aerl

SRX-R

MPPT Solar Charge Controller



SRX-R 600/60-48

Installation & Operation

AER09 REV 2.0.4, 9 NOV 2026

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Document

Document	Revision	Effective	Firmware
AER09	**2.0.4**	**11 / 2026**	**v2.17.9+**

Model	Format
SRX-R 600/60-48	**A4 · 30 pages**

About AERL

Company, contact, copyright

01

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.

1.1 Contact Information

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1.2 Disclaimer

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Effective November 2026.

Safety & Warranty

Symbols, manual scope, warranty terms

02

This installation manual contains important safety information and installation instructions for the AERL CoolMax SRX-R MPPT Solar Charge Controller. The following symbols indicate ideal installation methods, potentially dangerous conditions, and important operational information.

Important

Information that must be followed to ensure proper installation or operation of the CoolMax SRX-R.

Caution

Indicates a critical procedure for the safe installation or operation of the CoolMax SRX-R.

2.1 About This Manual

- This manual provides detailed installation and usage instructions; read all instructions and cautions before beginning installation.
- Only qualified electricians and technicians should install the CoolMax SRX-R. This manual is intended for installation technicians and the system owner.
- Do not disassemble or attempt to repair the CoolMax SRX-R unless you have written authority from AERL.
- AERL will not be held responsible for mishandling or installation that does not follow this manual or AERL technician guidance.

2.2 Warranty

Warranty	Duration
Standard warranty	**2 years**
Registered within 60 days of installation at aerl.com.au/warranty-registration (or connected to AERL Cloud within 60 days)	**5 years**
Plus 5, bought from AERL within 60 days of installation	**10 years**
SRX-R rack shelf	**2 years**

The warranty starts 30 days after AERL dispatches the controller, whether to you, your installer or the business you bought it from. If the controller connects to AERL Cloud before then, the warranty starts on the day it first connects instead.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law.

Full terms: AERL warranty statement for CoolMax SRX-R, aerl.com.au.

Specifications

General, characteristics, standards

03

3.1 General

Weight	**6.2 kg**
Dimensions (W × H × D)	**192 × 78 × 432 mm**
Enclosure type	**Indoor Type 1 / IP20**
Mounting method	**2U Rack**
Power connectors	**Backplane Connector**
Communications	**RS485 / CAN Bus / USB**
Cooling method	**Active (user serviceable)**
Cabinet air exchange (40 °C intake)	**25 m³/hour**

3.2 Environment

Ambient operating temperature*	**–20 to 50 °C**
Storage temperature	**–30 to 70 °C**
Relative humidity	**4–95% non-condensing**
Max altitude rating	**2000 m**
Pollution degree (Int & Ext)	**II**
Self-consumption @ idle	**3.5 W**
Max conversion efficiency	**96%**

3.3 Compliance

Overvoltage category / protection	**DC II / DC Type II**
Safety protection class	**I**

3.4 Electrical (SRX-R 600/60-48)

Nominal battery voltage / range	**24 V / 18–30 48 V / 40–60**
Max charge current	**60 A**
Nominal charge power	**1728 W @ 24 V 3456 W @ 48 V**
Max PV input power	**Nominal × 2.0**
Max PV input voltage (Voc)	**600 V**
Nominal device voltage	**336 V**
MPP voltage range (Vmp)	**170–540 V**
Min PV voltage (MPPT)	**100 V**
Max PV input current (Imp)	**18 A**
Max PV short circuit current (Isc)	**25 A**
Device startup voltage	**60 V (and ≥ V_{bat} + 10 V)**
Total backfeed current (I_{bf})	**0 A**

3.5 Protection

Overload behaviour	**Power limitation**
PV reverse polarity protection	**Yes**
Reverse current protection	**Yes**
Over-temperature protection / derating	**Yes**
Over-voltage / over-current protection	**Yes**
Pre-charge protection	**Yes**
Earth leakage current detection	**Yes**

Designed to meet: IEC 62109-1:2010 (safety) · EN 61000-6-3 & EN 61000-6-4 (EMC). *Charge current derates up to 10% per °C above 80% of the upper ambient limit.

Introduction

Features, firmware coverage

04

> Thank you for purchasing an Australian engineered CoolMax SRX-R Series Charge Controller.

CoolMax Charge Controllers deliver an efficient, reliable charging process that maintains battery life while maximising generation from your PV array.



CoolMax SRX-R — front three-quarter view

4.1 Features

CoolMax Charge Controllers use advanced Maximum Power Point Tracking (MPPT) to extract the maximum power available from your PV array.

AERL's MPPT algorithm does not lock onto local power peaks, and its tracking losses stay under 0.5% across the array's full operating temperature range.

- 2U rack format for easier installation & servicing
- PV array oversizing up to 200%
- Reverse polarity & current protection
- Remote module control & monitoring
- On-board ground-fault detection
- Scalable for large storage applications
- Built-in overload & thermal protection
- Australian engineered

4.2 Firmware

This user manual covers CoolMax SRX-R Control Firmware Revisions **v2.17.9 and later**.

Safe Handling & Transport

Handling, transport, storage, pre-install

05

5.1 Handling Precautions

- The CoolMax SRX-R weighs approximately **6.2 kg (13.7 lb)**. Use proper lifting techniques when handling the unit to avoid injury.
- Always handle the unit with care to prevent damage to the electronic components.
- Do not remove an SRX-R MPPT module from the backplane while charging — always turn off the PV isolator first.
- Never touch electrical terminals when the unit is connected to a power source.
- Ensure all power sources are disconnected before performing any maintenance or installation work.

5.2 Transport Guidelines

- Transport the CoolMax SRX-R in its original packaging whenever possible to provide maximum protection.
- If original packaging is unavailable, use appropriate protective materials to prevent damage during transit.
- Secure the unit properly during transport to prevent shifting or falling which could cause damage.
- Protect the unit from extreme temperature variations, moisture, and direct sunlight during transport.

5.3 Storage Requirements

- Store the CoolMax SRX-R in a clean, dry environment within **−30 to 70 °C** (−22 to 158 °F).
- Relative humidity must remain between **4–95% non-condensing** during storage.
- Keep the unit away from corrosive materials and environments.
- For extended storage periods, periodically check the unit for signs of moisture or damage.

5.4 Pre-installation Inspection

- Before installation, inspect the unit for any physical damage that may have occurred during transport.
- Check all connectors and terminals for signs of damage or corrosion.
- Verify that all components are present and in good condition.
- Do not install a damaged unit. Contact your distributor or AERL directly if any issues are found.

Installation

Standards, mounting, wiring, backplane

06

6.1 Standards & Requirements

All installations must comply with national and local electrical standards and codes; AERL recommends professional installation. No ongoing maintenance is required.

> **Local standards & certified installation**
>
> Installation must comply with the electrical standards, codes, and wiring rules at the site; only an installer accredited or licensed in your jurisdiction should perform the work. Install in a clean, dry location away from direct sunlight. Standards cited elsewhere reflect design intent at publication; refer to current local standards.

> **Hazard (solar isolator)**
>
> Ensure the SOLAR ISOLATOR / BREAKER is in the **OFF** position before connecting or disconnecting the controller. Do not connect CoolMax controllers in parallel with third-party charge controllers.

6.2 Grounding

CoolMax controllers are designed for floating systems but include provisions for positive functional earthing for telecom applications if required. The chassis ground is marked with the standard earth symbol.

> **Do not functionally earth the array**
>
> If a negative earth is used for the batteries, load, or DC system, **do not** functionally earth the array. If damaged, the controller should only be repaired by a qualified service centre; incorrect reassembly risks electric shock or fire.

6.3 Mounting the Shelf

The SRX-R shelf must be mounted horizontally in a suitably ventilated lockable IP5X cabinet, ensuring the backplane area is restricted to licensed electricians and qualified technicians. A representative rack-cabinet installation populated with multiple SRX-R shelves is shown in Figure 1A.



Figure 1A · SRX-R rack cabinet installation

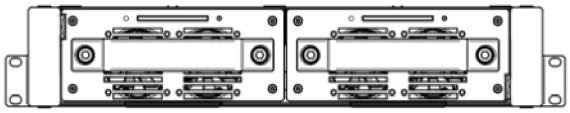


Figure 1B · SRX-R modules in shelf

6.4 Wire and Disconnect Sizing

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

Use a minimum of **1/0 AWG (50 mm²)** multistrand cable for the output between the backplane and the battery bus bar or termination. Confirm the conductor's current-carrying capacity is appropriate for the chosen load circuit breaker, and use an appropriately sized insulated crimp ferrule when terminating both input and output connections.

> **Earthing conductor sizing**
>
> Size the protective earth conductor between the SRX-R shelf and the installation's main earthing system per **AS/NZS 5033 Figure 4.13** (earthing-conductor sizing decision tree) or the equivalent installation standard in your jurisdiction. **#12 AWG (4 mm²) is the minimum cross-section** acceptable at the SRX-R earth stud — it is not a default. Many installations require larger: for example, arrays exposed to lightning-protection requirements (LPS) or installations without DC overcurrent protection typically require **16 mm²**, or the earth conductor sized to the array cable, whichever is greater. The installer is responsible for the final selection.

Backplane terminations on the shelf use studded connections. Apply the torque values below, using the provided nut and spring washer for each terminal:

Terminal	Stud	Current rating	Torque
Battery (+ / −)	**M10**	**350 A**	**17 Nm**
PV+, PV−, Earth	**M5**	**180 A**	**2.2 Nm**

Example setup — two MPPTs in a single 2U shelf

For the example scenario of two SRX-R MPPT modules installed in a single 2U shelf as the only charge controllers on the battery bus, the breaker and configuration below are the **recommended setup** for that scenario. For other scenarios (multi-shelf installations, mixed-controller systems, etc.) contact AERL for guidance on multi-shelf or mixed-controller systems.

- The output current limit of the CoolMax SRX-R 600/60-48 is **60 A per module**.
- Use a **160 A non-polarised DC circuit breaker** between the shelf output and load.
  Recommended: Noark Ex9MD 160 A DC MCB
- Refer to your local PV / electrical code for PV array cable sizing, length, and ampacity recommendations.
- All devices connected to the controller must have suitable insulation in accordance with the relevant product standards.

6.5 Backplane Terminations

> ⚠ **Hazard (polarity)**
>
> Reversing the polarity of either the input or output may damage the CoolMax SRX-R and void product warranty. **Confirm polarity** with a multimeter prior to closing the input and output circuit breakers.

> ⚠ **Hazard (cable entry)**
>
> All SRX-R wiring must enter through the designated backplane entry points. Under **no circumstances** should holes be drilled into the chassis to make other cable entry points; metal swarf can enter the internal electronics and damage the unit once powered up.

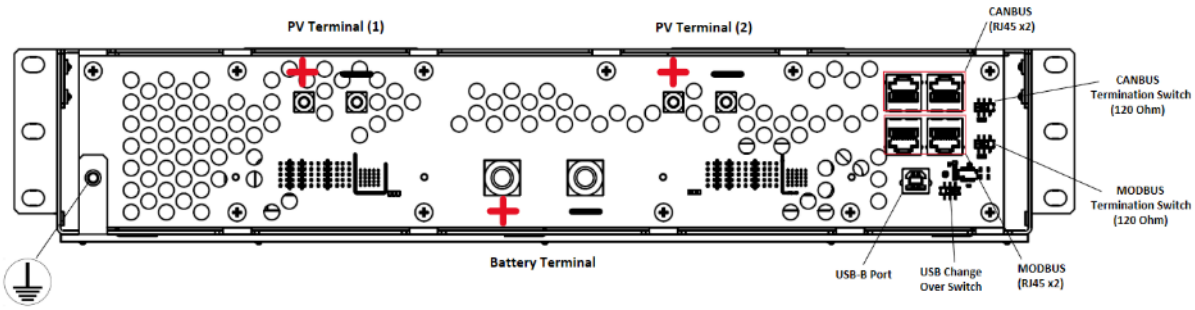


Figure 2 · SRX-R backplane

The backplane exposes the following user controls:

- **CANBUS Termination Switch** (120 Ω)
- **MODBUS Termination Switch** (120 Ω)
- **USB Change-Over Switch** (MPPT 1 / MPPT 2)

> **Shared switches**
>
> The CAN and Modbus buses are shared internally between both module slots, so each switch above is a **single shared control** that applies to both modules in the shelf. The USB Change-Over switch is the only per-module selector.

Operation & Status

Start-up, programming, LED states

07

7.1 Start-Up & Shutdown Procedure

The CoolMax SRX-R starts up once the PV input is **above 60 Vdc** and at least **10 Vdc higher than the connected battery voltage**; the device will not power up from the battery terminal. To start: connect the battery first, then turn the PV isolator / breaker on; the LED flashes blue for about 60 seconds, then begins to charge. To shut down: turn the PV isolator off, wait for the LED to turn off, and disconnect the battery breaker.

> ⚠ **Equipment damage (shutdown order)**
>
> Do not disconnect the battery fuse / breaker under load. Turn off the PV isolator **first** per the procedure above.

> ⚠ **Do not hot-swap modules**
>
> Do not remove an SRX-R MPPT module from the backplane while charging — turn off the PV isolator first to prevent equipment damage.

7.2 Programming the Device

When the CoolMax SRX-R is first powered on, the device runs a self-test and the LED indication strip flashes orange to indicate that no charge profile has been configured.

The CoolMax SRX-R is programmed via the USB-B port on the backplane board (Figure 3). Set the **USB Change-Over Switch** to the module you intend to program (MPPT 1 / MPPT 2) — only one module communicates over USB at a time. The AERL Link software for Windows 10/11 can be downloaded from aerl.com.au/professionals.

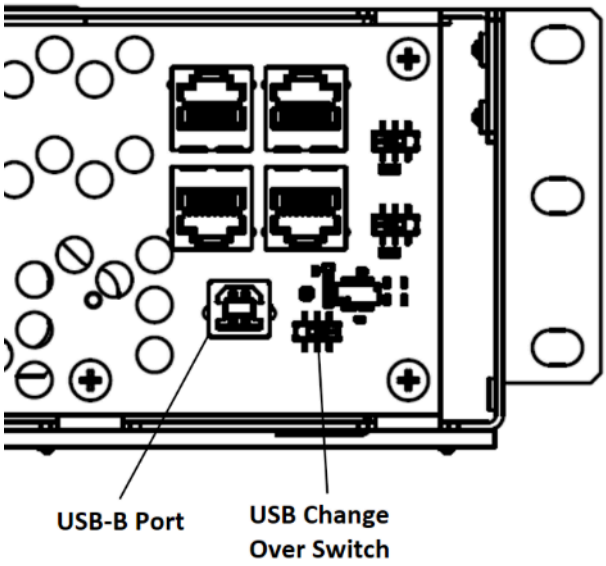


Figure 3 · USB-B programming port & toggle switch

7.3 Device Status Indicator

	Flashing	Solid	Meaning (flash)	Meaning (solid)
Green			Remotely controlled & OK	OK
Blue			Starting up	Sleeping
Orange		*N/A*	Setup required / FW update in progress	—
Red			System fault	Hardware fault

Figure 4 · LED indication states

Battery Charge Profile

Three-stage profile, AERL Link, presets, safeguards

08

The CoolMax SRX-R uses an advanced three-stage charging process with pre-set voltage profiles for each supported nominal battery voltage. The controller does not charge until a charge profile is configured for the connected battery.

Default profile

The CoolMax SRX-R default charge profile is intended for a generic $LiFePO_4$ battery solution. AERL supports most other chemistries that do not require external BMS communications; always refer to the battery manufacturer's specifications.

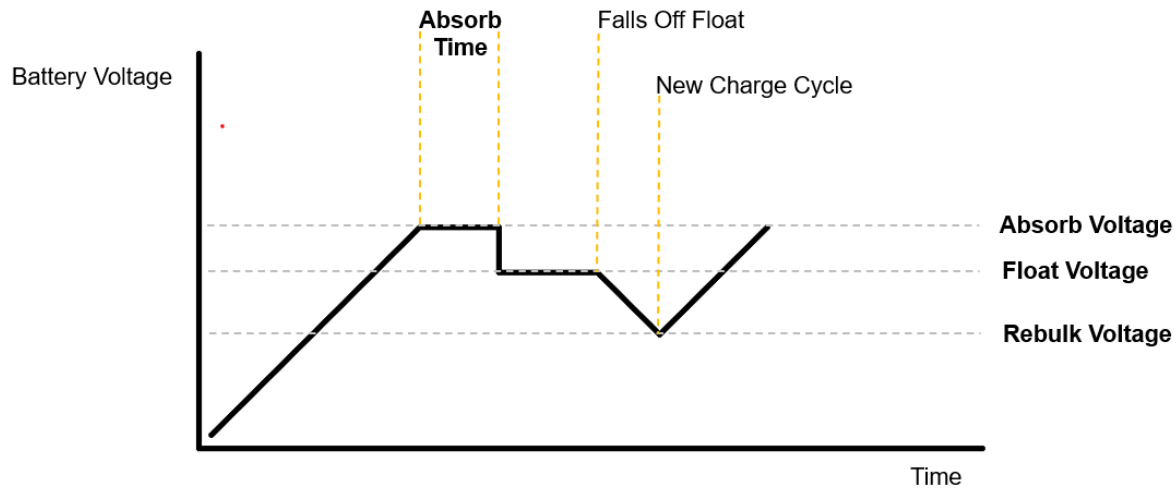


Figure 5 · Battery charge profile illustrated

The programmable profile exposes Battery Charge Rate, Tail Current (end-of-absorption threshold), and the Absorb, Float, Re-Bulk, and Equalisation voltage points. Refer to your battery manufacturer's specifications for the optimal profile; configuration with AERL Link is covered on the next page.

Equalisation

Equalisation is only required for flooded lead-acid cells with sulfation. It is **not** recommended for $LiFePO_4$ or other lithium-based solutions and will likely cause damage unless advised by the battery manufacturer.

8.1 Live Status with AERL Link

Once the SRX-R is connected over USB, AERL Link opens to the device's **Status** tab, the default view for any selected device, providing a live, read-only view of operating values:

- **Power:** live charging power into the battery (W).
- **PV Voltage / Current:** live values at the PV input terminals.
- **Battery Voltage / Current:** live values at the battery output terminals.
- **Status:** plain-text description of the current operating state, including any active warning or fault.
- **Firmware Version:** firmware revision currently running on the controller.

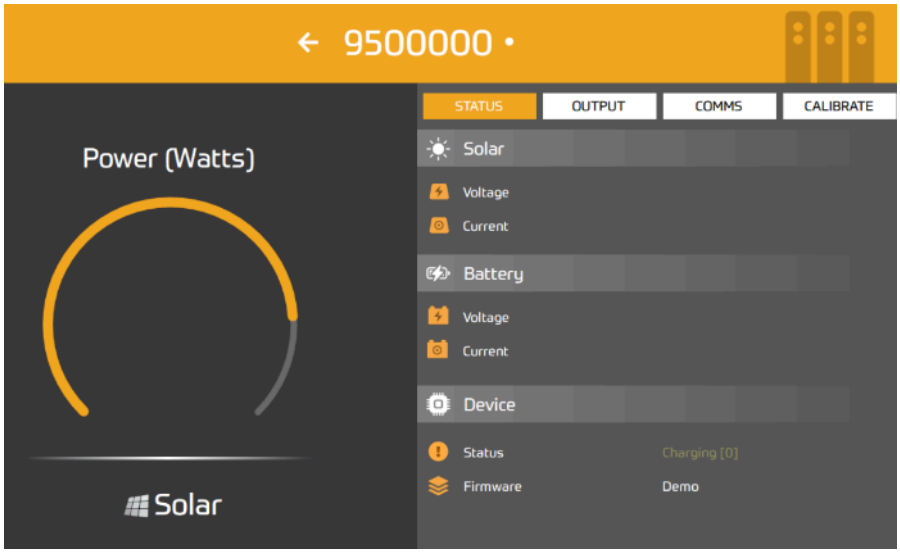


Figure 6 · AERL Link: Live Status (layout; live values not shown)

8.2 Setting the Profile with AERL Link

Connect over USB with the **USB Change-Over Switch** set to the module you wish to program. Within a few seconds the controller registers in AERL Link's **LOCAL** devices list. Figure 7 shows the device tile that appears; click its tile to open the device page, then select the **OUTPUT** tab to adjust the charge profile (Figure 8).

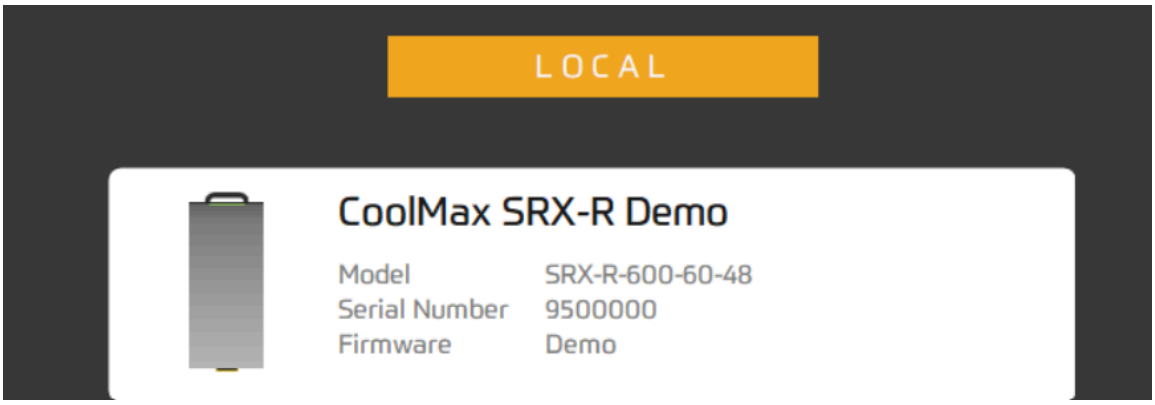


Figure 7 · AERL Link: Devices list

Click the device tile to open its page. On the **OUTPUT** tab, change values with the +/– arrows or the keyboard, then **Apply** to commit them to the controller.

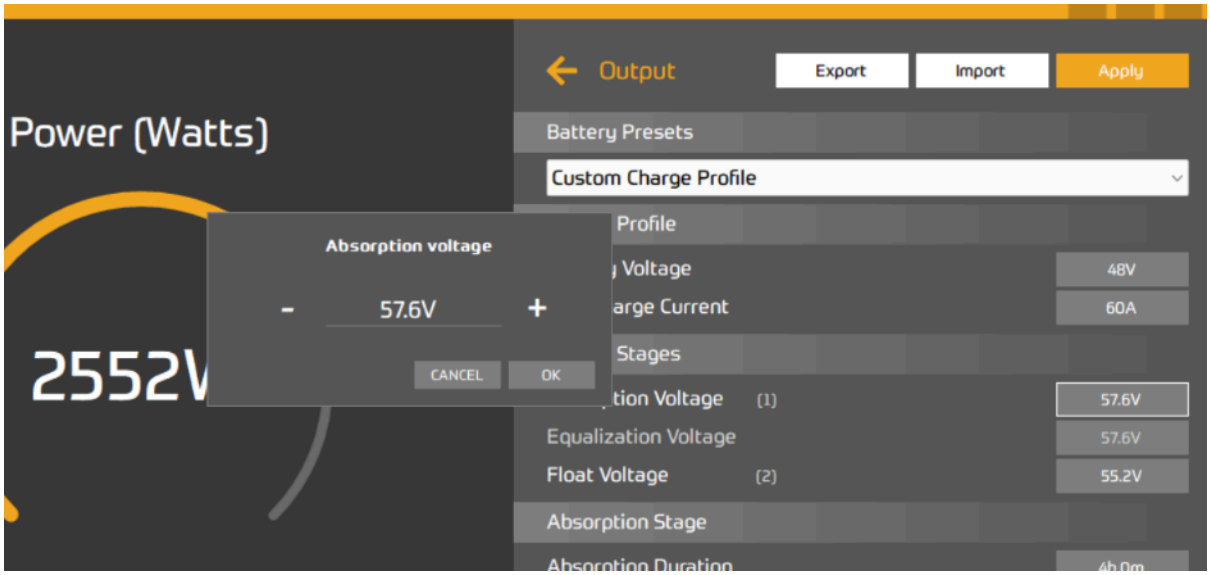


Figure 8 · AERL Link: Battery Settings panel

8.3 Battery Profile Presets & Saving

The **Battery Preset** dropdown on the **OUTPUT** tab lists pre-tuned profiles for common battery products. Selecting a preset populates the absorption, float, and re-bulk voltages, the absorption time, and the temperature-compensation factor with AERL's recommended values; presets refresh from AERL HQ on each AERL Link launch with an internet connection. **Export** saves the current profile to a JSON file and **Import** applies a saved profile; AERL Link verifies the saved profile's nominal voltage matches the connected device, and warns before applying a mismatch.

> **Presets are a starting point**
>
> Always cross-check the applied values against your battery manufacturer's published charge specification before relying on them in a production system.

8.4 Blackstart Guard

The CoolMax SRX-R includes a configurable **Blackstart Guard** that lets the converter begin charging into a battery bank whose voltage is below the controller's normal "no battery detected" safety threshold (for example, a deeply discharged lithium bank that has been left flat for an extended period and now reads well below its nominal range).

Blackstart Guard is **disabled by default**. With it disabled, the controller performs its standard start-up safety check: if the output voltage is implausibly low, it refuses to enable and reports a *Low Output Voltage / No Battery* fault. Enabling Blackstart Guard from the Settings panel in AERL Link bypasses that check, allowing the controller to start charging the depleted bank from a black state.

> **Disable Blackstart Guard once the bank has recovered**
> Leaving Blackstart Guard permanently enabled defeats a key safety check; the controller will no longer refuse to operate into a disconnected or faulty battery.

8.5 Battery Temperature Compensation

Temperature compensation measures the temperature of the batteries and adjusts the float and absorb voltage set points by a user-specified factor (mV/°C, per bank). The factory default is **50 mV/°C**. Compensation needs a battery temperature reading (see below); without one, the controller charges to the uncompensated set points.

> **Temperature source**
> Battery temperature compensation needs a battery temperature reading. The current firmware release does not use a temperature reported by the battery's BMS over CAN; contact AERL support before relying on temperature compensation.

8.6 Low-Temperature Charge Cutoff

Many lithium chemistries are damaged by charging below freezing. The SRX-R can be configured to inhibit charging when the remote battery temperature falls below a user-specified threshold. When the **Low-Temperature Charge Cutoff** is enabled in AERL Link, the controller suspends charging when battery temperature falls below the configured set point and resumes once it rises back above. Both the cutoff temperature and the enable toggle are configured from the Settings panel; the cutoff is **disabled by default**.

> **Requires a battery temperature reading**
> The cutoff only operates when a battery temperature reading is available to the controller; contact AERL support before relying on it. Without a temperature source, the controller cannot enforce the cutoff and charging will proceed regardless of battery temperature.

Firmware Updates

Field updates over USB via AERL Link

09

The CoolMax SRX-R supports field firmware updates over USB via AERL Link. Updates are signed and encrypted; the bootloader will reject a corrupted or unauthorised image.

Before you begin: install the latest AERL Link from aerl.com.au/professionals, ensure the unit is connected to a battery and powered up, and use a stable PC. **Do not** disconnect USB, kill power, or open the PV / battery isolators during the update.

1. Toggle the **MPPT 1 / MPPT 2** selector switch to the module you intend to update — only one module communicates at a time. Connect a USB cable from the PC to the USB-B port on the backplane (Figure 3).
2. Launch AERL Link. The connected charger appears on the Devices page. Click it to open. AERL Link checks the controller's hardware revision and serial against its repository; if a newer image is available, an **Update** prompt appears.
3. Click Update (standard updates) or wait (critical updates start automatically and cannot be deferred). If calibration is required as part of the update, AERL Link will warn you and recommend that a digital multimeter is on hand. A progress bar shows upload percentage; the transfer typically takes 1–2 minutes.
4. When upload finishes, the controller reboots. The LED briefly flashes blue, then returns to normal operation.
5. If both modules in the shelf require an update, flip the toggle switch to the other module and repeat.

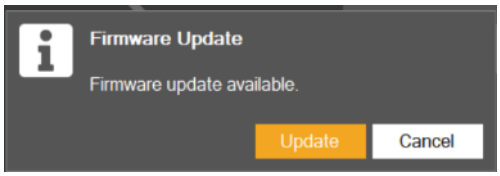


Figure 9 · AERL Link: Firmware Update

Note & recovery

AERL Link refreshes its firmware repository from AERL HQ each time it starts; allow the PC to reach the internet briefly before connecting if it has been offline for a while. If an update fails partway through (e.g. the cable was disconnected or the toggle switch was flipped mid-transfer), retry. The bootloader retains the previous valid image and the controller will continue operating normally until a complete, signed update is received.

Output Voltage Calibration

Field re-calibration with AERL Link

10

Each CoolMax SRX-R is factory calibrated, but field re-calibration can correct for sensor drift or be requested as part of a firmware update. AERL Link guides you through the procedure step by step.

Before you begin: have a multimeter that reads DC to ≥ 0.1 V resolution, a connected battery with output voltage in the normal operating range, a stable DC bus (isolate other charge sources, inverters, and large loads on the same battery), and the **MPPT 1 / MPPT 2** toggle switch set to the module being calibrated.

1. Connect the controller over USB and open the Device page in AERL Link.
2. Click **Calibrate**. AERL Link checks for a connected battery and a sensible output voltage; resolve any prompts first.
3. On the Start Calibration dialog, click **Yes**. The controller disables its output and prepares for calibration (a few seconds).
4. Measure output voltage at the battery terminals with your multimeter and enter the reading. AERL Link only accepts values within ±5% of the device-reported voltage.
5. Click **OK**. AERL Link writes the new calibration multiplier; the device resets, re-enables the output, and resumes charging using the corrected voltage scale.
6. Each module in a shelf is calibrated independently; flip the toggle switch and repeat for the second module.

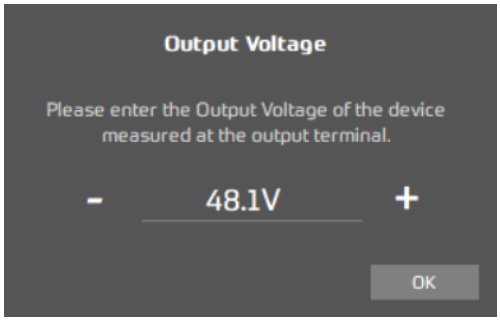


Figure 10 · AERL Link: Output Voltage Calibration

Do not interrupt calibration

Do not disconnect USB, flip the MPPT toggle switch, or interrupt power during calibration. The output is automatically re-enabled at the end of the procedure; allow it to complete cleanly. AERL Link re-prompts for calibration on first connect after install, and after a *calibration-required* firmware update; you can also re-run it manually at any time.

Ground Fault Detection

Chassis earth, modes, sensitivity, AERL Link

11

The CoolMax SRX-R features onboard PV and battery system ground-fault detection. All connected poles are checked for insulation degradation during start-up. The device chassis must be connected to the same earth as the PV array for ground-fault detection to function; the chassis earth point is the earth stud on the 2U shelf, at the end of the shelf beside the module terminals, marked with the standard earth symbol (Figure 11).

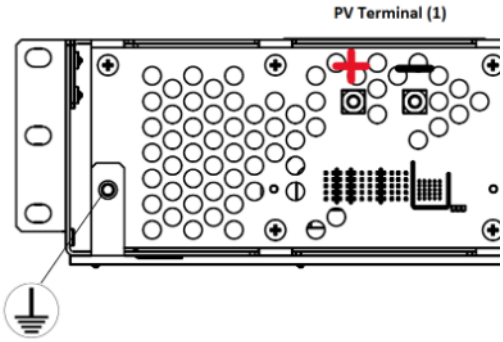


Figure 11 · Chassis earth point

11.1 Ground Fault Mode

The system earth-type configuration **(Ground Fault Mode)** must be adjusted in AERL Link for use with functionally earthed systems; otherwise an earth fault will be detected on the earthed pole. The SRX-R supports four mode configurations:

Mode	Use case
Disabled	**Ground fault detection is turned off. Not recommended outside of commissioning or test environments.**
Floating	**Default for solar-plus-battery systems with no functional earth on the DC side. Both PV and battery poles are monitored against chassis earth.**
Positive Earth	**The positive PV pole is intentionally bonded to chassis earth, common in some telecommunications applications. Fault detection on the earthed pole is suppressed.**
Negative Earth	**The negative PV pole is intentionally bonded to chassis earth. Fault detection on the earthed pole is suppressed.**

Mis-configuring this setting will either mask a genuine earth fault or trigger a false fault on the intentionally-earthed pole.

11.2 Ground Fault Sensitivity

The SRX-R trips a ground fault when the insulation resistance of a monitored pole falls below a fixed **50 kΩ**. Check that 50 kΩ meets your local standards. Firmware 2.0.1 (February 2024) and later trips at this fixed threshold. Earlier firmware offered a Low/Mid/High setting; update the firmware with AERL Link to get the fixed threshold. The Ground Fault Mode is set in AERL Link (Figure 12).



Figure 12 · AERL Link: Ground Fault Mode setting

Communications Protocols

RS485 / CAN pinouts, topology, AERL Link settings

12

The CoolMax SRX-R supports CAN bus and Modbus RTU (RS485) for remote monitoring; device control (enable/disable, setpoints, firmware updates) is available via CAN only. RS485 and CAN use separate RJ45 sockets on the backplane, two labelled MODBUS and two labelled CANBUS (Figure 2); their pin-outs are below (Figure 13). The register maps are in the CoolMax SRX Modbus RTU and CAN bus protocol documents, available from AERL.

Pin	MODBUS port (RS485)	CANBUS port
3	**RS485-A (non-inv.)**	—
4	—	**CAN High**
5	—	**CAN Low**
6	**RS485-B (inv.)**	**GND**
8	**GND**	—

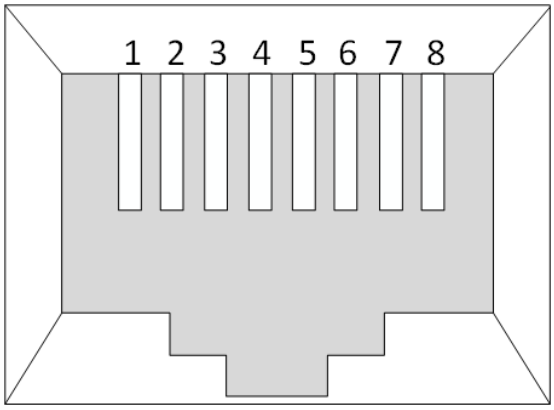


Figure 13 · Comms connector pin-outs

Modbus RS485 network topology

On a Modbus RS485 segment, each SRX-R module sits as a slave on a daisy-chained two-wire bus, with the master at one end. Terminate the bus at both ends with 120 Ω: at the master (many masters have a built-in or switchable terminator) and at the far end, by enabling the **120 Ω termination switch on the last module** only.

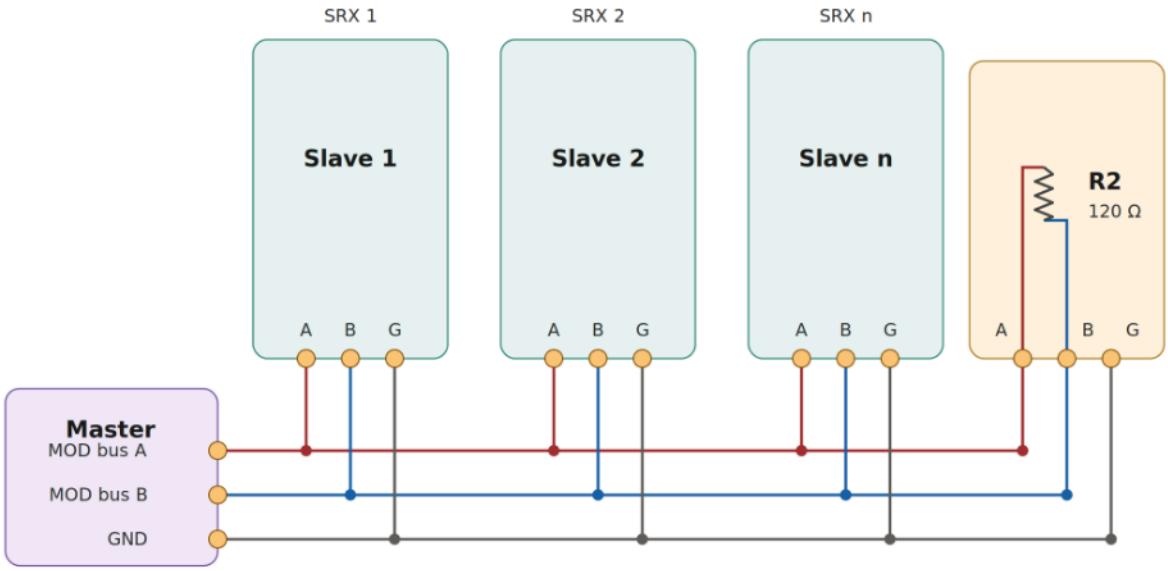


Figure 14 · Modbus RS485 topology

12.1 Configuring CAN and Modbus

Bus ID and speed are configured via AERL Link. With the device connected over USB (USB Change-Over switch set to the module being configured), open the Device page, select the **COMMS** tab, set the fields below (Figure 15), and click **Apply Settings**. The controller resets briefly when settings are applied. A changed RS485 or CAN bus speed cuts the controller off from any master still using the old speed: update the master to match before you leave the site.

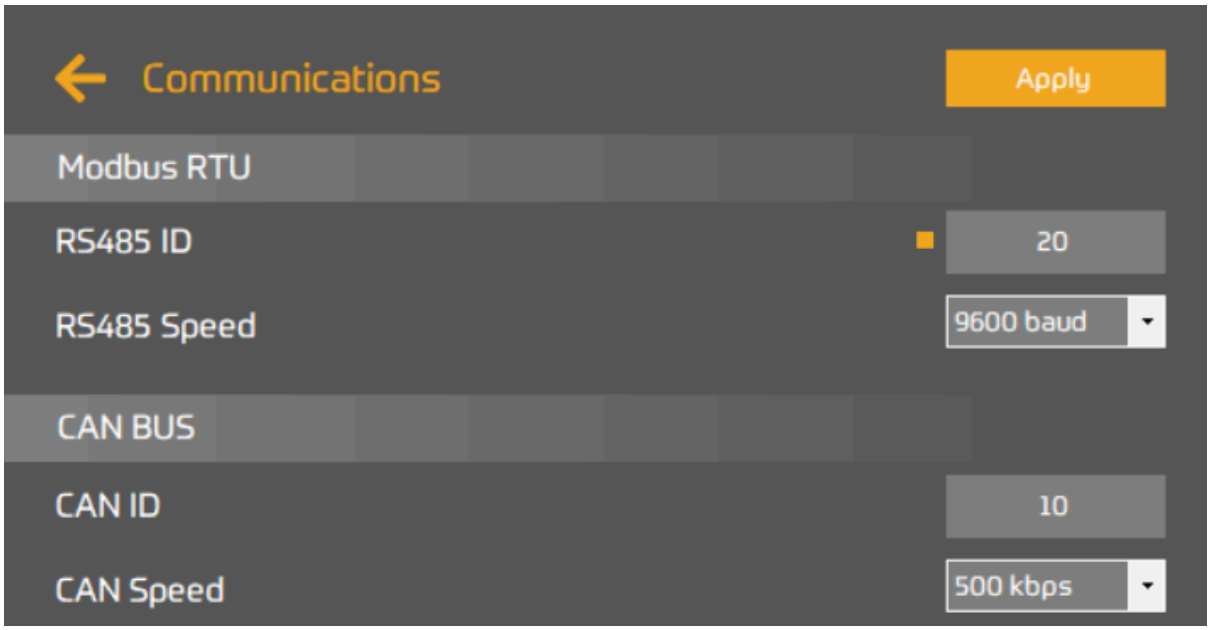


Figure 15 · AERL Link: Communication settings

Field	Range	Default	Notes
Modbus ID	**1–90**	**20**	**Unique slave address on the RS485 segment.**
RS485 speed	**9600 / 19200 / 38400 / 57600 / 115200 baud**	**9600 baud**	**Must match every device on the segment, including the master.**
CAN ID	**10–60**	**10**	**Unique address on the CAN segment. Units on a shared bus take a free ID automatically, skipping 24 and 56 (their frames would alias battery identifiers); 62 means not yet assigned.**
CAN bus speed	**125 / 250 / 500 kbps**	**500 kbps**	**Must match every device on the CAN segment.**

Each module in a shelf is configured independently; flip the USB Change-Over switch and repeat for the second module.

Troubleshooting

Warning & fault codes

13

If the CoolMax SRX-R detects an issue, a warning or fault code is triggered; refer to the tables below.

Warning codes

Code	LED	Warning	Description	Recommended action
–1153 · –1158	Solid blue	**Low input voltage (sleep)**	PV voltage below minimum or below battery voltage; device cannot charge.	Confirm PV string configuration is appropriate. May appear at sunrise / sunset.
–1162	Flashing blue	**Current flow interrupted**	Charge current stopped abruptly, for example a breaker opened or a cable was disconnected. Restarts automatically.	Check PV and battery breakers, fuses and terminations. If recurring, contact AERL.
–1400	Flashing blue	**Possible earth fault**	An earth-leakage reading at start-up was outside limits; the device re-tests before confirming. Charging continues.	If it recurs or becomes –1401 · –1403, inspect the wiring insulation.
–26	Flashing orange	**Device not configured**	Initial setup not completed; device will not begin charging.	Connect and configure the device with AERL Link.
–1160	Flashing orange	**Configuration out of range**	Set-point configuration outside limits for the detected nominal battery voltage.	Confirm the charge profile is appropriate for the battery. Refer to manufacturer recommendations.

Warning codes (continued)

Code	LED	Warning	Description	Recommended action
–1301	Flashing orange	**CAN master lost**	Was communicating with the CAN master but has not received a setpoint update within the allowed time-out.	Confirm the RJ45 connection is secure and the master is still active.
–1303	Flashing orange	**Waiting for CAN master**	CAN-controlled mode, no commands from master yet; charger appears disabled until the master connects.	Check CAN master is powered and sending commands. If standalone is intended, disable CAN control in AERL Link.
–1306	Flashing orange	**Charge held: battery voltage limit**	Reported by some pre-release firmware: the charge voltage set point is above the maximum charge voltage the battery's BMS requests over CAN. Charging stops and retries automatically.	Set the absorption and float voltages at or below the battery's requested charge voltage.
–1307	Flashing orange	**Charge held: battery current limit**	Reported by some pre-release firmware.	Contact AERL support.
110	Flashing orange	**Firmware update in progress**	A firmware update is being installed over CAN; charging is paused.	Wait for the update to finish. Do not remove power or the communications cable.

Fault codes

Code	LED	Fault	Description	Recommended action
−1 to −99	Solid red	**Generic hardware fault**	Any code from −1 to −99 other than −26: a hardware fault found at start-up or during operation.	Power cycle. If persistent, contact AERL for warranty replacement.
−150	Solid red	**Measurement fault**	The internal measurement circuit stopped providing fresh readings; the converter is stopped.	Power cycle. If persistent, contact AERL.
−350 · −1055 · −1161	Solid red	**Temperature sensor fault**	Internal or remote temperature sensor missing or unresponsive.	Check communications wiring configuration and ensure connected devices are functioning as expected. If persistent, contact AERL.
−365 · −370 · −380 · −390	Solid red	**Startup / precharge fault**	Issue during startup or precharge prevented safe converter online.	Power cycle. Check PV / battery isolators, breakers, wiring. If persistent, contact AERL.
−367 · −368 · −369 · −371 · −372 · −400 · −401	Solid red	**Critical system fault**	Critical system integrity fault; converter locked out for safety.	Power cycle; check comms wiring and power-supply integrity. If persistent, contact AERL.
−1050 · −1051 · −1052 · −1053 · −1054	Solid red	**Active cooling fault**	An active cooling fan has failed or is operating outside expected parameters.	Check the fan for blockages then power cycle the device. If persistent, contact AERL.
−1100	Solid red	**Internal temperature critical**	Internal temperature has reached a critical level; device has shut down to prevent damage.	Auto-restart when safe. Ensure adequate clearance and ventilation.
−1163	Solid red	**Current sensor fault**	A current measurement is outside its physical range; the converter is held off.	Power cycle. If persistent, contact AERL.
−360	1 flash red	**No output detected**	Converter enabled but no output current is flowing.	Power cycle. If recurring, contact AERL.

Fault codes (continued)

Code	LED	Fault	Description	Recommended action
–1159	2 flashes red	**Low output / no battery**	No battery detected or output voltage implausibly low.	Confirm battery is connected and output breaker is closed.
–1154	3 flashes red	**High output voltage**	Output voltage exceeds the configured maximum.	Battery may be getting charged from a secondary source. Confirm charge parameters across the system.
–1155	3 flashes red	**High battery voltage**	Battery voltage exceeds maximum permitted for detected nominal voltage.	Verify battery nominal voltage matches the configured profile.
–1305	3 flashes red	**Battery BMS fault**	Fault / alarm received from the battery's BMS over CAN (e.g. AERL LiFe² battery).	Refer to the battery manufacturer's manual for BMS troubleshooting.
–1157	4 flashes red	**High output current**	Output current exceeds the configured maximum.	Confirm no short on the output; load within device current limit.
–1152	5 flashes red	**High PV voltage**	PV input voltage exceeds rated maximum; device shut down to prevent damage.	Confirm string Voc at record-low ambient is within the device's rating.
–1156	6 flashes red	**High PV current**	PV input current exceeds rated maximum.	Confirm string configuration is appropriate for the device.
–1102	8 flashes red	**High battery temperature**	Battery temperature sensor over-temperature; high temperatures reduce battery life.	Increase temperature-compensation factor in AERL Link or reduce ambient.
–1103	9 flashes red	**Low battery temperature**	Battery temperature sensor under-temperature; low temperatures reduce battery life.	Consider a temperature-controlled battery environment.
–1401 · –1402 · –1403	10 flashes red	**Earth fault detected**	Earth fault detected on the input or output.	Isolate the controller, confirm the fault with an insulation resistance tester, and repair it before recommissioning.

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



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