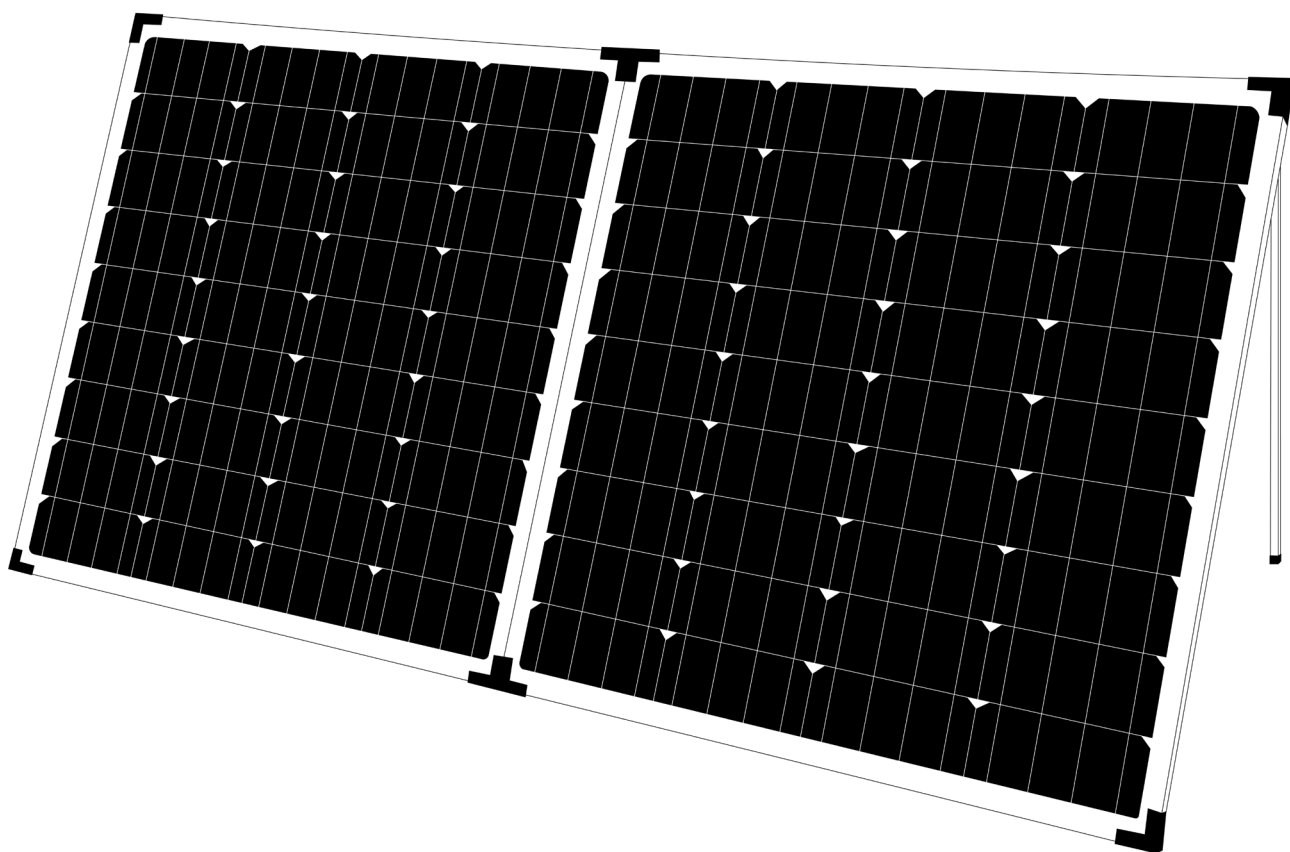




160W Folding Solar Panel **USER MANUAL**

AKSR-PN160W_02



V1.1

**PLEASE READ AND UNDERSTAND THIS MANUAL
COMPLETELY BEFORE USING THIS PRODUCT.**

WARNINGS & SAFETY INFORMATION

- Keep the solar panel and controller away from liquids at all times.
- Keep the solar panel and controller clean and always check connectors for debris before connecting.
- This product is not intended to be used by children. In addition to this, adults with reduced physical or mental capabilities, or those who are under the influence of drugs or alcohol should not use the product.
- Only use the solar panel to charge 12v, rechargeable batteries.
- Lead acid batteries produce harmful explosive gases. The battery should be mounted in a well-ventilated area, away from possible ignition sources.
- Take care when manoeuvring & setting-up the Solar Panel as to not damage the unit.
- Never connect the Solar Panel directly (without a controller) to a battery or other load.
- Tampering or modifying the solar panel, controller or wiring will void warranty.
- When transporting the solar panel, firmly secure the panel so that it will not move around or collide with other objects.
- Do not use the solar panel, controller or wiring if it is damaged or compromised in any way.

INCLUDED IN THE KIT



**160W Monocrystalline
Folding Solar Panel with
Adjustable Legs**



Solar Regulator/ Controller

(Manages voltage delivered to the battery, ensuring your battery is safe)



**4.5m Extension Lead with
Plugs and Battery Clips**



Heavy Duty Protective Carry Bag

SOLAR BLANKET SPECIFICATIONS

Solar Panel	Monocrystalline
Rated Max Power (PM)	160W
Open-Circuit Voltage (VOC)	22.6V
Short Circuit Current	9.16A
Max Voltage	18.4V
Peak Current Output	8.7A
Regulator Type	PWM (Pulse-Width Modulator)
Dimensions	730 x 670 x 58mm
Extension Lead	4.5 meters
Net Weight	12.0 kg (approx.)

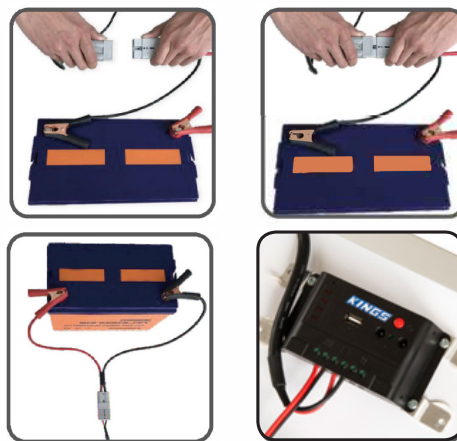
- Highly efficient monocrystalline modules in the solar panel guarantee efficient charging.
- When the 160W folding solar panel is folded, it's space-saving and portable; when the folding solar kit is open, it has a large solar cell area, providing a good consistent charge.
- The regulator is designed to protect the battery from overcharging, as well as short circuiting.
- Specially designed support legs enable the 160W folding solar panel to stand on rough surfaces, and on a desired angle for direct sun exposure.

OPERATION INSTRUCTIONS

The 160W Folding Solar Panel will perform at its peak when the monocrystalline cells are angled directly towards the sun.

CONNECTING YOUR SOLAR PANEL

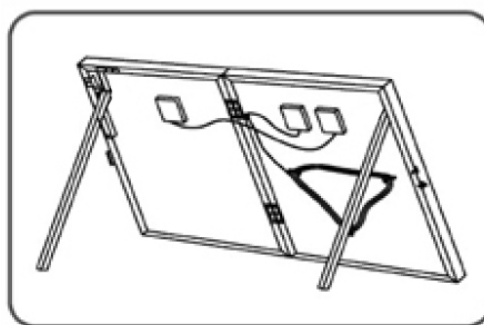
- With the panel setup facing directly towards the sun, connect the positive and negative clips to your battery.
- Always connect the battery clips to the battery first, before connecting to the solar panel. The solar controller will then illuminate.



DISCONNECTING & STORING YOUR SOLAR PANEL

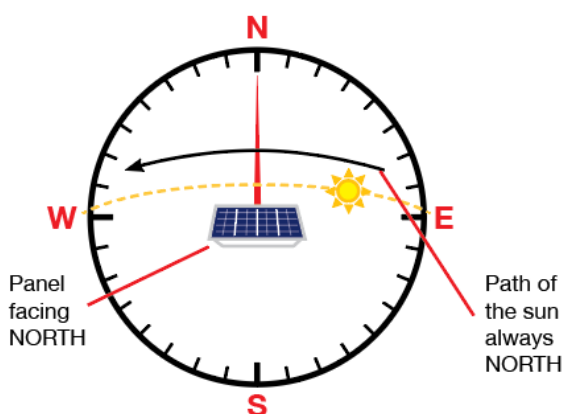
- Disconnect the solar panel from the alligator clips before removing the battery clips off the battery.
- Roll the wire neatly into the space behind the solar panel, make sure not to twist or kink the wiring in an unnatural way.

Note: *Never store your solar panel with the battery wire connected to the panel.*



TIP

- For optimal performance through-out the day, set the panel to approximately 30° from the ground. The range between 10° and 40° will gain the best power absorption across the course of the day.



ANGLE TO SUN BETWEEN 10° & 40°



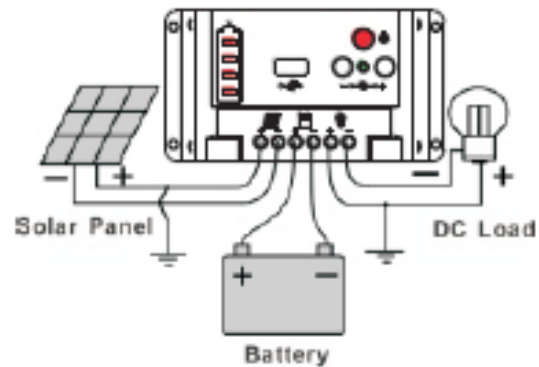
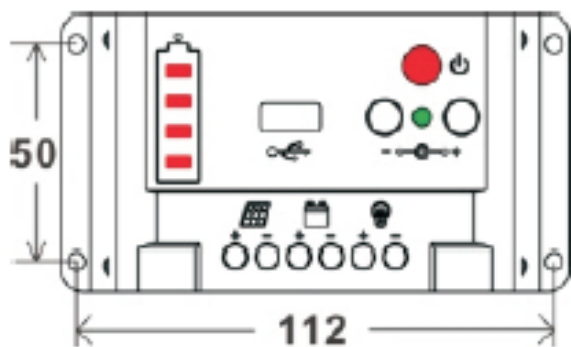
PULSE WIDTH MODULAR (PMW) SOLAR PANEL CONTROLLER

External Dimensions (mm):	120 x 64
Bolt Spacing (mm):	112 x 50
Mounting Hole Diameters (mm):	3.5

CONNECTING TO A LOAD

- Connect the solar panels (+) positive and (-) negative terminals to a Load's corresponding terminals. If the Load is receiving electricity, the Load Indicator Light will turn on.
- The power button will control the 2 x 12V DC sockets only.

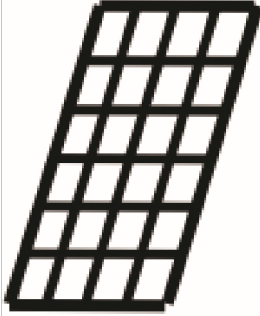

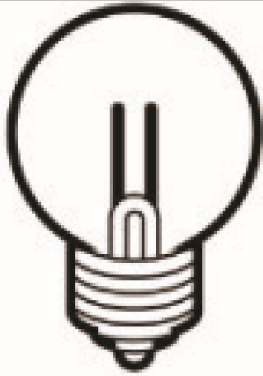
Note: Make sure the load does not exceed the PWM Controller's rated output.



USAGE RECOMMENDATIONS

- As the controller generates heat during operation, install in an environment with good ventilation and ample clearance.
- The controller measures the ambient temperature and adjusts battery charging accordingly, for this reason, place the controller and battery close to each other.
- Always use cables that are rated to or higher than the current output of the controller, overloading wires can result in fires and damage to equipment.
- The controller has a common positive pole inside. If grounding is required, ground the positive pole.

STATE INDICATORS

LED LIGHT	INDICATED ITEM	STATE	MEANING
	Solar Panel	Light ON	Solar Panel Generating Power
		Light OFF	Solar Panel is not Generating Power
		Slowly Flashing	Charging in Process
		Rapid Flashing	Over-voltage
	Battery	Light On	Battery Connected
		Light OFF	Battery is not Connected
		Slowly Flashing	Low Battery Voltage
		Rapid Flashing	Battery Over Discharged
	Load	Light ON	Load Drawing Power
		Light OFF	No Load/Load is Not = Drawing Power
		Slowly Flashing	Overload Protection
		Rapid Flashing	Short Circuit Protection

PARAMETER DETAILS

1	Battery Type	Sealed	GEL	Flooded	Ternary-Material Lithium	Lithium Iron Phosphate**
2	System Current	10A				
3	No-Load Loss	10mA				
4	Solar Energy Input Voltage	<55V				
5	System Voltage	12V Auto			3 & 4 Strings: 12V System	3 & 4 Strings: 12V System
6	Over-voltage Protection	17V			4.2* N + 2.0 V	3.65 V * N + 2.0V
7	Equalising Charging Voltage	14.6V	-	14.8V	-	
8	Boost Charging Voltage	14.4V	14.2V	14.6V	-	
9	Floating Charge Voltage	13.8V			-	
10	Overcharge Voltage	-			4.2V * N	3.65V * N
11	Overcharge Recovery	-			3.9V * N	3.4V * N
12	Boost Charging Recovery	13.2V			-	
13	Over-Discharge Recovery Voltage	12.5V			3.3V * N	3.0V * N
14	Undervoltage	12.0V			3.2V * N	2.8V * N
15	Over-Discharge Voltage	11.0V			3.0V * N	2.5V * N
16	Temperature Compensation	-4.0mv/°C/2V			-	
17	Equalising Charging Duration	1hr	-	1hr	-	
18	Boost Charging Duration	4hr			-	
19	Light Controlled Voltage	Light Controlled on at 5V, Light Controlled off at 6V				
20	Light Control Interval	1min				
21	Overload and Short-Circuit Protection	1.25x rated current: 30s; 1.5x rated current: 5s overload protection; >3x rated current: short-circuit protection				
22	Operating Temperature	-35°C to +65°C				
23	Weight	140g				

* PARAMETERS ARE TAKEN FROM AN AMBIENT TEMPERATURE OF 12°C, 12V SYSTEM VOLTAGE

**SINGLE-PIECE LITHIUM BATTERY PARAMETERS

TROUBLESHOOTING

SYMPTOMS	CAUSES AND SOLUTIONS
Indicator LED does not light up when Solar Panel is in direct sunlight.	Check to make sure all connections are strong and reliable.
Solar Panel Indicator LED flashing rapidly.	Over-voltage - Check battery voltage.
Solar Panel Indicator LED is off, battery voltage is sufficient, but there is no output.	The load will be switched on automatically after 10 minutes.
The Battery Indicator LED is off.	The battery is failing to supply power. Check whether battery has a proper connection and sufficient charge.
Battery Indicator LED flashing rapidly and no battery output.	The battery is over-discharged, the battery will need to be adequately recharged.
The Load Indicator LED is flashing slowly and is not receiving power.	The load power exceeds the rated power. Reduce load and hold key to recover.
The Load Indicator LED is flashing rapidly and the load is not being powered.	Short Circuit Protection. Hold key to recover.
The Load Indicator LED is on but, the load is not powered.	Check to make sure all connections are strong and reliable.
Other Issues.	Check to make sure all connections are strong and reliable. Ensure battery and/or load is 12V.

12 MONTH LIMITED WARRANTY

WARRANTY PERIOD:

Full 12 month warranty from date of purchase against all manufacturing defects.

WHAT DOES THE WARRANTY COVER?

Under normal usage conditions, this warranty covers:

- a. Any defect in design or manufacture which results in the product failing to perform substantially as described in authorised advertising or literature.
- b. We will either repair or replace the product at our discretion providing that the fault is found to have been caused by a design or manufacturing defect and not misuse or tampering.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. The benefits provided to you as the consumer by this warranty are in addition to other rights and remedies available to you under the law.

THE WARRANTY DOES NOT COVER:

- a. Any damage resulting from improper use
 - b. Faulty installation or modification made during installation
 - c. The cost of removing and reinstalling the product
 - d. Travel and /or other expenses due to customer's remote location
 - e. Transport charges and damage in transit. It is your responsibility to deliver and pick up your product, including any costs associated with the postage of your repair or replacement product. If you do freight your product we recommend that you insure against loss or damage.
 - f. Any loss directly or indirectly associated with the product failing to operate.
 - g. Damage caused by mould, insects, animals, misuse, incorrect operation, adverse weather, accidents and fair wear and tear
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TO MAKE A CLAIM, PLEASE ENSURE YOU RETAIN YOUR SALES RECEIPT OF PURCHASE

1800 88 39 64



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