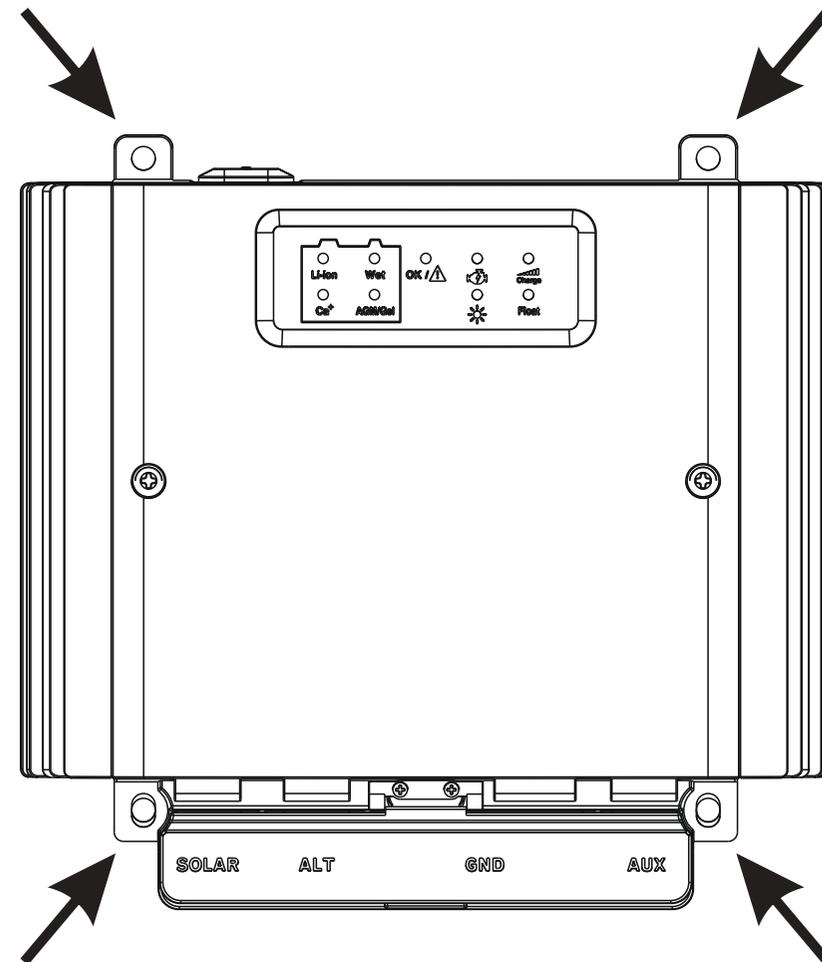
## Parts of the Charger

- |    |                             |
|----|-----------------------------|
| 1  | Top Cover                   |
| 2  | Status Membrane             |
| 3  | Remote Monitor Port         |
| 4  | Metal housing               |
| 5  | Mounting Feet               |
| 6  | Solar Terminal              |
| 7  | Alternator Terminal         |
| 8  | Common Ground Terminal      |
| 9  | Ignition Override Terminal  |
| 10 | Temperature Sensor Terminal |
| 11 | Auxiliary Battery Terminal  |
| 12 | Terminal Block              |



## Mounting the Charger

1. The charger can operate in harsh environments but it is best to locate far away from heat sources and excessive vibrations; and close to the auxiliary battery. It can be installed in any position, vertically or horizontally.
2. Use the four mounting feet of the charger to attach to a secure flat surface.
3. Drill the four fixing holes and use the screws included in the package to fasten the unit.
4. Remove the top cover before wiring the charger. Put the top cover back after wiring for protection of the terminals.

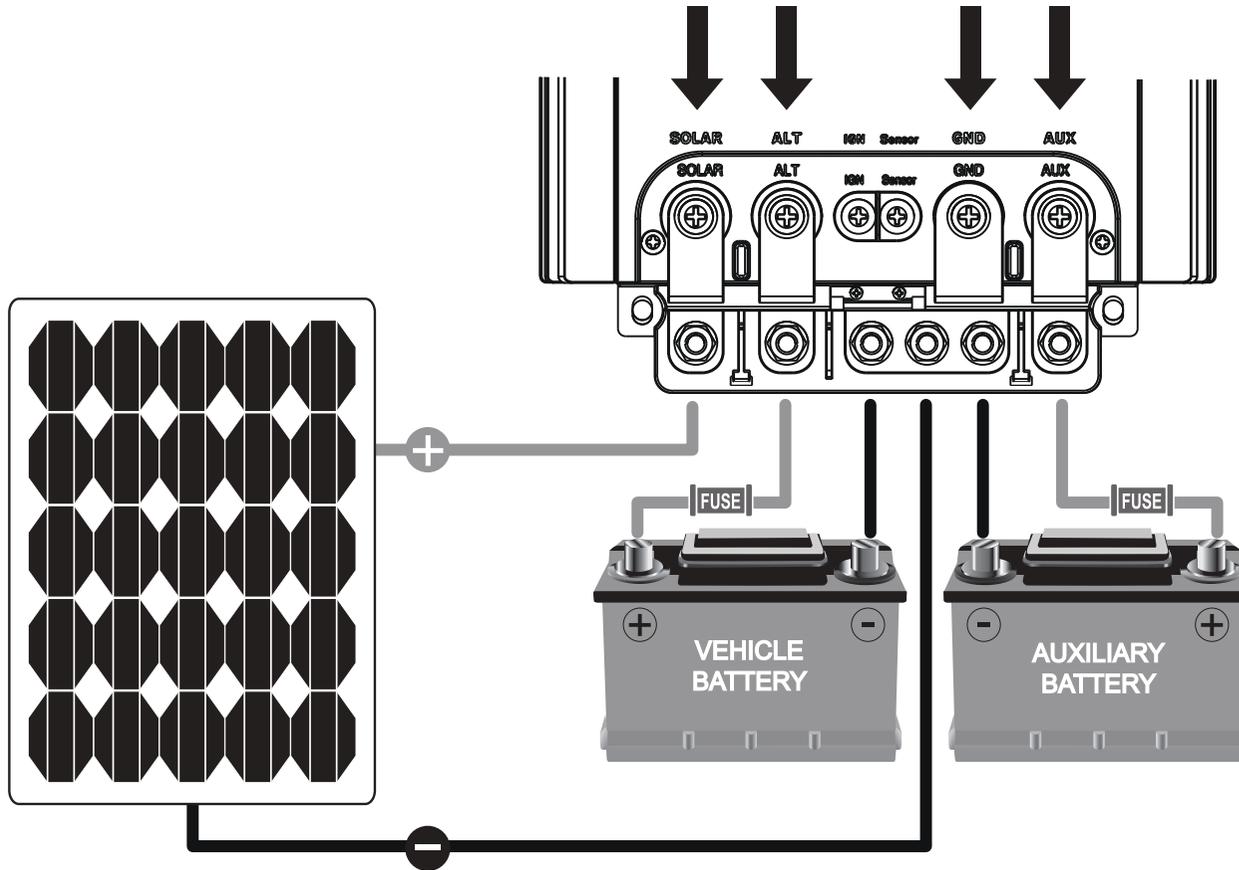




- A. Connect one end of the common ground cable to the “GND” terminal of the charger.
- B. Connect the grounds of solar panel, vehicle starter battery, DC input (**for HU6540 only**) and Auxiliary battery to the other end of the common ground cable.
- C. Connect one end of the auxiliary battery output cable to the “AUX” terminal.
- D. Connect the other end of the auxiliary battery output cable to the positive post of the auxiliary battery. Insert an inline midifuse holder (P/N FU6061) and 60A fuse near the Auxiliary battery.
- E. At this point, “OK/ERROR” LED should turn GREEN if the auxiliary battery voltage is within the charging range and default “AGM/GEL” battery is selected.
- F. Connect one end of the alternator input cable to the “ALT” terminal of the charger.
- G. Connect the other end of the alternator input cable to the positive post of the Main battery. Insert an inline 60A fuse near the Main battery.
- H. At this point, “ALT” LED should turn-on if the alternator voltage is within the acceptable range.
- I. Connect one end of the solar input cable (if available) to the “SOLAR” terminal of the charger.
- J. Connect the other end of the solar input cable to the positive output of the solar panel.
- K. At this point, “SOLAR” LED should turn-on if the solar voltage is within the acceptable range.
- L. Connect one end of the DC input cable (if available) to the “DC” terminal of the charger (**for HU6540 only**).
- M. Connect the other end of the DC input cable to the positive output of the DC supply. Insert an inline 60A fuse for additional protection from short circuit i.e. cables touching the chassis (**for HU6540 only**).
- N. At this point, “DC” LED should turn-on if the DC voltage is within the acceptable range.
- O. “CHARGE” LED will begin blinking to indicate if charging is in progress.

## Selecting Battery Type

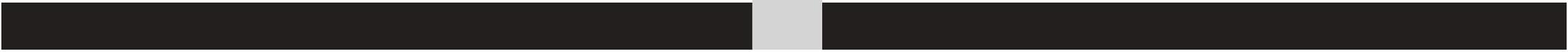
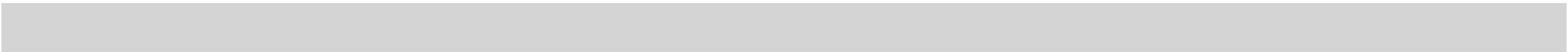
## Connecting the Charger using the Terminal Block



**Note:**

Please tighten the screws properly and ensure that none of the screws are loose. Max torque is 3 N·m for the M5 screws and 8 N·m for the nuts.





## Ignition Sensor Installation

Ignition sensor is another optional feature used to detect vehicle ignition and identify that the vehicle is running. This ignition connection enables a “low input operation” mode for compatibility with smart (variable voltage) alternators found in modern vehicles.

1. Cut a desired length of cable (recommended AWG22) and crimp to the M3 ring terminal included with the package to make the Ignition Sensor cable.
2. Connect the ring terminal end of the Ignition cable to the “IGN” terminal of the charger.
3. Connect the sensor end of the Ignition cable to the ignition wiring of the vehicle.



## Temperature Sensor Installation

Temperature sensor is an optional feature used to compensate for the auxiliary battery temperature and protect the battery from overheating.

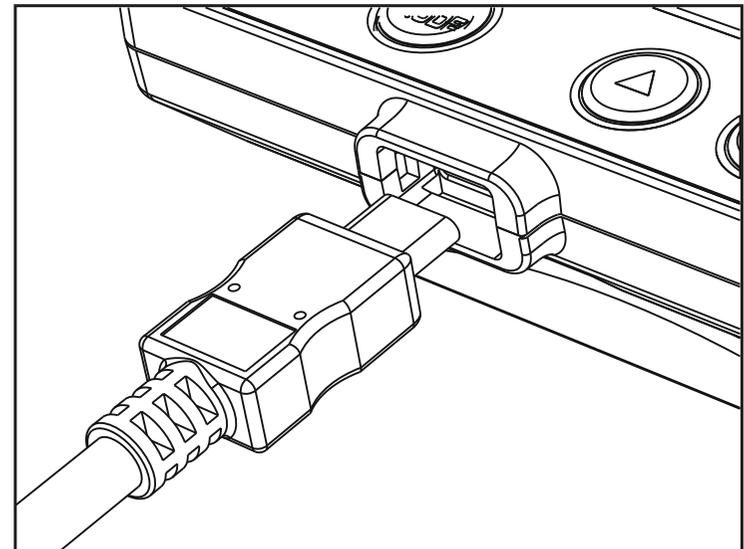
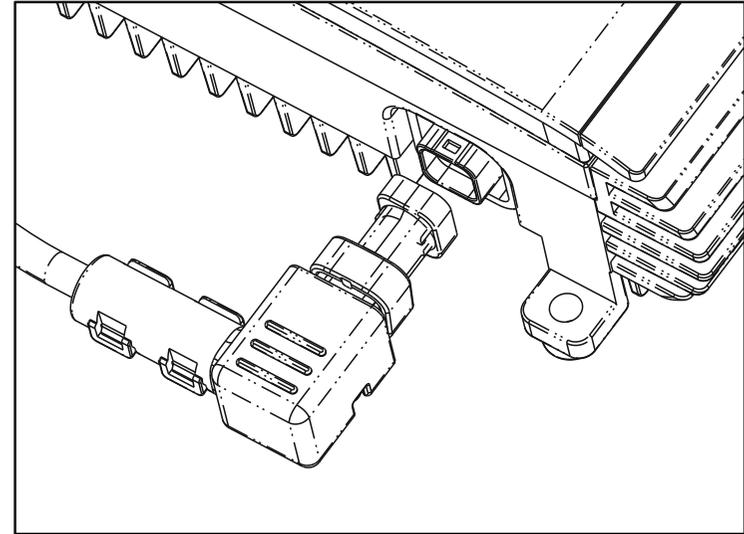
1. Connect the ground of the Temp Sensor cable to the “GND” terminal of the charger.
2. Connect positive of the Temp Sensor cable to the “Sensor” terminal of the charger.
3. Connect the sensor end of the Temp Sensor cable to the negative pole of the Auxiliary battery.





## Remote Display Installation

1. Choose an appropriate location for mounting the monitor. It should be visible enough to see while driving.
2. Fix the wall mount using screws or double-sided adhesive tape. Wall mount fixture enables adjusting the monitor for better viewing angle.
3. Attach the monitor housing to the wall mount fixture by fitting the ball joint stick to the slot at the back of the monitor and sliding it to lock.
4. Connect the USB Type-C end of the monitor cable to the **HU6526** USB connector slot. Gently push the cable plug into the display mating connector until it clicks into position.
5. Connect the other end of the monitor cable to the **HU6525 / HU6540** 6-pin connector slot. Follow the marking on the cable plug and mating connector for correct orientation. Gently push the cable plug into the display mating connector until it clicks into position.
6. At this point, display icons should be visible in the screen if the charger is powered.
7. Press the Power button to toggle the monitor from standby mode and operating mode.
8. To disconnect Data Cable from the charger, apply little pressure on the sides of the Data Cable plug and slowly pull it back.





## Remote Display Warning Messages

- a)  – **Low Voltage Warning or Battery not connected.** The main or Auxiliary battery voltage is lower than 11.4V or there is no connection to one of the batteries. Fuses and connections must be checked.
- b) **Flashing Voltage with**  – Battery won't hold charge.
- c) **OVP – Over Voltage Protection.** High voltage is detected at any of the SOLAR, ALT, AUX or DC terminals.
- d) **OCP – Over Current Protection.** The detected charge current is higher than specifications. Check short circuits or cable faults and then reset the whole system.
- e) **OTP – Over Temperature Protection.** Charging is suspended to prevent damage to the battery when the detected battery temperature is above 50°C. Charger also stops if internal temperature is above 115°C. The device will resume charging once temperature drops to a safe level.
- f) **REV – Reverse Polarity Protection.** The auxiliary battery connection is reversed. Check the connection.
- g) **BAD – Battery can't be recovered.** The charger has detected that the auxiliary battery is unable to be charged safely. Inspect the battery, replace if necessary.





# Electrical Specifications

Input Range		
Alternator	11-32 V	
Solar	15-41 V	
DC	n/a	11-32 V
Solar MPPT		
12V Panel	25 A max.	40 A max.
18V Panel	25 A max.	40 A max.
24V Panel	25 A max.	40 A max.
12V Alternator Input		
Low Voltage Turn OFF	12.6 V	
Low Voltage Turn ON	13.2 V	
Over Voltage Turn ON	14.8 V	
Over Voltage Turn OFF	16 V	
24V Alternator Input		
Low Voltage Turn OFF	25.2 V	
Low Voltage Turn ON	26.4 V	
Over Voltage Turn ON	29.6 V	
Over Voltage Turn OFF	32 V	
Ignition Override		
Low Voltage Turn OFF	11.5 V	
Low Voltage Turn ON	12 V	
Over Voltage Turn ON	31 V	
Over Voltage Turn OFF	32 V	

DC Input		
Low Voltage Turn OFF	n/a	11 V
Low Voltage Turn ON	n/a	12 V
Over Voltage Turn ON	n/a	31 V
Over Voltage Turn OFF	n/a	32 V

Output		
Voltage	3-15 V	
Current	25 A max.	40 A max.
Power	375 W max.	600 W max.
Operating Temp	-20 to 85 °C	
Protection Class	IP67	
Standard	EN55014, AS/NZS CISPR14	
Dimension (mm)	158x115x53	178x125x58
Weight (g)	800	1140
Remote Display	Optional	

Battery Type	Bulk Voltage	Float Voltage
AGM / Gel	14.4V	13.6V
Standard Wet	14.6V	13.6V
Calcium	14.8V	13.6V
Lithium-Ion	14.4V	13.6V



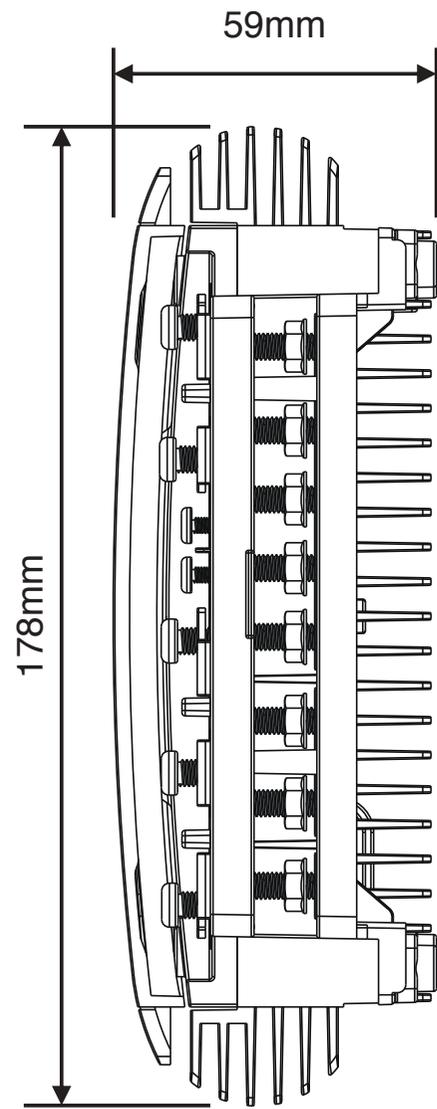
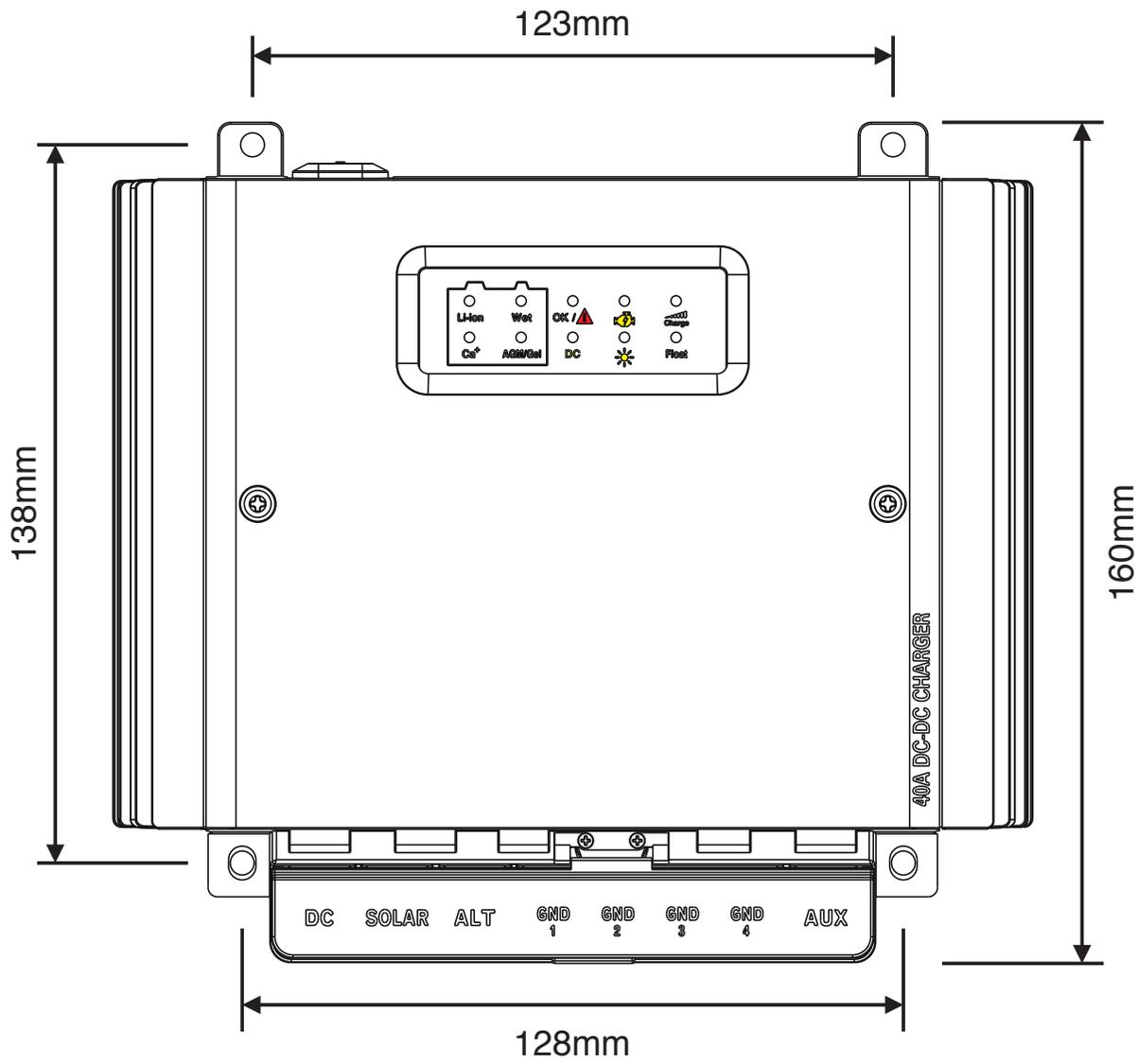
**Trailer or Caravan Installation**

**Multiple Auxiliary Batteries**

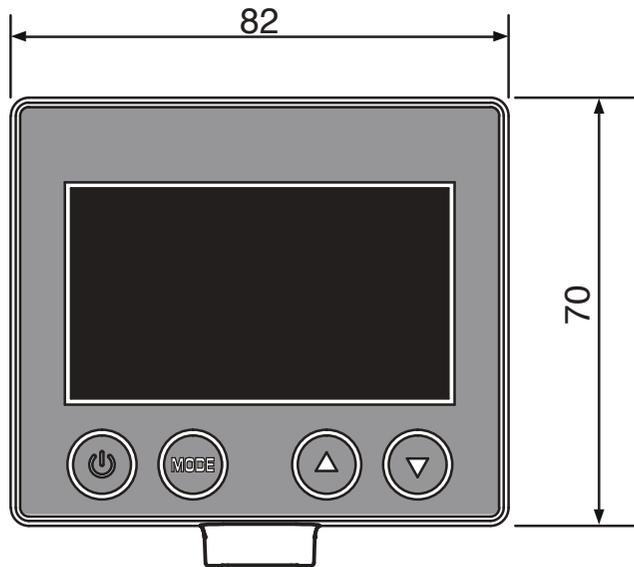




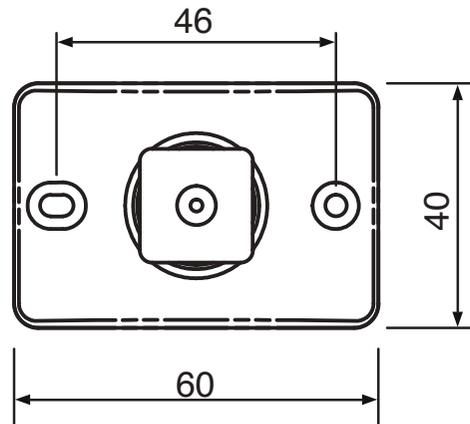
# HU6540 Dimensions



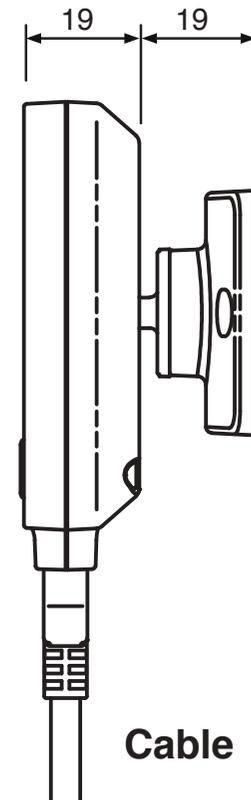
## HU6526 Dimensions



**Remote Monitor HU6526**



**Wall Mount Bracket**



**Cable**

## Declaration of Compliance

Tested and approved by **Intertek** and conforms to  
EN 60335-1  
EN 60335-2-29  
EN 55014-1  
EN 55014-2  
PAH Testing  
RoHS 2.0  
IP67

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