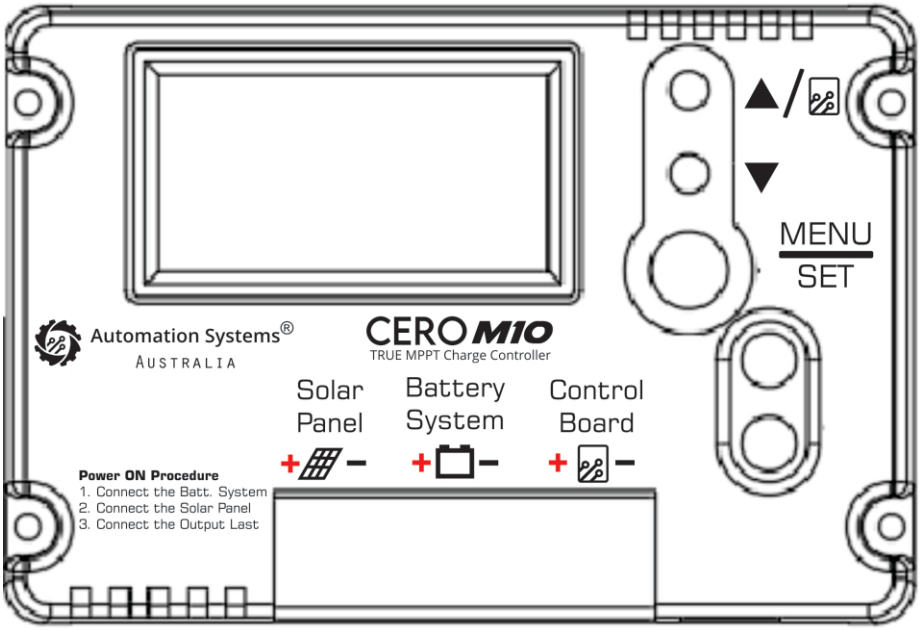
Automation Systems®
AUSTRALIA

CERO M10

TRUE MPPT Charge Controller



Power ON Procedure

1. Connect the Battery System First
2. Connect the Solar Panel Second
3. Connect the Output Last (Control Board Terminal)

SLA and GEL Batteries are Auto Detected and do NOT require any setting changes.

Table of Contents

Specifications

Battery Voltage	12V/24V Auto
No-load loss	≤0.03A
Maximum input voltage of the solar panel	50V
Maximum charging current	10A
Maximum load current	20A
Maximum input power of the solar panel	120W/12V 240W/24V
Supported Battery Types	SLA, GEL, Lithium Ion Phosphate, Ternary Lithium. Custom Settings

Precaution

1. Do not operate the controller until you have thoroughly read this manual.

2. Unauthorized disassembly and repair is forbidden to prevent equipment damage and safety threats.

3. Do not install exposed to the elements, if installed outdoors install into an enclosure.

4. Avoid installing in a metal enclosure in outdoor applications to prevent overheating.

5. It is recommended to install a suitable fuse or circuit breaker outside the controller to enhance circuit safety and prevent risks from overloads and other abnormal conditions.

6. Before installing and adjusting the wiring, always disconnect the fuses or circuit breakers near the photovoltaic array and battery terminals to avoid electric shock and equipment damage risks.

7. Pay strict attention to the wiring sequence during installation to ensure correct positive and negative connections and prevent damage to the controller and related equipment due to reversed connections.

8. After installation, carefully check that all wires are tightened to avoid loose connections that could cause heat accumulation and potential fire hazards.

Usage Recomendations

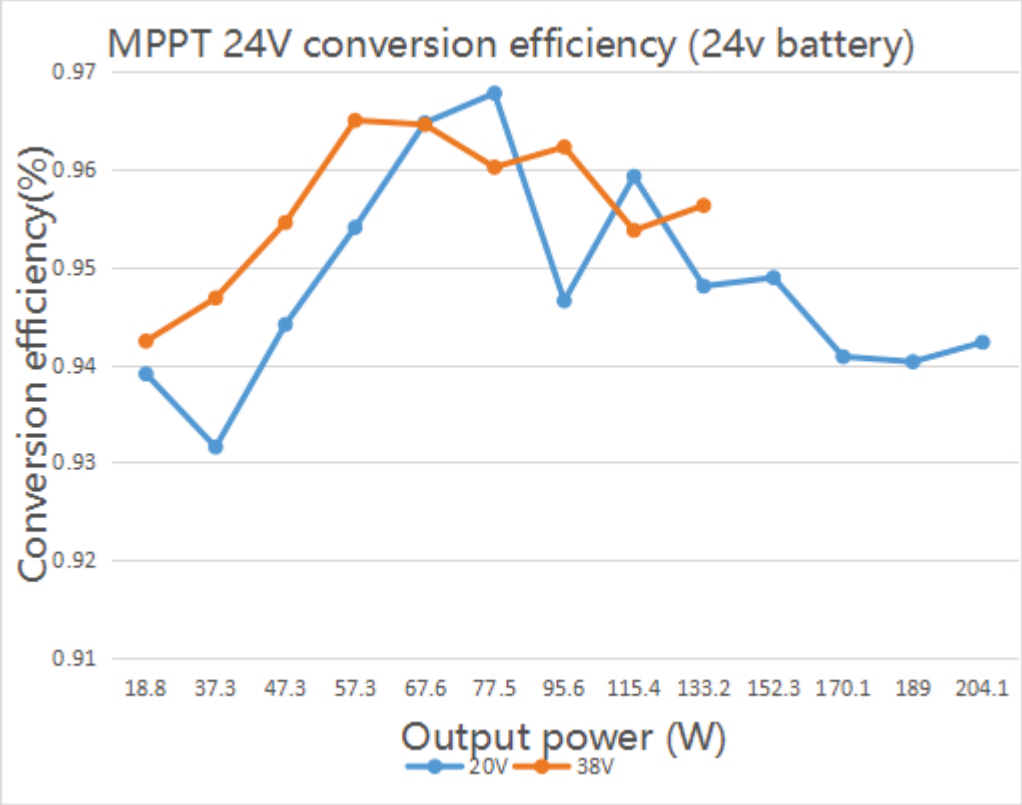
1. During the initial installation, ensure the battery has sufficient voltage for the controller to accurately identify the battery type.

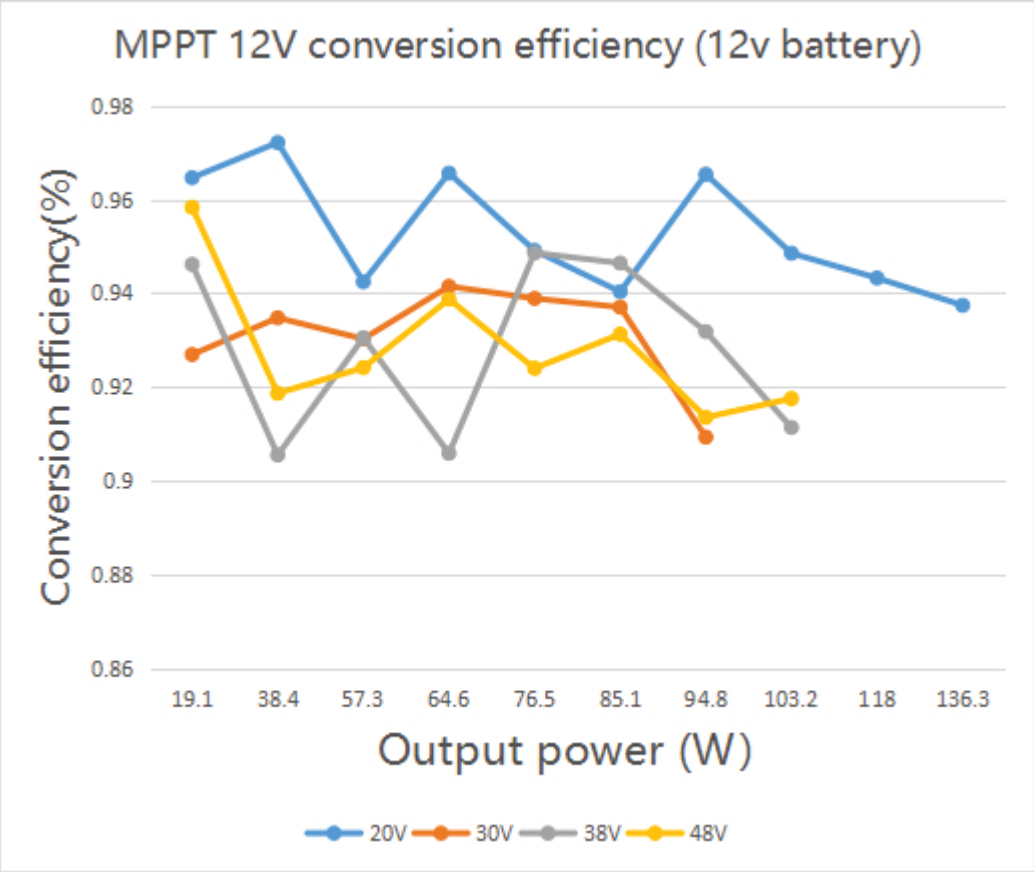
2. Install the controller as close to the battery as possible to minimize voltage drop caused by long wires, which could affect voltage.

3. Lead-acid batteries (including gel lead-acid and sealed lead-acid) and lithium batteries (lithium iron phosphate and ternary lithium) are applicable for this controller. Using other battery types may lead to malfunctions or equipment damage.

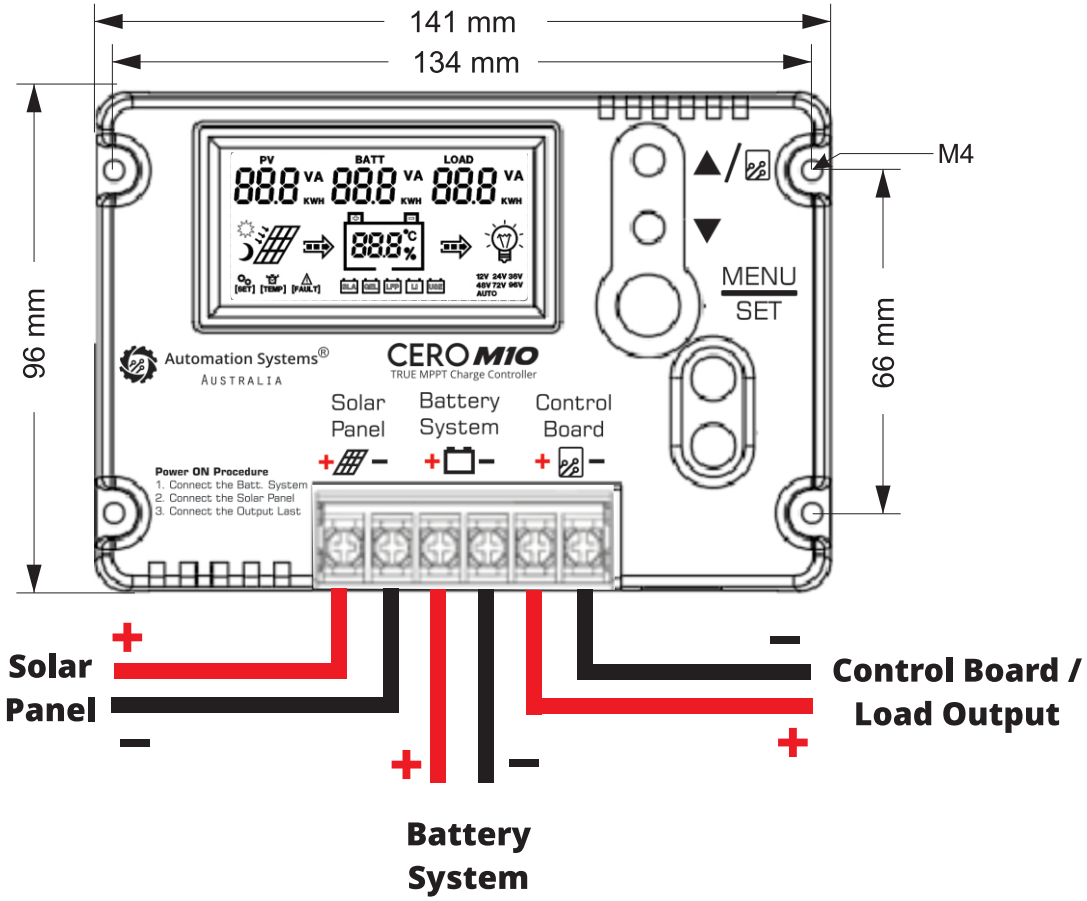
4. Only use photovoltaic panels as the charging source. Do not use DC or other power sources for charging, as this will damage the controller.

Conversion Efficiency





Dimensions & Terminations Overview

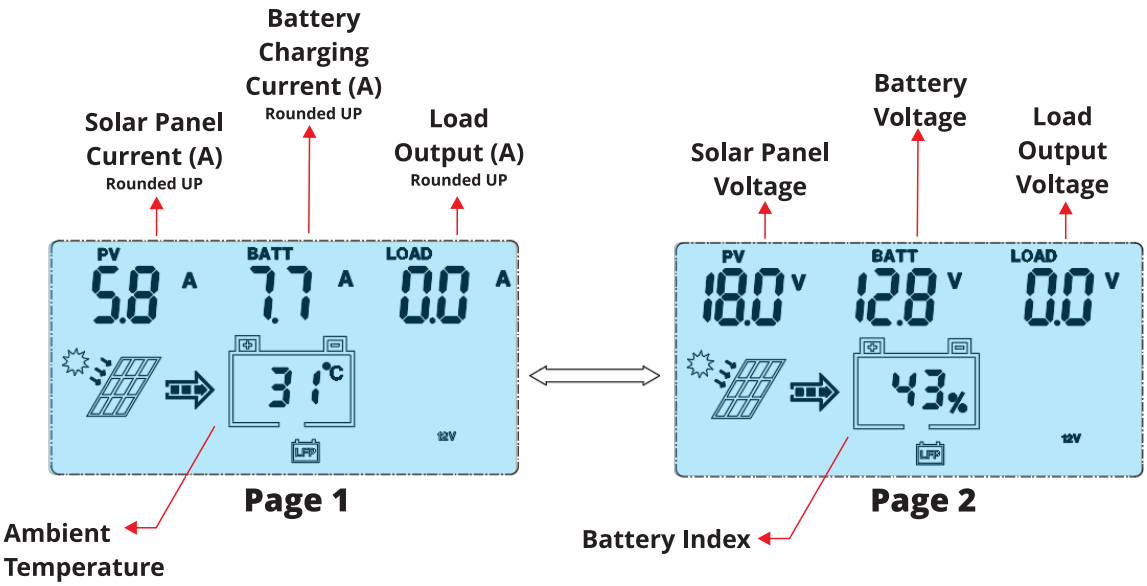


Navigation

Button	Function based on Navigation Position
▲/	*If you are on a* **Main Display Page:** ON/OFF the Control Board/Load Output *If you are on a* **Settings Page:** + Increase a Parameter *If you are on a* **Settings Page:** Hold for 3 Seconds to return to standby Main Display Page
▼	*If you are on a* **Settings Page:** - Decrease a Parameter *If you are on a* **Settings Page:** Hold for 3 Seconds to Restore Factory Setting
MENU / SET	*If you are on a* **Main Display and Settings Page:** Cycle through the Monitoring Displays *If you are on a* **Main Display Page:** Hold for 3 Seconds to Enter Settings

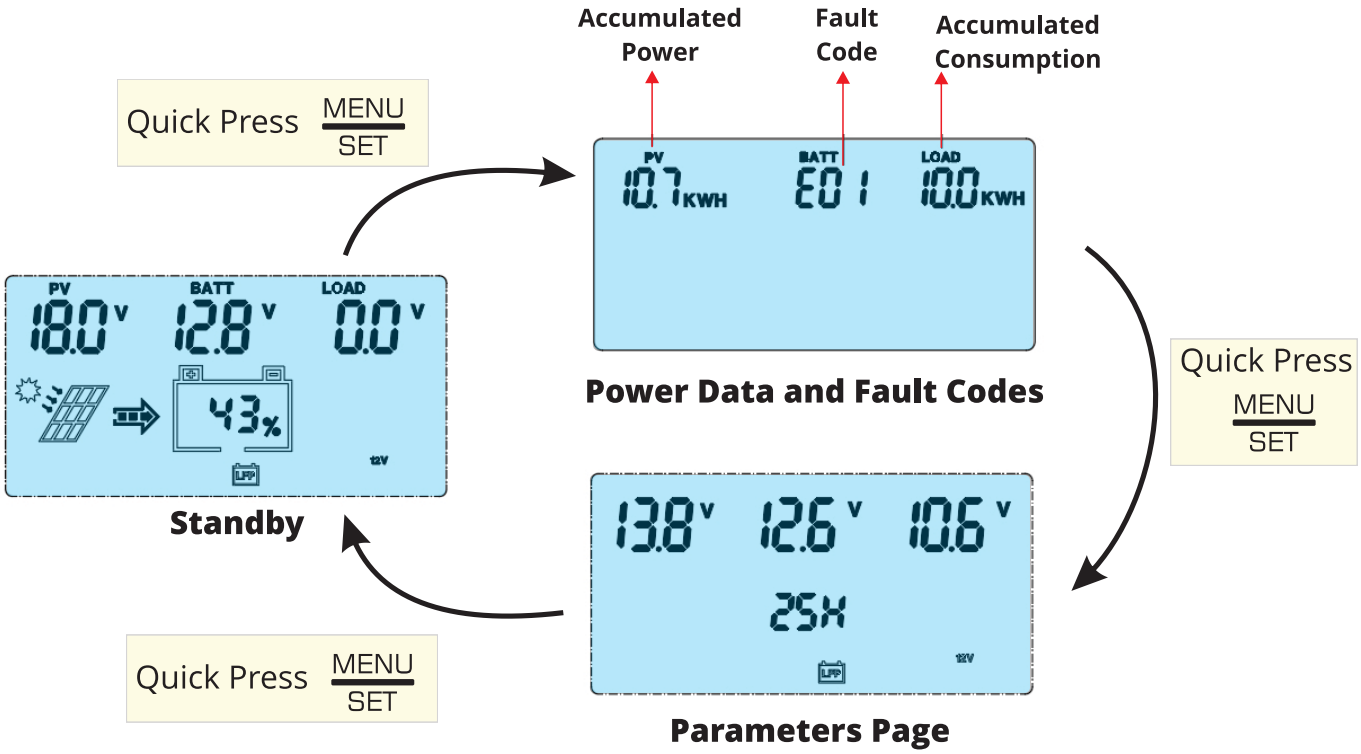
Standby Monitoring

Whilst in standby state the M10 will provide real-time data as displayed below. The displays auto rotate every 3 seconds.



Accumulated Data, Fault Codes and Parameters Page

From the standby state quick press the MENU/SET button to cycle to power and fault code page or quick press again to cycle to current parameter page.

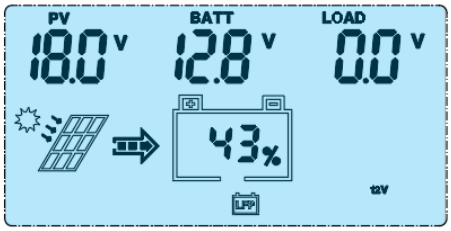


Manual Setting Changes

From standby press and hold the MENU/SET button for 5 seconds, the **[SET]** icon will appear in the bottom left corner indicating we are in the setting state.

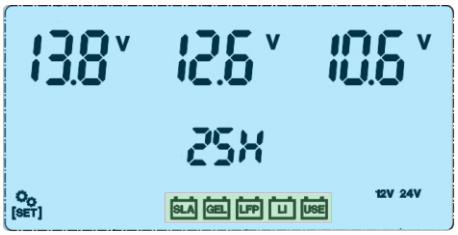
The parameter to be changed will flash and you can quick press the MENU/SET button to cycle between the different parameter setting changes.

Using the ▲ **or** ▼ will adjust the specific parameter and quick press MENU/SET will save and move to the next parameter.



Hold for 5 Seconds MENU/SET

Manual Battery TYPE Selection

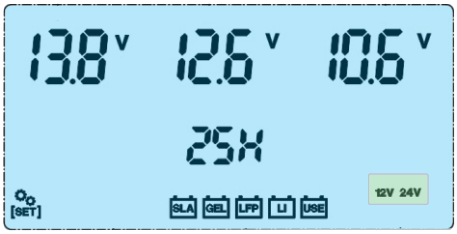


The battery type is AUTOMATICALLY detected when using SLA (Sealed Lead Acid) or GEL (Gel Lead Acid). In the case of a LITHIUM ONLY the battery type needs to be selected manually.
If selecting LFP, LI or USE- See Expert Settings

SLA **Sealed Lead Acid (Auto Detected)**
GEL **GEL Lead Acid (Auto Detected)**
LFP **Lithium Iron Phosphate**
LI **Ternary Lithium**
USE **Custom**

Quick Press MENU/SET

Manual Battery VOLTAGE Selection

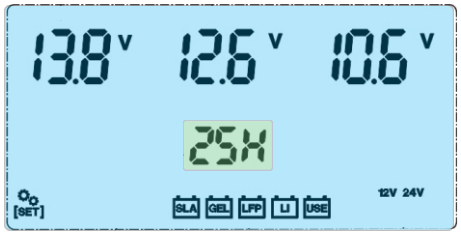


The battery voltage is AUTOMATICALLY detected when using the correct power on procedure however if necessary it can be manually set here.

12V 12V Mode **24V** 24V Mode

Quick Press MENU/SET

Manual Load Mode Selection



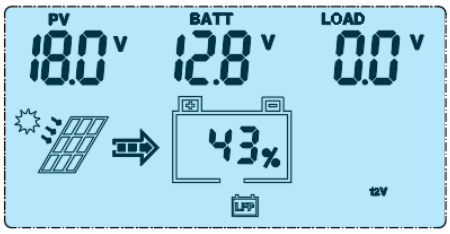
00H	When there is NO solar input (dark), turn on the load output. when there is solar input (light) turn off the Load Output.
01H-23H	When there is NO solar input (dark), turn on the load output for the nominated time (1 Hour to 23 Hours)
24H	Load output ALWAYS on.
25H	Load output Switchable ON/OFF using ▲/

Expert Settings

Within the battery type selection LFP,LI or USE parameters are customizable BUT should only be performed by a trained professional. Incorrect settings will cause battery failure, device failure and may result in cases of a fire.

ALL adjustments made to FLD,LRV and LDV are made in 12V calculations when input, if the system is set to 24V mode it will automatically double the input parameters.

DO NOT under any circumstances input parameters for 24V directly.

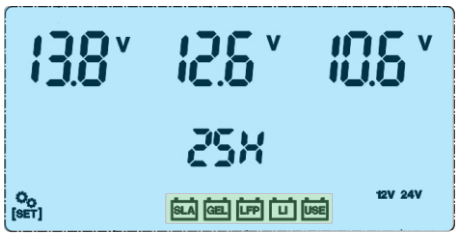


Hold for 5 Seconds MENU SET

FLD Float Charge Voltage

LRV Low Recovery Voltage

LDV Low Discharge Voltage

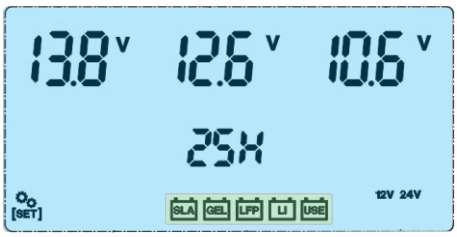


Manual Battery TYPE Selection

	(Auto Detected) Gel Lead Acid **GEL**	**(Auto Detected)** Sealed Lead Acid **SLA**	**(Manually Set)** lithium Iron Phosphate **LFP**	**(Manually Set)** Ternary Lithium **LI**	**(Manually Set)** Custom Battery **USE**
Battery Voltage Mode	12V/24V	12V / 24V	12V / 24V	12V / 24V	12V / 24V
Float Charge Voltage (FLD)	13.7V / 27.4V	13.7V / 27.4V	14.0V / 28.0V (Adjustable)	12.3V / 24.6V (Adjustable)	13.7V / 27.4V (Adjustable)
Low Discharge Voltage (LDV)	10.7V / 21.4	10.7V / 21.4	11.2V / 22.4V (Adjustable)	9.5V / 19.0V (Adjustable)	10.7V / 21.4 (Adjustable)
Low Recovery Voltage (LRV)	12.0V / 24.0V	12.0V / 24.0V	12.0V / 24V (Adjustable)	10.5V / 21.0V (Adjustable)	12.0V / 24.0V (Adjustable)

Reset Parameters

Within the battery type selection press and hold the ▼ Button for three seconds to reset the parameters.

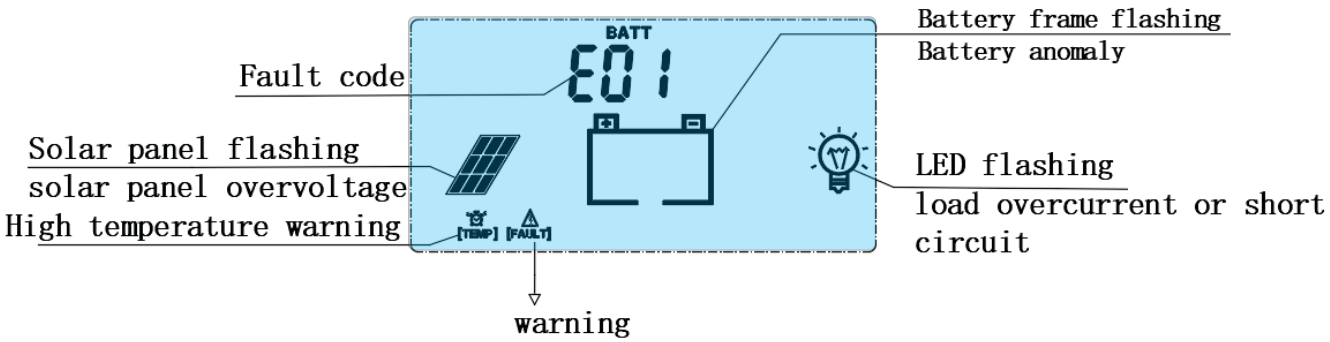


Hold for 3 Seconds ▼

Manual Battery TYPE Selection

Errors and Fault Codes

Within the standby screens we can read multiple issues that may arise such as over voltage warnings, temperature warning, over current warnings etc. If a **[FAULT]** icon appears in the bottom of the display it can be checked by pressing MENU/SET.

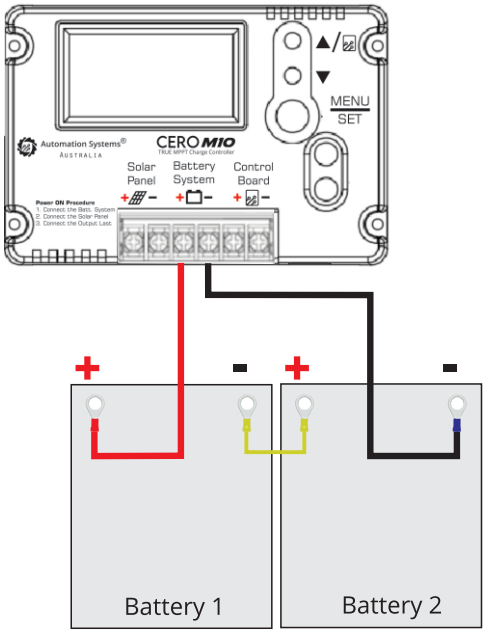


Fault Code	Description	Cause	Resolution
E01	Battery Low Voltage	Battery Voltage is Less than LDV (Low Discharge Voltage)	The warning will automatically be cleared after the battery voltage is above LRV (Low Recovery Voltage)
E02	Battery Over Voltage	Battery Voltage is Below HDV (High Discharge Voltage)	The warning will automatically be cleared after the battery voltage is below HRV (High Recovery Voltage)
E03	Load/Control Board Over Current	The load current has exceeded 20A	The warning will automatically be cleared after the current is below 15A.
E04	Charging Over Current	Charging Current has exceeded 10A	Once the charging current decreases to below 8A the warning will be cleared.
E05	High Temperature Warning	The Temperature of the internal PCB is above 80°C	The [TEMP] icon flashes and charging is paused. When the temperature returns to below 70°C the charging will resume.
E06	PV Input over voltage	The solar panels voltage is greater than 50V	When the solar panel voltage is less than 48V the warning will be cleared within 10 seconds.
	199°/200° Temprature	Temperature Sensor Malfunction	Restart the device.

Battery Connection (24V Mode)

24V MODE

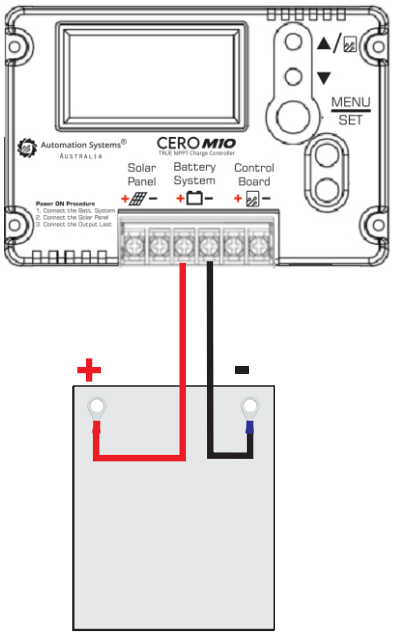
Used for Automated Gate Applications.



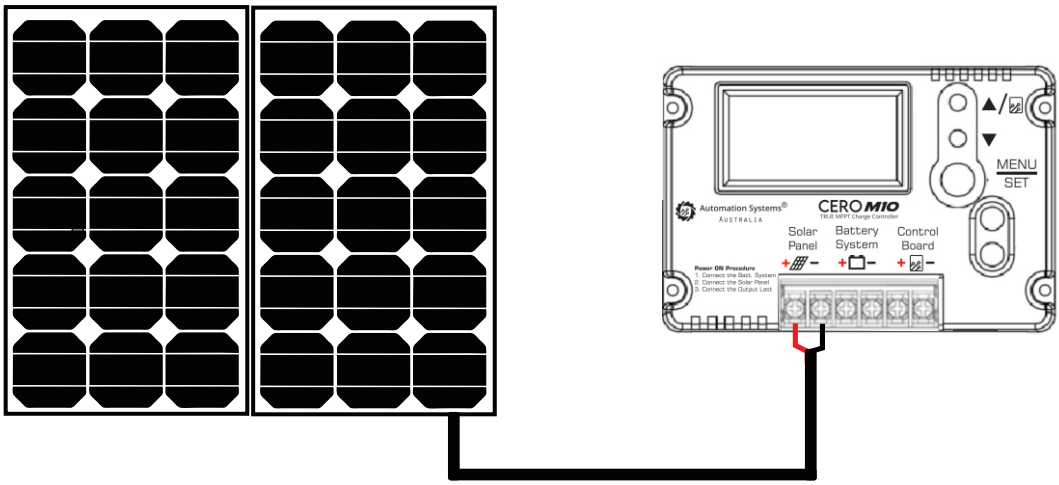
Battery Connection (12V Mode)

12V MODE

Used for Typical Applications Outside of Automated Gates such as lighting.



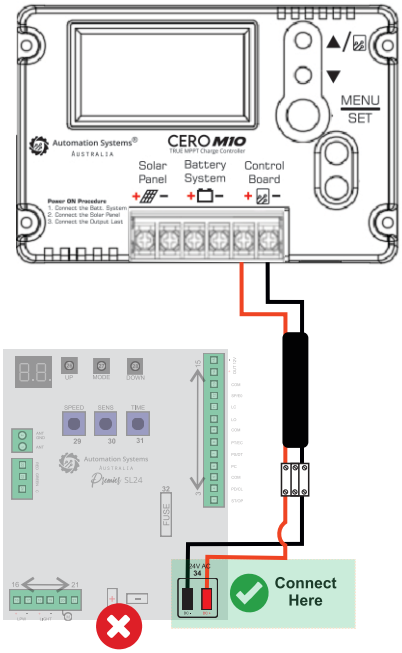
Solar Panel Connection



ALWAYS Connect the Solar Panel AFTER the batteries/battery to ensure the system can Auto-Detect the voltage configuration.

Titan 2410/Premier SL 24 Sliding Gate Control Board Connection

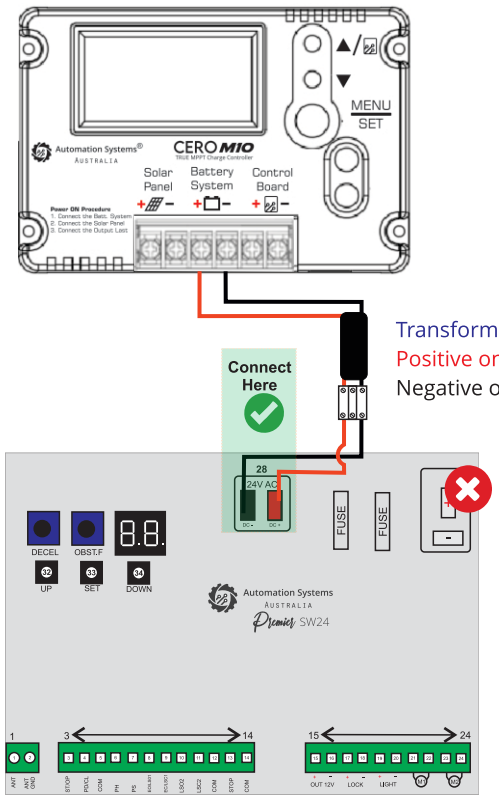
24V MODE



Transformer Terminal 24V
Positive on RIGHT SIDE (+)
Negative on LEFT SIDE (-)

Premier SW 24 Swing Gate Control Board Connection

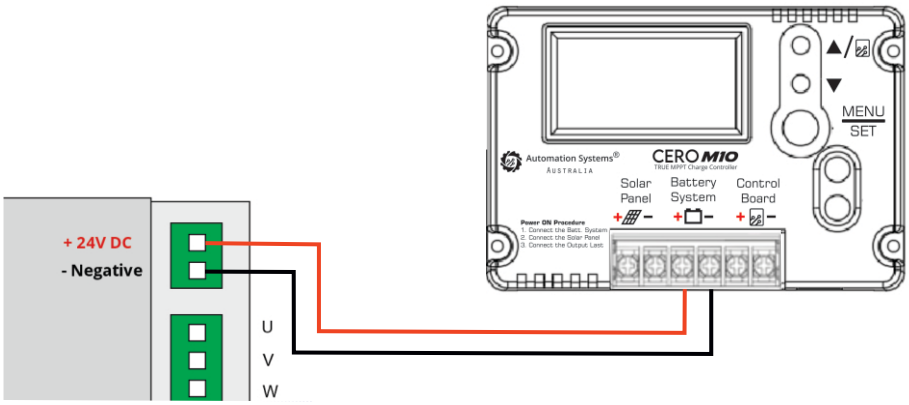
24V MODE



Transformer Terminal 24V
Positive on RIGHT SIDE (+)
Negative on LEFT SIDE (-)

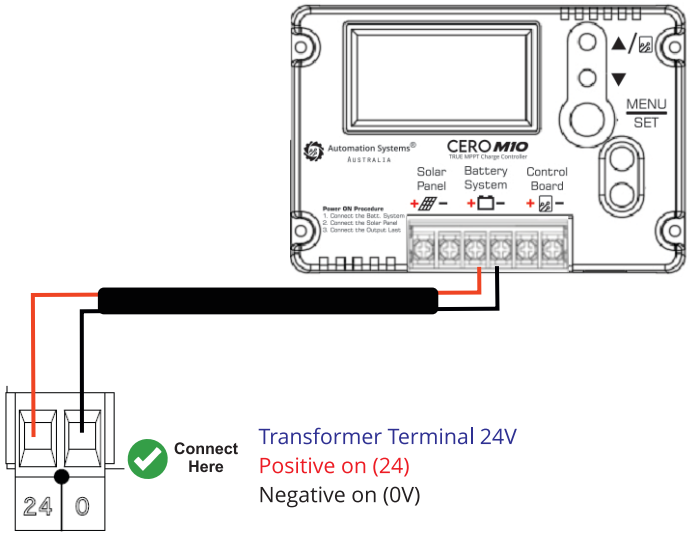
Sentry Brushless Boom Gate Control Board Connection

24V MODE



BXV (ZN7)/ZL65/ZLX24 Gate Control Board Connection

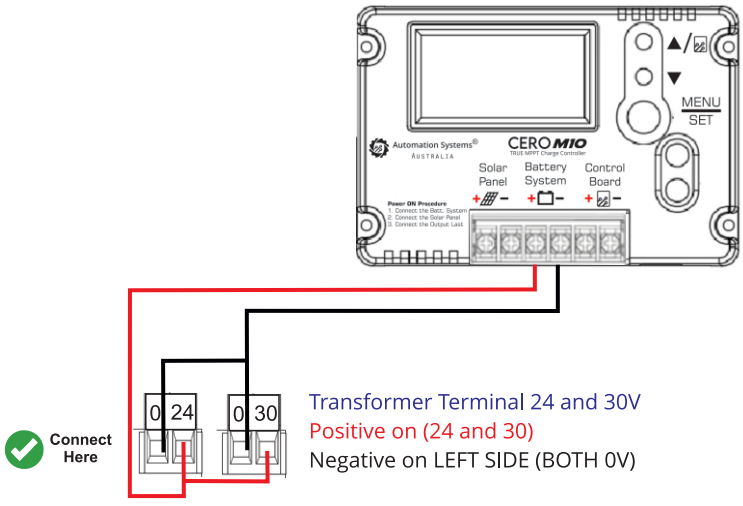
24V MODE



Transformer Terminal 24V
Positive on (24)
Negative on (0V)

BKV (ZN8) Gate Control Board Connection

24V MODE



Transformer Terminal 24 and 30V
Positive on (24 and 30)
Negative on LEFT SIDE (BOTH 0V)

Warranty Terms and Conditions

The product is warranted for a period of 12 months (1 years) from the date of purchase. The product is to be installed for its intended purpose and for normal use as outlined within the installation manual, the product warranty is exclusively for defects in manufacturing and manufacturing workmanship. It does not cover out of guidelines use, natural or other disasters, abnormal weather conditions, damage incurred in shipping or handling, damage caused by disaster such as fire, flood, wind, earthquake, lightning, excessive voltage, mechanical shock, water damage, damage caused by unauthorized attachment, alterations, modifications, or foreign objects, damage caused by peripherals (unless such peripherals were supplied by Automation Systems Australia), defects caused by failure to provide a suitable installation environment for the products, damage caused by usage of the products for purpose other than those for which it was designed, damage from improper maintenance, damage arising out of any other abuse, mishandling, and improper application of the products.

At is discretion Automation Systems Australia will require the item determined by the support staff to be returned to base in it original unmodified condition for a warranty inspection if within the warranty period. A return authorization “RA” number will be provided to be enclosed with the product in question. The warranty will not cover freight fees to base, customs fees or any labour costs at the installation site but will cover repair or replacement of the product as seen fit. Automation Systems Australia will cover the freight of the returned item to the original address if deemed as a warranty repair or replacement item. Any warranty repairs or replacements continue to carry through the remaining warranty period and do not extend or restart the period.

Under no circumstances shall Automation Systems Australia be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose). And of all other obligations or purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

Automation Systems Australia will at its option repair or replace out-of-warranty products at a determined cost which are returned to its base according to the following conditions. Anyone returning goods to Automation Systems Australia must first obtain an authorization number. Automation Systems Australia will not accept any shipment whatsoever for which prior authorization has not been obtained. Products which Automation Systems Australia determines to be repairable will be repaired and returned. A set fee which Automation Systems Australia has been predetermined and which may be revised from time to time will be charged for each unit repaired. Products which Automation Systems Australia determines not repairable will be replaced by the nearest equivalent product available at that time. The current market price for the replacement product will be charged for each replacement unit.