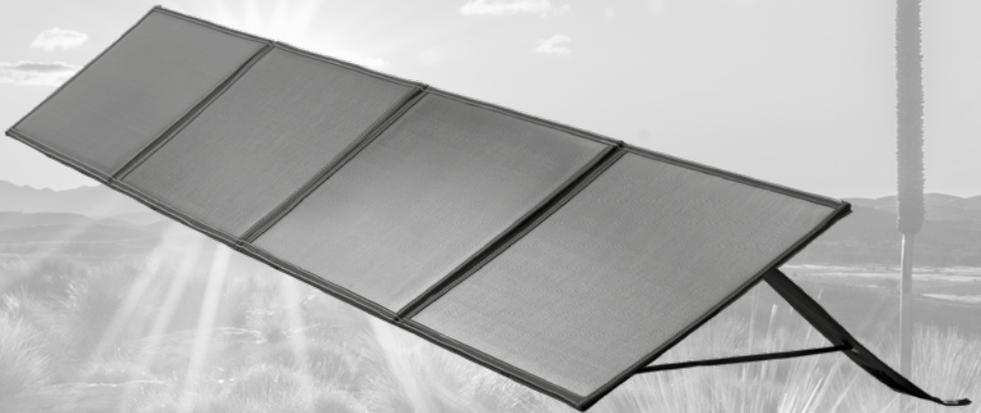




# PORTABLE SOLAR PANEL KIT

Owner's Manual



**ISOLAR120 - 120W**

**ISOLAR200 - 200W**

**IMPORTANT:** Please read all procedures and precautions before installing and using the Ironman 4x4 Solar Panel Kit. If you have any questions please contact our customer service department.

# Safety Information



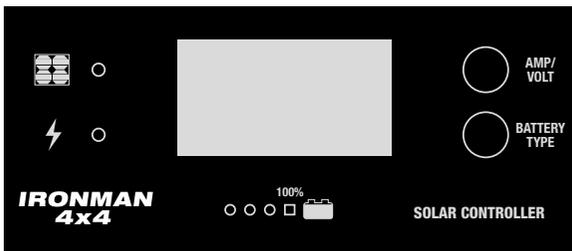
**IMPORTANT:** Read these instructions for use carefully before operating the unit. Keep these instructions for future reference.

- Follow the instructions within this manual carefully.
- Do not disassemble the solar panel or controller.
- Do not charge a damaged battery.
- Do not charge a frozen battery.
- Do not use this solar kit if it is damaged in any way – contact Customer Service for advice if necessary.
- To be repaired by qualified persons only – contact Customer Service on 1300 731 137

**WARNING:** RISK OF EXPLOSIVE GASES WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. IT IS IMPORTANT THAT EACH TIME BEFORE USING OR CONNECTING YOUR SOLAR CONTROLLER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

- Do not connect the Solar kit directly to the battery being charged, the regulator must be used
- Ensure that the battery being charged is in a well-ventilated area as poisonous gases may be emitted during the charging process
- Ensure correct connection to the battery terminals - Connect the Red coloured DC clamp to the positive '+' battery terminal. Then connect the Black coloured DC clamp to the negative '-' battery terminal
- NOT designed for long term or permanent installations

## UNDERSTANDING YOUR CONTROLLER



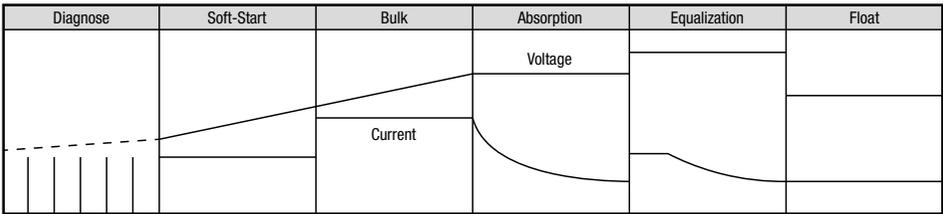
- Amp / Volt button will provide information on the charging status of the battery.
- Battery Type button is used to select the correct type of battery being used.
- The LCD Display will provide information of Battery Type, Battery Voltage & Amp Hour charging
- Indicating LEDs will illuminate to confirm Connection Status and Battery Charge Levels



# Specifications

**CHARGING STAGE** – The controller has a 6-stage charging algorithm.

**Diagnose\* - Soft Charge – Bulk Charge - Absorption charge – Equalizing Charge\* - Float Mode**



**Diagnose \*** - Only for Lithium battery type, subjected to the Lithium battery initial voltage then determine going to Soft start or Bulk charge; if the Lithium battery is protected by BMS, the controller will automatically send the signal periodically to the battery terminal to activate the BMS against protection.

**Soft start** - When batteries suffer an over-discharge, the controller will softly ramp the battery voltage up to 10V for 12V battery.

**Bulk Charge** - Maximum current charging until batteries rise to Absorption level. For Lead crystal battery type, the charge controller will deliver two step level of Bulk charge, when the first level rises the battery voltage up to 14.4V, then switch into the second level of the 50% of the first bulk charge rate, until the Lead crystal battery voltage up to 14.7V.

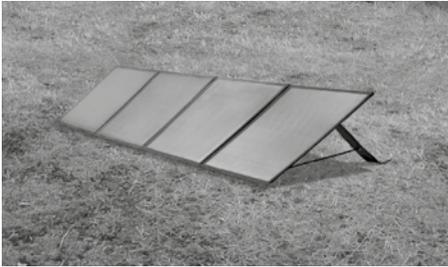
**Absorption** - Constant voltage charging and battery is over 85% for lead acid battery; a Li-ion battery, LiFePO4 and LTO battery will close fully charging after absorption stage, the absorption voltage level will reach 12.6V for Li-ion, 14.4V for LiFePO4 battery; 14.0V for LTO battery & 14.7V for Lead crystal battery.

**Equalization \*** - Only for WET or Calcium battery type, when the battery is deeply drained below 10V or every 28 days cycle, it will automatically run this stage to bring the internal cells as an equal state and fully complement the loss of capacity. (Lead crystal, Li-ion, LiFePO4, LTO, Gel and AGM battery do not run Equalization charge)

**Float Charge or Re-Bulk charge** - Battery is fully charged and maintained at a safe level. A fully charged Lead acid battery (Crystal, GEL, AGM, WET battery) has a voltage of more than 13.8 Volts; if the lead acid battery voltage drops to 12.8V at float mode, it will return to Bulk charge.

Li-ion, LiFePO4 and LTO battery have no float mode; If a Li-ion battery voltage drops to 12.0V after absorption stage, it will return to Bulk charge; if a LiFePO4 battery voltage drops to 13.4V, or LTO battery voltage drops to 13.2V after Absorption stage, they will return to Bulk charge.

# Setup and Operation



Select a suitably cleared area to unfold the kit, the position should allow a clear view of the sun and face as close as possible to 'NORTH'.

The adjustable stand allows you to adjust the solar panel to the optimal angle. To maximise the battery charging it is recommended to regularly relocate the kit to be fully facing the sun or removed from any shadows.

1.



2.



1. Connect the battery to the controller via the battery clamp adapter
2. Connect the solar panel kit to the controller via the 5mtr power cable
3. Once connected the controller will receive power and the settings can be adjusted.
4. Press the BATTERY TYPE button and hold for 3 seconds to activate the Battery selection mode. The default setting is AGM Battery, however the controller will automatically memorize your battery type setting for future connections.
5. Press the Battery Type button until the required battery type is shown on the LCD display, the display will flash for 3 to 5 seconds before the selection is completed.



There are 8 battery types to choose from on the controller:  
LEADCRYSTAL, WET, GEL, AGM, CALCIUM, LTO, LIFEPO4, LITHIUM ION

- LiFePO4 battery shown in LCD indicates Lithium Iron Phosphate battery - LFP battery.
- LTO battery shown in LCD indicates Lithium titanate oxidized battery - Li4Ti5O12 battery.

**CAUTION:** Incorrect battery type setting may damage your battery.



# Specifications

<b>SOLAR CELL</b>		
Type	<b>A Grade Monocrystalline Cell - Shingle Assembly</b>	
Material	<b>Silicon with ETFE Coating</b>	
<b>DIMENSIONS AND WEIGHT</b>	<b>ISOLAR120</b>	<b>ISOLAR200</b>
Dimensions - Open	<b>1430 x 475 x 4mm</b>	<b>2150 x 575 x 4mm</b>
Dimensions - Folded	<b>475 x 360 x 20mm</b>	<b>575 x 520 x 20mm</b>
Product Weight - Incl. all accessories	<b>7.5kg</b>	<b>11.5kg</b>
Product Weight - Panels	<b>5.2kg</b>	<b>7.2kg</b>
No. of panels	<b>4</b>	<b>4</b>
No. of cells per panel	<b>36</b>	<b>54</b>
Cell Coating	<b>ETFE</b>	
Construction	<b>Cells assembled in Shingle Format</b>	
UV Stabilised (Non Fade)	<b>Anti-UV Coating on Face</b>	
Rated Maximum Power	<b>120W</b>	<b>200W</b>
Voltage @ P <sub>MAX</sub>	<b>18.0V</b>	<b>18.0V</b>
Current @ P <sub>MAX</sub>	<b>6.66A</b>	<b>11.11A</b>
Open-Circuit Voltage (V <sub>OC</sub> )	<b>22V</b>	<b>22V</b>
Short-Circuit Voltage (I <sub>SC</sub> )	<b>7.01A</b>	<b>11.56A</b>
Efficiency Rate	<b>17.90%</b>	<b>17.00%</b>
<b>REGULATOR</b>		
Type	<b>PMW</b>	
Performance Specifications ISOLAR120	<b>12V/10A - Max Input: 22V @ 10A</b>	
Performance Specifications ISOLAR200	<b>12V/15A - Max Input: 22V @ 15A</b>	
Connections	<b>Inbuilt 50A Anderson &amp; Direct Wire Compatible</b>	
Size (L x W x D)	<b>158 x 114 x 36mm</b>	
Battery Types	<b>LEADCRYSTAL, WET, GEL, AGM, CALCIUM, LTO, LIFEP04, LITHIUM ION</b>	
Functions	<b>High end PWM charging, 8 type battery optional &amp; real time charging status display</b>	
Water Proof/Resistant (IP rated)	<b>IP65</b>	

# Specifications

KIT CONSTRUCTION	
Fabric Specifications	<b>1680D Oxford Fabric</b>
UV Stabilised (Non Fade)	<b>Anti-UV stabilised</b>
CARRY BAG CONSTRUCTION	
Style/Type	<b>Top Opening</b>
Fabric Specifications	<b>600D Oxford Fabric</b>
UV Stabilised (Non Fade)	<b>UV Stabilized Treatment</b>

## CONTROLLER

LED indications							LCD Display	LCD Backlight
LED Color	RED	BLUE	BLUE	BLUE	BLUE	GREEN		WHITE
Soft-start charging	ON	FLASH	FLASH	OFF	OFF	OFF	Normal Display	ON
Bulk charge (charged capacity < 25%)	ON	ON	ON	OFF	OFF	OFF		
Bulk charge (charged capacity < 50%)	ON	ON	OFF	FLASH	OFF	OFF		
Bulk charge (charged capacity < 75%)	ON	ON	OFF	OFF	FLASH	OFF		
Absorption charging	ON	ON	ON	ON	ON	FLASH		
Float charging	ON	OFF	OFF	OFF	OFF	ON		
Solar good, VB < 5V	ON	OFF	FLASH	OFF	OFF	OFF	b03 / bLv	FLASH
Solar good, battery reversed	ON	OFF	FLASH	OFF	OFF	OFF	b0 2/ brc	FLASH
Solar good, battery over-voltage	ON	OFF	FLASH	FLASH	FLASH	OFF	b01 / bov	FLASH
Solar off, battery over-voltage	OFF	OFF	FLASH	FLASH	FLASH	OFF	b01 / bov	FLASH
Solar good, battery over 65°C	ON	OFF	Subject to battery voltage			OFF	b04	FLASH
Battery good, solar reverse	FLASH	OFF				OFF	P01	FLASH
Battery good, solar over-voltage	FLASH	OFF				OFF	P02	FLASH
Over Temperature Protection							otP	FLASH



# Maintenance

## TROUBLESHOOTING

SITUATION	POSSIBLE CAUSE	SOLUTION
Charge icon not displaying when solar charger is in the sun	<ul style="list-style-type: none"><li>• The solar panel is not connected to the controller</li><li>• Battery is low</li><li>• No load is connected to the battery</li></ul>	<ul style="list-style-type: none"><li>• Check all connections, ensure the terminals are connected correctly</li><li>• Recharge the battery</li></ul>
Controller is turned off	<ul style="list-style-type: none"><li>• Battery is too low</li><li>• Battery is not connected properly</li></ul>	<ul style="list-style-type: none"><li>• Charge the battery</li><li>• Ensure all connections from controller to battery are correct</li></ul>

## CLEANING INSTRUCTIONS

Periodically, clean the panels with warm water and a soft sponge or cloth to remove any built-up dust or foreign deposits. Keeping your solar kit clean will ensure optimum performance.

## FURTHER INFORMATION

The Solar kit and Controller are both sealed units and cannot be repaired. If a problem does occur, check all connections, including correct polarity of the DC battery clamps and/or disconnect the DC battery clamps from the battery and wait 30 seconds.

For further information or assistance please contact Customer Service on 1300 731 137 or email: [info@ironman4x4.com](mailto:info@ironman4x4.com)



ISOLART20/ISOLAR200/051121