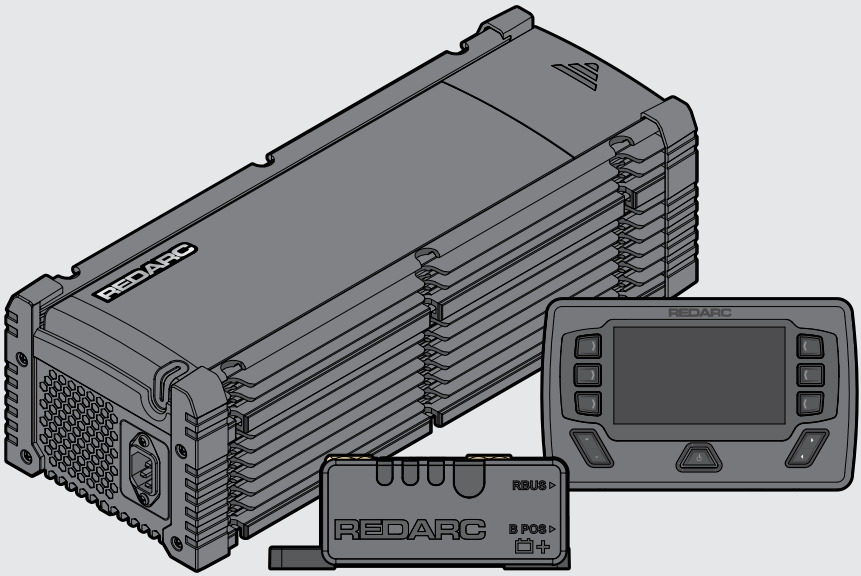
THE POWER OF REDARC®

The Manager Alpha®

MODELS:

- BMS12050
- BMS12075
- BMS12100



AUSTRALIAN MADE

INST333–5

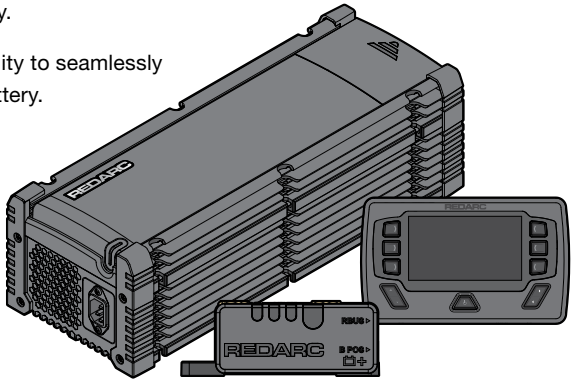
THE MANAGER ALPHA®

The Manager Alpha is a 50 A / 75 A / 100 A Battery Management System designed to achieve the best charge for an auxiliary battery using any combination of AC, alternator and solar inputs. The Manager Alpha charges all common 12 V automotive battery types including standard and heated lithium. The system allows for centralised monitoring of your setup in 4×4s, caravans, camper trailers, motor-homes, work vehicles, and trucks.

The Manager Alpha prioritises charging from solar before supplementing from the vehicle start battery or AC to lighten the load on your alternator, reduce AC energy consumed, and maximise the collection of free solar energy, with an option for excess solar energy to then top-up the vehicle start battery.

The Manager Alpha features the RedVision® Display with smartphone monitoring and the Smart Battery Monitor to provide optimal management of your auxiliary battery.

The Manager Alpha also features the capability to seamlessly revive and charge a fully flattened lithium battery.



GET THE FREE CONFIGURATOR APP

Configure the settings of your Manager using your smartphone via Bluetooth®.

GET THE FREE REDVISION® APP

Monitor your RedVision® System using your smartphone via Bluetooth®.

The Configurator App and the RedVision® App and their interactions with the Manager have not been tested on all smartphone models. Visit the application pages within each App store to view compatibility details.

CONTENTS

For the latest version of this document and any available translations, visit the product page on the REDARC website at www.redarcelectronics.com

IMPORTANT SAFETY INSTRUCTIONS

INSTRUCTIONS PERTAINING TO RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

SAVE THESE INSTRUCTIONS

This manual contains important safety instructions. Do not operate the system unless you have read and understood this manual. REDARC recommends that the Manager referenced in this manual be installed by a suitably qualified person.

Disclaimer: REDARC accepts no liability for any injury, loss or property damage which may occur from the improper or unsafe installation or use of its products.

SAFETY MESSAGE CONVENTIONS

Safety messages in this manual contain a signal word that indicates the level of the hazard, as follows:

⚠ **WARNING:** Indicates a potentially hazardous situation which could result in death or serious injury to the operator or to bystanders.

⚠ **CAUTION:** Indicates a potentially hazardous situation which may result in moderate or minor injury to the operator or to bystanders.

NOTICE: Indicates a situation that may cause equipment damage.

IMPORTANT SAFETY INSTRUCTIONS:

⚠ WARNING

When using this product, basic precautions should always be followed, including the following:

- **Read all the instructions before using the product.**
- **To reduce the risk of injury, close supervision is necessary when the product is used near children.**
- **Do not use the Manager if damaged or modified. Damaged or modified products may exhibit unpredictable behaviour resulting in fire, explosion or risk of injury.**
- **Do not operate the Manager with a damaged cord or plug, or a damaged output cable.**
- **Do not alter or disassemble the Manager under any circumstances. Take it to REDARC or a qualified service person when service or repair is required. Incorrect handling or reassembly may result in a risk of electric shock or fire and may void the Unit warranty.**
- **No user serviceable parts inside. Do not attempt servicing this product.**
- **RISK OF EXPLOSIVE GASES: Working in the vicinity of a Lead-Acid battery and Li-Ion technologies is dangerous. Batteries generate explosive gases during normal operation. For this reason, it is of utmost importance that you follow the instructions each time you use the charger.**
- **GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS — The Charger shall be grounded to reduce the risk of electric shock. The Charger is equipped with an electric cord having an equipment-grounding conductor and a grounded plug. The plug is to be plugged into an AC mains outlet that is properly installed and grounded in accordance with all local codes and ordinances.**
- **DANGER — Do not alter the AC cord or plug provided — If it does not fit in the AC mains outlet, have a proper outlet installed by a qualified electrician. Improper connection increases the risk of an electric shock. If the supply cord is damaged, it must be replaced by the genuine REDARC part available from the manufacturer or service agent.**
- **BATTERY SAFETY: Keep clear of naked flame, sparks and other sources of ignition. This may cause the battery to explode.**
- **The Auxiliary Battery output terminal of this charger should not be connected to the vehicle Start Battery.**
- **Connections to the Manager must be installed in the following order: Auxiliary Battery positive (+), Auxiliary Battery negative (–) (battery monitor), Ground, Start Battery positive (+), Solar, R-Bus cables then AC mains.**
- **Connections to the Manager must be disconnected in the following order: AC mains, R-Bus cables, Solar, Start Battery positive (+), Ground, Auxiliary Battery negative (–) (battery monitor), then Auxiliary Battery positive (+).**
- **When finished using AC mains, disconnect the power.**

⚠ CAUTION

1. This appliance is not intended for use by persons (including children under 8 years old) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance in a safe way by a person responsible for their safety and they understand the hazards involved. Children should be supervised to ensure that they do not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
2. Use of an attachment not recommended or sold by REDARC may result in a risk of fire, electric shock, or injury to persons.
3. The AC power connection must be connected to an earthed socket outlet. Do not use the Main Unit AC input if the cord is damaged. Use of a non-genuine or damaged AC input cord may result in a risk of fire, electric shock, or injury to the installer. If the supply cord is damaged, it must be replaced be an appropriate cord or assembly available from the manufacturer or service agent.
4. Only use the Manager for charging Standard Automotive Lead Acid, Lead Crystal, Calcium Content, Gel, Absorbent Glass Mat (AGM), Sealed Lead Acid (SLA), Deep Cycle, Heated or Standard Lithium Iron Phosphate ($LiFePO_4$) type 12 V batteries.
5. Make sure the settings at the Battery Setup menu on the Display are correct for the type of auxiliary battery under charge. Charging a battery with the wrong profile may cause the Manager to indicate a fault or give misleading results and cause injury to persons, damage to the Manager, the battery and/or property. Noticeable oscillations between Boost and Absorption stages are a possible indication of the wrong choice of battery type. Check and adjust battery type. If you are unsure of the battery type or settings to use, set to the Gel setting.

6. The Manager is intended to recharge batteries. The battery that is connected to this product is only suitable if it complies with the given battery standard for that battery type and if it is a battery based on Lithium technology, it is provided with a battery management system that will monitor and control the electrical and thermal health of the battery during charging. When installing, the battery is to be verified as in compliance with the applicable battery standard.
7. The Heated Lithium charging profile should only be used with lithium batteries that feature a functioning heating element. If unsure, the Standard Lithium charging profile must be used. Using the wrong charging profile may damage your lithium battery.
8. If the Manager Alpha's default input current rating exceeds, the spare capacity of the vehicle electrical system or alternator, reconfigure the "DC Current Limit" setting to be within available capacity.
9. Check the manufacturer's data for your battery and ensure that the 'Maximum' voltage of the profile you select does not exceed the manufacturer's recommended maximum charging voltage. If the 'Maximum' voltage is too high for your battery type, select a different profile.
10. Check the manufacturer's data for your battery and ensure that the Manager Alpha's 'Maximum Output Current' does not exceed the manufacturer's recommended maximum. If the 'Maximum Output Current' is too high for your battery, reduce it by configuring the "Max Charge" setting in the Configurator App or Display.
11. Cable and fuse sizes are specified by various codes and standards which depend on the type of vehicle the Manager is installed into. Selecting the wrong cable or fuse size could result in harm to the installer or user and/or damage to the Manager or other equipment installed in the system. The installer is responsible for ensuring that the correct cable and fuse sizes are used when installing the Manager. The fuse must be UL Listed / UL Recognized.
12. DO NOT attempt to charge non-rechargeable batteries with the Manager.
13. The auxiliary battery must be placed in a well-ventilated area when charging vented batteries.
14. Be extra cautious so as to reduce the risk of dropping a metal tool onto a battery. Doing so might cause the battery to spark or short-circuit the battery or other electrical parts that may cause an explosion.
15. REDARC recommends the AC supply cord (supplied with the Manager) be plugged directly into a suitable AC mains outlet without use of an extension lead. If an extension lead is required, REDARC recommends a minimum conductor size of 1.5 mm² and the extension be the shortest possible length, avoiding coiling any excess cable.

PERSONAL SAFETY PRECAUTIONS: To assist with the safe operation and use of the Manager:

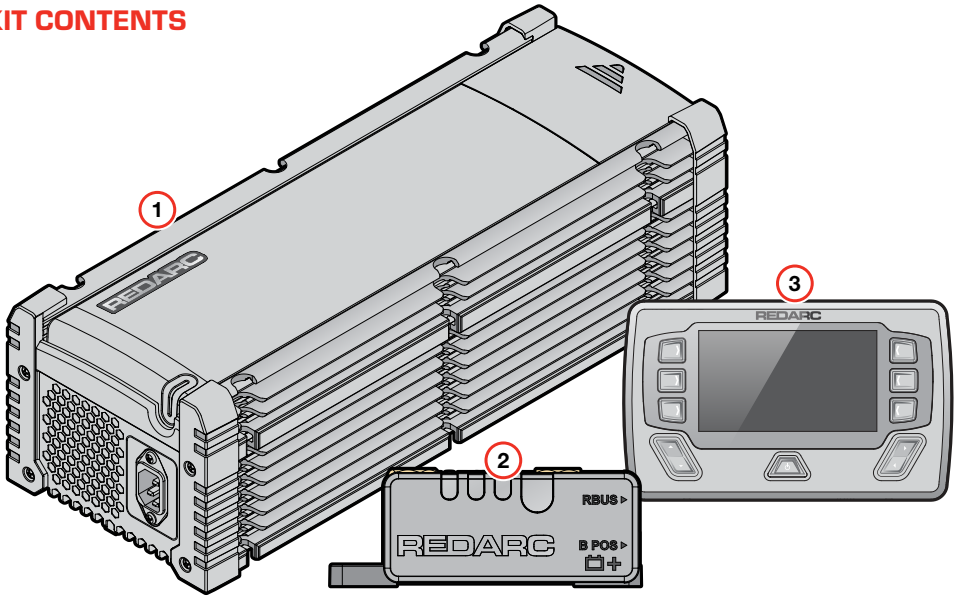
a. Consider having someone close by to come to your aid when you are installing the Manager.
b. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
c. Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
d. If battery acid contacts your skin or clothing, remove the affected clothing and wash the affected area of your skin immediately with soap and water. If battery acid enters your eye, immediately flood the eye with running cold water for at least 10 minutes and seek medical assistance immediately.
e. To improve user safety, it is recommended to control the Manager and monitor the charging process using the Display away from the vicinity of the battery being charged.
f. **HOT SURFACE:** High amperage loads connected to the Battery Monitor can cause the terminal/metal components to become extremely hot. To avoid burns, do not touch the hot parts without suitable personal protective equipment.

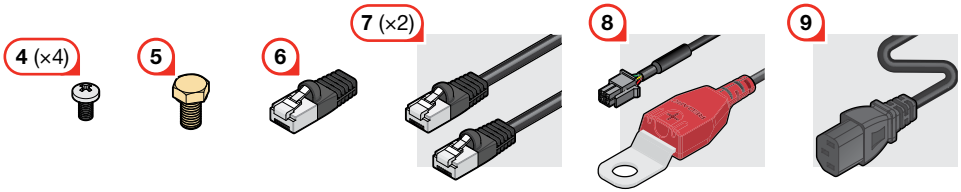
NOTICE

1. For correct operation, the start battery input to the Main Unit must be connected to the vehicle start battery and not directly to either an alternator or generator output.
2. DO NOT connect computers or IT equipment to the R-Bus inputs on the Manager. Damage may occur.
3. It is recommended to leave the Display and Battery Monitor connected to the Main Unit at all times.
4. When using the Manager in Storage Mode, it is recommended to have a valid charging source to maintain the battery at a healthy state of charge. If no charging source is present during extended storage periods it could lead to the battery being overly discharged and potentially cause damage to the battery or any loads connected.
5. A partially shaded solar panel (or a solar panel experiencing low-light conditions such as at dawn or dusk) may appear as an active source with minimal current being delivered from the solar panel. This is a normal situation, as a shaded solar panel will deliver a normal voltage with a very small amount of current. The battery may still be charged from other active sources.
6. Modification of the 'Advanced Settings' menu items affect the way the Manager responds to charging situations. Modification of these settings may result in the Manager not functioning at 100% of its capacity. These settings should only be modified if absolutely necessary and when the effects of the changes are fully understood.
7. It is the installer's responsibility to ensure their installation complies with any applicable legal and regulatory requirements. Within Australia and New Zealand, installers may wish to consult AS/NZS 3001 as one potentially relevant standard.
8. Keep the Manager away from major heat sources, high voltages, and avoid exposure to direct sunlight for long periods of time.
9. While REDARC makes every effort to test compatibility with commonly available system components, to guarantee optimal performance of the Manager Alpha REDARC branded batteries and solar products should be used.

MANAGER ALPHA OVERVIEW

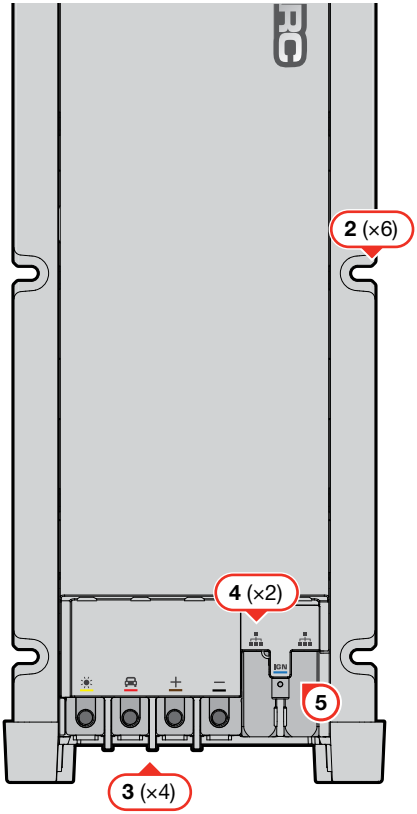
KIT CONTENTS

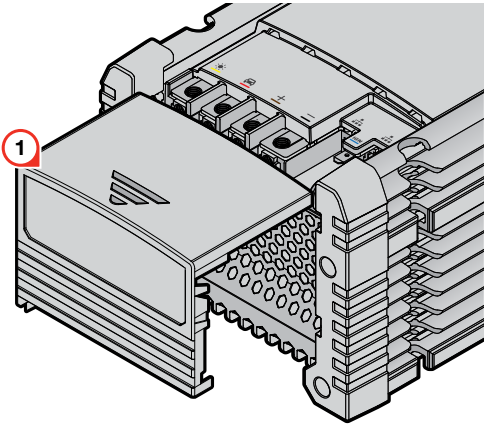


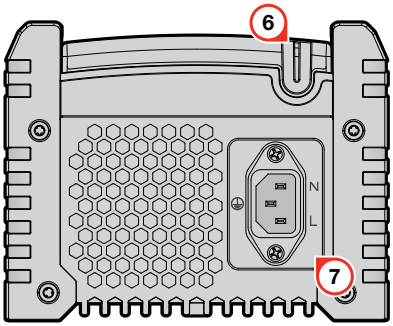


Ref.	Part Description	Qty.
1	**Main Unit**	1
2	**Battery Monitor**	1
3	**Display**	1
4	M6 × 12 mm Pan Head Fasteners (terminal fasteners in Main Unit)	4
5	M10 × 20 mm Alternative Terminal Bolt	1
6	R-Bus (RJ45) Terminating Resistor	1
7	R-Bus (RJ45) Cable, 2 m (6'6")	2
8	Battery Sense Lead, 1 m (3'3")	1
9	Mains Cable	1

PARTS OF THE MAIN UNIT







1. **Terminal Cover**

   Removable Cover (using a medium-sized (5 mm to 6 mm (3/16" to 1/4")) flat blade screwdriver) to protect cable connections (page 23).

2. **Mounting Points (×6)**

3. **Terminal Inputs/Outputs**

   Solar: Input terminal to allow unregulated, solar panel/s to charge the auxiliary battery (page 28).

   Start Battery: Input terminal to the vehicle's start battery positive (+) terminal (page 27).

   Auxiliary Battery: Output terminal to the auxiliary battery positive (+) terminal (page 24).

   Ground: Terminal to common ground (page 26).

4. **R-Bus Interface Input**

   Cable connections for the Display and Battery Monitor (page 30).

5. **Vehicle Ignition Input**

   IGN Input terminal to an ignition signal for vehicles with smart alternators (page 27).

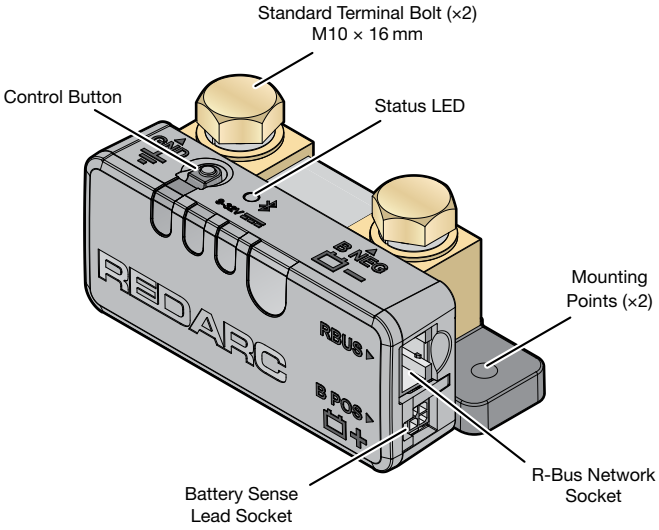
6. **Status LED**

   On start-up, the status LED will normally light up white, then red for a short period. If there are faults, the status LED will light up red and the Display will show the active faults (page 40).

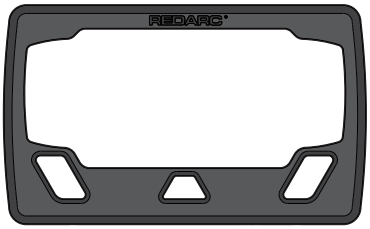
7. **AC Mains Socket**

   Allows AC Mains charging (page 32).

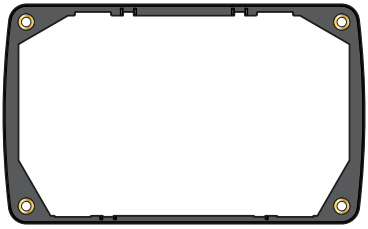
PARTS OF THE BATTERY MONITOR



PARTS OF THE DISPLAY



Bezel

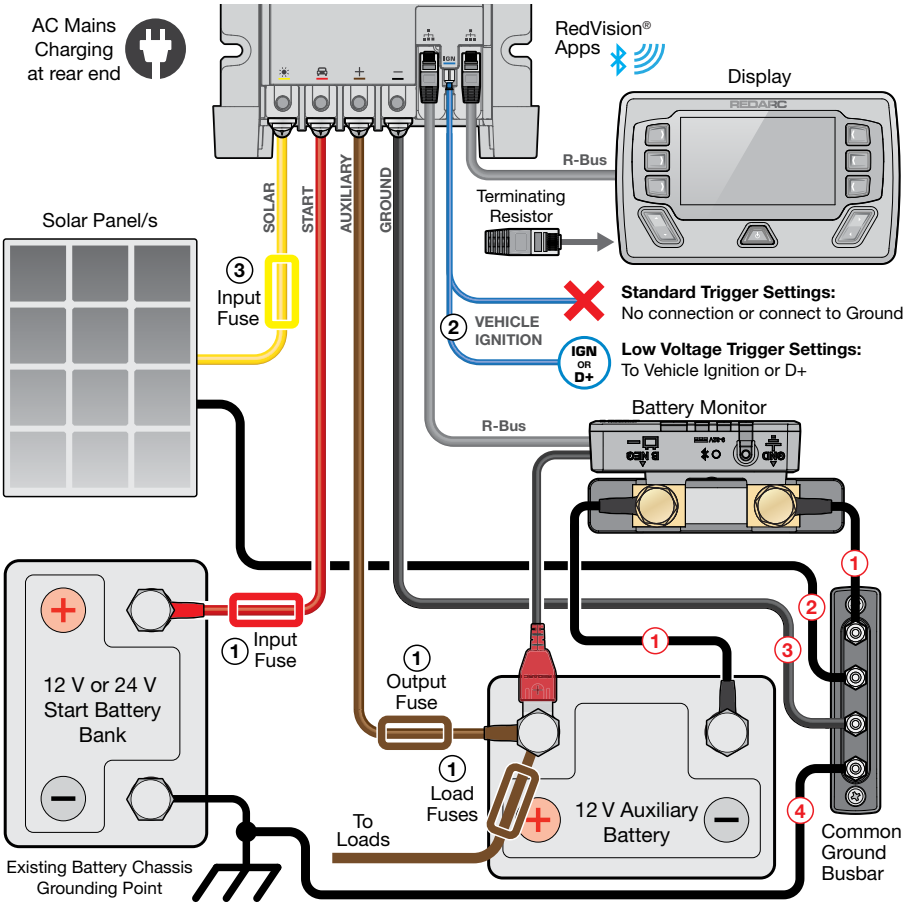


Spacer

The screen shown on the Display is an example only. The layout and appearance of the screen may vary depending on the Display software version and the devices on your system.

TYPICAL MANAGER SETUP

NOTICE: For correct operation, the Manager must be connected to the vehicle start battery and not to the alternator or generator output. The Battery Monitor must be the only connection made to the auxiliary battery negative (–) terminal and all loads must connect to the common ground. Ensure the common ground bus bar (if used) is also connected to the vehicle ground (or chassis) using a cable rated to take the highest current.



This wiring diagram shows a common/typical system configuration. If unsure, contact REDARC Technical Support for advice on your individual system requirements.

1. These fuses must be suitably rated for the cable gauge used. REDARC recommends the use of MIDI/MEGA type fuses (page 12).
2. If required, connect the **Vehicle Ignition** to D+ or ignition switched fuse in one of the vehicle's fuse boxes, located in either the engine compartment or vehicle cabin, see page 27.
3. To determine if an input fuse is required for **Solar**, refer to page 11 and page 29.

1. The Battery Monitor **Ground** and **Battery Negative** cable need to be able to carry the larger of the maximum capacity of the Manager 50/75/100 or the maximum current drawn by all connected loads.
2. The Solar common ground cable needs to carry current delivered from solar panel array.
3. The Common Ground cable from the Main Unit requires a cable size that can carry the maximum capacity of the Manager 50/75/100.
4. Cable size needs to carry the maximum capacity of the Manager 50/75/100. Connect to chassis earth point or chassis side of any vehicle current monitoring device. **Do not connect directly to the Start Battery negative (–) terminal.**

SYSTEM PLANNING

⚠ CAUTION:

- Cable sizes are specified by various codes and standards which depend on the type of vehicle the battery is installed in. Selecting the wrong cable size could result in harm to the installer or user and/or damage the Manager or other equipment installed in the system. The installer is responsible for ensuring that the correct cable sizes are used when installing the Manager.
- If undersized cables are used, overheating of cables could cause damage (including fire) and charging performance will likely be compromised.
- Wiring must be installed in protected areas away from heat sources and sharp objects. Cables must not be routed over or through moving parts of the vehicle. Additional protection such as conduit may be required, especially if routing cables through the engine bay and exposed areas.

WHAT YOU WILL NEED

TOOLS

The tools listed may be required for mounting and wiring the Manager:

- Screwdriver set
- Spanner set
- Power drill
- Medium-sized (5 to 6 mm (3/16" to 1/4")) flat blade screwdriver
- Pliers
- Side/Cable cutters
- Suitable cable lug crimping tool
- Heat gun

CONSUMABLES

Components not included with the Manager may be required for mounting, wiring connections and cable management, including:

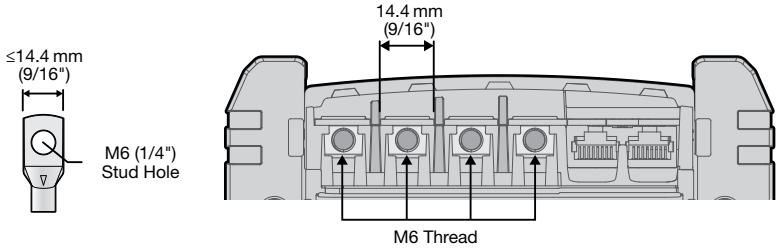
- Mounting fasteners
- Cables/wires
- Lug/Ring terminals
- Busbar/s
- Electrical tape
- Heat shrink
- Cable ties
- Conduit/Split tubing
- P-Clips

MAIN UNIT REQUIREMENTS

LUGS

⚠ CAUTION: Avoid using the top facing terminals, doing so may strain and damage the cables.

On the Main Unit, the **Auxiliary Battery**, **Ground, Start Battery** and **Solar** terminals have M6 screw threads. Select lugs for an M6 (1/4") stud hole and a cable barrel that suits the required cable gauge. Ensure that the lug tongues do not exceed the maximum dimensions shown below.



CABLE LENGTH AND GAUGE CONSIDERATIONS

Maximum Expected Currents

When selecting the **Auxiliary Battery**, **Ground, Start Battery** and **Solar** cable sizes for your installation, consider the maximum expected currents for each connection. The table below highlights the maximum current each cable connection can carry for each Manager model.

Terminal	BMS12050	BMS12075	BMS12100
Auxiliary Battery	50 A	75 A	100 A
Ground	55 A	82 A	110 A
Start Battery	55 A	82 A	110 A
Solar	55 A	82 A	110 A

Ground Cable

The **Ground** cable should be no longer than 2 m (6'7") in length and must be sized to conduct the full rated capacity of your Manager 50/75/100. Refer to 'Main Unit Cable and Fuse Selection' (page 12).

Auxiliary and Start Battery Cable

The **Auxiliary** and **Start Battery** cables must meet the following requirements:

- The **Auxiliary Battery** cable must be no longer than 2 m (6'7") in length.
- Both cables must be sized to conduct the configured maximum current of the auxiliary and start battery terminals.*
- Both cables must be fused for protection. Refer to 'Main Unit Cable and Fuse Selection' (page 12) fuse sizing and further information.

***NOTE:** The maximum current going into the auxiliary battery (**Max Charge Current**) and the maximum current drawn from the start battery (**DC Current Limit**) can be configured via the Display or the Configurator App see 'Setting Up the Display' (page 33) and 'Charger Settings' (page 35).

Do not re-configure the maximum currents above the cable gauge and fuse rating installed — consider using the End-User Lockout feature in the Configurator App (see 'End-User Lockout' (page 38)).

Solar Cable

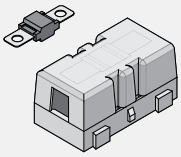
The **Solar** cable must be sized to conduct the short circuit current of your solar panel/s, regardless if it is below or greater than the Manager's maximum solar input current. For information on connecting multiple solar panels in your installation, refer to 'Connecting Multiple Solar Panels' (page 29).

NOTE: When connecting the Main Unit to a solar array, ensure the solar cable from the Main Unit to the solar array is double insulated for safe operation (and to comply with AS/NZS 3001.2).

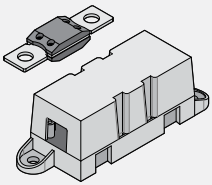
FUSING

Fuses are required for the **Auxiliary** and **Start Battery** connection and should be mounted within 150 mm (6") of the battery's positive (+) terminal.

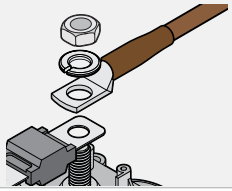
MIDI Fuse with Holder



MEGA Fuse with Holder



Fuse Assembly



MAIN UNIT CABLE AND FUSE SELECTION

Select cable sizes based on the maximum expected currents from the **Auxiliary Battery, Ground**, **Start Battery** and **Solar** cables. Appropriately sized fuses need to be selected for the **Auxiliary** and **Start Battery** connections to protect wiring.

The cable gauges in the table below allow for a safe charging performance and conduction of fault currents and is highly recommended to stay within the recommended cable sizes.

REDARC strongly recommends using good quality PVC V90 or XLPE insulated cables.

Expected Current	Fuse Rating *(REDARC Fuse Kit)*		One-way Length		Cross Sectional Area mm²	Cable Gauge (AWG / B&S)	Refer to NOTES
	Auxiliary Battery	Start Battery					
25 A	40 A (FK40)		0 – 2 m	0 – 6'7"	6	-	
			2 – 5 m	6'7" – 16'5"	7.7	8	
			5 – 12 m	16'5" – 39'4"	13.5	6	
40 A	50 A (FK50)	60 A (FK60)	0 – 5 m	0 – 16'5"	13.5	6	
			5 – 12 m	16'5" – 39'4	20.2	4	
50 A – 55 A	60 A (FK60)	70 A (FK70)	0 – 5 m	0 – 16'5"	13.5	6	1
					20.2	4	
			5 – 9 m	16'5" – 29'6"	20.2	4	
			9 – 12 m	29'6" – 39'4"	20.2	4	1
					26.6	3	
75 A – 82 A	100 A (FK100)	125 A (FK125)	0 – 5 m	0 – 16'5"	33.6	2	1, 3
					16	-	2
					53.4	0	3
			5 – 12 m	16'5" – 39'4"	33.6	2	1, 3
					25	-	2
					53.4	0	3
100 A – 110 A	125 A (FK125)	175 A (FK175)	0 – 9 m	0 – 29'6"	42.4	1	1, 3
					25	-	2
					85	3/0	3
			9 – 12 m	29'5" – 39'4"	42.4	1	1, 3
					35	-	2, 3
					85	3/0	3

NOTES:

1. This cable size is not capable of carrying the expected current in engine bay environments. Do not use this cable size for connections to components located in the engine bay (i.e. start battery cable).
2. Only use XLPE insulated cables (must be high temperature rated).
3. To allow the Manager to carry the expected current, a **step down assembly** is required for the lug to fit to the Main Unit in order to use the correct cable gauge.

NOTE: Vehicles with smart alternators may have a reduced charging current is the minimum specified cable gauge is selected for long cable lengths. To avoid this, you can use the next cable size up.

STEP DOWN ASSEMBLY EXAMPLES

Scan the QR code for cable step down assembly examples.

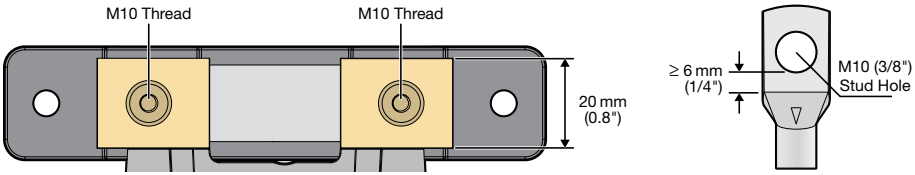
BATTERY MONITOR REQUIREMENTS

LUG REQUIREMENTS

The **Ground** (**GND** ⏚) and **Battery Negative** (**B NEG** ⊟ **–**) terminals on the Battery Monitor have M10 screw threads. Select lugs for a 10 mm (3/8") stud and a cable barrel that suits the required cable gauge.

The **Ground** (**GND** ⏚) terminal is capable of connecting multiple loads, for important lug requirements and instructions see page 25.

NOTE: If installing the lugs to the Battery Monitor terminals facing downwards, select a lug with a tongue that is long enough to cover the shunt surface. This is to ensure that there is no interference between the ramped section of the lug and the shunt. See page 32 for more information.



CABLE REQUIREMENTS

⚠ **CAUTION:** If undersized cables are used, overheating of cables could cause damage (including fire) and charging performance will likely be compromised.

Appropriate battery negative cables are required for the **Battery Negative** (**B NEG** ⊟ **–**) and **Ground** (**GND** ⏚) terminals on the Battery Monitor. These cables are used to connect the Battery Monitor to the auxiliary battery and to the common ground — see page 24 and page 25.

Battery Negative Cables

The **Battery Negative** cable should be no longer than 1 m (3'3") to minimise the voltage drop between the Battery Monitor and auxiliary battery. Refer to the table below to determine a suitable cable gauge for this connection based on the current your system has.

NOTE: Your auxiliary battery's negative connection is made via the **Battery Negative** (**B NEG** ⊟ **–**) terminal on the Battery Monitor.

IMPORTANT: The following table should be used as a reference only, considerations when selecting an appropriate cable for your installation include:

- Cable length
- Peak current draw
- Time spent at high current
- Environment ambient temperature

System Current	100 A	200 A	300 A	400 A	500 A
Maximum Cable Length	1 m (3'3")				
Recommended Cable Cross Section	35 mm²	70 mm²	95 mm²	120 mm²	150 mm²
Closest Equivalent AWG/BAE/B&S	2	3/0	4/0	250 kcmil	300 kcmil

CONSIDERATIONS PRIOR TO INSTALLATION

COMMON GROUND REQUIREMENTS

The Main Unit, Battery Monitor and all other components in your setup must share a common electrical ground point for correct system operation. This can be achieved by connecting all grounds to a common ground busbar or by a good quality connection to the vehicle chassis (if appropriate).

USING A COMMON GROUND BUSBAR

Consider the location of the busbar, ensuring it's mounted in a central location to avoid excessive cable lengths. The common ground busbar must be capable of carrying all current loads — see 'Typical Manager Setup' (page 9) for further information.

USING VEHICLE CHASSIS

Good quality electrical connections to a chassis can only be achieved if the connection is free of paint, protected against corrosion, and has a suitable fastener. The common ground must have a robust electrical connection to the battery earthing point.

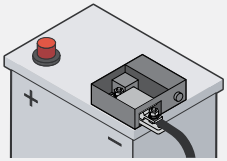
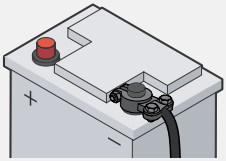
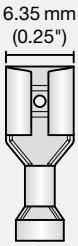
VEHICLE IGNITION REQUIREMENTS

Vehicle Alternator Type

If you have a variable-voltage (smart alternator) the **Vehicle Ignition** connection will be required for the Manager to function correctly. Identify the type of alternator your vehicle has by checking for a battery sensor on your vehicle's start battery as illustrated below.

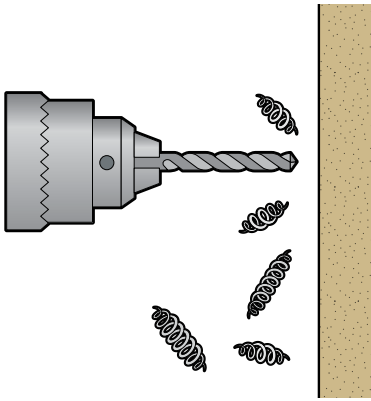
Connection Type

If a **Vehicle Ignition** connection is required for your installation, use a 6.35 mm (0.25") sized FASTON.

Vehicle Alternator Type		Connector Type
		
Battery Terminal with Sensor (Smart Alternator)	Regular Battery Terminal (Standard Alternator)	

MAIN UNIT SWARF BARRIERS

On the Main Unit there are four swarf barriers to prevent swarf, cable trimmings and other materials from entering the Main Unit during installation.



DURING INSTALLATION

DO NOT remove any of the barriers when mounting and wiring your system.

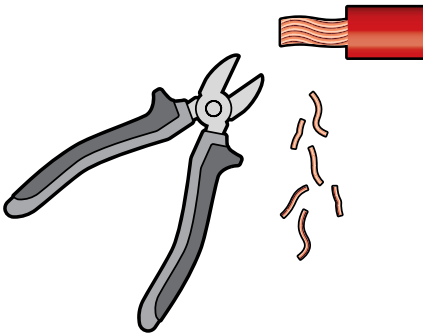
Metallic objects entering the Main Unit can cause permanent damage and may void the warranty.

AFTER INSTALLATION

Once the Main Unit and all other components in your system are fully installed, the barriers MUST be removed.

DO NOT operate the system until the barriers have been removed.

If the barriers are not removed before operating the system, this will affect the performance of the Manager Alpha and may void the warranty.

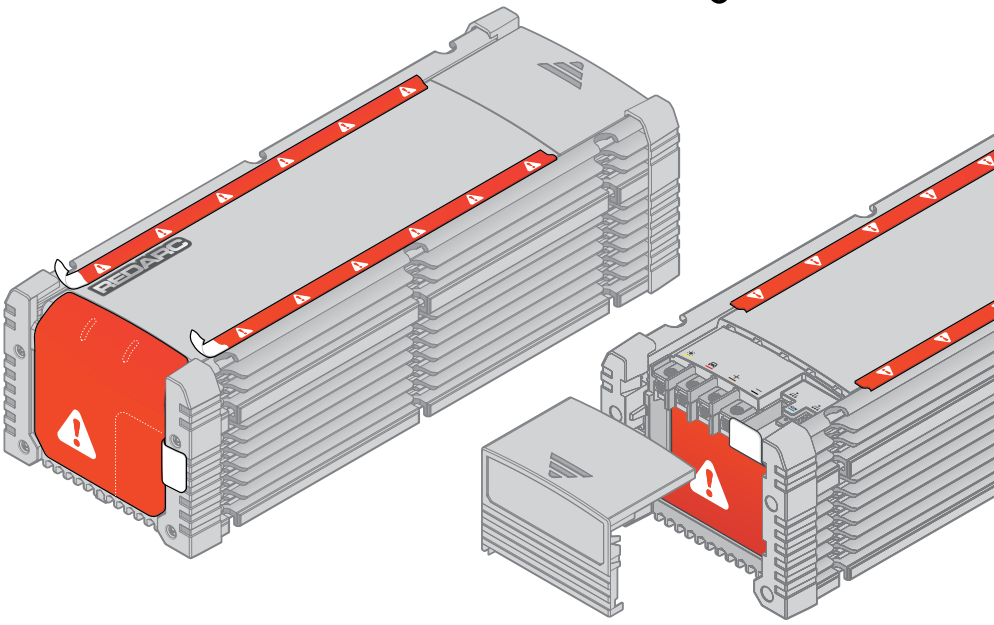


CARE AND MAINTENANCE

Throughout the life of the product, be cautious when conducting any work near the Main Unit that could create swarf or cable trimmings.

For the duration of the work, cover the Main Unit and take any precautions necessary to prevent swarf, cable trimmings and other materials entering the Main Unit.

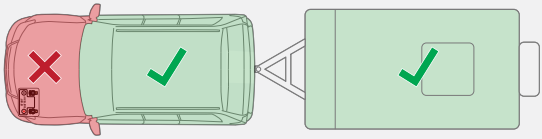
Do not use high pressure air to clear swarf and cable trimmings.



INSTALLATION — MOUNTING

GENERAL MOUNTING REQUIREMENTS

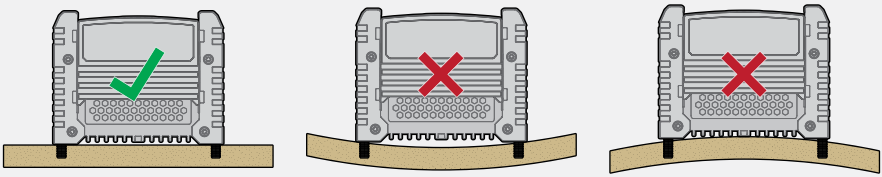
NOTICE: DO NOT install the Main Unit, Battery Monitor or Display in the engine bay. These parts are not rated to engine bay environment conditions.



The Main Unit, Battery Monitor and Display are only rated for indoor installations in any liveable areas of the vehicle or caravan/camper trailers.

- Avoid using excessive cable lengths by first testing that all cables will comfortably reach each component correctly in your setup.
- Mount in a location that is dry, clean and is not prone to high humidity. Liquid or condensation entering into the Main Unit, Battery Monitor and Display may cause irreparable damage.
- Mount the system to fixed surfaces that have adequate strength to support it when all connections and wiring are in-place. DO NOT mount on any moveable parts.
- The surfaces must be flat and safe to drill through — check the reverse side before drilling.
- Ensure there is adequate space around the Main Unit, Battery Monitor and Display for strain-relief, cable management and operation of the Manager (see page 31 for further information).
- **DO NOT mount the Main Unit, Battery Monitor and Display using adhesives or adhesive tape.**

Mounting to a flat surface



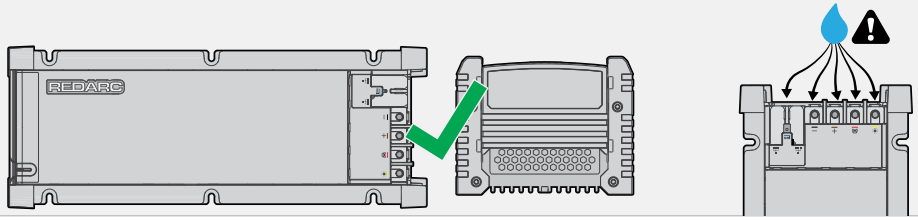
MOUNTING THE MAIN UNIT

MOUNTING POSITION

The Main Unit can be mounted in any orientation ensuring that the cables are routed with drip loops where required, see page 31 for more information.

The Main Unit should be mounted within 2 m (6'7") of cable length from the auxiliary battery.

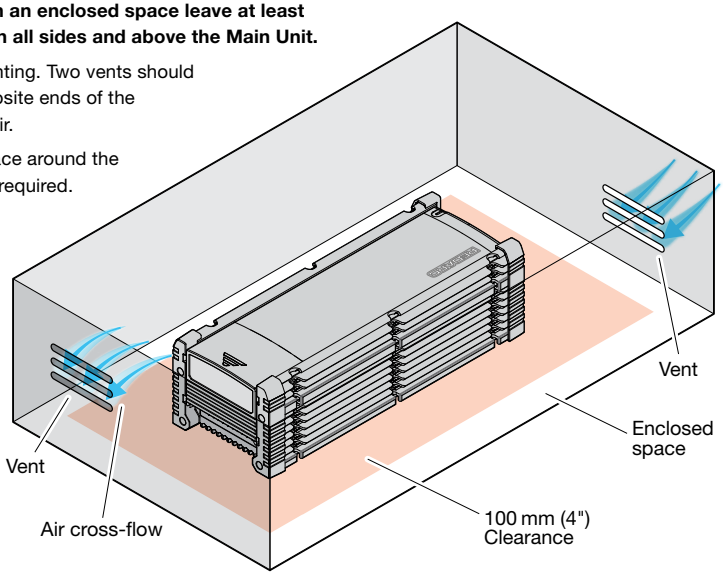
Main Unit mounting orientation



MOUNTING CLEARANCES

⚠ **HOT SURFACES:** The heatsink can reach high temperatures during operation. For this reason, the installer is responsible to **leave at least 10 mm (0.4") of clearance down the sides and 40 mm (1.6") at each end of the Main Unit** to allow for air-flow.

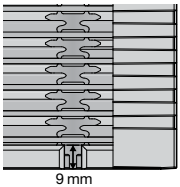
- **If installing the Main Unit in an enclosed space leave at least 100 mm (4") of clearance on all sides and above the Main Unit.**
- Ensure there is adequate venting. Two vents should ideally be positioned at opposite ends of the enclosure for cross-flow of air.
- Ensure there is sufficient space around the Main Unit to access it when required.

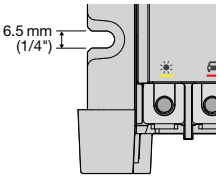


MOUNTING HARDWARE

All six Mounting Points must be used when mounting the Main Unit.

Ensure the selected fasteners are suitable for the mounting surface and there is clearance-fit through the Mounting Points on the Main Unit.

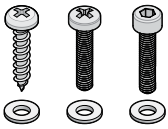




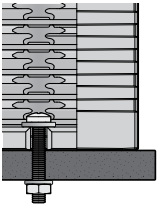
Use six M6 (1/4") bolts/screws with washers.

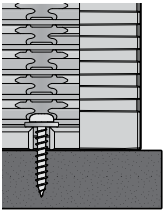
If using countersunk fasteners, apply countersunk washers to avoid damaging the Mounting Points.

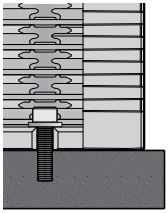
If mounting the Main Unit on a sheet metal panel, it is recommended to apply a load spreading material (i.e. mudguard washers) on the opposite side of the panel.



Recommended Fasteners
(not supplied)



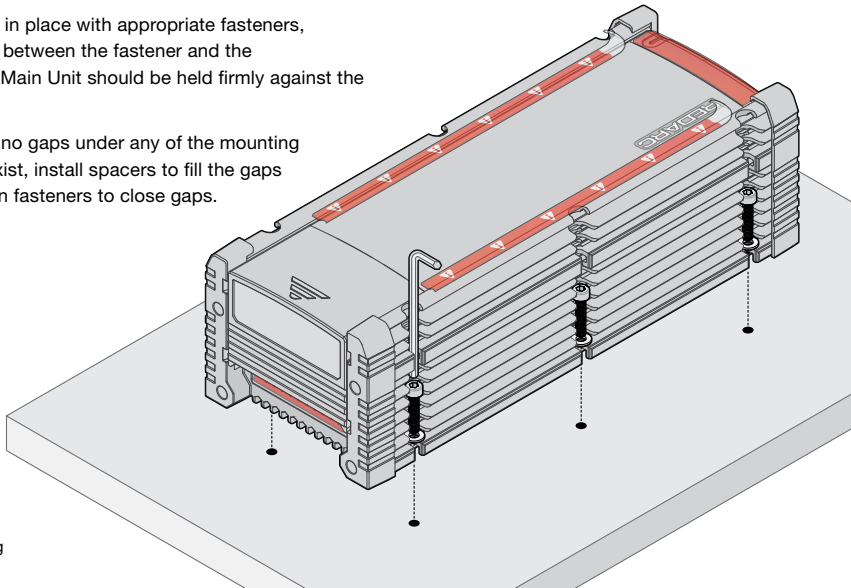




MOUNTING STEPS

⚠ **WARNING:** Use suitable Personal Protective Equipment (PPE) when operating power tools.

1. Confirm clearances around the Main Unit are adequate.
2. If clearance/pilot holes need to be drilled, place the Main Unit in its final position and mark the centre of each Mounting Point or use the template provided on the retail packaging.
3. Remove the Main Unit and drill the holes. De-burr the drilled holes and remove any swarf. Touch up any bare metal surfaces that have been exposed with a rust-inhibitor.
4. Fasten the Main Unit in place with appropriate fasteners, applying a washer in between the fastener and the Mounting Point. The Main Unit should be held firmly against the mounting surface.
5. Check that there are no gaps under any of the mounting points. If gaps still exist, install spacers to fill the gaps — do not over tighten fasteners to close gaps.

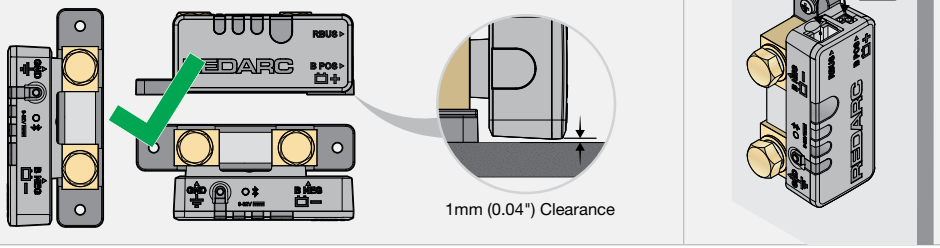


MOUNTING THE BATTERY MONITOR

MOUNTING POSITION

- DO NOT mount with the **RBUS** and **B POS** (+) sockets facing upwards, to prevent condensations/liquids from running into the Battery Monitor. The Battery Monitor can be mounted in any orientation.
- Ensure the main housing of the Battery Monitor is clear from any protrusions (1 mm (0.04") clearance).

Battery Monitor mounting orientation

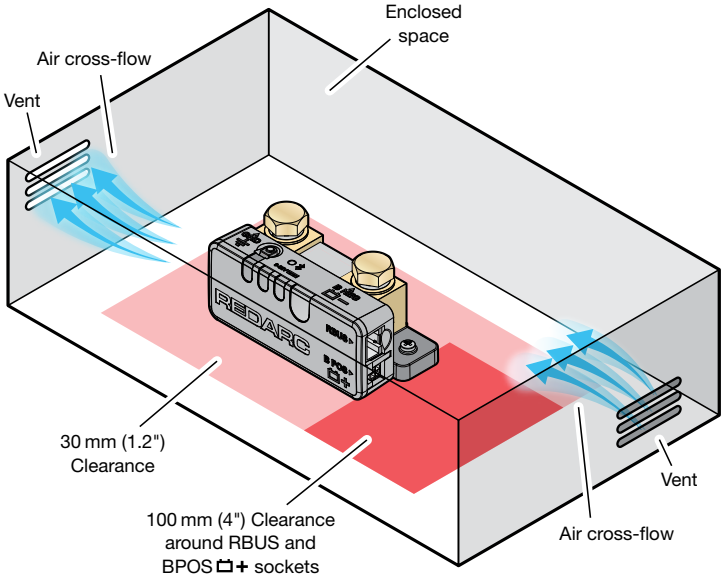


MOUNTING CLEARANCES

⚠ HOT SURFACE: High amperage loads connected to the Battery Monitor can cause the terminal/metal components to become extremely hot. For this reason, the installer is responsible to **leave at least 30 mm (1.2") of clearance on all sides and above the Battery Monitor** to allow for air-flow.

Leave at least 100 mm (4") of clearance around the **RBUS** and **B POS** (+) sockets to allow for R-Bus cable routing. This clearance also provides room for strain-relief and cable management once wiring is complete. See 'Strain-Relief and Cable Management' (page 31) for more information.

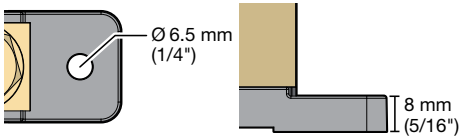
If installing the Battery Monitor in an enclosed space, two vents should ideally be positioned at opposite ends of the enclosure for cross-flow of air.



MOUNTING HARDWARE

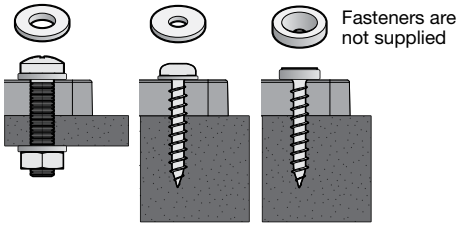
When mounting the Battery Monitor, both Mounting Holes must be used.

Ensure the selected fasteners are suitable for the mounting surface and there is clearance-fit through the Mounting Holes on the Battery Monitor.



Two fasteners are required for mounting the Battery Monitor. REDARC recommend using M6 (1/4") to M4 (#8) fasteners with washers.

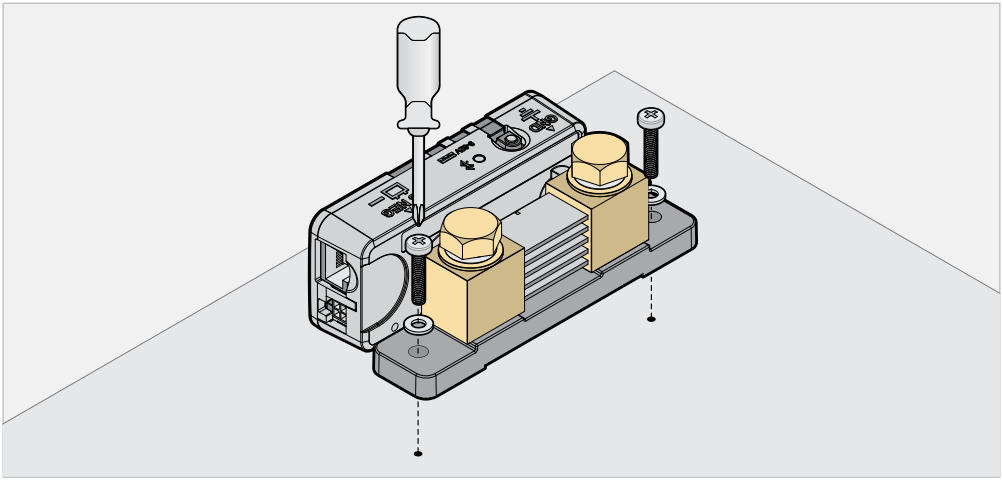
If using countersunk fasteners, apply countersunk washers to avoid damaging the Mounting Holes.



MOUNTING STEPS

⚠ **WARNING:** Use suitable Personal Protective Equipment (PPE) when operating power tools.

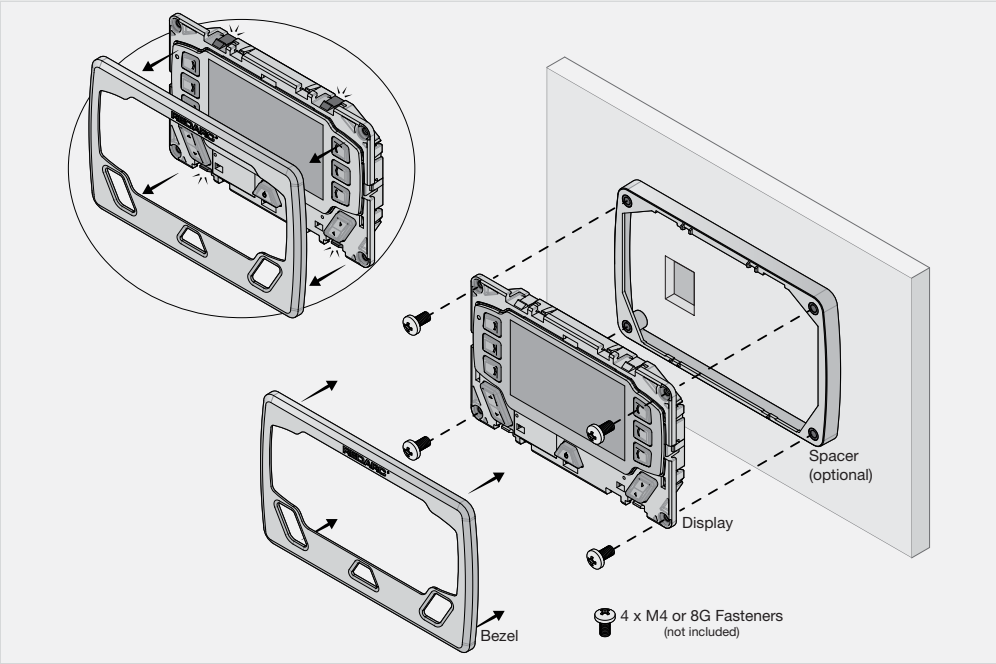
1. Confirm clearances around the Battery Monitor are adequate.
2. If clearance/pilot holes need to be drilled, place the Battery Monitor in its final position and mark the centre of each Mounting Hole.
3. Remove the Battery Monitor and drill the holes. De-burr the drilled holes and remove any swarf. Touch up any bare metal surfaces that have been exposed with a rust-inhibitor.
4. Fasten the Battery Monitor in place, applying a washer in between the fastener and Mounting Hole.



MOUNTING THE DISPLAY

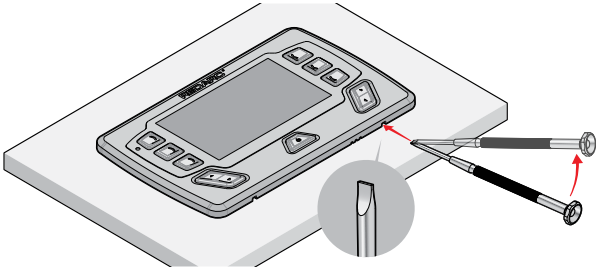
⚠ WARNING: Ensure that the Display is not mounted in vehicle head-impact zones. Doing so may result in injury to the driver and/or passenger in the event of an accident. Ensure the Display is not mounted where it may distract the driver of the vehicle. Distracting the driver may result in an accident.

- Mount in an orientation and location where the Display is accessible to use and is protected from harsh environments.
- The spacer may be required when the depth of the mounting surface is too shallow to accommodate for the R-Bus Interface cable or the surface is difficult to cut.
- To mount the Display, remove the bezel by gently lifting the four tabs located at the back of the Display. Use four suitable M4 fasteners to mount the Display using all four mounting points, then clip the bezel back to its original location.



REMOVING THE BEZEL

When necessary, the Bezel of the Display can be removed by lifting up the two tabs at the bottom and two at the top of the Display using a suitable flat head tool.



INSTALLATION — WIRING

⚠ WARNING: Do not make any cable and wiring connections when the vehicle ignition is on or the AC Power is connected, as there is a risk of personal injury, damage to the vehicle and auxiliary battery. Do not use the Manager AC input if the cord is damaged. The use of a non-genuine or damaged AC input cord may result in a risk of fire, electric shock, or injury to persons. If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or service agent. The AC Power connection must be connected to an earthed socket outlet.

⚠ CAUTION:

- Damage to cabling can cause failure of the Manager and vehicle electrical systems. Ensure cabling is clear of sharp edges or moving parts, and have enough slack to allow for flexing. REDARC recommend using cable ties and conduit or split tubing to manage cabling.
- Ensure the correct cable and lug size is used to suit the application. Selecting the wrong cable and lug size could result in harm to the installer or user and/or damage to the auxiliary battery or other equipment installed in the system. The installer is responsible for ensuring that the correct cable sizes are used when installing the Manager.

LUG AND HEATSHRINK ASSEMBLY

Before making any connections, assemble each cable with appropriate size lug using heatshrink as demonstrated below.

REDARC recommends using heatshrink as it protects the cable and lug connection from harsh environments, sharp cutting edges and abrasion.

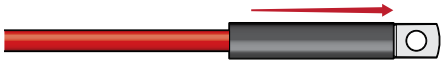
1. Slide the heatshrink over the cable.

2. Strip the end of the cable back enough to ensure the insulation does not enter the barrel of the lug when fully inserted.

3. Insert the stripped wires into the barrel of the lug.

4. Crimp the lug using the correct crimping tool.

5. Slide the heatshrink to partially cover the lug, leaving the lug tongue exposed.



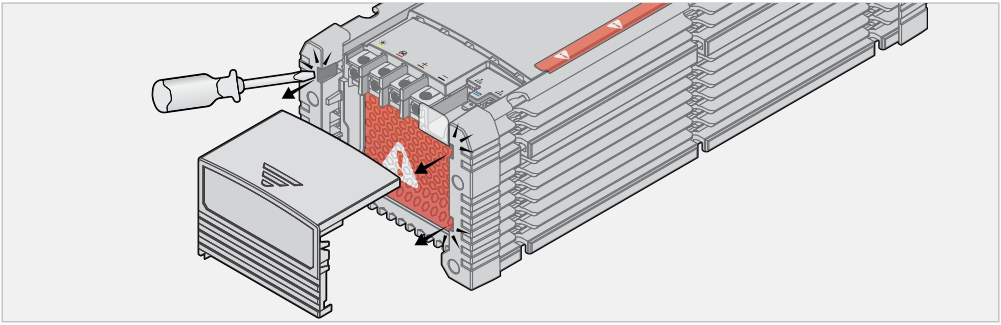
6. Shrink the heatshrink.

CONNECTIONS TO THE MAIN UNIT

REMOVABLE TERMINAL COVER

To remove the terminal cover from the Main Unit, use a medium-sized (5 to 6 mm (3/16 to 1/4")) flat blade screwdriver to insert into the four recesses and gently lever it out.

Avoid pulling or tugging on the terminal cover while levering, as this may damage the terminal cover clips.



LUG CONNECTIONS

Connect the cables to their corresponding terminals on the side of the Main Unit using the supplied fasteners.

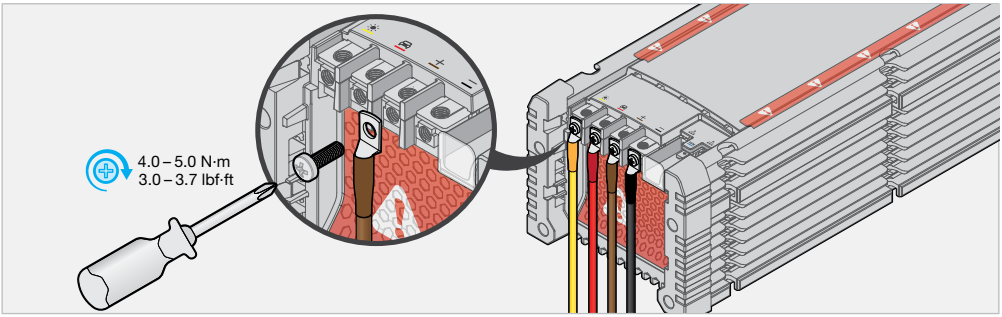
Secure using the supplied M6 Pan Head bolts and torque to 4.0 – 5.0 N·m (3.0 – 3.7 lbf·ft).

Enusre the connections to the Main Unit are made in the following order:

1. **Auxiliary Battery positive (+)**
2. **Auxiliary Battery negative (–) — Battery Monitor**
3. **Common Ground**
4. **Start Battery Positive (+)**
5. **Solar**
6. **R-Bus cables**
7. **AC Mains**

⚠ **WARNING:** Ensure of accurate torquing of the terminal screws. Over-torquing can cause damage to the terminal threads. Under-torquing leads to loose screws which can create a high-resustance connection that could overheat, damaging the Main Unit and wiring, or could cause a fire.

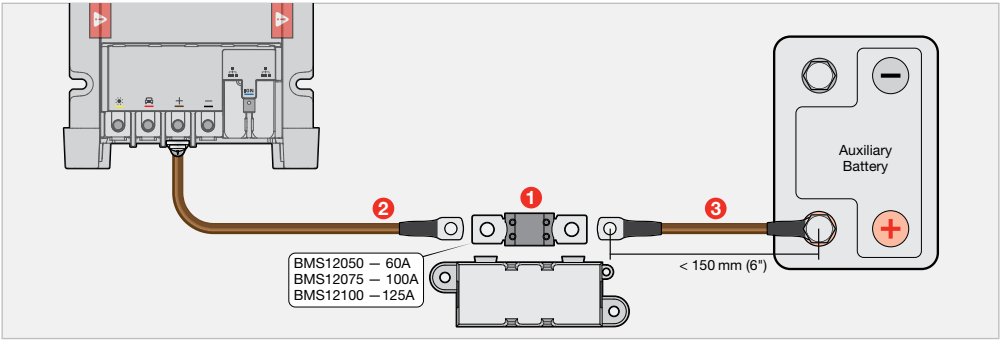
NOTICE: Do not use a rattle gun or impact driver when fastening lugs, as these could damage the terminals.



AUXILIARY BATTERY CABLE CONNECTION

Ensure there are no connections to the negative (–) terminal of your Auxiliary Battery before making any connections.

1. Mount a MIDI/MEGA fuse close to the auxiliary battery (no more than 150 mm (6") in cable length).
2. Connect the **Auxiliary Battery** cable from the Main Unit to one end of the fuse, ensuring that the cable length is no more than 2 m (6.6').
3. Connect a cable to the other end of the fuse and to the positive (+) terminal of the auxiliary battery.



BATTERY MONITOR CONNECTIONS

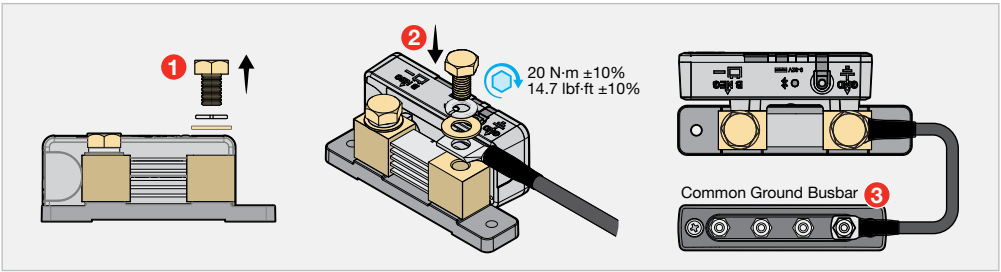
NOTICE:

- Apply the correct torque to the Terminal Bolts on the Battery Monitor. Over-torquing bolts may damage the terminals.
- DO NOT bottom-out the thread when fastening Terminal Bolts into the terminal, this may cause a poor electrical connection.

IMPORTANT: Only connect the Battery Sense Lead once ALL other wiring is complete.

GROUND (GND) CABLE CONNECTION

1. Remove the M10 Bolt and washers from the **Ground** (**GND** ⏚) terminal.
2. Align the lug stud hole with the terminal and fasten using the flat washer, spring washer and bolt. Torque to 20 N·m (14.7 lbf·ft).
3. Connect the **Ground** cable to a point that forms a common ground with all components in your setup. This can be achieved by connecting all grounds to a common ground busbar or by a good quality connection to the vehicle chassis (if appropriate).



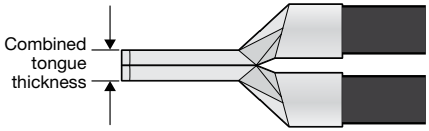
Connecting Multiple Loads

> ⚠ **CAUTION:** Do not use the Battery Monitor outside the recommendations below. Exceeding the recommendations could damage the Battery Monitor and/or other equipment installed in the system. The installer is responsible for ensuring the correct bolt size and **Ground** cable size is used.

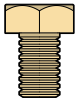
The Battery Monitor is capable of connecting multiple loads to the **Ground** (**GND** ⏚) terminal. Depending on your system setup, you may need to use the supplied Alternative Terminal Bolt (M10 × 20 mm). Refer to the table below to determine if this bolt is required. The lugs belonging to circuits with the highest currents should be closest to the Battery Monitor terminal.

Bolt Size (supplied)	**Combined Thickness of Lug Tongues**	
	Minimum	**Maximum**
Standard M10 × 16 mm	–	4 mm (5/32")
Alternative M10 × 20 mm	4 mm (5/32")	8 mm (5/16")

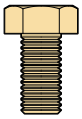
Lug thickness for Ground (GND⏚) Terminal



Lug side view



< 4 mm (5/32")
use Standard Bolt
(M10 × 16 mm)

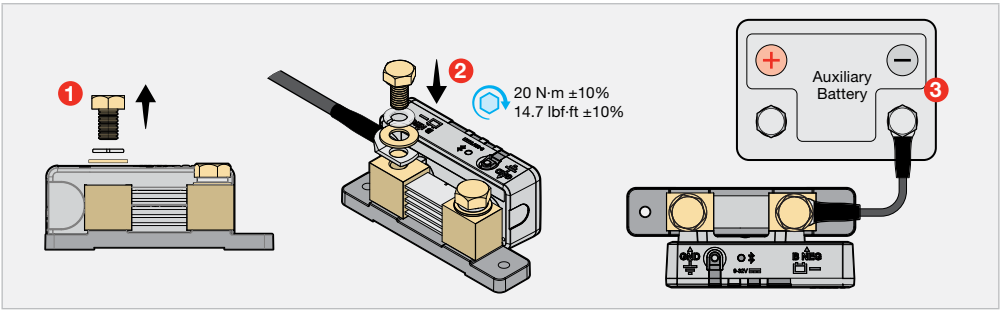


4 to 8 mm (5/32 to 5/16")
use Alternative Bolt
(M10 × 20 mm)

BATTERY NEGATIVE (B NEG) CABLE CONNECTION

1. Remove the M10 Bolt and washers from the **Battery Negative** (**B NEG** ⏍ **–**) terminal.
2. Align the lug stud hole with the terminal and fasten using the flat washer, spring washer and bolt **(2)**. Torque to 20 N·m (14.7 lbf·ft).
3. Connect the **Battery Negative** cable to the auxiliary battery negative (–) terminal using appropriate fasteners.

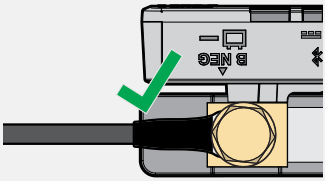
NOTE: The **Battery Negative** cable should not exceed 1 m (3'3") to minimise voltage drop between the Battery Monitor and auxiliary battery.



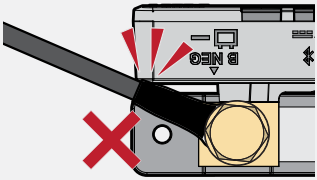
CORRECT LUG FITMENT

Hold the **Ground** and **Battery Negative** cables when torquing to avoid the cables touching the Battery Monitor Housing, this will prevent potential damage to the Battery Monitor.

Cable away from the Battery Monitor Housing



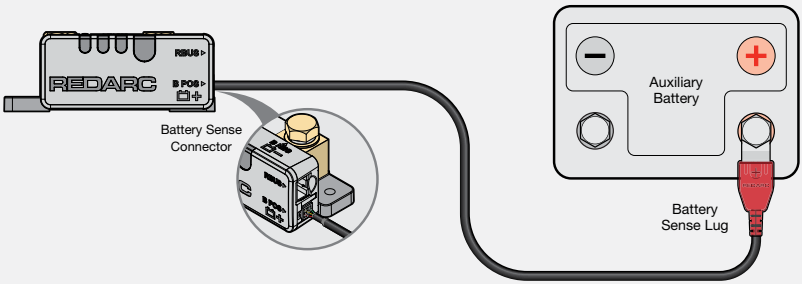
Cable touching Battery Monitor Housing



BATTERY SENSE LEAD CONNECTION

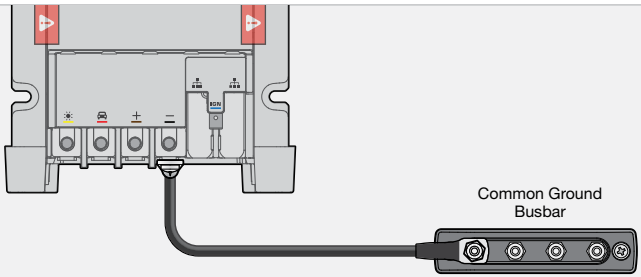
Insert the Battery Sense Connector on the Battery Sense Lead into the **B POS** (+) socket on the Battery Monitor. Then, connect the Battery Sense Lug to the auxiliary battery positive (+) terminal using appropriate fasteners to secure.

NOTICE: Do not fit the Battery Sense Lead between the auxiliary battery and lugs carrying high currents. Connect the lugs carrying high-currents to the auxiliary battery first, then add the Battery Sense Lug on top (last).



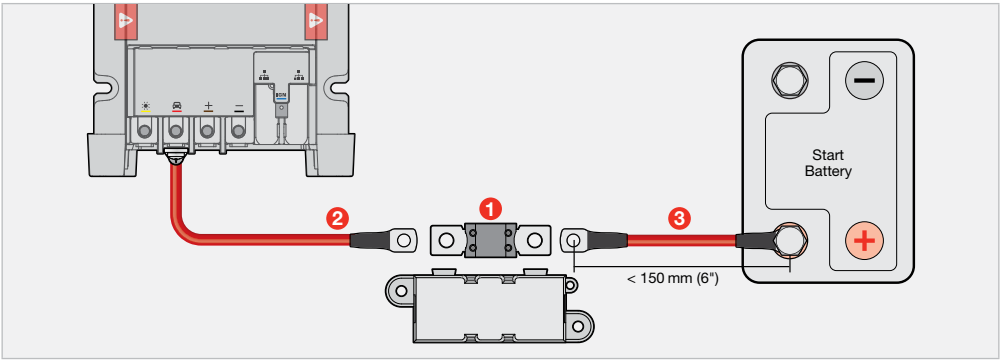
COMMON GROUND CABLE CONNECTION

The **Ground** cable must be connected to a ground point that forms a common ground with all components in your system. This can be achieved by connecting all grounds to a common ground busbar or by a good quality connection to the vehicle chassis (if appropriate).



START BATTERY CABLE CONNECTION

1. Mount a MIDI/MEGA fuse close to the start battery (no more than 150 mm (6") in cable length).
2. Connect the **start battery** cable from the Main Unit to one end of the fuse **(2)** — see page 12 for appropriate fuse sizing.
3. Connect a suitably sized cable to the other end of the fuse then to the positive (+) terminal of the start battery.



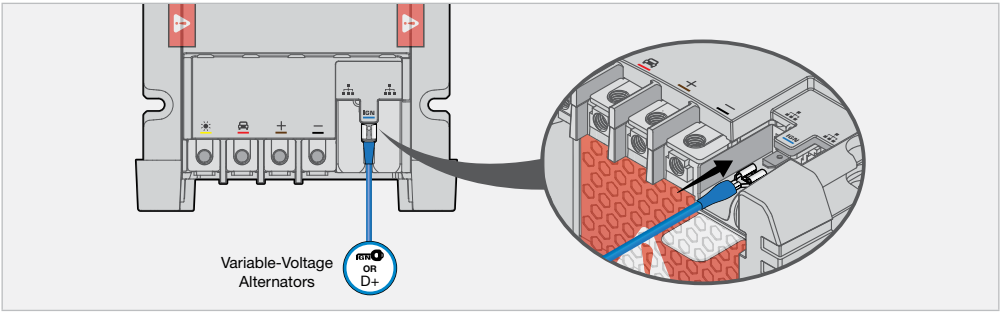
VEHICLE IGNITION CABLE CONNECTION

The vehicle ignition cable is used to enable charging from the start battery input with the ignition. This feature allows vehicles with variable-voltage alternators to trigger the DC Input (start battery). The correct DC Input Setting must be selected for your system via the Display in the 'BMS Settings' screen (see 'Charger Settings' (page 35)).

Depending on your vehicle's alternator type, connect the vehicle ignition cable:

- **Fixed-voltage alternator (standard alternator)** — do not connect.
- **Variable-voltage alternator (smart alternator)** — connect to a point that is live only when the ignition is turned on.
- **Idle-stop vehicles** — connect the vehicle ignition wire to D+ or engine-running signal.

Secure the **Vehicle Ignition** cable to the Manager by sliding the FASTON onto the vehicle ignition terminal. The FASTON should firmly attach to the Main Unit.



SOLAR PANEL/S CABLE CONNECTION

⚠ CAUTION: During the installation process, ensure that the panels are covered with an opaque material to prevent potentially dangerous voltages from inadvertently being generated.

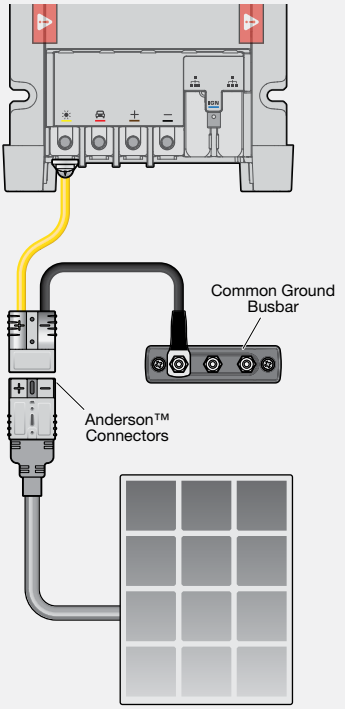
IMPORTANT: DO NOT connect solar panels that have inbuilt regulators or use a supplementary external regulator. The Manager has an inbuilt regulator that may not function correctly if regulated solar panels are connected.

The Manager 50/75/100 will always draw as much power as possible from solar and is capable of drawing power from multiple solar panels with large solar arrays, which can be configured in a combination of parallel connections. Ensure the open circuit voltage of the solar panel array is below the maximum solar input voltage rating of the Manager at minimum ambient temperature (see 'Electrical Specifications' (page 43)). See 'Connecting Multiple Solar Panels' (page 29) when connecting more than two solar panels in your system.

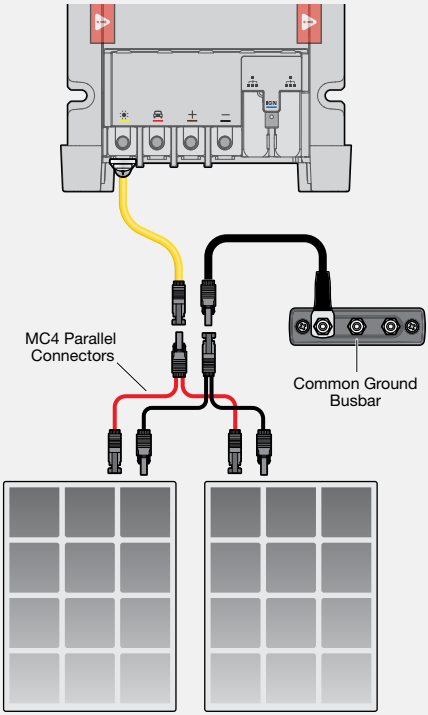
When connecting 1–2 solar panels it is important the solar connection meets the following requirements:

- The solar panel ground is connected to a common ground point (i.e. common ground busbar).
- The solar cable gauge is capable of carrying the combined short circuit capacity of both panels.

Connecting with Anderson™ example



Connecting with MC4 Connectors example



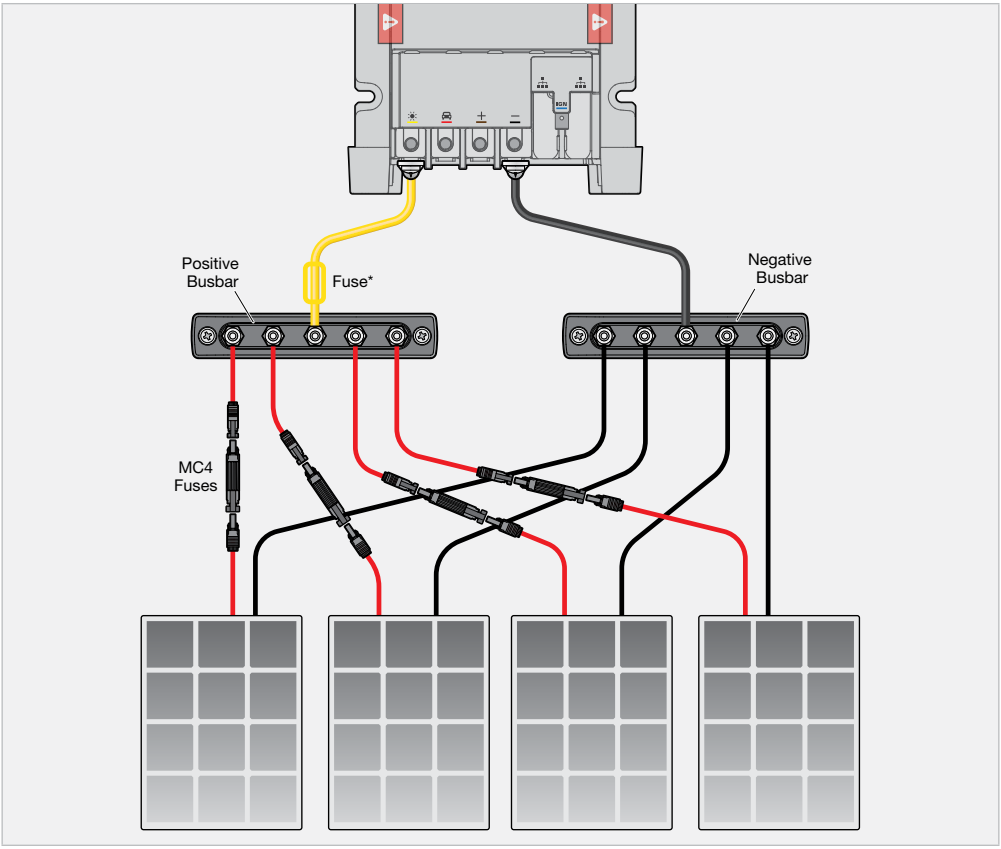
CONNECTING MULTIPLE SOLAR PANELS

When connecting more than 2 solar panels in parallel, it is important the solar connection meets the following requirements:

- If connecting multiple solar panels to the Manager ensure they are all the same, to ensure correct operation and best performance of the system.
- The solar panel ground is connected to a common ground point (i.e. common ground busbar).
- A positive busbar or fuse box is used to connect all panels in an array.
- Each panel is fused to protect against overcurrent faults and is appropriately sized to each panel's short circuit current capacity. Each fuse rating must be no more than 1.5 × of the short circuit current capacity of the panel it's protecting.
- The solar cable gauge is capable of carrying the combined short circuit capacity of the solar panel array, regardless of the maximum solar current rating of the Manager (see page 43).*

  ***NOTE:** A cable gauge not capable of carrying the combined short circuit capacity of the panels can be used as long as it's sized greater than the maximum solar current rating of the Manager and is protected by a suitably rated fuse.

- Busbars and fuse boxes must be capable to withstand the environment conditions of their mounting location. When selecting junctions and fuses for the solar array, ensure they are double insulated and DC PV rated for safe operation (and to comply with AS/NZS 3001.2).



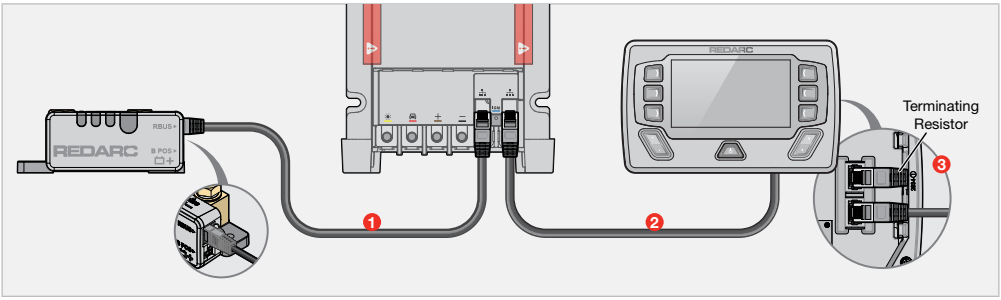
R-BUS CABLE CONNECTION

NOTICE: Do not connect computers or IT equipment to R-Bus sockets. This may damage internal components in the Battery Monitor and Display.

CONNECTING THE BATTERY MONITOR TO THE MAIN UNIT

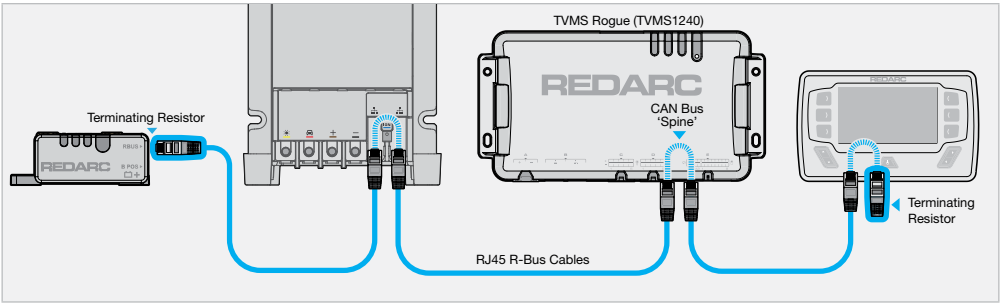
1. Using one of the supplied R-Bus cables, connect one end of the cable to the RBUS socket on the Battery Monitor. Then, connect the other end of the cable to either of the R-Bus sockets on the Main Unit.
2. Connect one end of the other supplied R-Bus cable into the RBUS socket located at the back of the Display. Then, connect the other end of the cable to either of the R-Bus sockets on the Main Unit.
3. Insert the supplied Terminating Resistor into the other RBUS socket at the back of the Display. This will complete the R-Bus daisy-chain — see below 'About Terminating Resistors'.

NOTE: Leave a minimum of 100 mm (4") of clearance around the R-Bus sockets on the Battery Monitor and Display to allow for routing of the R-Bus cable.



ABOUT TERMINATING RESISTORS

The R-Bus system connects devices in a continuous daisy-chain network. Terminating Resistors must be present at each end of the daisy-chain to complete the R-Bus system. The Battery Monitor has its own built in terminating resistor.



REMOVE SWARF BARRIERS

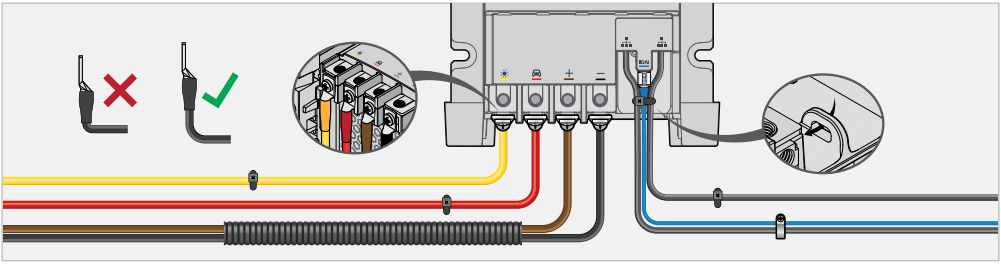
Once the installation is complete remove the four swarf barriers from the Main Unit before configuring and operating the Manager Alpha.

STRAIN-RELIEF AND CABLE MANAGEMENT

⚠ **CAUTION:** Wiring must be installed in protected areas away from heat sources, sharp objects and parts of the vehicle that move during operation or maintenance. Additional protection such as conduit may be required, especially if routing cables through the engine bay or exposed locations.

PROTECT AND SECURE THE CABLES

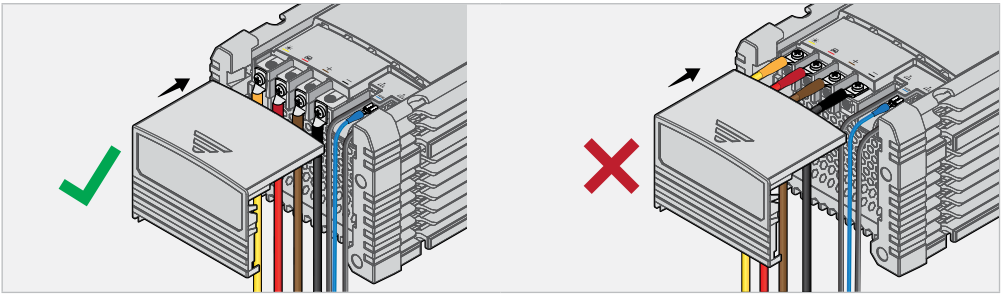
- Allow for strain-relief for cables, ensuring cables are not pulled or stretched tightly. This can cause damage or allow the terminating fasteners to become loose and affect the performance of the Main Unit.
- To avoid connections becoming loose, secure all cables to a fixed point close to the Main Unit, Battery Monitor and Display (ideally within 200 mm (8")). Cable ties, cable clips and P-clips are recommended.
- Flexible conduit can be used to manage and protect bundled cables.
- A cable tie can be used to secure the two R-Bus Interface cables and the vehicle ignition cable.



TERMINAL COVER

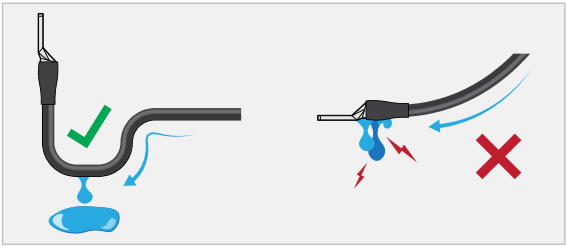
⚠ **CAUTION: Avoid using the top facing terminals, doing so may strain and damage the cables.**

The terminal cover provided with the Main Unit helps protect the terminal connections and is required to be fitted onto the Main Unit once all lug connections have been made. See 'Removable Terminal Cover' (page 23) for removal instructions.



PREVENTING WATER ENTRY

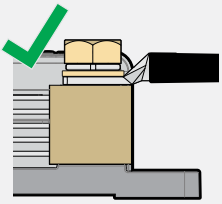
Ensure that cables are routed with drip loops where required, this is to prevent moisture from running down the cables into the Main Unit, Battery Monitor and Display.



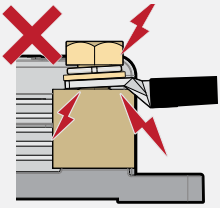
BATTERY MONITOR CABLE MANAGEMENT

IMPORTANT: Ensure lugs are fastened firmly against the top face of the terminal. Loose lugs will have a bad electrical connection, causing inaccurate readings from the Battery Monitor, and can result in damage to the wiring and Battery Monitor.

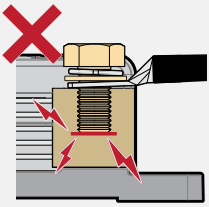
Good Connection



Loose Connection



Lug tongue facing downwards and is not long enough to fasten flush to the shunt.



Do not use the longer Alternative Terminal Bolt if it is too long and causes a loose connection.

AC MAINS CHARGING

⚠ WARNING: GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS — The charger shall be grounded to reduce the risk of electric shock. The charger is supplied with an electric cord having an equipment-grounding conductor and a grounded plug. The plug is to be plugged into a mains outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER — Do not alter the AC cord or plug provided — If it does not fit in the AC mains outlet, have a proper outlet installed by a qualified electrician. Improper connection increases the risk of an electric shock. If the supply cord is damaged, it must be replaced by the genuine REDARC part or assembly available from the manufacturer or service agent.

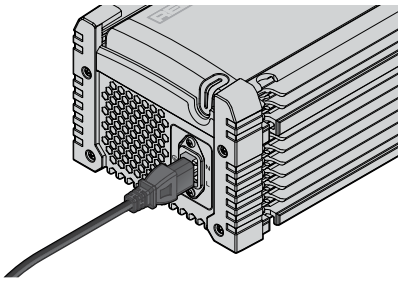
To reduce risk of damage to power cords, do not operate the product with the AC Mains Cable coiled as the cord may overheat.

When finished using AC mains, disconnect the power.

⚠ CAUTION: The connection to the mains supply shall be in accordance with the national wiring rules.

REDARC recommends the AC supply cord (supplied with the Manager) be plugged directly into a suitable AC mains outlet without use of an extension lead. If an extension lead is required, REDARC recommends a minimum conductor size of 1.5 mm² and the extension be the shortest possible length to avoid coiling any excess cable.

- Ensure that the supplied AC Mains Cable is not coiled and is secured in place when using to charge.
- Ensure the AC Mains Cable is not damaged or degraded.
- Use only on AC inputs within specifications (see 'Main Unit Specifications' (page 42)).



DISPLAY USER GUIDE

REDVISION DISPLAY USER GUIDE

For RedVision system / Display operation instructions, refer to the supplied RedVision Display User Guide.

Scan the QR code to download the RedVision Display User Guide.

SETTING UP THE DISPLAY

1. After connection and starting up, press the Soft Key on the Display to proceed.
2. In the **Battery Settings** screen, use the Left/Right Buttons (◀/▶) and Up/Down Buttons (▲/▼) to configure your battery settings:

   ***Chemistry —** Set the chemistry of your auxiliary battery.

   ***Capacity (Ah) —** Configure the capacity of your auxiliary battery.

   ***Max Current (A) —** Set the maximum charge current going into the connected auxiliary battery.

   SOC Alarm (%) — Set the State of Charge Alarm. When your auxiliary battery state of charge goes below this configured value, the Display will alert you.

   Voltage Alarm (V) — Set the Voltage Alarm. When your auxiliary battery voltage goes below this configured value, the Display will alert you.

   Once completed, press the Soft Key, to confirm the battery settings.
3. In the **Date and Time** screen use the Up/Down Buttons (▲/▼) and Left/Right Buttons (◀/▶) to set the date and time. Once complete, press the Soft Key.

*Refer to the manufacturer's specifications of your auxiliary battery when configuring.

CALIBRATING

When the battery is first connected, the system will start a calibration process to determine the State of Charge (SoC) of the battery. This will continue until the battery is fully charged. REDARC recommends connecting the Main Unit to AC Mains to fully charge the auxiliary battery before applying heavy loads.

SYSTEM SETTINGS

System Settings allows for modification of the current operating mode as well as providing information on the system and previous fault history.

SYSTEM MODE

The **System Mode** setting lets you set the Manager to operate in **Storage** or **Touring Mode**.

Touring Mode

Use when 'on the road' for correct operation. In this mode the Manager will monitor the auxiliary battery and detect certain faults, including short circuit, over current and over voltage.

Storage Mode

Use for medium to long term storage of the system. In this mode the charger will keep your auxiliary battery at the optimum long-term level. The charger will also conduct periodic maintenance on the auxiliary battery including battery tests, desulphation, and equalisation depending on your configured battery type.

If **Start Battery Charge** mode is enabled, the Manager will also keep your start battery topped up at a float level during Storage Mode.

When in **Storage Mode**, it is recommended to have a valid charging source to maintain the battery at a healthy state of charge — this is achievable by using AC Mains or solar. Alternatively, disconnect all loads from your auxiliary battery and check on your system periodically.

NOTE: If the Manager is set to Storage Mode, it will automatically switch to Touring Mode once it senses an increase in input voltage from the start battery input.

BMS INFORMATION

The BMS Information screen provides information on charge stage, current flow, Stage of Charge (SoC), solar input and battery status.

MANAGER INPUTS

Displays live voltage and where the charging source is coming from, solar, DC or AC.

STATE OF CHARGE LOGS

Using the Left/Right Buttons the screen shows the SoC over the last 24 hours and the maximum and minimum SoC per day over a 30 day period.

SOLAR POWER INPUT LOG

Using the Left/Right Buttons the screen shows the Solar Power generated per day over a 7 day period.

CHARGER SETTINGS

The Charger Settings enables modification of the Main Unit's operation and function.

BATTERY INFORMATION

Displays and allows for alternation of the battery type and size of the connection battery.

NIGHT MODE

The Night Mode function enables you to disable the fan in the Main Unit when charging your auxiliary battery. The Night Mode function can also be configured using the Configurator App.

Note that while Night Mode is active and the fan is disabled, the charger output current may decrease when required in order to maintain optimal internal temperature of the Main Unit.

BMS SETTINGS — DC INPUT

The **BMS Settings** is used to configure the **DC Input Trigger** and **DC Current Limit** of your setup.

DC Input Trigger

Dictates the vehicle start battery turn on/off voltage of the Manager (ensure vehicle ignition cable requirements are met based on your alternator type — see page 27). REDARC recommends selecting either '12 V' or '24 V' DC Input Trigger for a standard vehicle system. Below defines each DC Input Trigger setting:

NOTE: Start Battery Charge and Recovery Mode is only available for 12 V vehicle batteries and requires the DC Input Trigger to be set to either 'Auto' or '12 V' mode.

- **Auto —** automatically detects if the start battery is 12 V or 24 V and operates within the 12/24 V parameters explained below. Suitable for most vehicle alternators.
- **12 V —** for a 12 V vehicle system and prevents the Main Unit from going into 24 V mode.
- **24 V —** for a 24 V vehicle system and prevents the Main Unit from going into 12 V mode.
- **Ignition —** for non-standard systems between 9 V and 32 V.
- **Always On —** for systems utilising a dual battery isolator or other non-standard systems between 9 V and 32 V.

Vehicle Input Trigger Setting		Vehicle Ignition Cable Connected	Alternator Type	Start Charging when ABOVE	Stop Charging when BELOW
Auto	12 V	No	Standard	12.9 V	12.7 V
		Yes	Smart*1	12.0 V	11.9 V
	24 V	No	Standard	25.8 V	25.4 V
		Yes	Smart*1	24.0 V	23.8 V
Ignition		Yes	Non-standard Systems	9.1 V	9.0 V
Always On		Ignored	Non-standard Systems	9.1 V	9.0 V

DC Current Limit

Sets the maximum current drawn from the start battery positive terminal to be at or below the maximum capacity of your Manager 50/75/100. Ensure this reflects the start battery cable gauge selected for your install, refer to 'Main Unit Cable and Fuse Selection' (page 12).

START BATTERY CHARGE MODE

When configuring the Manager via the Configurator App, the **Start Battery Charge** Mode can be set On/Off (see page 37 for Bluetooth pairing instructions). When your auxiliary battery is fully charged this allows the Manager to begin charging the vehicle's start battery automatically using energy from solar and AC sources.

When in this Mode, the Manager delivers up to 25 A to the start battery (unless the DC Current Limit is configured below 25 A) and aims to charge the start battery up to 12.8 V.

NOTE: Start Battery Charge Mode is only available for 12 V vehicle batteries and requires the DC Input Trigger setting on the Display or Configurator App to be set to either 'Auto' or '12V' mode.

MONITORING START BATTERY CHARGE MODE

To monitor the Start Battery Charge progress via the Display, use the Right Arrow Button (▶) to navigate to the **BMS Information** screen, then press the Soft Key, this will direct you to the **Start Battery Charge** screen.

START BATTERY RECOVERY MODE

Start Battery Recovery Mode is a manually initiated feature to use power from your auxiliary battery to jump start your start battery in the event of a flat battery. Once the 15 minute cycle has completed you should be able to start the vehicle. The start battery input on the Manager will be disabled for 5 minutes after a full start battery recovery cycle to allow the alternator to restore your start battery to a healthy state of charge.

When in this Mode, the Manager delivers 50 A to the start battery (unless the DC Current Limit is configured below 50) and aims to charge the start battery up to 14.6 V.

NOTE: Start Battery Recovery Mode is only available for 12 V vehicle batteries and requires the DC Input Trigger setting on the Display or Configurator App to be set to either 'Auto' or '12V' mode.

TURNING START BATTERY RECOVERY ON VIA THE DISPLAY

1. In the RedVision® Display, use the Right Arrow Button (▶) to navigate to the **BMS Information** screen, then press the Soft Key.
2. In the **Start Battery Recovery** screen, press the Soft Key.
3. To confirm, press the Soft Key.

When the Manager is in start battery recovery mode, navigate to the **Start Battery Recovery** screen to monitor the current going into the start battery.

To monitor the Start Battery Recovery progress via the Display, use the Right Arrow Button (▶) to navigate to the **BMS Information** screen, then press the Soft Key, this will direct you to the **Start Battery Recovery** screen.

SYSTEM CONFIGURATION

PAIR THE CONFIGURATOR APP TO THE DISPLAY

Once the Manager installation is complete, it can be configured using the RedVision® Configurator App which connects to the system via the RedVision® Display. The App defines the behaviours of each device for your installation — this is important to make sure the system operates correctly and safely.

Once configured, test the system to make sure it is operating safely and correctly.

GET THE REDVISION® CONFIGURATOR APP

The Configurator App and its interactions with the Manager have not been tested on all smartphone models. Visit the application pages within your App store to view compatibility details.

NOTICE

- The Configurator App allows modification to the core functionality of your RedVision® system. Only use this app if you have read and fully understand all instructions in this manual.
- If a TVMS is installed in your system, ensure that the channel and master override switches are turned Off after use to prevent accidental operation of the channel and flattening of the auxiliary battery.

PAIRING INSTRUCTIONS

1. Download the RedVision® Configurator App and make sure Bluetooth® is enabled on your smartphone.
2. On the RedVision® Display, use the Left Arrow Button (◀) to navigate to the setting screens, then use the Up/Down Buttons (▲/▼) to navigate to the **Display Settings** screen.
3. Press the Bluetooth® Soft Key to enter into the **Bluetooth® Pairing Ready** screen.
4. Open the Configurator App and allow the required permissions if it's the first time using the App. Then, in the **Config System** screen, press the **Read Device** button and select the system that matches the Product Serial Number on the Display.
5. Enter the Passcode shown on the Display screen into the input field on your smartphone, then tap **Pair**. Once the Display is successfully connected, the Configuration Main Menu in the App will open.

CONFIGURE THE MANAGER

1. In the Configurator App, press the **Read Device** button and select the system that matches the Product Serial Number on the Display.
2. Under the Configurator Name heading, enter in a suitable name for your device.
3. The configured battery settings from the Display will appear on your smartphone. Configure any additional settings to suit your system setup, once completed, tap **Save**.

   NOTE: The RedVision® User Interface settings do not require configuring unless you have a TVMS installed in your system (refer to the TVMS manual for more information).
4. Once your system has been configured, in the Configurator App press **Program**.
5. In **Config System** screen in the App, re-select the system that matches the Displays Product Serial Number. Do not exit the Configurator App until the success banner appears on your smartphone.
   Once this occurs the Bluetooth Configuration is complete.

EDIT A CONFIGURATION

1. Open the RedVision® Configuration App. From the list, choose the configuration you want to edit.
2. Edit the configuration as required to suit your RedVision® system — remember to tap **Save**.
3. Once all changes have been made, press **Program**.

FAILED TO CONFIGURE

If the Programming process fails, repeat the steps again before contacting REDARC. If it continues to fail, contact REDARC directly or your local REDARC Distributor.

END-USER LOCKOUT

The Manager allows you to add an Installer PIN (personal identification number) to prevent end-users from changing the configuration of their RedVision® system. This is to avoid safety hazards if the system is reconfigured in an unsafe way by persons who do not fully understand the important system requirements.

IMPORTANT: By adding an Installer PIN, the saved configuration cannot be edited without entering the correct PIN. DO NOT forget the PIN.

ADD AN INSTALLER PIN

1. Open the RedVision® Configuration App. From the **Config System** screen, select the configuration you want to add an installer PIN to.
2. Tap the **Setting Icon** at the top of the right screen, then select **Add Installer PIN** from the pop-up list.
3. Type a 4 to 8 digit PIN into the **New PIN** field, then retype it in the **Confirm new PIN** field. Tap **Add**.
   The PIN will now have to be input in order to make any changes to the locked configuration.
4. To save the Installer PIN into the system, press **Program**.

REMOVE THE INSTALLER PIN

1. Open the RedVision® Configurator App.
2. From the **Config System** screen, select the configuration you want to remove the Installer PIN from.
3. Tap the **Settings Icon** at the top right of the screen, then select **Remove Installer PIN** from the pop-up list.
4. Type the PIN into the **Current PIN** field, then tap **Remove**.

PAIR THE REDVISION® APP TO THE DISPLAY

The RedVision® App gives you remote access to the Manager functions and features including battery level monitoring, system and input source monitoring, system diagnostic, and firmware update notifications.

GET THE REDVISION® APP

The RedVision® App and its interactions with the Manager have not been tested on all smartphone models. Visit the application pages within your App store to view compatibility details.

PAIRING INSTRUCTIONS

1. Download the RedVision® App and make sure Bluetooth® is enabled on your smartphone. Note, some smartphones also require location services to be enabled.
2. On the RedVision® Display, use the Left Arrow Button (◀) to navigate to the setting screens, then use the Up/Down Buttons (▲/▼) to navigate to the **Display Settings** screen.
3. Select the Bluetooth® Soft Key to enter into the **Bluetooth® Pairing Ready** screen.
4. In the App, tap the **Menu Icon**. Under the **Devices** heading, tap the Add icon **+**.
5. Nearby Devices will appear in the list. If no devices appear, tap **RESCAN** to try again.
6. Select the system that matches the Product Serial Number on the Display. Read and accept the disclaimer.
7. Accept the pairing request (if applicable), then enter the Passcode shown on the Display and tap **Pair/OK**.
8. Once your smartphone is successfully paired, it will display the RedVision Home screen. When first pairing to a new system, the Home screen can take several minutes to appear while the App learns your system configuration. Subsequent connections will be much quicker.

SUBSEQUENT CONNECTIONS

Once a smartphone has been paired with the RedVision® Display, it will automatically reconnect to the previously connected system, if you want to change between systems, tap the **Menu Icon** at the top right, then select from the list of known systems.

PAIR MULTIPLE SMARTPHONES

The Redvision® Display can be paired to multiple smartphones, however it can be monitored/controlled by one smartphone at a time. When the RedVision® App is minimised on one smartphone, the RedVision® App can be opened on another smartphone and will connect automatically if it has previously been paired.

To pair another smartphone, repeat the steps 'Pair the RedVision® App to the Display'.

CARE AND MAINTENANCE

- Periodically check that all connections are firm, and all cables are adequately managed. Parts of the system may have moved from repeated vibration, particularly if the vehicle has been travelling on uneven/corrugated road surfaces.
- Look for signs of damage or wear along the cables especially parts of the cable around connections, through glands, or against surfaces — replace if damaged.
- Do not use solvents, alcohol or domestic cleaning products to clean the Main Unit, Battery Monitor and Display. If sand, girt, or dirt accumulate on the devices, wipe it clean with a slightly damp cloth.
- Do not allow the devices to come into contact with corrosive substances.

TROUBLESHOOTING

GENERAL TROUBLESHOOTING

If you experience any of the problems listed below, follow the recommended actions in order until the problem is resolved — all steps may not be needed to resolve the problem.

The Status LED on the Main Unit is flashing or solid White.
The Status LED will flash white when power is first drawn to the Main Unit and when performing a firmware update. If the Status LED is flashing or solid white outside of this and the Main Unit is not charging, contact REDARC directly or your local REDARC Distributor.

The Status LED on the Main Unit is flashing or solid Red.
There is a fault. Check your Display for more information, or refer to 'Faults' (page 41) for more information to identify and resolve the fault.

The RedVision Display will not connect to the RedVision App / Configurator App.
In the event of the Display failing to connect to your smartphone, complete the following steps — all steps may not be required to resolve the problem.

1. Make sure the smartphone is within 5 m (16'5") of the RedVision® Display.
2. Check Bluetooth® is enabled on your device.
3. In the RedVision® App, click the **Menu Icon** to navigate to the list of devices, locate your Display and delete it.
4. In your smartphone's Bluetooth® settings, remove the Display from your Bluetooth devices list.
5. Unplug all R-Bus Cables from the Display and then reconnect them again.
6. Switch off and re-start your smartphone.
7. Re-pair the Display and your smartphone.

Delete all Display Pairings.

1. On the RedVision® Display, use the Left/Right Buttons (◀/▶) to navigate to the **Display Settings** screen.
2. Press the Bluetooth® Soft Key to enter into the **Bluetooth® Pairing Advertising** screen.
3. Press the Delete Soft Key then press the Soft Key to confirm that you want to clear all paired devices.

FAULTS

The Status LED on the Main Unit, Display and the RedVision® App on your smartphone indicate when there is a Fault in your system.

If the Status LED on the Main Unit flashes Red and there is no fault indicated on the Display and RedVision® App, there is a communication fault in the R-Bus system.

COMMUNICATIONS FAULT

In the event of a communication error, the RedVision® App, Configurator App and Display will be unable to communicate with the Main Unit and Battery Monitor.

To resolve, complete the following steps before directly contacting REDARC or your local REDARC Distributor.

1. Check all R-Bus (RJ45) cables to make sure they are securely connected to the correct interfaces on the Main Unit, Display and Battery Monitor and are free of damage.
2. Confirm that terminating resistors are fitted at each end of the R-Bus 'daisy-chain' (note that the Battery Monitor has an inbuilt terminating resistor). See 'About Terminating Resistors' (page 30) for further information.

FURTHER ASSISTANCE

For further assistance, scan the QR code or visit the Resources page of the REDARC website to access common frequently asked questions (FAQs) and troubleshooting tips for the Manager Alpha.

www.redarcelectronics.com/au/resources

Alternatively, contact REDARC Tech Support or your local REDARC Distributor.

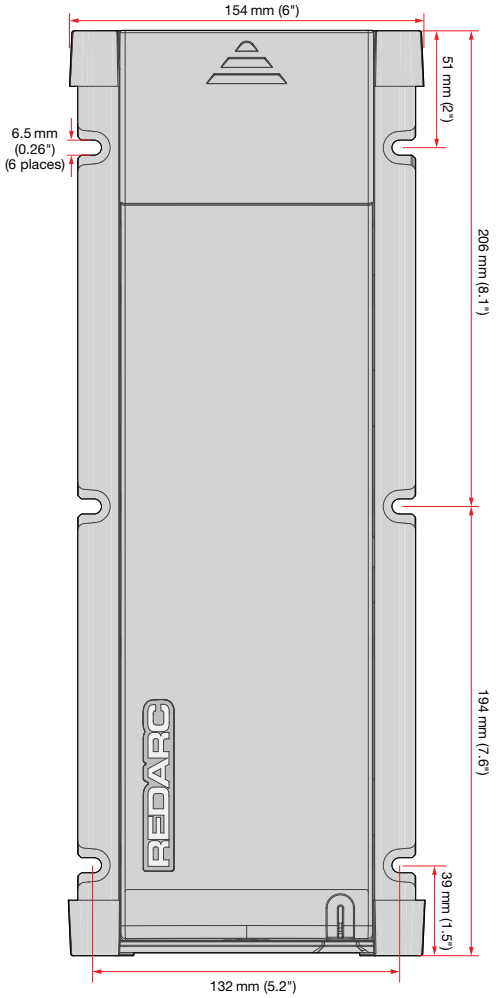
REDARC Tech Support: 1300 REDARC (733 272)

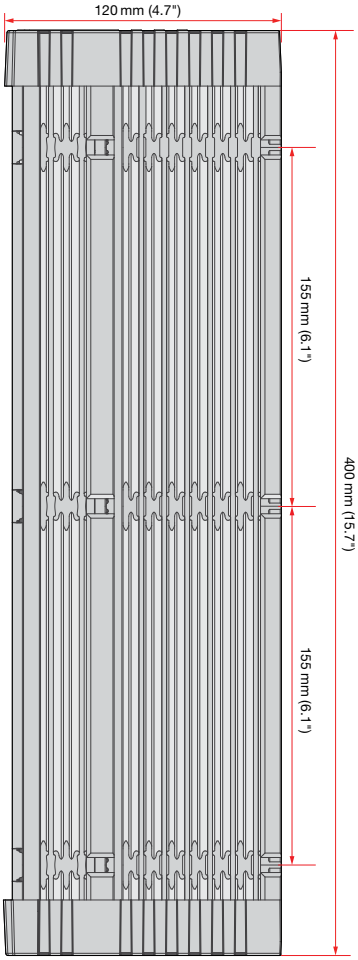
SPECIFICATIONS

Specifications are subject to change without notice.

MAIN UNIT SPECIFICATIONS

	BMS12050	BMS12075	BMS12100
Main Unit Weight	5.8 kg (12.8 lbs)	6.0 kg (13.2 lbs)	6.1 kg (13.4 lbs)
Main Unit Dimensions	400 × 154 × 120 mm (15.7" × 6" × 4.7")		





ELECTRICAL SPECIFICATIONS

	BMS12050	BMS12075	BMS12100
Nominal Current Rating	50 A	75 A	100 A
Operating Temperature		–20°C to 60°C (–4°F to 140°F)	

Start Battery Input

Voltage Range		9 – 32 VDC ⎓	
Maximum Input Current	55 A	82 A	110 A

Solar Input

Voltage Range*1		9 – 32 VDC ⎓	
Maximum Input Current	55 A	82 A	110 A
Maximum Array Size	1000 W	1500 W	2000 W

AC Mains Input

AC Input Power	230 VAC ∼, 50 Hz	950 W	1400 W	1800 W
	120 VAC ∼, 60 Hz,	950 W	1200 W	1200 W
Voltage Range			95 – 264 VAC_{rms} ∼ (45 – 65 Hz)	
Maximum Input Current			10 A_{rms} ∼	

Output

Nominal Output Voltage		12 V	
Voltage Range		9 – 16 VDC ⎓	
Maximum Output Current	50 A	75 A	100 A
Recommended Battery Capacity	50 – 625 Ah	75 – 940 Ah	100 – 1250 Ah
Maximum Output Power	800 W	1200 W	1600 W

Maximum Volts @ Battery Terminals (25°C / 77°F)

	Storage Mode	Touring Mode	Float
Gel / AGM	14.2 V	14.2 V	13.3 V
Calcium	16.0 V	15.0 V	13.3 V
Standard Lead Acid	15.5 V	14.6 V	13.3 V
Heated and Standard Lithium	14.2 V	14.2 V	13.6 V

Thermal Specifications

Battery Type	Charging Temperature Range
AGM / Calcium / SLA / Heated $LiFePO_4$*2	–25°C to 60°C (–13°F to 140°F)
Gel / Standard $LiFePO_4$	0°C to 60°C (32°F to 140°F)

Temperature Compensation

SLA / AGM / Gel / Calcium Setting	0°C < –30 mV/°C < 60°C (32°F < –17mV/°F < 140°F)
$LiFePO_4$ Setting	40°C < –70 mV / °C < 60°C (104°F < –39 mV/°F < 140°F)

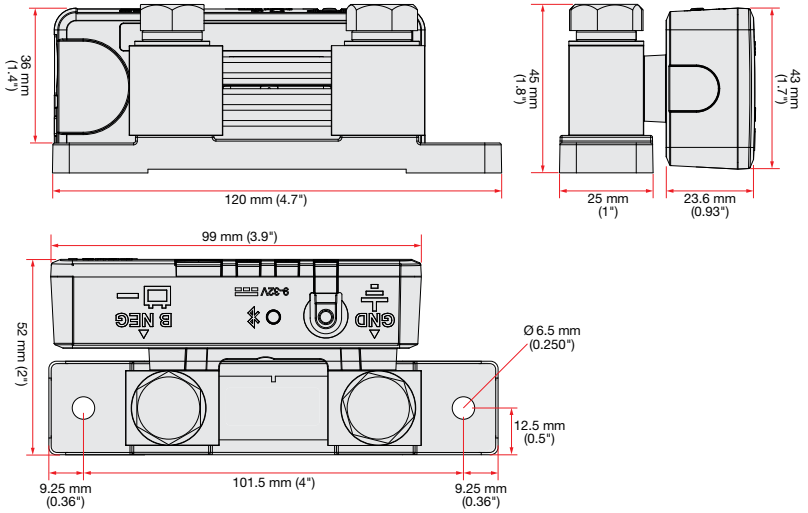
***1** The maximum voltage of the solar array should be calculated for the minimum temperature that it would be exposed to. The value should be less than 32 V or else damage to the Manager may occur. The Manager will not charge if the voltage is too high.

***2** The Heated Lithium charging profile should only be used with lithium batteries that feature a functioning heating element. If unsure, the Standard Lithium charging profile must be used. Using the wrong charging profile may damage your lithium battery.

BATTERY MONITOR SPECIFICATIONS

GENERAL SPECIFICATIONS

Weight	355 g (12.5 oz)
Dimensions	120 × 52 × 45 mm (4.7" × 2" × 1.8")



ELECTRICAL SPECIFICATIONS

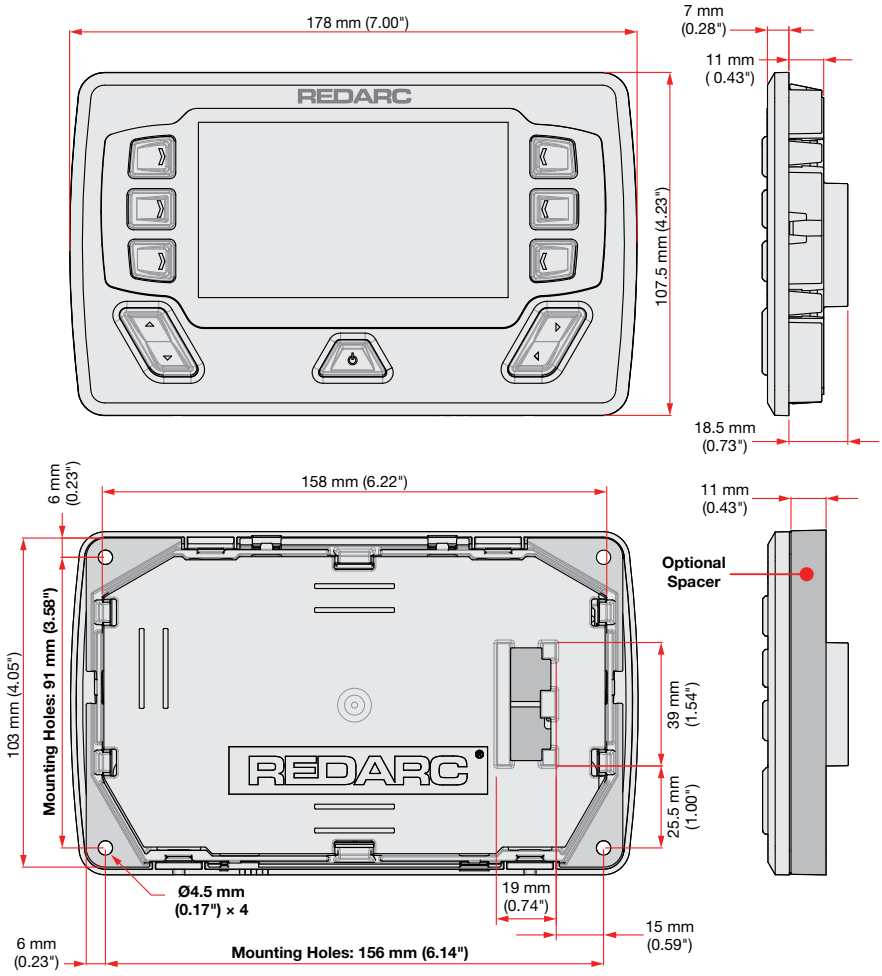
Operating Voltage Range	9 – 32 VDC ⎓
Unit Operating Temperature	–20°C to 60°C (–4°F to 140°F)

OPERATION SPECIFICATIONS

Current Measurement Range	± 500 A
Battery Temperature Measurement Range	–40°C to 100°C (–40°F to 212°F)
Battery Type	Standard Lead Acid, Calcium Content, Gel, AGM, or $LiFePO_4$ type only

DISPLAY SPECIFICATIONS

Weight	300 g (10.6 oz)
Dimensions	178 × 107.5 × 18.5 mm (7" × 4.2" × 0.7")
Operating Temperature	–20°C to 75°C (–4°F to 167°F)



COMPLIANCE

CAN ICES-003 (B)/ NMB-003(B)

FCC STATEMENT — CLASS B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

ICES STATEMENT

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

This device complies with Industry Canada (IC) license-exempt RSS standard(s). Operation is subject to the following two conditions.

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes.

1. L'appareil ne doit pas produire de brouillage.
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillardest susceptible d'en compromettre le fonctionnement.

FCC PART 15 AND ISED RSS COMPLIANCE

This device complies with Part 15 of the FCC Rules and with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage.
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillardest susceptible d'en compromettre le fonctionnement

MODIFICATION WARNING

Any changes or modifications not expressly approved by REDARC could void the user's authority to operate this equipment.

WARRANTY

LIMITED WARRANTY

For full warranty terms and conditions, visit the Warranty page of the REDARC website:
www.redarcelectronics.com/warranty

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IMPORTER CONTACT INFORMATION

UK: Ozparts UK Ltd, 1 Prospect Place, Pride Park, DE24 8HG, Derby, UK

Europe: OZPARTS PL sp. z o.o. ul. Słowackiego 32/5 87-100, Torun, Poland

For written request please email power@redarcelectronics.eu

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