CoolMax SRX MV 300

24 V and 48 V MPPT Solar Charge Controller · Legacy Product



SRX MV 300/50 · SRX MV 300/60

Installation and Operation User Manual

REV 10.0, 16 NOV 2026

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Document

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AER07.004	**10.0**	**11 / 2026**	**Control v4.08+ · Interface v3.0+**

Models	Format
SRX MV 300/50 · SRX MV 300/60	**A4 · 28 pages**

About AERL

Australian Energy Research Laboratories (AERL) was founded in 1985 by Stuart Watkinson to commercialise the Power Optimizer, which he developed while studying at the University of Queensland. It became the AERL MAXIMIZER™, a universal maximum power point tracker (MPPT).

Today AERL designs, integrates and supports power conversion, lithium energy storage, monitoring and earth-fault detection products for commercial, industrial and off-grid energy systems, including oil and gas, mining and telecommunications sites.

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Important Safety Information

About this manual

01

This manual contains important safety information and installation instructions for the AERL CoolMax SRX MV 300 MPPT solar charge controller. It uses the following symbols for important operating information and potentially dangerous conditions.

Important

Indicates information that must be followed to ensure proper installation or operation of the CoolMax SRX.

Caution

Indicates a critical procedure for the safe installation or operation of the CoolMax SRX. Take extreme care when you carry out this task.

1.1 About This Manual

This manual gives installation and operating instructions for the CoolMax SRX MV 300/50 and SRX MV 300/60. Read all of its instructions and cautions before you start the installation.

Only qualified electricians and technicians may install the CoolMax SRX. This manual is for installers and the system owner.

Do not disassemble or attempt to repair the CoolMax SRX unless you are a qualified technician and have authority in writing from AERL to do so.

AERL will not be held responsible in any way for the mishandling of this product or for installation of the product in a manner that does not follow the instructions in this manual or as advised by AERL.

Warranty 02

Your warranty	How long
You are the original purchaser of the CoolMax SRX	3 years from the date of purchase
You are the original purchaser and registered the warranty within 60 days of installation	5 years from the date of purchase

Register at **aerl.com.au/warranty-registration**. You will need the controller's model and serial number, from the ID label, and the installation date.

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 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.

Before returning a controller, contact AERL for a Return Materials Authorisation (RMA). Proof of purchase is required for a warranty claim.

Full terms: the CoolMax SRX 300 Series Warranty Statement, at aerl.com.au.

Specifications

General, electrical, environment, compliance and warranty

03

3.1 General

Parameter	Value
Weight	6.8 kg
Dimensions (W × H × D)	226 × 480 × 111 mm
Enclosure type	Indoor Type 1 / IP20
Input and output power connectors	Screw terminals (8–42 mm²)
Communications	CAN bus and RS485 (Modbus RTU)
Communications ports	RJ45 and USB (Mini-B)

3.2 Electrical

Characteristic	SRX MV 300/50	SRX MV 300/60
Nominal battery voltage / range	24 V or 48 V / 20–60 Vdc	24 V or 48 V / 20–60 Vdc
Maximum charge current	50 A	60 A
Nominal PV power, 48 V battery (at 57.6 V absorb)	2880 W	3456 W
Nominal PV power, 24 V battery	1440 W	1728 W
Maximum PV short-circuit current	32 A	32 A
Maximum PV open-circuit voltage	300 V at the lowest expected temperature	300 V at the lowest expected temperature
Minimum PV maximum-power voltage	1.3 × nominal battery voltage	1.3 × nominal battery voltage
Maximum conversion efficiency	98.3%	98.3%
Overload behaviour	Operating point shift (power limitation)	Operating point shift (power limitation)
Battery temperature compensation	Yes	Yes
Remote temperature sensor option	Yes (SRX-RTS)	Yes (SRX-RTS)
Self-consumption (idle)	100 mA at 20 V	100 mA at 20 V

3.3 Environment

Characteristic	SRX MV 300/50	SRX MV 300/60
Ambient operating temperature	−20 to 60 °C	−20 to 60 °C
Storage temperature	−30 to 70 °C	−30 to 70 °C
Required cabinet air exchange (intake at 40 °C)	14 m^3/hour	16 m^3/hour
Heatsink temperature rise at full power	30 °C	35 °C
Sealed inductors and conformal coating	Yes	Yes

3.4 Compliance and Warranty

Parameter	Value
Conforms to	IEC 62109-1 EN 61000-6-3:2012 EN 61000-6-4:2012
Warranty	3 years; 5 years if registered within 60 days of installation

Introduction

Features, firmware

04



Figure 4.1 CoolMax SRX MV 300

> **Legacy product**
>
> The CoolMax SRX MV 300 is no longer manufactured. This manual is re-issued for systems already installed. For a new 48 V system, see the CoolMax SRX 600/70-48 at aerl.com.au, or contact AERL.

The CoolMax SRX MV 300 is an Australian engineered MPPT solar charge controller for 24 V and 48 V battery systems. It charges the battery efficiently and with a battery-specific charge profile, while making full use of the PV array.

4.1 Features

CoolMax charge controllers use maximum power point tracking (MPPT) to draw the maximum power available from the PV array.

- Peak conversion efficiency 98.3%
- Low-heat thermal design, designed for long-term reliability
- PV input up to 300 V open-circuit voltage
- Built-in overload and thermal protection
- Common-positive wiring
- Master/slave operation
- Touch-screen configuration
- Multi-stage battery charging

4.2 Firmware

This manual covers CoolMax SRX control firmware v4.08 and later and interface firmware v3.0 and later. For firmware updates, contact AERL support.

Installation

Standards and requirements, grounding, ground fault detection

05

Important

Install the CoolMax SRX in a clean, dry location away from direct sunlight. It cools best when mounted vertically. Keep at least 15 cm clear above the controller for air flow.

Caution — equipment damage

Do not connect a CoolMax SRX in parallel with third-party charge controllers. Doing so voids the warranty.

5.1 Standards and Requirements

All installations must comply with national and local electrical standards and codes of practice. AERL recommends professional installation.

5.2 Grounding

AERL charge controllers are designed to be installed in floating systems, but have provision for positive functional earthing for telecommunications applications if required.

Caution — hazard

DO NOT FUNCTIONALLY EARTH THE ARRAY if a negative earth is used for the batteries, load or DC system.

Important

The CoolMax ground (inside the enclosure) is marked with the protective earth symbol.

Caution — hazard

If the controller is damaged or malfunctioning, it may only be disassembled and repaired by a qualified service centre. Contact your installer or AERL. Incorrect reassembly risks malfunction, electric shock or fire.

5.3 Ground Fault Detection

> **Important**
> Since 11 July 2015, solar PV installations in Australia and New Zealand have required an earth fault alarm on power conversion equipment (PCE), which includes solar charge controllers such as the CoolMax SRX (AS/NZS 5033:2014, clause 3.4.3, the edition current when this product was sold). Check the current edition of AS/NZS 5033 and local requirements for your installation.

Under AS/NZS 5033:2014 clause 3.4.3:

1. In systems where the PV array operates at LV, an earth fault alarm system shall be installed which, on an earth fault, causes an action to be initiated to correct the earth fault.
2. The alarm system is to repeat its operation at least hourly until the earth fault is corrected.
3. The alarm may be an audible signal or a visual indicator placed where operating staff or system owners will be aware of it, or another form of fault communication (for example email or SMS) shall be used to inform the system operator.
4. The system owner shall be given operating instructions that include the actions to take when the alarm operates.

Operating voltage below 120 Vdc. Equipment operated at ELV is not subject to AS/NZS 5033:2014 clause 3.4.3 and does not need a ground fault circuit or remote ground fault indicator.

Operating voltage 120 Vdc or higher. An external ground fault protection kit and a remote ground fault alarm are required. Recommended solutions are below.

Multiple controllers. When two or more charge controllers are installed on the same battery bank, disable all but one ground protection circuit. Only one ground fault indicator is required.

5.4 Ground Fault Detection and Interruption Solutions

	Negative grounded	Positive grounded	Floating
Ground fault protection circuit	AERL GFDI device, part no. AER-GFDI-N	AERL GFDI device, part no. AER-GFDI-P	AERL EarthGuard EG-600 (successor to the EG-300)
Remote ground fault indication (options)	System Information / Alarms screen; CoolMax Modbus RTU and CAN bus communications to external devices	System Information / Alarms screen; CoolMax Modbus RTU and CAN bus communications to external devices	EarthGuard alarm indication relay

The AER-GFDI-N and AER-GFDI-P kits were made for the CoolMax SRX 300; contact AERL for availability. Refer to the installation and operating manual of each device for installation and programming instructions.

5.5 Mounting the Controller

Fix the CoolMax SRX to a vertical surface with the M5 screws provided, through the eight mounting holes in the chassis flanges (Figure 5.1).

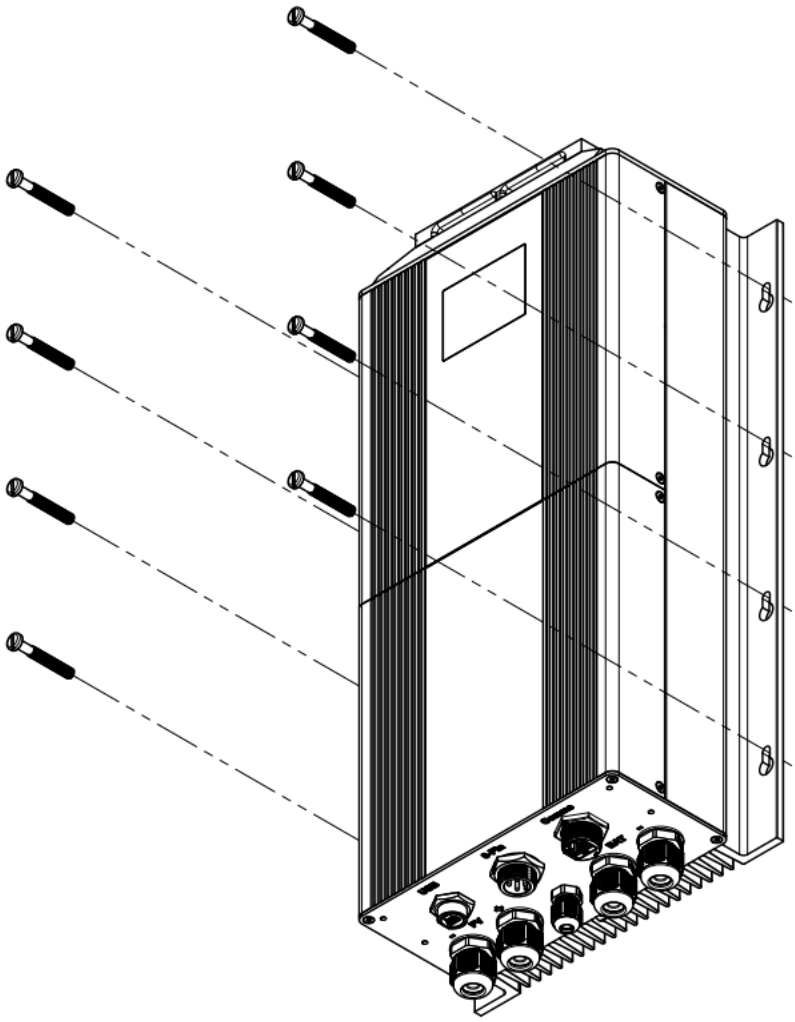


Figure 5.1 SRX MV 300 mounting hole locations

5.6 Mounting Clearances

Keep the clearance zone in Figure 5.2 around the controller for cooling at full load: 15 cm above, and 10 cm to each side and below.

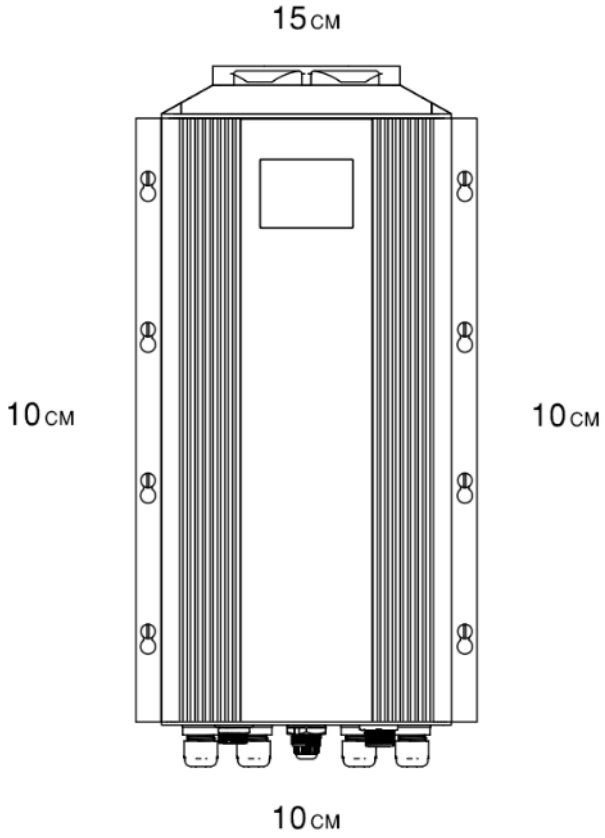


Figure 5.2 SRX MV 300 mounting clearances

5.7 Wiring Information

> **Important**
>
> - Wire sizes must comply with local and national standards. Input conductors and circuit breakers must be rated at 1.56 times the short-circuit current of the PV array.
> - Use copper wiring rated at 75 °C or higher.

SRX MV 300/50

- The output current limit is 50 A.
- Use at least #6 AWG (16 mm²) wire for the output between the controller and the battery bus bar or termination.
- Fit a 63 A non-polarised DC circuit breaker between the controller output and the load. Recommended: NOARK Ex9BP 63 A 2-pole 300 Vdc circuit breaker.
- Terminate both the input and output conductors with appropriately sized insulated crimp ferrules.
- Torque all wire and ground terminals to 1.7 Nm (15 in-lb).

SRX MV 300/60

- The output current limit is 60 A.
- Use at least #4 AWG (25 mm²) wire for the output between the controller and the battery bus bar or termination.
- Fit an 80 A non-polarised 2-pole DC circuit breaker, rated for at least 300 Vdc, between the controller output and the load. A 63 A breaker is too close to the 60 A output current and may trip in normal operation.
- Terminate both the input and output conductors with appropriately sized insulated crimp ferrules.
- Torque all wire and ground terminals to 1.7 Nm (15 in-lb).

Refer to the relevant IEC or AS/NZS wiring standard for PV array cable sizing, length and current-carrying capacity.

5.8 Wiring Compartment

> **Caution — hazard**
>
> All wiring must enter the controller through the labelled cable glands in the base plate or the rear entry ports inside the enclosure. Never drill holes anywhere in the controller: metal swarf can enter the electronics and damage the unit once powered. Drilling any hole in the controller voids the warranty.

To install the cabling, remove the access panel: undo the two M4 countersunk Phillips screws on the bottom of the enclosure and the two M3 countersunk Phillips screws on each side of the access panel (Figure 5.3).

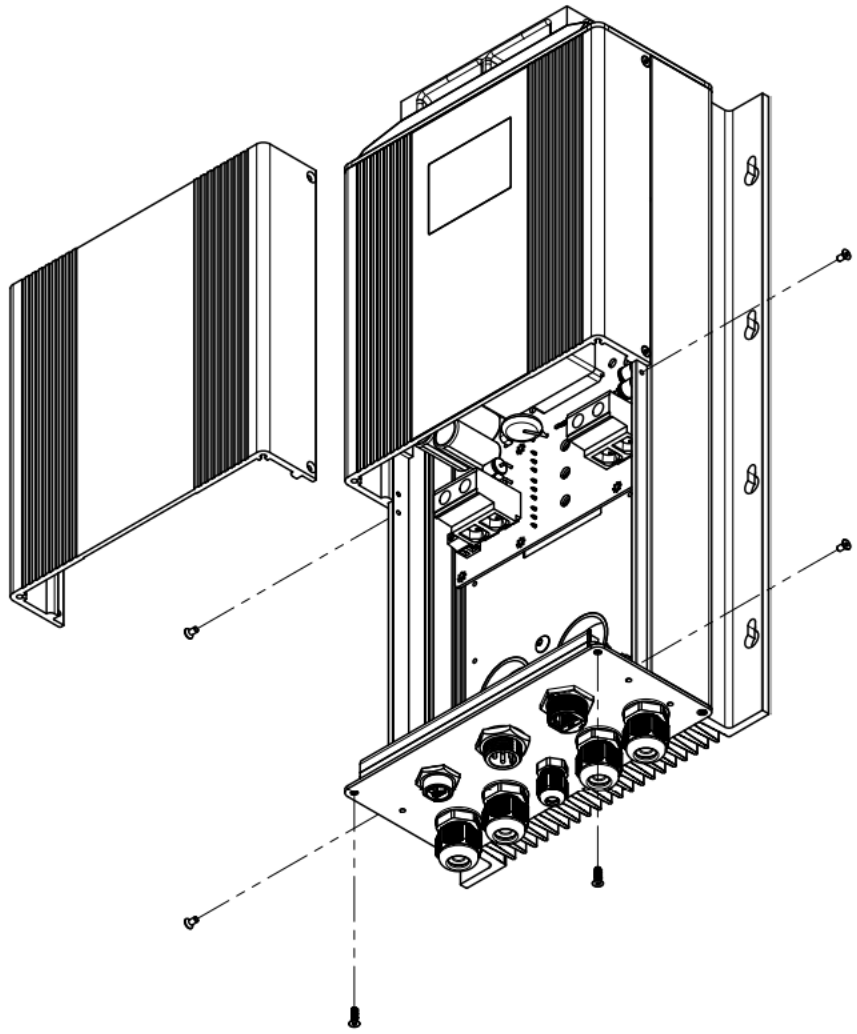


Figure 5.3 Access panel screw locations

5.9 Wiring Polarity

> **Caution — equipment damage**
> Reversing the polarity of the input or output may damage the controller and voids the warranty. Confirm polarity with a multimeter before you close the input and output breakers.

With the access panel removed, the input and output terminals are visible (Figure 5.4): PV input on the left, battery output on the right. If a ground fault device is fitted, its breaker sits between the input and output breakers.

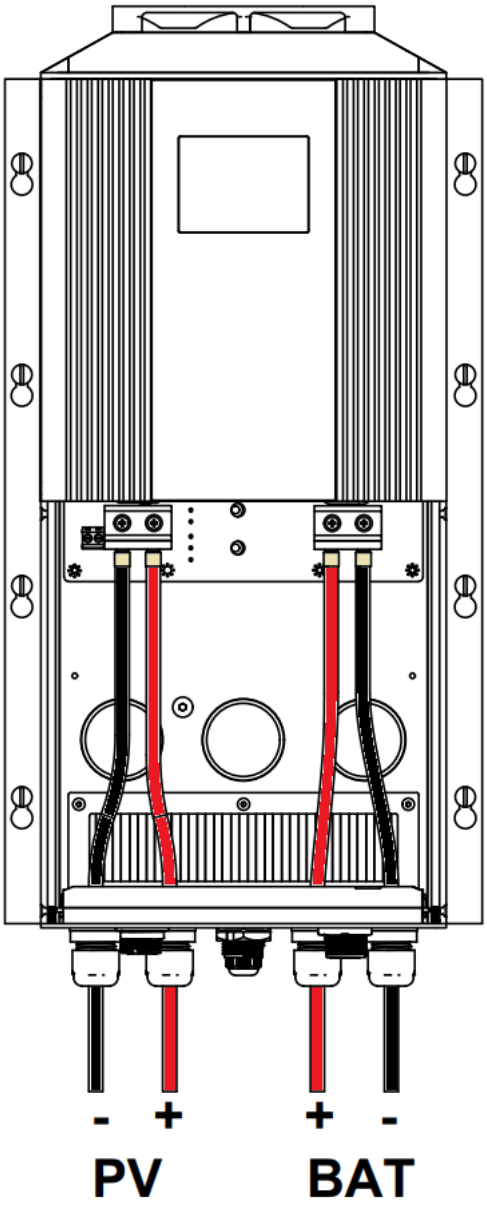


Figure 5.4 Access panel removed: PV input (left) and battery output (right)

Operation

Powering up, programming the controller, battery charge profile

06

6.1 Powering Up

The CoolMax SRX powers up when a PV or battery voltage is applied. The minimum voltage for start-up is 40 Vdc.

1. Close the PV breaker first.
2. Wait for the screen to start, then close the battery breaker.
3. Refit the access panel (the reverse of removal).

When the controller first powers up, the Real Time screen (Figure 6.1) appears. It shows live input and output measurements, the daily charge (and total charge in kWh), PV open-circuit voltage and PV power, and is the starting point for configuring the controller.

If battery temperature compensation is in use, **(B)** appears next to Temperature and the battery temperature is shown. Without a remote temperature sensor, **(I)** appears and the controller's internal core inductor temperature is shown.

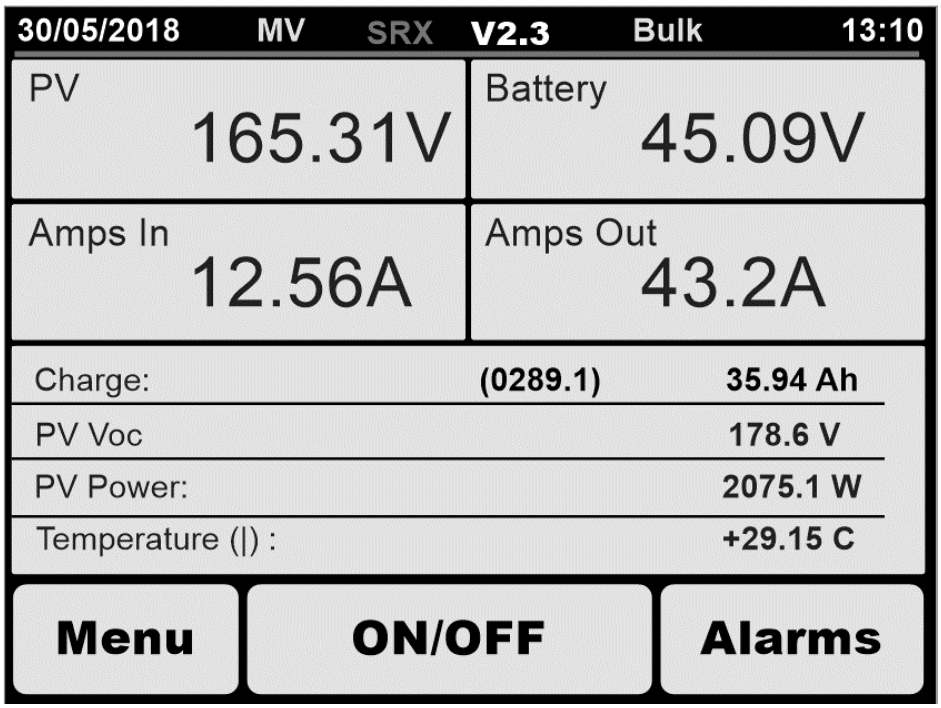


Figure 6.1 Real Time telemetry screen

Power saving mode

After 30 minutes without a touch, the screen dims. Tap the screen to restore full brightness.

6.2 Programming the Controller

The CoolMax SRX is configured from the touch screen on its front (Figure 6.2). The screen shows live measurements, the charge profile, and alarms, alerts and system information.

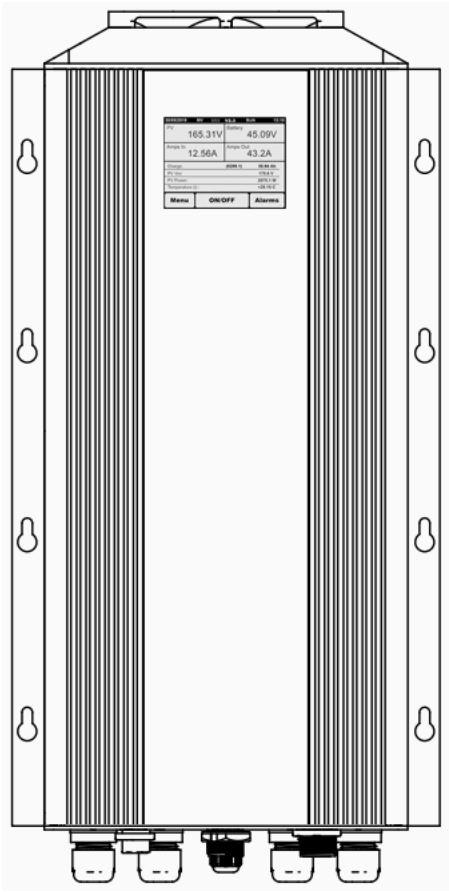


Figure 6.2 Touch screen location

6.3 Battery Charge Profile

> **Important**
> The default charge profiles are for lead-acid batteries. The CoolMax SRX MV 300 charges to the set points in its charge profile. Other batteries, including some lithium batteries, can be used with a suitable charge profile. Contact AERL support to confirm compatibility before installation.

For safety, the charge output does not switch on by itself. Configure the charge profile for the battery before you enable the output.

The controller uses a three-stage charge (Figure 6.3) and has preset charge voltages for each supported nominal battery voltage. Always check the battery manufacturer's charge voltages for the best battery life and performance; adjust them in the charge profile settings (Setting the Battery Charge Profile, below).

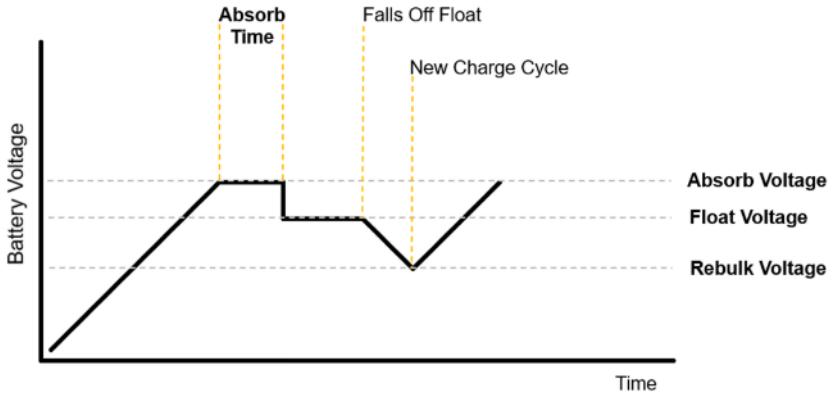


Figure 6.3 Battery charge profile: absorb, float and rebulk

Charge profile configuration

The charge profile sets the battery charge rate and the absorb, float and rebulk voltages. Equalisation is not supported.

> **Important**
> Equalisation is not supported on the CoolMax SRX. It is normally needed only for flooded lead-acid cells that have sulphated from poor charging. Equalisation is not required or recommended for $LiFePO_4$ or other lithium batteries, and is likely to damage them unless the battery manufacturer advises otherwise.

The default profile suits most applications; for the best profile for your battery, refer to its manufacturer's manual or datasheet. The SRX MV 300 default charge profile:

Setting	Default
Nominal battery voltage	48 V
Battery capacity	10 kWh

Setting	Default
Charge rate	1C
Absorb voltage	57.6 V
Absorb duration	120 minutes
Float voltage	55.2 V
Rebulk voltage	52.0 V

6.4 Setting the Battery Charge Profile

1. On the Real Time screen, tap **Menu** (bottom left).
2. On the MAIN MENU, tap **Settings**.
3. On the SETTINGS screen, tap **Set Points**.

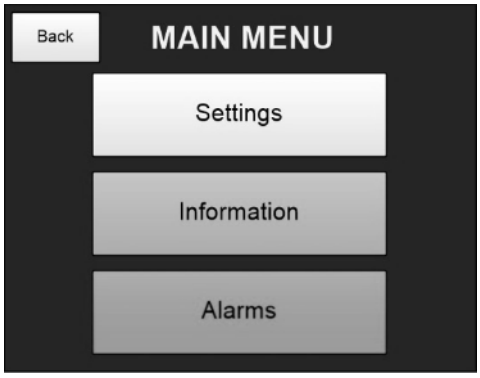


Figure 6.4 Main menu

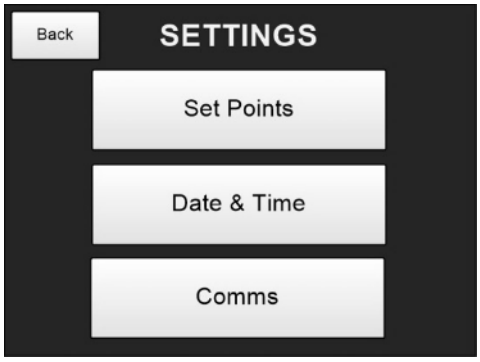


Figure 6.5 Settings

4. On the SET POINTS screen, the selected setting is highlighted. Tap **Up** or **Down** to move between settings and **Edit** to change the selected one.

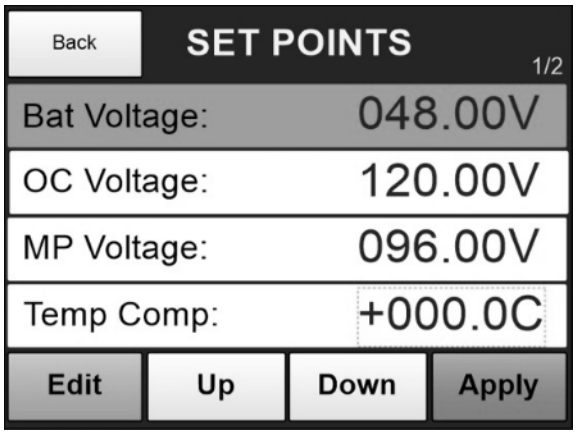


Figure 6.6 Set points (page 1 of 2)

> **Important**
>
> There are two pages of charge profile settings (1/2 and 2/2). Selecting the nominal battery voltage and tapping **Next** fills the second page with the default profile for that voltage.

> **Caution — equipment damage**
>
> Set the charge profile to the battery manufacturer's recommendations. The default profile may not suit your battery; a wrong profile may damage the battery or shorten its life.

5 Enter the PIN to edit the setting (default **1111**).

6 Adjust the value with **Up** and **Down**, then tap **Apply**.

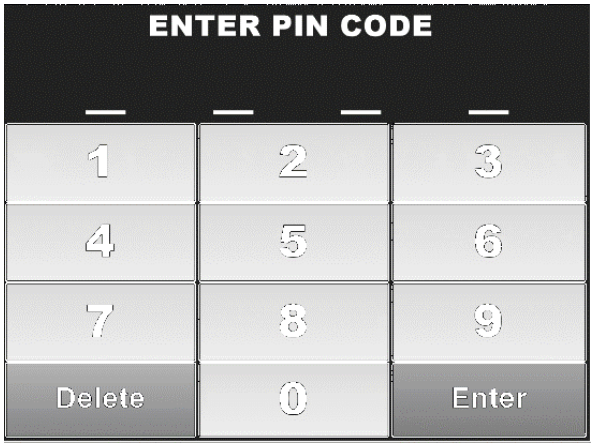


Figure 6.7 PIN entry

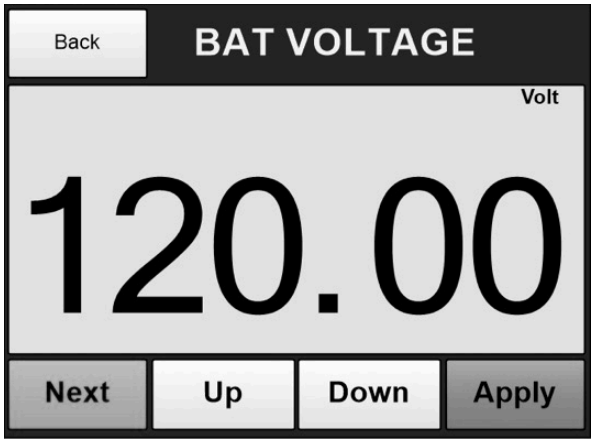


Figure 6.8 Editing a value

7 Save the charge profile by tapping **Apply** on the SET POINTS screen. The controller saves the settings and restarts.

> **Important**
>
> If a set point is outside the allowed limits for the nominal battery voltage, a warning appears and the profile cannot be saved. If you leave without tapping **Apply**, the new profile is not saved and you must enter it again.

6.5 Enabling the Output

On the Real Time screen, tap **ON/OFF** to open the OUTPUT CONTROL screen, then tap **Enable Output**. Leave **Midnight Reset** ticked. After a few seconds the screen shows OUTPUT IS NOW: ON.

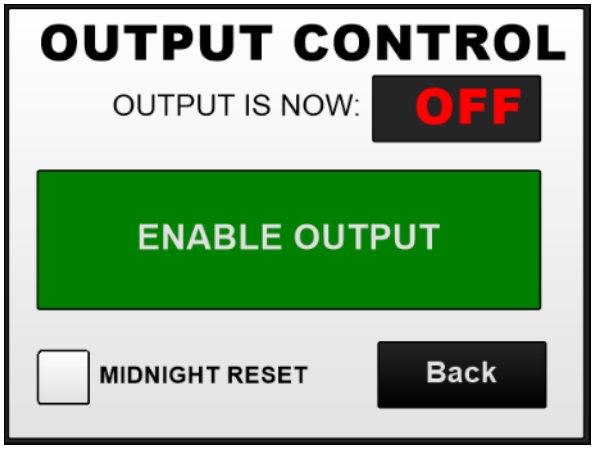


Figure 6.9 Output control: output off



Figure 6.10 Output control: output on

> **Important**
> Once the output has been enabled, the controller remembers the output state through a loss of power.

6.6 Setting the Time and Date

1. On the Real Time screen, tap **Menu**, then **Settings**, then **Date & Time**.
2. On the TIME / DATE screen, tap **Time**. Tap **Next** to move between digits and **Up** / **Down** to change them, then tap **Apply**. The TIME / DATE screen returns.
3. Tap **Date** and set it the same way, then tap **Apply**.



Figure 6.11 Time / date



Figure 6.12 Set time

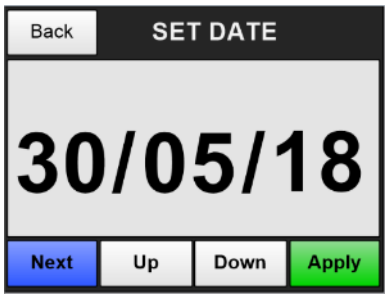


Figure 6.13 Set date

6.7 Battery Temperature Compensation

> **Important**
> Temperature compensation needs the AERL CoolMax SRX remote temperature sensor, part number **SRX-RTS**.

Temperature compensation measures the battery temperature and adjusts the absorb and float voltages to suit it. The controller adjusts its voltages by the factor set in the charge profile (Temp Comp, in mV/°C). The factor is per bank, not per cell.

Connecting the temperature sensor

> **Important**
> Set a temperature compensation value in the charge profile; the controller does not use the sensor until one is set.

Plug the sensor into the RJ45 port labelled **RTS** on the communications module at the base of the controller. Check the connector's orientation and do not force it; it clicks into place.

Sensor location

Place the sensor close to the battery cells, preferably centrally near the top of the bank.

> **Caution — equipment damage**
> Do not place the sensor where it may be exposed to water, moisture, direct sunlight or chemicals.

6.8 Relay Alarms and Generator Control

The CoolMax SRX has two relays for alarms and indication, rated 12 V / 1 A, on the 8-pin AUX connector (Figure 6.14).

- **Relay 1 (RLY 1), float indication.** Closes when the battery bank reaches float. Use it to signal the battery's state of charge to a battery inverter.
- **Relay 2 (RLY 2), low battery voltage alarm.** Commonly used to start a generator. Its settings are adjusted with the CoolMax Utility software (below).

Relay	NO	COM
RLY 1, float indication	Pin 1	Pin 2
RLY 2, low battery voltage alarm	Pin 3	Pin 4

When a relay activates, its contacts close. When it deactivates, the contacts are fully open, so an external alarm or generator control circuit can sense whether the relay is open or closed.

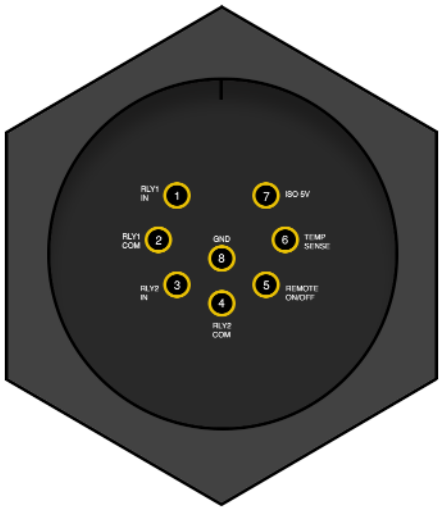


Figure 6.14 8-pin AUX connector: 1 RLY1 IN, 2 RLY1 COM, 3 RLY2 IN, 4 RLY2 COM, 5 remote on/off, 6 temperature sense, 7 isolated 5 V, 8 GND

Pins 5 to 8 carry remote on/off, temperature sense, isolated 5 V and ground. Contact AERL support before using them.

6.9 CoolMax Utility Software

The CoolMax Utility (Windows) adjusts settings that are not on the touch screen, including the RLY 2 low battery voltage alarm. Download the **CoolMax SRX 300 Utility** from the documentation library at aerl.com.au.

1. Run **Comms_Drivers_Setup (Install this first)** to install the FTDI USB drivers.
2. Connect the PC to the controller's USB Mini-B port.
3. Run **Coolmax.exe** from the CoolMax Utility V1 folder.

6.10 Communications

The CoolMax SRX supports CAN bus and Modbus RTU (RS485) for remote monitoring and control. Both are on the RJ45 comms socket at the bottom of the controller. The register and message maps are in the **CoolMax SRX 300 Series Modbus and CAN Communications Protocol**, at aerl.com.au.

Pin	Signal
1	+12 V (CAN)
2	+12 V (Modbus)
3	CAN-L
4	RS485-A
5	CAN-H

Pin	Signal
6	RS485-B
7	Not connected
8	Isolated GND

Master/slave operation

Two or more controllers can run as master and slave, linked by a patch cable between their comms sockets (Figure 6.15). Contact AERL support to set up master/slave operation.

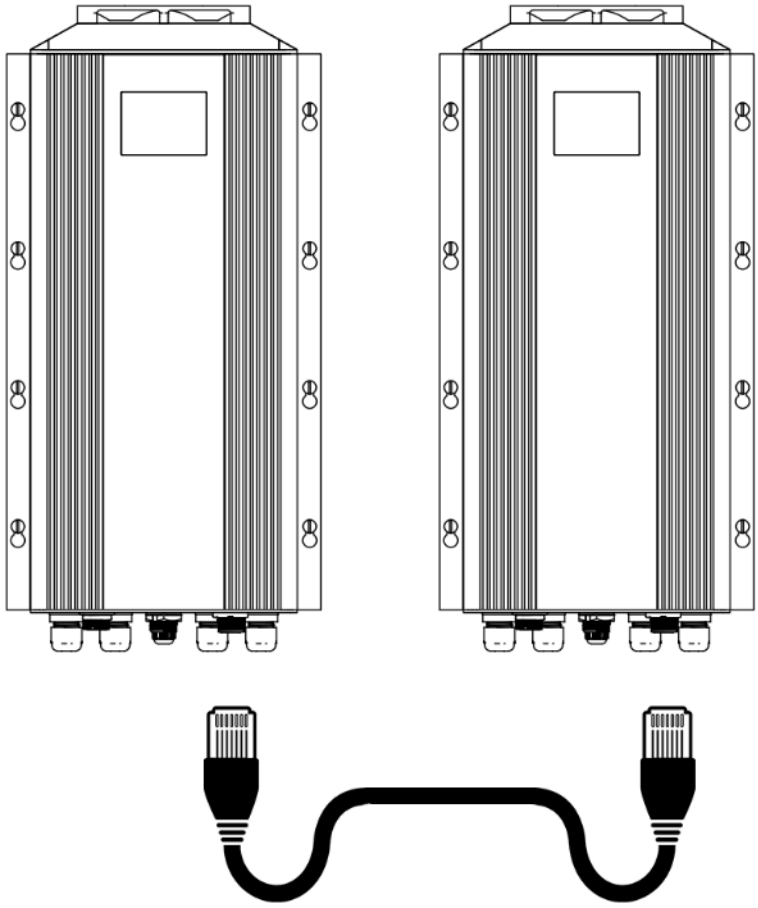


Figure 6.15 Master/slave connection between two controllers

Troubleshooting

Warning codes, fault codes

07

When the CoolMax SRX detects a warning or fault, it raises an alarm in **Alarms** on the Real Time screen. Warning codes start with W and fault codes with F.

7.1 Warning Codes

Code	Warning	Description
W001	Low input voltage detected	The PV input voltage is not high enough for the selected battery voltage.
W002	Temperature sensor not detected	The temperature sensor is unplugged or faulty.
W003	Low genset voltage detected	Low voltage detected on the genset line.
W004	Datalog full	The internal datalog is full and can no longer log data.
W005	PV array not detected	The PV array is not detected.
W006	Set points out of bounds	The set point configuration is outside its limits and may be dangerous for the selected nominal battery voltage.

7.2 Fault Codes

Code	Fault	Description
F001	Low output voltage detected	Low output voltage detected. Confirm the battery is connected to the controller.
F002	High output voltage detected	High output voltage detected.
F003	High output current detected	High output current detected.
F004	Reserved	Reserved.
F005	High discharge current detected	The battery bank is discharging at an abnormally high rate.
F006	High battery temperature detected	The battery temperature sensor has detected a high battery temperature. Operating the battery at a high temperature greatly reduces its life.
F007	Input breaker open	The PV input breaker is open.
F008	Output breaker open	The battery output breaker is open.
F009	System power overload	System power overload.
F010	Negative PV current detected	Negative PV current detected. The controller has shut down to prevent damage.

Code	Fault	Description
F011	High PV current critical	High PV input current detected. The controller has shut down to prevent damage.
F012	High PV voltage critical	High PV voltage detected. The controller has shut down to prevent damage.
F013	High output current critical	High output current detected. The controller has shut down to prevent damage.
F014	Output voltage out of range	The battery voltage is outside the operating range for the selected nominal battery voltage (upper limit: absorb voltage + 3 V; lower limit: absorb voltage ÷ 1.4). Check the nominal voltage set point.
F015	Active cooling failure	The controller has detected a fault in its active cooling. Contact AERL for help or a replacement fan module.
F016	Internal temperature critical	The controller's internal temperature has reached a critical level and it has shut down to prevent damage.

If your situation is not covered here, contact AERL support on 1800 950 865 or at support@aerl.com.au.



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