

cangoee
power

Y62 Patrol Installation Guide

INS0174



off-grid / on-grid / on-demand.

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Overview

The following guide is designed to assist with the install by providing a quick and easy guide for installation of this battery kit into the Y62 Nissan Patrol vehicle.






Cangoee strongly recommends following this guide and urges that the installers are qualified professionals.

Tools

Tool	Description	Visual
13mm Socket		
12mm Socket		
10mm Socket		
8mm Socket		

What's in The Kit

Included Cables and Parts

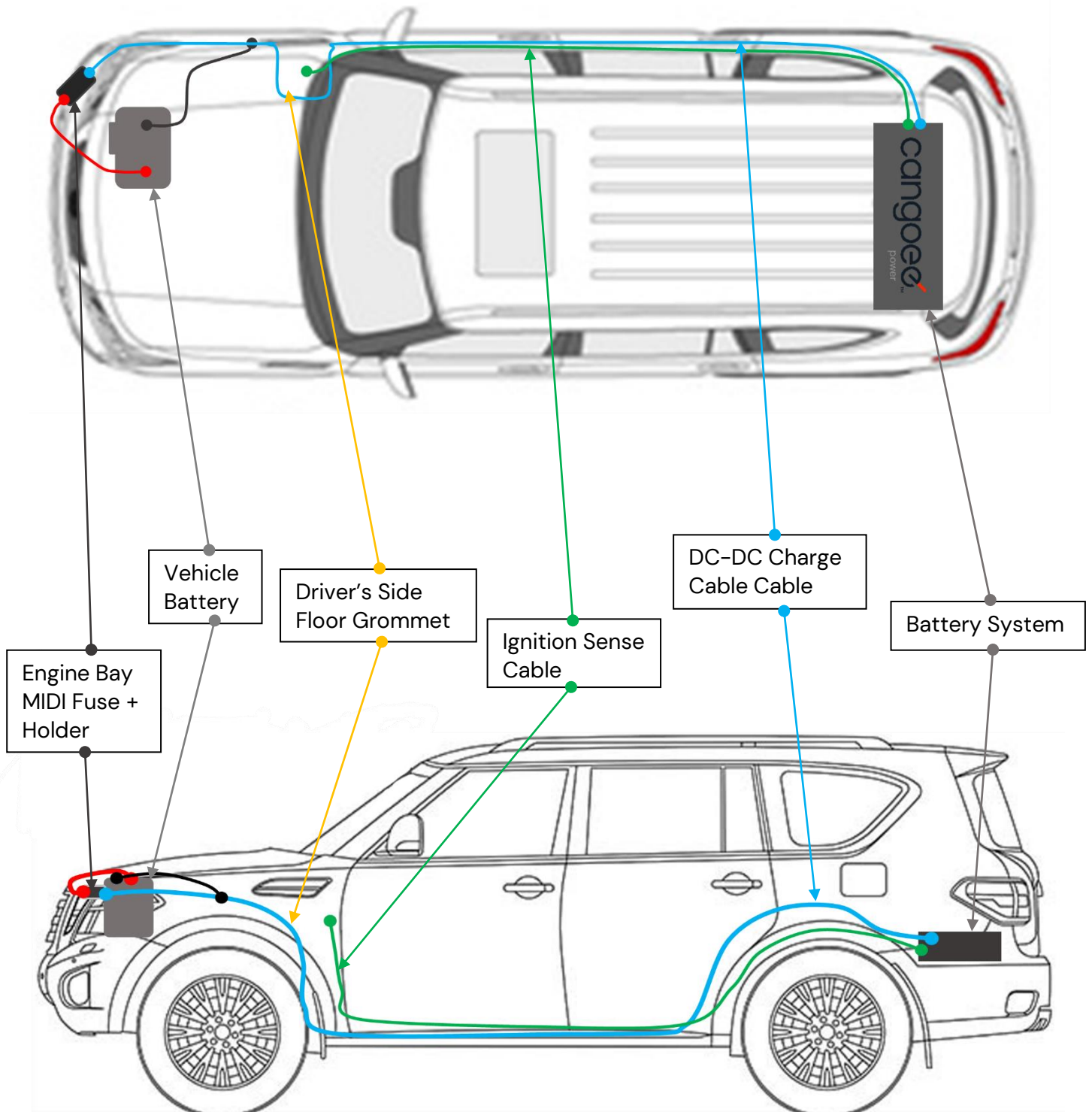
Tool	Description	Visual
CANGOEE Y62 Battery System	The battery system for install	
DC – DC Charge Cable	DC-DC long twin core cable with black outer insulation: Red and Black Connections	
Ignitions Sense – Fuse Tap Cable	Used for the Ignition Sense function: Black braided with fuse clip on end	
Midi Fuse on Bracket	Midi Fuse attached to bolt-on bracket	
Main Positive Battery Connection (B+)	Cable connection for Midi Fuse	

Please ensure proper care is taken when handling these parts as there are no spares included in this kit.

Installation Overview

This is an overview of the installation kit and where each component fits.

Please carefully examine the below diagram and adhere to the guide, this will ensure the finished installation matches this diagram.



WARNINGS and SAFETY

SAFETY!

The battery contains Lithium Ferrous Phosphate (LiFePO4) cells, considered the safest of all lithium-ion chemistries. The battery contains a large amount of stored energy. Please follow these quick tips for safe use and operation:

- Ensure appropriate PPE gear is worn at all times during this install.
- Ensure the battery is secured safely before travel.
- Do not drill into the enclosure. Doing so may inadvertently puncture one of the internal cells.
- Do not short circuit the battery. Be careful not to drop a metallic object across the two exposed terminals. Always keep the terminal caps on the Positive (red) and Negative (black) posts during operation.
- Do not mount the battery upside down. The battery can also be mounted on its side if mounting upright is not an option.
- Do not connect multiple batteries in series to raise the voltage. The Battery Management System (BMS) is not designed to accommodate higher voltages.
- If the chemicals from a battery cell come into contact with your skin, immediately seek medical advice.

Please Note:

Cangoee strongly recommends that the installation of the battery kit be carried out by a competent, un-intoxicated individual. However, if installing at home or independently, strict adherence to the instructions and careful execution of each step is paramount to ensure proper installation and optimal functionality of your Cangoee battery system.

Please Ensure the consistent use of proper PPE, and, turn off the vehicle to minimize the risk of serious injuries or damage to the installer as well as the vehicle.

WARNINGS!

Please follow these warnings carefully and adhere to the 'safety' Guidelines when installing this battery system:

- Avoid mechanical shock.
- Avoid direct sunlight exposure.
- Do not store or mount batteries in incorrect orientations.
- Do not transport the battery unsecured.
- Do not expose the battery to water.
- Do not expose the battery to fire.
- Do not pierce the battery.
- Do not disassemble.
- Do not drill into the battery enclosure.
- Do not short battery terminals.
- Do not connect multiple batteries in a series configuration.
- Do not charge the battery outside the range of 0°C - 45°C.
- Do not store below -20°C or above 60°C.
- Risk of burns if misused.
- Always follow safe working practices.
- Installation of this device must only be carried out by appropriately qualified competent person(s).
- All connections must be fused at recommended fuse ratings to avoid damage to components.
- All minimum cable gauges and maximum lengths must be followed.
- Only use Lithium Battery Chargers to recharge batteries.

WARNING

This install works with live wires and electricity, ensure all safety guidelines are followed and proper equipment is used during this Install. Failing to follow these guidelines could result in incorrect installation of the Cangoee battery, malfunction, or severe injury.

Stage 1: Remove Rear OEM Floor and Clear Space— Location: Boot Space

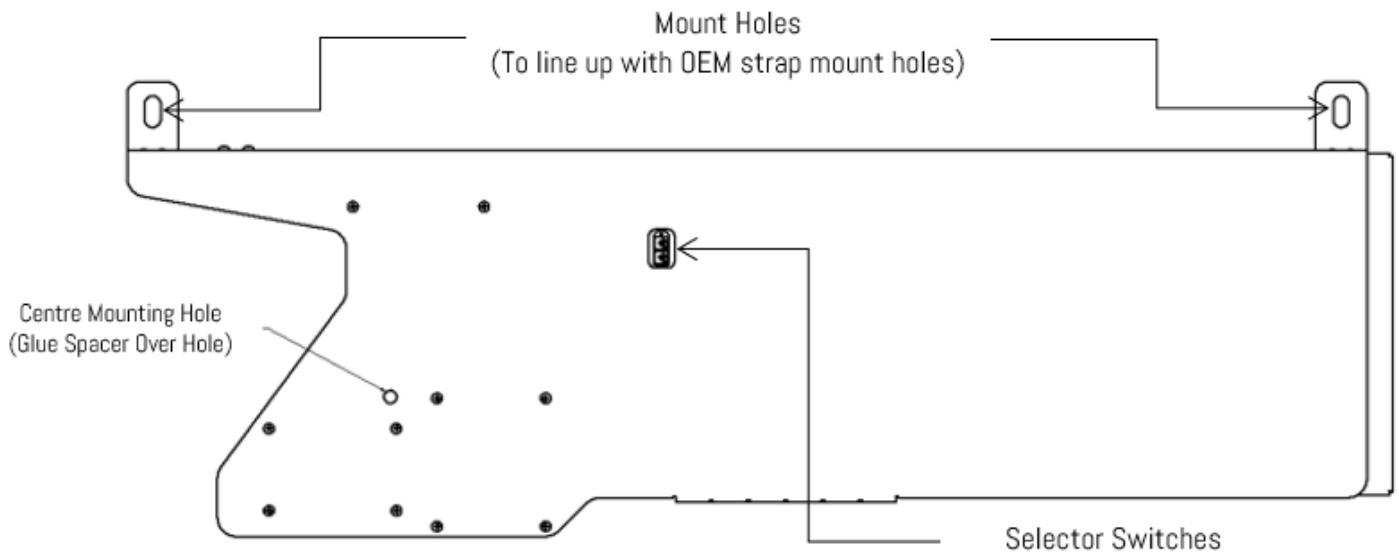


1. Remove false floor and retaining strap bolts (13mm socket)
Remove driver side floor trim piece (10mm socket)
2. Relocate OEM jack and tools to under 3rd row seat trim flap + remove strap bracket (these will need to be placed back during stage 2)
3. Unscrew OEM strap mounts and keep fixing screws for later use.



Stage 1
COMPLETE

Stage 2: Cangoee Y62 Rear Mounting Plate Diagram



Selector Switch Settings/ DCDC Charger

The DC-DC charger in the CAN battery allows the battery to charge from a vehicle engine/alternator/start battery. However, to avoid draining the start battery, charging is only desired while the engine is running.

In some applications it can be difficult to determine when the engine is running. Therefore, the DC-DC charger reads several inputs to determine when to turn ON (charge) and turn OFF (stop charging) to achieve:

- Charging when the engine is running, to maximize charging of the Cangoee Battery
- Not charging when the engine is not running, to avoid discharging the vehicle start/cranking battery.

Logic to determine when to turn the DC-DC charger ON and OFF will be implemented using software running on a microcontroller to allow advanced control combining several inputs:

- Start battery voltage
- Ignition signal voltage
- Timing delays
- 2 x 7-position (6-0) rotary switches: user-accessible from outside the battery

Selector Switch Modes

These tables demonstrate the selection modes. The first table denotes the off delay, and the second table is your voltage this works by cutting power to the battery when the voltage decreases to not drain the vehicle battery or cause unexpected surges.

(E.g. if set to 0 and 6 the battery will cut out immediately once the voltage reduces due to the ignition sense, if set to 4 and 1 the battery will cut out after 30 seconds if the voltage goes below 12.5 volts.)

Carefully view the below tables to understand the different **selection modes**.

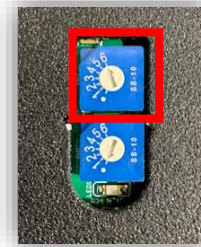
Voltage Switch Position	On Level	Off Level
0	11	10
1	12	11
2	13	12
3	13.3	12.3
4	13.5	12.5
5	13.7	12.7
6	14	13

Delay Switch Position	Delay Off Time	Application
0	0 Sec	Trad Alt, or Ignition Relay
1	30 Sec	Smart Alternator
2	1 Min	Smart Alternator
3	1.5 Min	Smart Alternator
4	3 Min	Smart Alternator
5	3.5 Min	Smart Alternator
6	0 Sec	Ignition Signal Control

MEASURED VOLTAGE



OFF DELAY



ATTENTION?

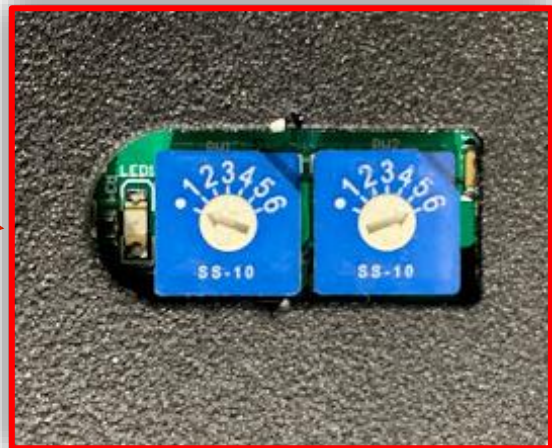
Please carefully view the different selection modes, as the switches are not easily accessible once installed.

Stage 2.1: Placement of Battery – Location: Boot Space



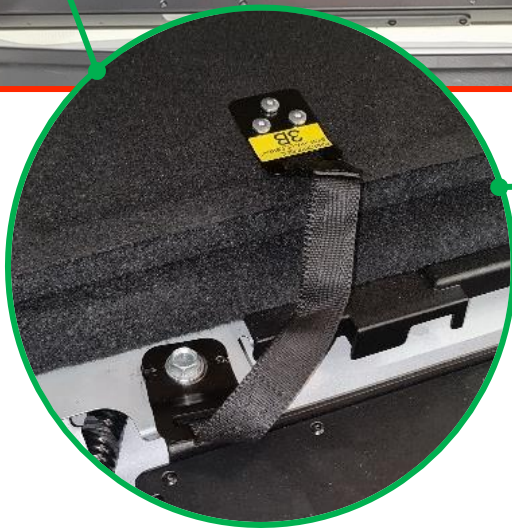
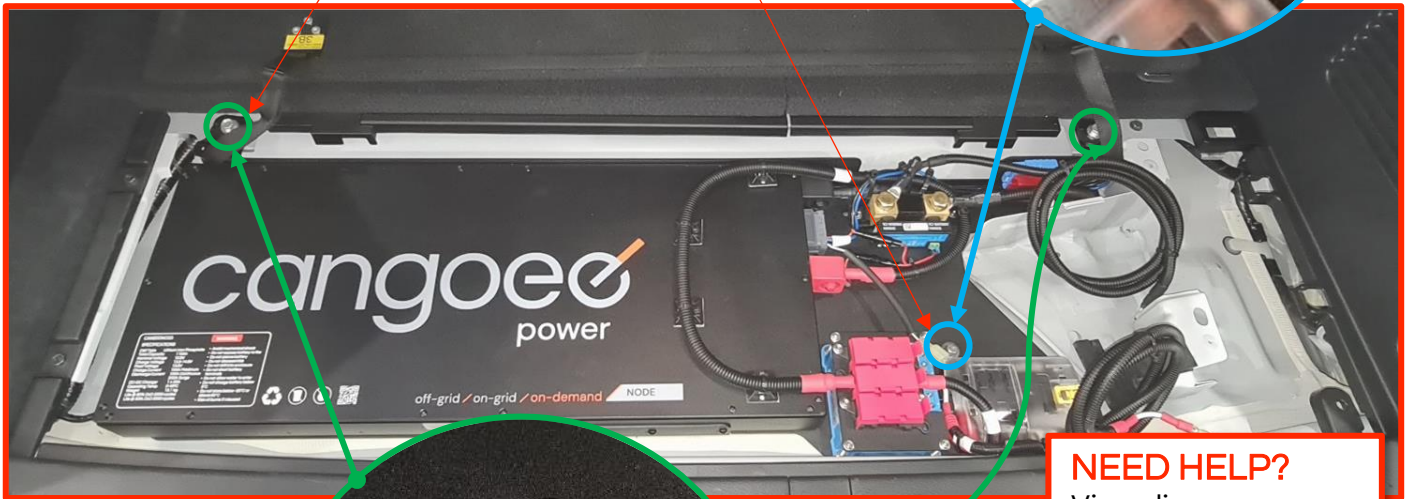
ATTENTION?
Please carefully view the different selection modes on pages 7-8 as the switches are not easily accessible once installed.

1. Glue spacers to underside of battery plate (on central hole)
2. Set battery charge settings to ignition sense by setting selector switches on underside of battery to 0-6
3. Carefully place battery into rear compartment and line up with OEM strap mount holes



Stage 2.2: Fixing Battery in Place – Location: Boot Space

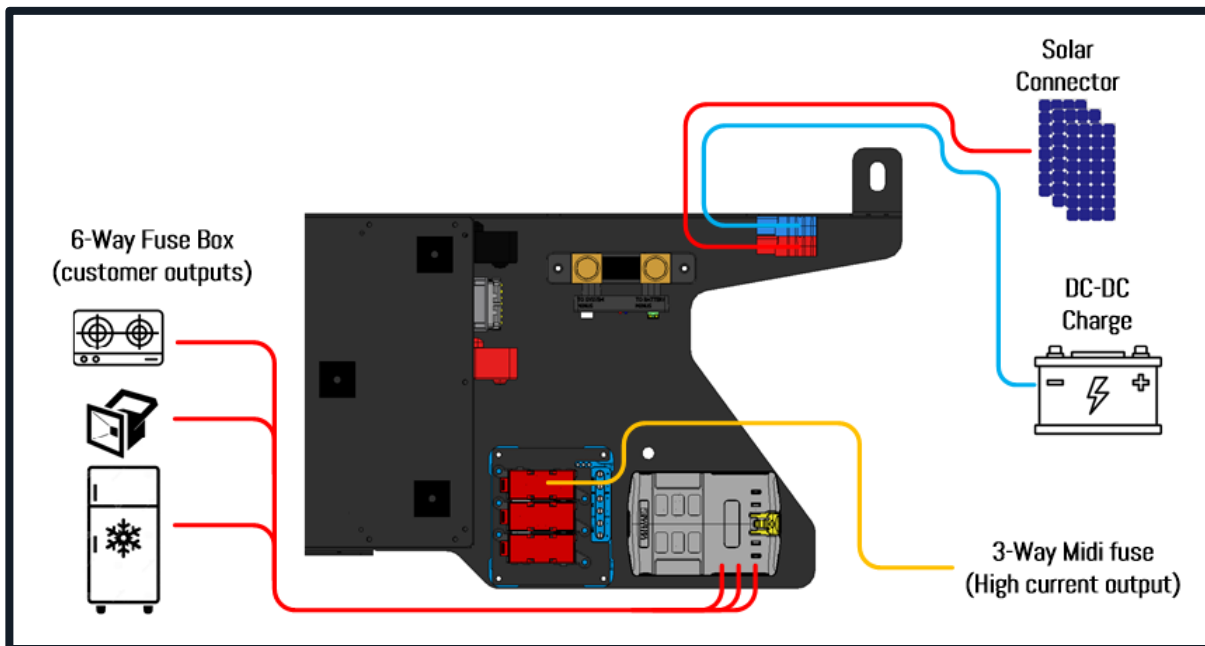
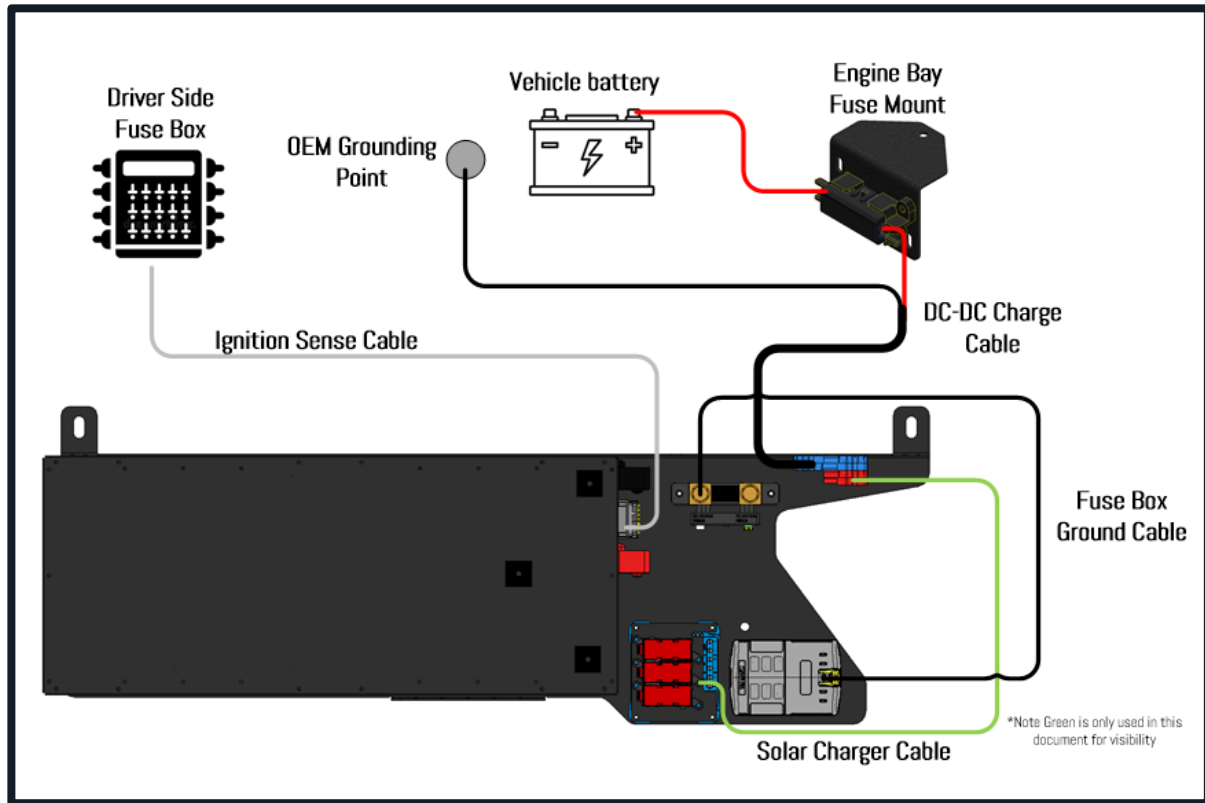
4. Use included M6x30 bolt + spring washer + flat washer to fasten center of bracket
5. Mount Cangoee Battery Kit using OEM floor mount and bracket mount holes. Ensure OEM straps are placed on top of battery top fixing brackets



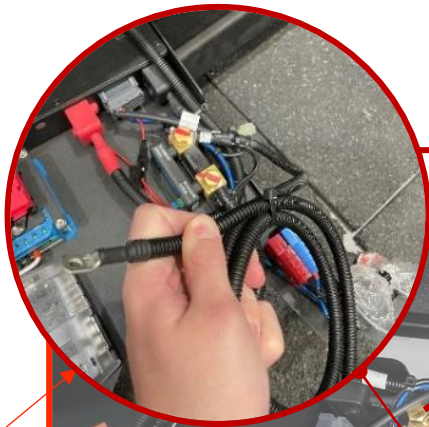
NEED HELP?
View diagram on
Page 6 For Mounting
Locations.

Stage 2
COMPLETE

For Stages 3 - 5: General Wiring Diagrams – For User Reference

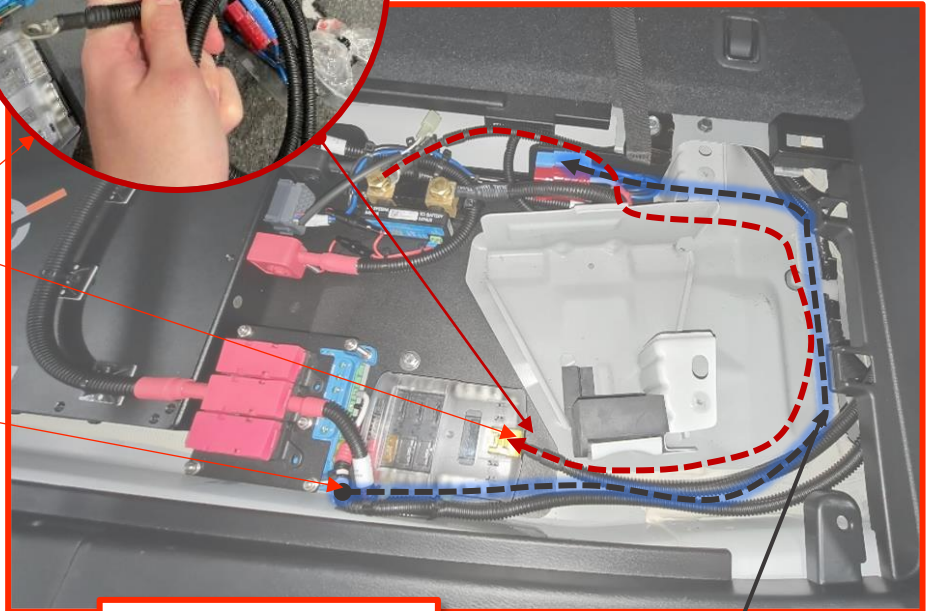


Stage 3.0: Main Cable Connections – Location: Boot Space



Fuse Block Negative Cable

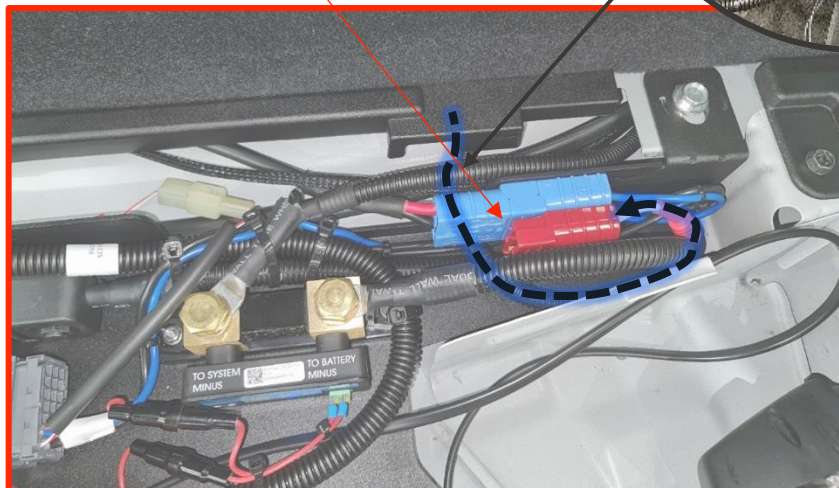
1. Route Fuse Block Negative through trim and onto ground terminal of fuse block
2. Route Solar Charge Cable through side trim



3. Connect Solar Charge Cable using supplied cable and plug into Red Anderson

NEED HELP?
View Wiring Diagram on Page 10 for wire routing

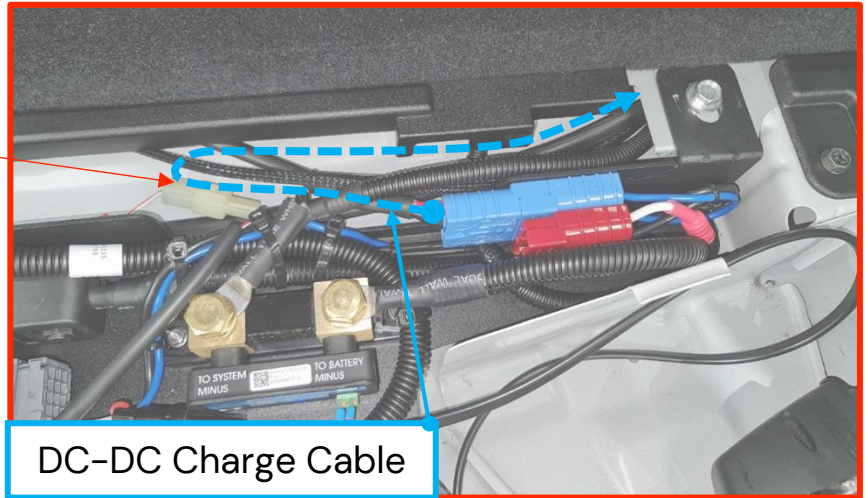
Solar Charge Cable



Stage 3.1: Main Cable Connections – Location: Boot Space

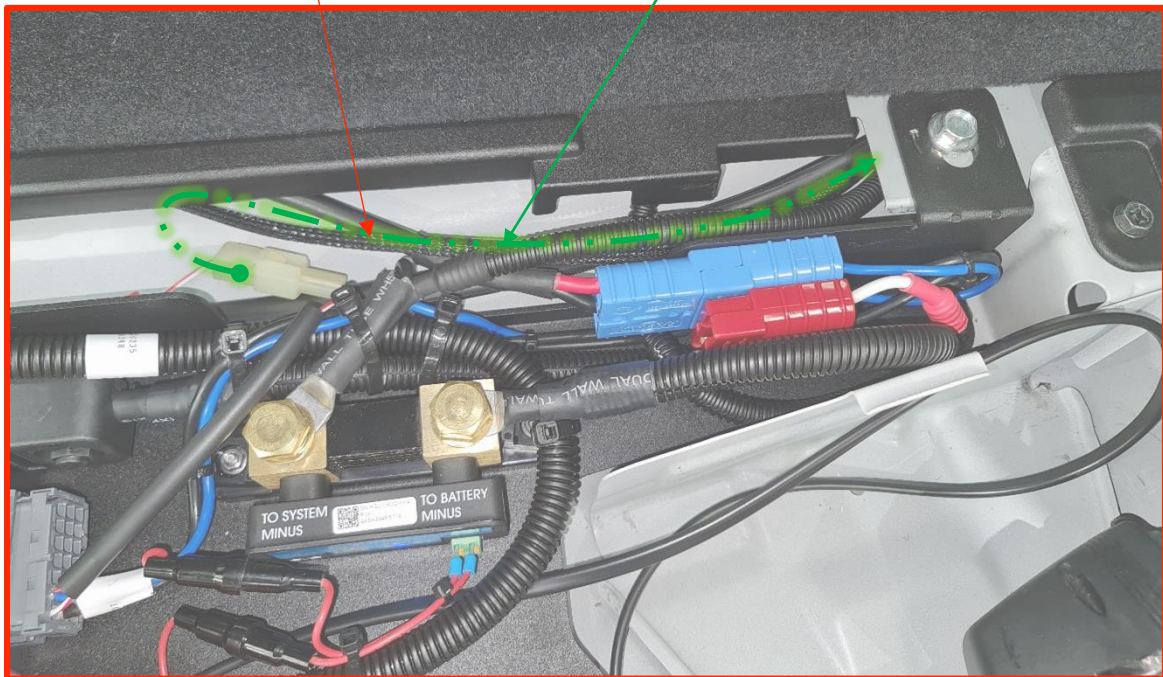
4. Connect DC-DC Charge Cable using supplied cable and plug into Blue Anderson – Route through side opening as shown

NEED HELP?
View Wiring Diagram
on Page 10 for wire
routing



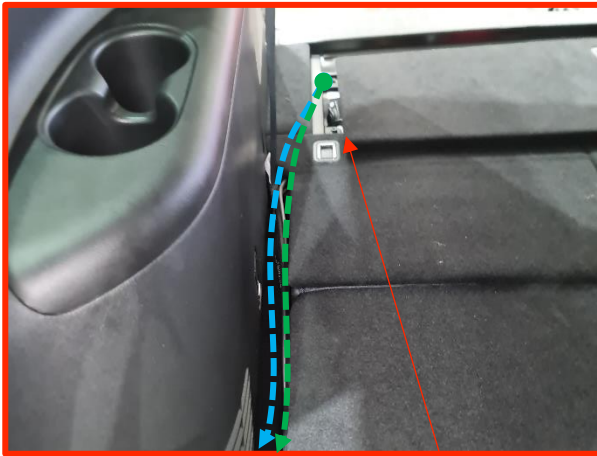
5. Connect Ignition Sense Cable into Female latch clip – Route through side opening as shown

Ignition Sense Cable



Stage 3
COMPLETE

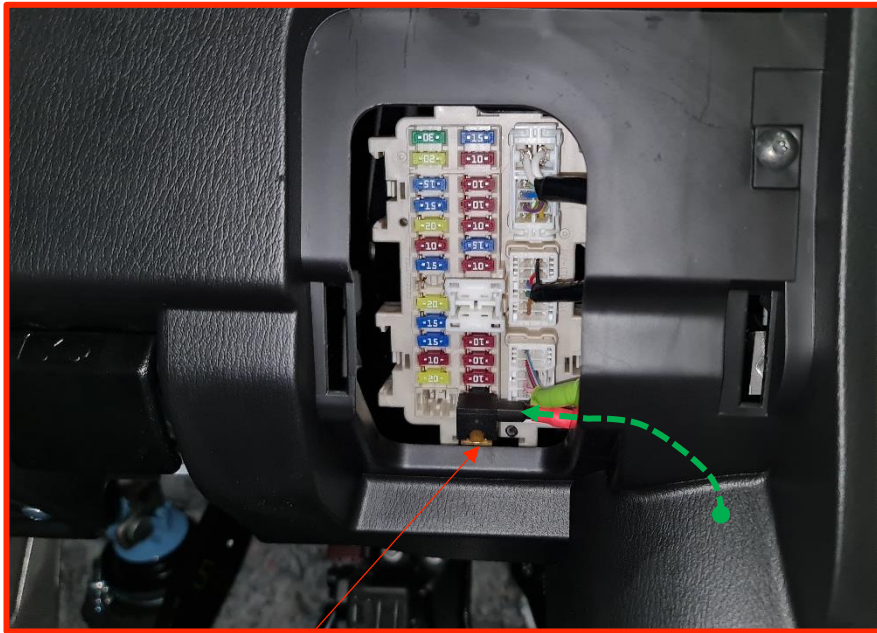
Stage 4.0: Routing DC-DC Cable through Vehicle – Location: Rear



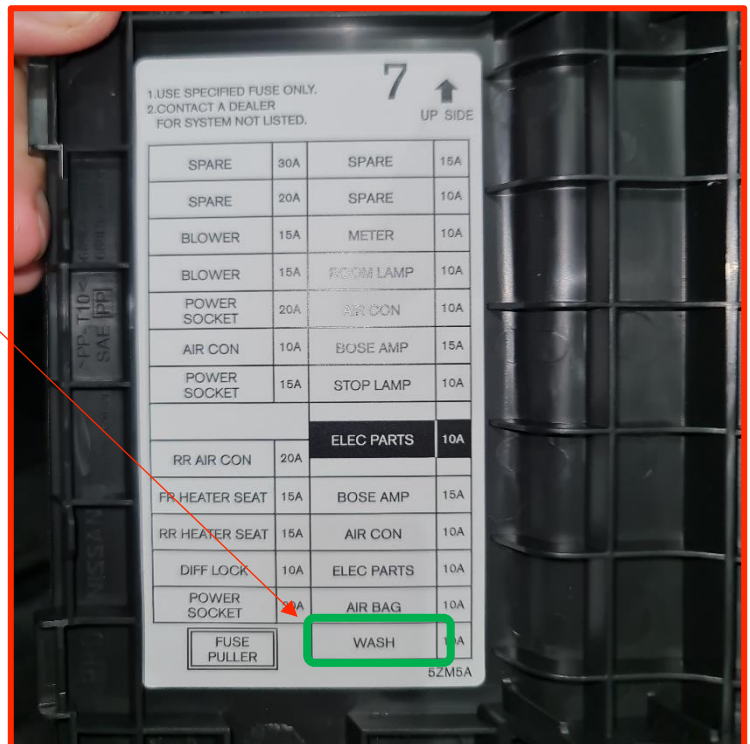
1. Route DC-DC and Ignition Sense Cables from rear through side opening
2. Run DC-DC Cable and Ignition Sense Cable through firewall to driver's side seat.
3. (Optional) Zip tie to factory power conduit for proper cable management
4. Remove OEM Grommet plug and Push DC-DC Cable through to the engine bay wires will need to be routed through grommet and sealed later to ensure watertightness



Stage 4.1: Routing Ignition Sense Cable through Vehicle Location: Rear to Front of Vehicle



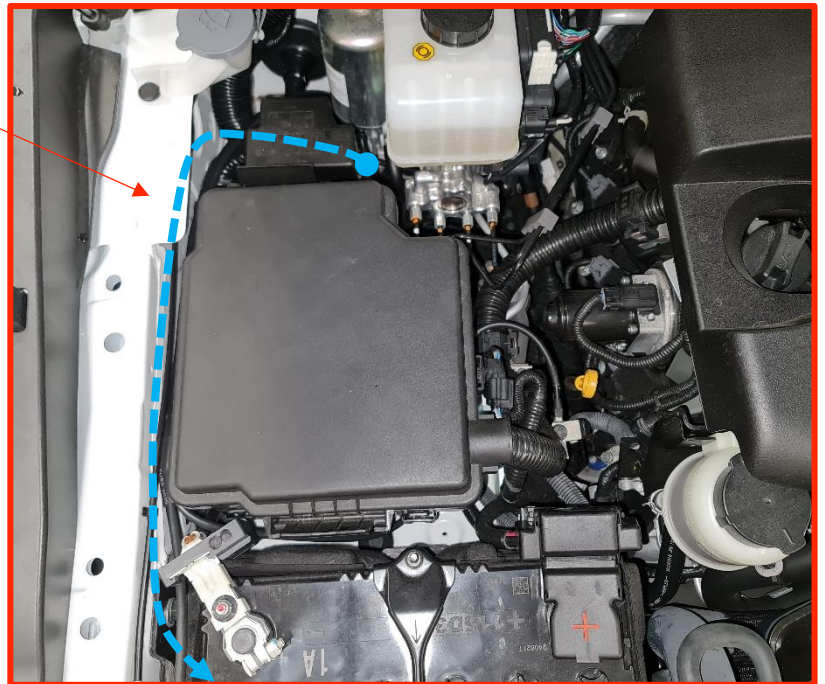
5. Run Ignition Sense Cable through to vehicle fuse box.
6. Tap 'WASH' Fuse on fuse panel to connect Ignition Sense



Stage 4.2: Routing DC-DC Cable through Vehicle – Location: Rear to Front of Vehicle

7. Run DC-DC Cable through the front driver side and into the engine bay – this will run through the grommet as shown

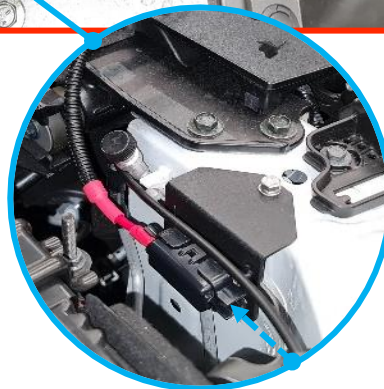
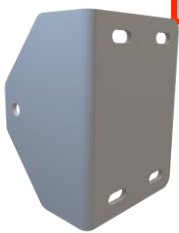
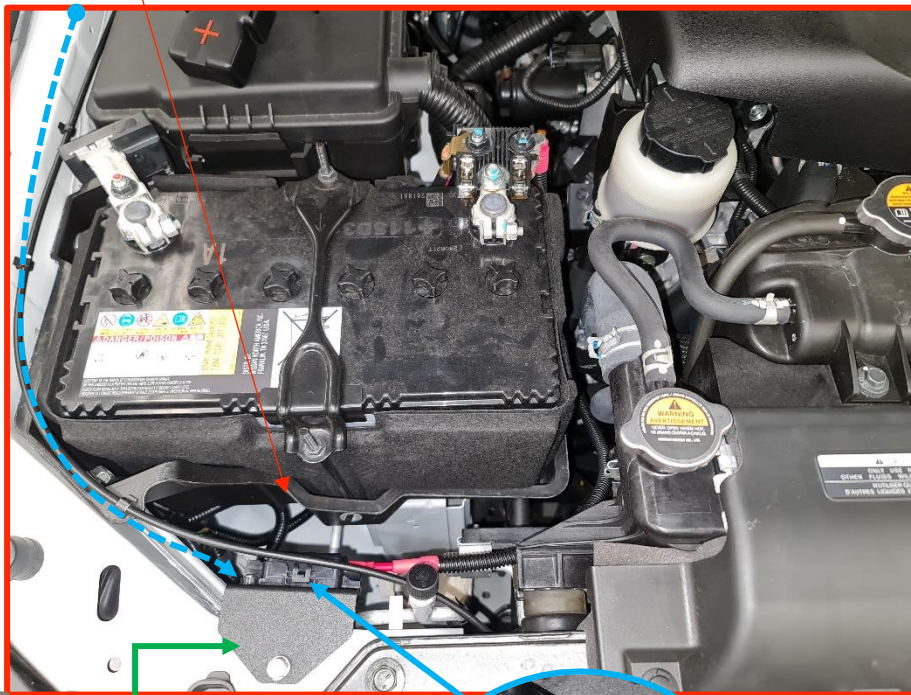
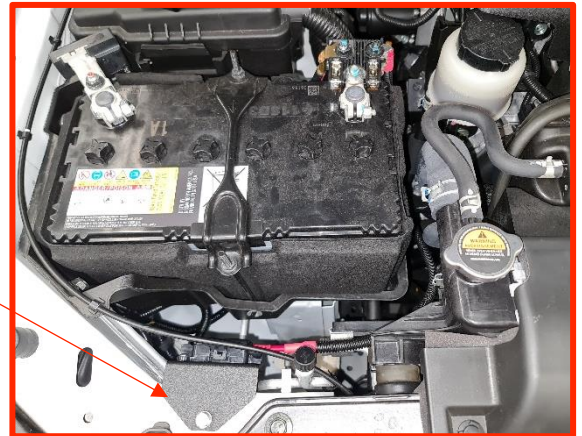
8. Run along front of engine bay and ensure cable is secured using cable ties



Stage 4
COMPLETE

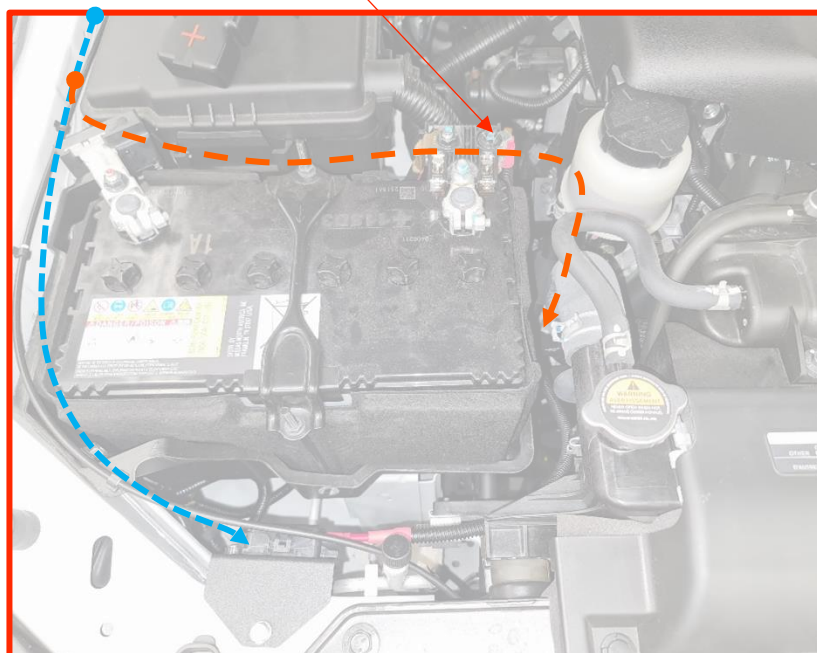
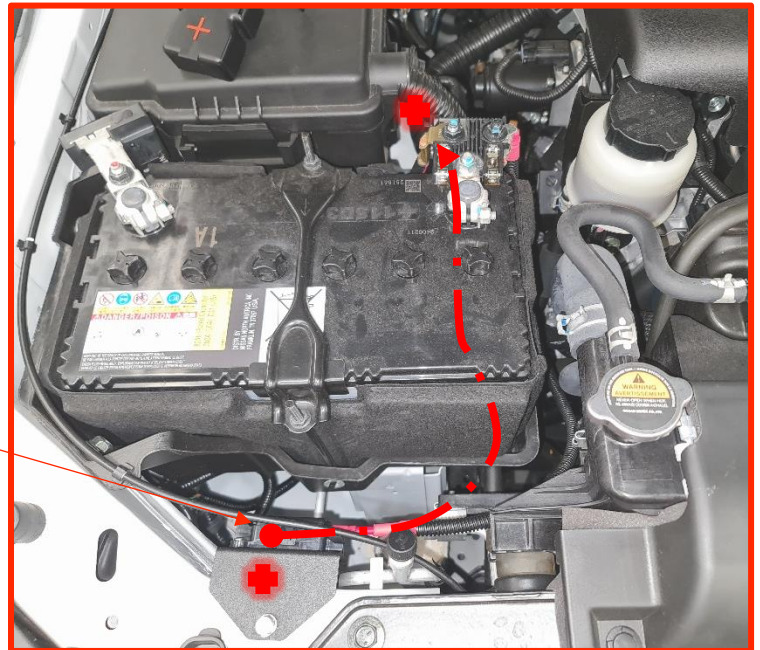
Stage 5.0: Wiring Front Engine Bay – Location: Front of Vehicle - Engine Bay

1. Fix Midi Fuse Mounting plate onto front of engine bay as shown – Ensure correct M8 Bolt is used
2. Run DC-DC Positive into Midi Fuse – make sure to connect properly and tighten



Stage 5.1: Wiring Front Engine Bay – Location: Front of Vehicle – Engine Bay

3. Attach Positive to positive cable onto adjacent end of midi fuse and connect to vehicle battery positive
4. Run DC-DC Cable negative to the battery compartment and bolt onto side of battery mounting point



Stage 5
COMPLETE

Please Note

Cangoee strongly recommends that installers do not disassemble, rearrange, or misplace components of the battery system as this could result in improper use, malfunction, or serious damage to the battery system.

Once again, we urge that installers where appropriate PPE gear when assembling and disassembling and that safety guidelines and warnings are adhered to.

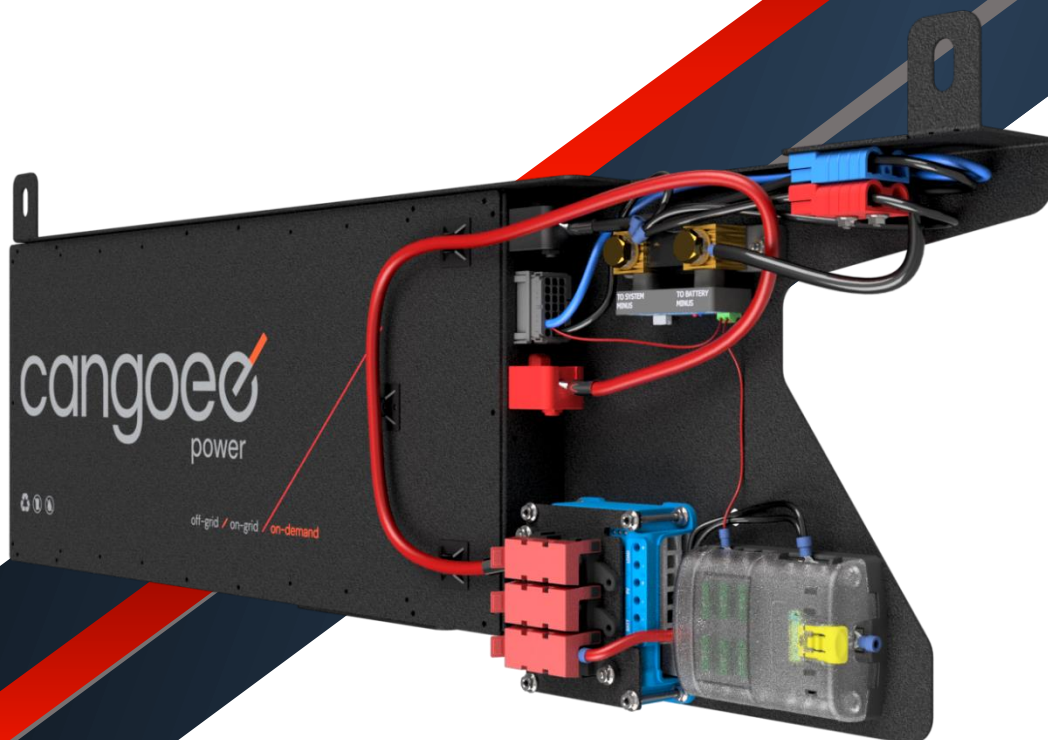
Please Make Sure that the vehicle is **turned off** whilst installing or uninstalling the battery system.

WARNING

This install works with live wires and electricity, ensure all safety guidelines are followed and proper equipment is used during this Install. Failing to follow these guidelines could result in incorrect installation of the Cangoee battery, malfunction, or severe injury.

Congratulations!

Your brand new Cangoee Battery System is installed



Battery Management System

The Vehicle Kit is equipped internally with a Battery Management System (BMS), which is an electronic solid-state circuit board that serves multiple important functions:

- ❑ **Battery Cell Management:** The BMS manages and maintains the cells within the battery.
- ❑ **Safety Measures:** The BMS provides safeguards that protect against overcharging and over-discharging and activates in response to situations where the battery is producing low voltage (less than 10.5V), overcurrent (more than 100A), or short-circuit situations.
- ❑ **Cell Balancing:** The BMS ensures that the Power Hub cells are equalised throughout its operation to promote overall efficiency and longevity.
- ❑ **Cell Temperature Sensing.** If the BMS detects the temperature of the cells to be above 45°C, it will automatically stop charging and discharging until the temperature has returned within the range of 0°C – 45°C.

Unlike lead-acid batteries, overcharging or over-discharging a lithium battery may lead to a hazardous scenario, therefore, the BMS is essential to the lithium battery.

Victron Connect App

Download the Victron Connect application onto your smart device to access and manage the Power Hub's Victron Energy Components.

Victron Connect info:





**Download on the
App Store**



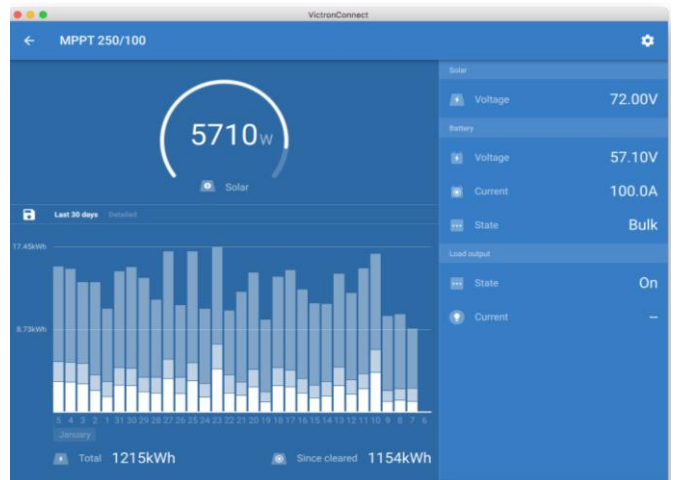
**Get it on
Google Play**



**Available on the
Mac app**





**Download for
Windows**



Victron Energy SmartSolar MPPT 75/15



Victron Energy SmartSolar MPPT 75/15	
Manual	Datasheet
	

The Victron Energy SmartSolar MPPT 75/15 model is a compact and highly efficient solar charge controller, ideal for optimizing solar power systems. It offers advanced Maximum Power Point Tracking (MPPT) technology to maximize the energy harvested from your solar panels.

Solar Panel Array Input Limitations

MAX OPEN CIRCUIT VOLTAGE (Voc): 75 V

It is recommended to stay at least 10% below the rated maximum open circuit voltage (Voc)

MAX SHORT CIRCUIT CURRENT (Isc): 15A

Pre-set and suggested programming settings in the Victron Connect Application



Victron Connect → SmartSolar MPPT 75/15 → ⚙️ (Settings) → Battery

Settings	
Battery voltage	12V
Max charge current	15A
Charger enabled	<input checked="" type="checkbox"/>
Battery preset	User defined
Expert mode	<input type="checkbox"/>
Charge voltages	
Absorption voltage	14.40V
Float voltage	13.80V
Equalization voltage	13.80V
Equalization	
Automatic equalization	Disabled
Manual equalization	Start now
Voltage compensation	
Temperature compensation	-16.20mV/°C
Battery limits	
Low temperature cut-off	Disabled

Table 1 Pre-set and Suggested Programming Settings in the Victron Connect Application for SmartSolar MPPT

Victron Energy SmartShunt 500A/ 50mV



Victron Energy SmartShunt 500A/ 50mV	
Manual	Datasheet
	

The Victron Energy SmartShunt is an all in one battery monitor, only without a display. A smartphone can be utilised as a display. The SmartShunt connects via Bluetooth to the VictronConnect app on the smart device and conveniently displays all monitored battery parameters.

Pre-set and suggested programming settings in the Victron Connect Application

Victron Connect → SmartShunt 500A/ 50mV → ⚙️ (Settings) → Battery

← Battery settings	
Battery capacity	110Ah
Charged voltage	14.0V
Discharge floor	20%
Tail current	1.00%
Charged detection time	3m
Peukert exponent	1.05
Charge efficiency factor	99%
Current threshold	0.10A
Time-to-go averaging period	3m
Battery SOC on reset	<input type="button" value="Keep SOC"/>
State-of-Charge <small>Manually set the current state-of-charge</small>	85.0%
Synchronize SOC to 100%	<input type="button" value="Synchronize"/>
Zero current calibration	<input type="button" value="Calibrate"/>

Table 2 Pre-set and Suggested Programming Settings in the Victron Connect Application for SmartShunt

Safety Tips

The battery contains Lithium Ferrous Phosphate (LiFePO₄) cells, considered to be the safest of all lithium-ion chemistries. The battery consists of a large amount of stored energy. Please follow these safety tips for use and operation:

- ❑ Ensure the battery is secured safely before travel.
- ❑ Do not drill into the enclosure. Doing so may inadvertently puncture one of the internal cells.
- ❑ Do not short-circuit the battery. Be careful not to drop a metallic object across the two exposed terminals. Always keep the terminal caps on the Positive (red) and Negative (black) posts during operation.
- ❑ Do not mount the battery upside down. The battery can also be mounted on its side if mounting upright is not an option.
- ❑ Do not connect multiple batteries in series to raise the voltage. The BMS is not designed to accommodate higher voltages.

Longevity Tips

Factors that mainly affect the lifespan of the battery are depth of discharge and operating temperature. To ensure longevity and use of the battery:

- ❑ Do not fully discharge the battery to zero. Each time the battery is discharged to zero, either intentionally or unintentionally, it reduces the lifespan of the battery.
- ❑ Do not discharge the battery below 80% depth of discharge (i.e., 20% full).
- ❑ Do not charge the battery outside the range 0°C – 45°C to maximize the life of the battery and avoid damage to the cells.
- ❑ Avoid exposing the battery to direct sunlight, mount the battery in a compartment or undercover.

The cells are designed to last 2,000 cycles at 80% DOD (Depth of Discharge) and 5,000 cycles at 50% DOD.

Tips for Use

- ❑ Batteries of the same voltage may be placed in parallel to increase storage capacity. However, each battery should be independently fused, and the battery must be from **CANGOEE**.
- ❑ If the battery temperature is potentially less than 0°C it is essential to allow the battery to warm to ambient temperature before connecting power to it.
- ❑ The battery is splash-proof and water resistant but not waterproof, **DO NOT** directly submerge the battery in water.
- ❑ The battery is designed to be housed in a dry, enclosed compartment, not in direct sunlight or exposed to outside weather conditions for an extended period.
- ❑ Only use Lithium Battery Chargers to recharge the battery.

Maintenance Tips

If not using the battery for a prolonged period (months at a time), then store the battery as follows:

- ❑ Disconnect all loads from the battery so that there is no external current draw.
- ❑ Ensure the battery is close to full capacity as the battery will slowly self-discharge over time.
- ❑ Do not keep the battery on trickle charge as this may harm the internal battery cells.

Within every two months, give the battery a quick recharge to ensure battery longevity.