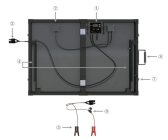
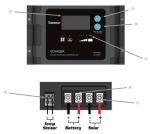
USER MANUAL ECLIPSE SOLAR SUITCASE

Identification of Parts



Key Parts

1. 20A Voyager Charge Controller
2. Junction Box
3. MC4 Connectors
4. Tilt Stands
5. Battery Alligator Clips
6. In-line fuse (15A)
7. Latch
8. Handle
9. Case (Not pictured)

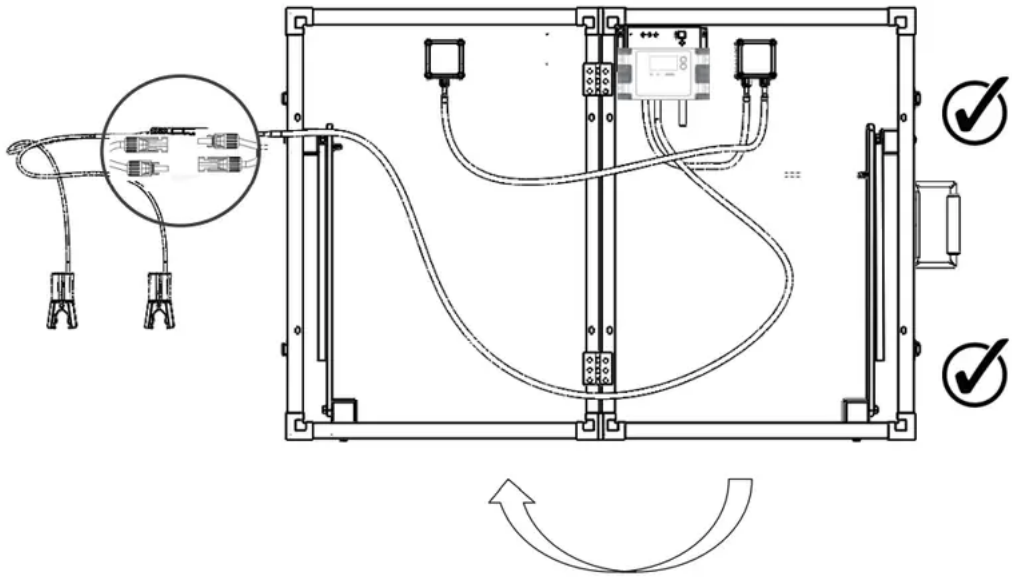


Key Parts

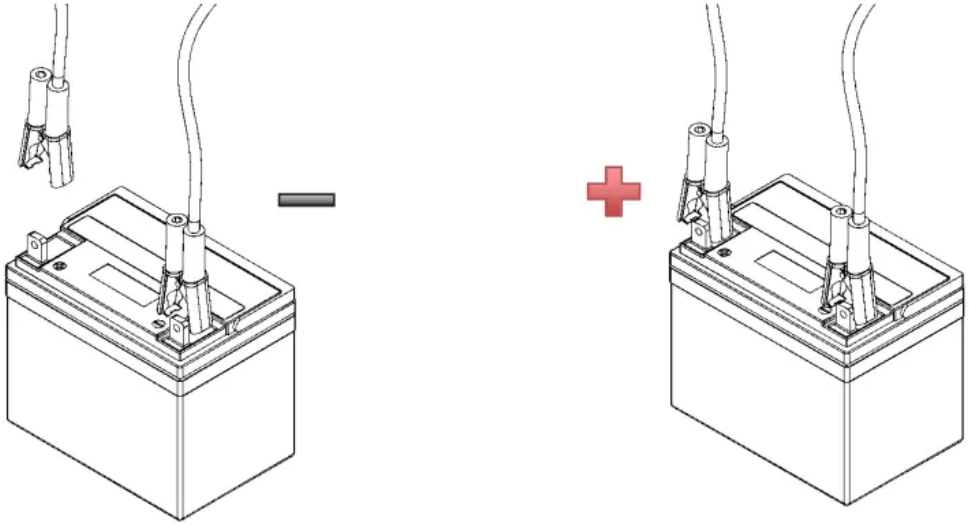
1. Backlit LCD
2. AMP/VOLT Button
3. BATTERY TYPE Button
4. LED Bar
5. Remote Temperature Sensor Port
6. Battery Terminals
7. Solar Terminals

Installation

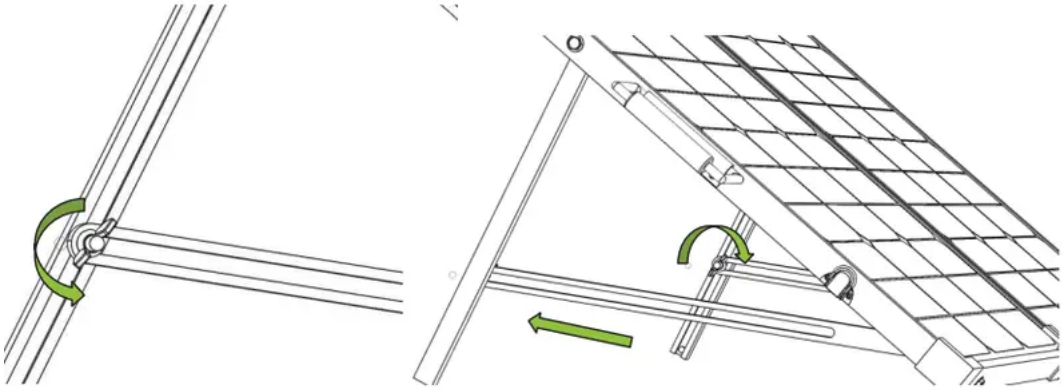
1. Unlatch and unfold unit then connect MC4 Connectors

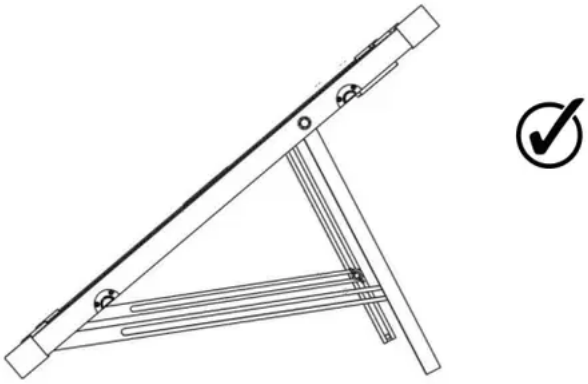


2. Connect Battery Alligator Clips to 12V Battery

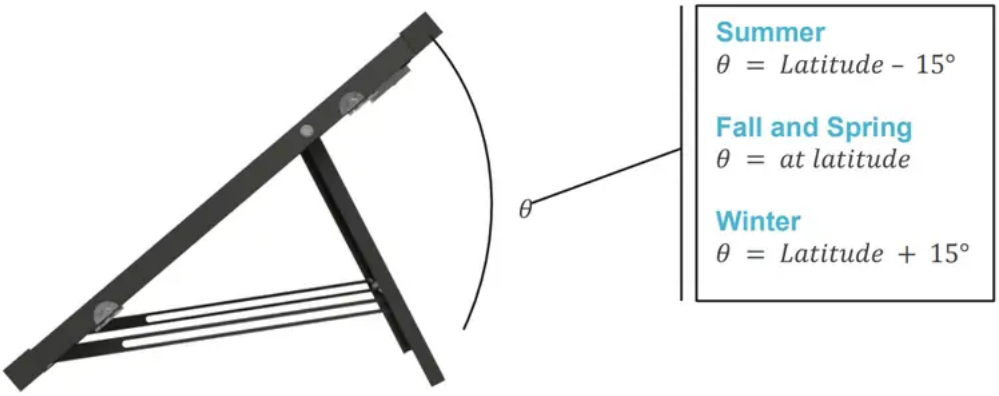


3.Unscrew butterfly nut tilt to desired angle and lock butterfly nut





To maximize the output, adjust the angle of the suitcase regularly to track the sun's movement throughout the season



Operation

When the controller powers on, the Voyager will run a self-quality check mode and automatically display the figures on LCD before going into auto work.

	Self-test starts, digital meter segments test
	Software version test
	Rated voltage Test
	Rated Current Test
	External battery temperature sensor test (if connected)

Selecting Battery Type

WARNING

Incorrect battery type setting may damage your battery. Please check your battery manufacturer’s specifications to when selecting battery type.

The Voyager provides 7 battery types for selection: Lithium-ion, LiFePO4, LTO, Gel, AGM, Flooded, and Calcium Battery. Press and hold the BATTERY TYPE Button for 3 seconds to go into battery selection mode.

Press the BATTERY TYPE Button until the desired battery is displayed. After a few seconds, the highly

NOTE

Lithium ion batteries shown in the LCD indicate different types shown below:

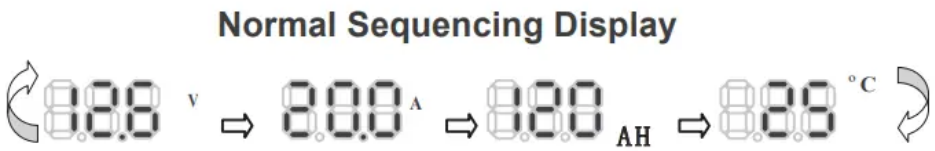
- Lithium Cobalt Oxide LiCoO2 (LCO) battery
- Lithium Manganese Oxide LiMn2O4 (LMQ) battery
- Lithium Nickel Manganese Cobalt Oxide LiNiMnCoO2 (NMC) battery
- Lithium Nickel Cobalt Aluminum Oxide LiNiCoAlo2 (NCA) battery

LiFePO4 battery indicates Lithium-iron Phosphate or LFP Battery

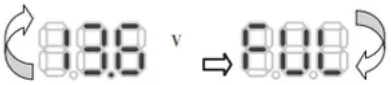
LTO Battery indicates Lithium Titanate Oxidized, Li4Ti5O12 Battery

AMP/VOLT Button

Pressing the AMP/VOLT Button will sequence through the following display parameters: Battery Voltage, Charging Current, Charged Capacity (Amp-hour), and Battery Temperature (if external temperature sensor connected)



NOTE: The following is an alternative display voltage for when the battery is Fully charged



LED Display

System Status Icons

LED Behavior

LED Indicators						
				100%		
LED Color	RED	BLUE	RED	ORANGE	GREEN	GREEN
Soft-chargeing	ON	FLASH	ON	OFF	OFF	OFF
Bulk charging (BV < 11.5V)	ON	ON	ON	OFF	OFF	OFF
Bulk charging (11.5V < BV < 12.5V)	ON	ON	OFF	ON	OFF	OFF
Bulk charging (BV > 12.5V)	ON	ON	OFF	OFF	ON	OFF
Absorption charging	ON	ON	OFF	OFF	ON	OFF
Float charging	ON	OFF	OFF	OFF	OFF	ON
Solar weak (Dawn or Dusk)	FLASH	OFF	According to BV			OFF
In the night	OFF	OFF				OFF

NOTE: BV = Battery Voltage

LED Error Behavior

LED Indicators								
							Error Code	Screen
LED Color	RED	BLUE	RED	ORANGE	GREEN	GREEN		
Solar good, BV < 3V	ON	OFF	FLASH	OFF	OFF	OFF	'b01'	FLASH
Solar good battery reversed	ON	OFF	FLASH	OFF	OFF	OFF	'b02'	FLASH
Solar good, battery over-voltage	ON	OFF	FLASH	FLASH	FLASH	OFF	'b03'	FLASH
Solar off, battery over-voltage	OFF	OFF	FLASH	FLASH	FLASH	OFF	'b03'	FLASH
Solar good, battery over 65□C	ON	OFF	FLASH	FLASH	FLASH	OFF	'b04'	FLASH
Battery good, solar reversed	FLASH	OFF	According to BV			OFF	'PO1'	FLASH
Battery good, solar over-voltage	FLASH	OFF				OFF	'PO2'	FLASH
Over Temperature Protection							'otP'	FLASH

SystemStatus Troubleshooting

Description	Troubleshoot
Battery over voltage	Use a multi-meter to check the voltage of the battery. Make sure the battery voltage is not exceeding the rated specification of the charge controller. Disconnect battery.
Charge controller does not charge during daytime when the sun is shining on the solar panels.	Confirm that there is a tight and correct connection from the battery bank to the charge controller and the solar panels to the charge controller. Use a multi-meter to check if the polarity of the solar modules has been reversed on the charge controller's solar terminals.
Everything is connected correctly, but the LCD on the controller does not turn on	Check the rated battery voltage. The LCD will not display on the charge controller unless there is at least 9V coming from the battery bank.

Maintenance

For best controller performance, it is recommended that these tasks be performed from time to time.

1. Check wiring going into the charge controller and make sure there is no wire damage or wear.
2. Tighten all terminals and inspect any loose, broken, or burnt up connections
3. Make sure readings in the LCD and LED are consistent.

Frequently Asked Questions

Q. Can the kit charge two or more 12V batteries connected in parallel?

A. Yes, it's possible if the batteries have the same type and capacity and are wired in parallel as a single 12V battery bank.

Q. Is there any risk that the solar kit will over charge my battery?

A. One of the functions of the solar charge controller is to ensure that your battery is not over charged; therefore there is no risk of overcharge.

Q. Can I extend the battery leads?

A. Yes, it's possible – please choose the same size of cable for extension. However, there longer the extension, the greater the line loss. Bigger gauge will be required for longer runs.

Q. Do I need to clean the solar panels?

A. Yes, it is recommended for better performance. Dust and dirt should first be swept off the panel surface using a soft brush. When the sweeping is complete, use a wet cloth to wipe the panel surface to remove remaining dirt and grime.

Q. Can rain damage the solar kit?

A. The solar panels and charge controller are both fully waterproof (IP66, IP65).

Technical Specifications

Solar Panel Parameters

Description	100 W Parameters	200 W Parameters
Maximum Power	100 W	200 W
Open Circuit Voltage (Voc)	21.6 V	21.2 V
Short Circuit Current (Isc)	6.10 A	12.12 A
Maximum Power Voltage (Vmp)	17.6 V	17.7 V
Maximum Power Current (Imp)	5.68 A	11.3 A
Cell Type	Monocrystalline	Monocrystalline
Operating Temperature	−40°F to +185°F	− 40°F to +185°F
Folded Size	21.1 X 21.5 X 3.1 in	41.3 X 21.1 X 3.1 in
Net Weight	19.40 lbs.	33.60 lbs.

Charge Controller Parameters

Electrical Parameters	
Model Rating	20A
Normal Battery Voltage	12V
Maximum Solar Voltage(OCV)	26V
Maximum Battery Voltage	17V
Rated Charging Current	20A
Battery Start Charging Voltage	3V
Electrical Protection and Feature	Spark-free protection. Reverse polarity solar and battery connection Reverse current from battery to solar panel protection at night Over temperature protection with derating charging current Transient overvoltage protection, at the solar input and battery output protects against surge voltage
Grounding	Common Negative
EMC Conformity	FCC Part-15 class B compliant; EN55022:2010;
Self-consumption	< 8mA
Mechanical Parameters	
Dimensions	L6.38 x W3.82 x H1.34 inches
Weight	0.88 lbs.
Mounting	Vertical Wall Mounting
Ingress Protection Rating	IP65
Maximum Terminals Wire Size	10AWG (5 mm^2)
Terminals Screw Torque	13 lbf·in
Operating Temperature	-40 ℉ to +140 ℉
Meter Operating Temperature	-4 ℉ to +140 ℉
Storage Temperature Range	-40 ℉ to +185 ℉
Temp. Comp. Coefficient	-24mV / °C
Temp. Comp. Range	-4°F ~ 122°F
Operating Humidity	100% (No condensation)

Battery Charging Parameters

Soft-Charge	Output battery voltage is 3V-10VDC, Current = half of the solar panel current						
Bulk	10VDC to 14VDC Current = Rated Charge Current						
Absorption @ 25°C	Constant voltage until current drops to 0.75/1.0 amps and holds for 30s. Minimum 2 hours charging time and maximum 4 hours' time out If charging current < 0.2A, stage will end.						
	Li-ion 12.6V	LiFePO4 14.4V	LTO 14.0V	GEL 14.1V	AGM 14.4V	WET 14.7V	CALCIUM 14.9V
Equalization	Only Wet (Flooded) or Calcium Batteries will equalize, 2 hours maximum Wet (Flooded) = if discharge below 11.5V OR every 28 days charging period. Calcium =every charging cycle						
	Wet (Flooded) 15.5V					Calcium 15.5V	
Float	Li-ion N/A	LiFePO4 N/A	LTO N/A	GEL 13.6V	AGM 13.6V	WET 13.6V	CALCIUM 13.6V
Under Voltage Recharging	Li-ion 12.0V	LiFePO4 13.4V	LTO 13.4V	GEL 12.8V	AGM 12.8V	WET 12.8V	CALCIUM 12.8V

Charging Parameters Glossary

Equalization Voltage—equalization voltage is a corrective over-charge of the battery. The user should consult their battery manufacturer regarding specific battery equalization capacity. This parameter sets the equalization voltage to set the battery at when it reaches the equalization state.

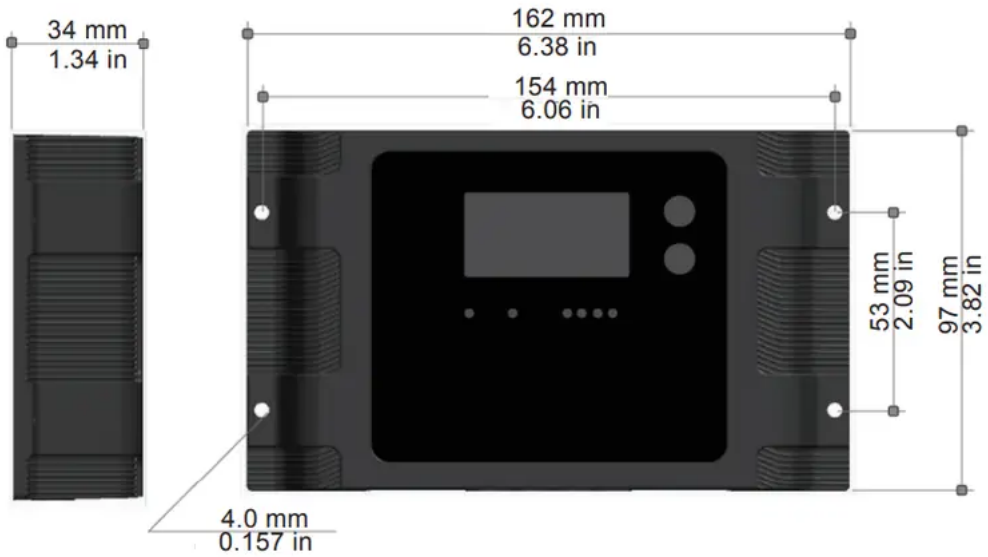
Boost Voltage—users should check with their battery manufacturer for proper charging parameters. In this stage, users set the boost voltage where the battery will reach a voltage level and remain there until the battery undergoes an absorption stage

Float Voltage—once the charge controller recognizes the set float voltage, it will commence floating. The battery is supposed to be fully charged in his state, and the charge current is reduced to maintain battery stability levels.

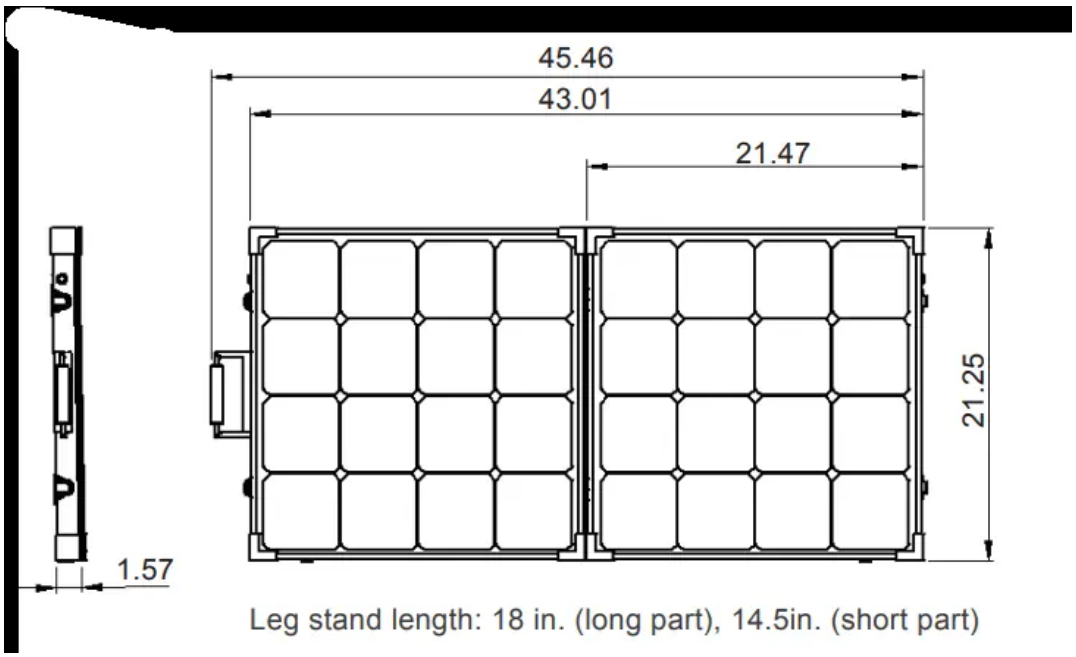
State of Charge	12 V Battery	Volts per Cell
100%	12.7	2.12
90%	12.5	2.08
80%	12.42	2.07
70%	12.32	2.05
60%	12.20	2.03
50%	12.06	2.01
40%	11.9	1.98
30%	11.75	1.96
20%	11.58	1.93
10%	11.31	1.89
0	10.5	1.75

Dimensions

Voyager

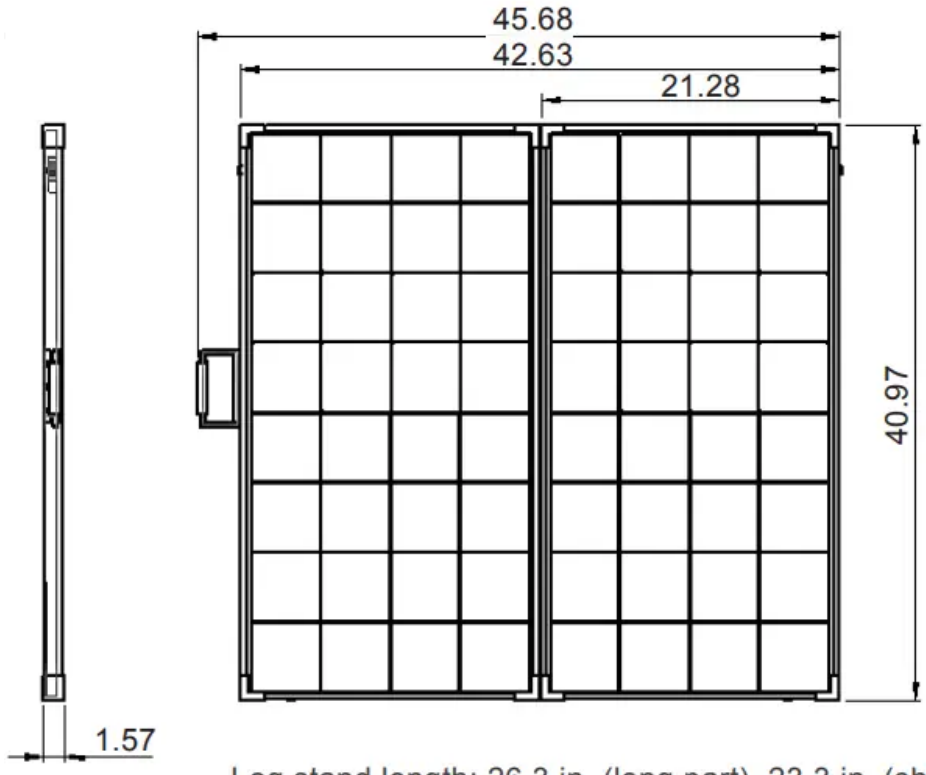


100W Eclipse Suitcase



Leg stand length: 18 in. (long part), 14.5in. (short part)

200W Eclipse Suitcase



Leg stand length: 26.3 in. (long part), 23.3 in. (short part)

Warning

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