CAN MASTER & SITE CONTROLLER INTEGRATION

CoolMax SRX

CAN Bus Integration Guide

Doc · SRX-CAN-GUIDE

ACTIVE FLAGS	msg 5 · bytes 4–7
INHIBIT REASON	msg 5 · byte 3
OUTPUT OFF	Status 4 or 6
POWER TARGET PERIOD	1 to 5 s
FASTEST TARGET RATE	every 250 ms
TARGET TIMEOUT	about 32 s
SELF-CLEAR HOLD-OFF	10 s to 30 min
HALT CHARGING, BIT	27

DOCUMENT	REVISION	EFFECTIVE	PRODUCT
SRX-CAN-GUIDE	1.0.3	11 / 2026	CoolMax SRX / SRX-R
AUDIENCE	FIRMWARE	FORMAT	
Integrators	2.0.1 and later	A4 · 6 pages	

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HALT ALL SYSTEM CHARGING

On **bit 27** (PWM Regulation Failure), stop every charge source on site, not just the SRX, until the fault is resolved or the affected unit is physically isolated. Bit 27 is Critical: latch an alarm on the first occurrence. See chapter 03.

Firmware before 2.19.5 logs −390 but raises no flag bit: rely on the current cross-check (rule 7).

FIRMWARE

Applies to CoolMax SRX and SRX-R firmware 2.0.1 and later. Min FW (chapter 03) is the first firmware with each flag. Firmware 2.6.6 to 2.8.4 has been withdrawn; update units on it to 2.17.9.

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CHAPTER 01

Reading the SRX

WHAT	WHERE	NOTES
Active Flags	`msg 5, bytes 4 to 7 (big-endian)`	Bit 0 is the least significant bit of byte 7. More than one bit can be set.
Inhibit Reason	`msg 5, byte 3`	From 2.19.5. Ignore bytes 0 to 2 always, and byte 3 on earlier firmware (bytes 0 to 3 are undefined there).
Device Status	`msg 0, bytes 4 to 7`	Status 4 or 6 means the output is off.
Event code	`AERL Link`	Not broadcast on CAN. Use it to confirm the exact cause on site.

> **IMPORTANT**
> **Use the flags to detect faults, not the status.** Some stops leave the flags at 0 (chapter 04).

CHAPTER 02

General Rules

01 **Most faults will clear themselves.** The SRX will restart once the condition has cleared, after a hold-off of 10 s to 30 min. The EMS should keep sending Power Targets throughout.

02 **Commands reach every unit on the bus.** Enable, Reset, Shutdown, Power Target and Remote Temperature must be sent to every SRX unit. **Reset restarts every SRX on the bus**; do not use this command to try to reset an individual unit. Reset needs 2.4.2 or later: update units on 2.0.1 to 2.0.3.

03 **The system controller shall latch all safety alarms.** An SRX flag can clear before the fault has been fixed, so ensure all safety alarms are captured and actioned by the controller.

04 **Repeated faults on a single unit.** A unit that records multiple faults should be investigated on site, even if the faults have cleared.

05 **Send Power Targets every 1 to 5 s** (never faster than every 250 ms). After about 32 s without a Power Target, the SRX will stop following the target and return to default behaviour.

06 **To slow or stop charging, lower the current limit.** Keep the voltage target at or above the battery voltage.

07 **Cross-check the total charge current. This is mandatory.** The master controls every charge source on site (SRX units, AC-coupled inverters, genset chargers), so it knows the total charge current it has requested. Alarm if the battery current measured by the BMS or shunt stays above the request, beyond your measurement tolerance, for more than a few seconds: requesting 100 A but seeing 140 A means a source isn't following its target or something is charging unregulated. Compare the summed SRX output current with the current requested from the SRX units to find the source. If current flows while the units report output off, or above the request, treat it as bit 27 and halt charging. **Firmware before 2.19.5 logs −390 but raises no flag bit: there, this cross-check is the only detection.**

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CHAPTER 03

What to Do for Each Flag

CLASS	MEANING
INFO	Normal operation. Log only.
AUTO	Clears by itself. Alarm only if it repeats frequently.
CONFIG	Usually caused by your settings or targets. Fix these first.
SERVICE	Repeats point to a unit or wiring fault. Raise a service alarm after about 3 in an hour.
CRITICAL	Latch an alarm on the first occurrence. The system should be inspected before re-initialisation.

Halt Charging: Yes means stop all system charging (every charge source, not just the SRX) until the fault is resolved or the affected unit is physically isolated. **Min FW:** the first firmware with the flag (cover, Firmware).

BIT	FLAG	CLASS	HALT CHARGING	MIN FW	TYPICAL CAUSE	WHAT TO DO	EVENT CODES
0	**Hardware Fault**	SERVICE	No	2.0.1	Internal AERL hardware fault, or a battery BMS alarm.	Contact AERL. For a BMS alarm, clear it at the battery.	−1 to −99, −150, −1305
1	**No Config Data**	CONFIG	No	2.0.1	Unit not commissioned.	Commission with AERL Link.	−26
2	**Config Data Out of Range**	CONFIG	No	2.0.1	Charge profile doesn't suit the battery, or (from 2.19.5) your targets are outside the battery's limits.	Check the SRX profile against the battery spec, and your targets against the BMS limits. Other units may also turn off: send Enable once it's fixed.	−1160, −1306 (2.19.5)
3	**Battery Sense Lost**	SERVICE	No	2.0.1	Battery Sense wiring or feed lost.	Check the battery sense connection.	–
4	**CAN Master Lost**	CONFIG	No	2.0.1	No valid Power Target for about 32 s.	Check your controller and the CAN bus. Don't rely on this flag; detect loss of your own targets.	−1301
5	**Internal Over Temp**	AUTO	No	2.0.1	Unit too hot.	As bit 11.	–
6	**Vin Low**	INFO	No	2.0.1	Not enough PV: dawn, dusk, heavy cloud.	None. If it repeats and latches during full sun, it may be a symptom requiring service: contact AERL.	−1153, −1158
7	**Vout Low**	SERVICE	No	2.0.1	No battery: breaker or contactor open.	Check the battery breaker and BMS contactor.	−1159
8	**Vout High**	CONFIG	No	2.0.1	Battery above the voltage target, usually because the target was set below the battery voltage, or another charger pushed it up.	**Don't lower the voltage target.** Raise it to at least the battery voltage and throttle with the current limit. If no target change explains it, check the controller calibration.	−1154, −1155

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CHAPTER 03 · CONTINUED

BIT	FLAG	CLASS	HALT CHARGING	MIN FW	TYPICAL CAUSE	WHAT TO DO	EVENT CODES
9	Vin High	SERVICE	No	2.0.1	PV voltage above the rating, often on cold mornings.	Check the string open-circuit voltage design.	-1152
10	High PV Current	SERVICE	No	2.0.1	PV current too high.	As bit 17.	-
11	Over Temp	AUTO	No	2.0.1	Heatsink too hot after the unit reduced its output.	Check ventilation, fans and ambient temperature.	-1100
12	Low Battery Temp	AUTO	No	2.0.1	Battery cold.	Reduce charge current per the battery spec. Adhere to the BMS CCL/CVL limits.	-
13	Earth Fault Positive	SERVICE	No	2.0.1	Low insulation on the positive side.	As bit 20.	-1401
14	Earth Fault Negative	SERVICE	No	2.0.1	Low insulation on the negative side.	As bit 20.	-1403
15	Active Cooling Fault	SERVICE	No	2.0.1	Fan fault.	Check and clear the fans. Watch heatsink temperature (msg 4).	-1050 to -1054
16	Iout High	AUTO	No	2.0.1	Output current spike, typically sun bursting through cloud on a large array. From 2.19.5 it reports on bit 24.	None for occasional trips. If it trips in steady sun, ensure the array is within specifications.	-1157
17	Iin High	SERVICE	No	2.0.1	PV current above the rating.	Ensure the array is within specifications.	-1156
18	Cross Check Fault	SERVICE	No	2.0.1	Internal self-check failed; the unit restarts.	Contact AERL if it repeats.	-400
19	Temp Sensor Timeout	SERVICE	No	2.0.1	Temperature sensor or temperature feed lost.	Check the sensor. If you send Remote Temperature (msg 31), make sure it is still being sent.	-350, -1055, -1161
20	Earth Fault	SERVICE	No	2.0.1	Low insulation resistance between the PV/battery circuit and earth.	Latch a critical alarm. Notify per AS/NZS 5033, isolate the affected array, and test insulation before recommissioning. The SRX may keep charging. From 2.6.6 the flag clears after about 30 min, possibly before the fault is fixed; from 2.19.6 it holds until the unit resets.	-1400 to -1403
21	No Output	SERVICE	No	2.0.1	Converting but no current reaching the battery: breaker, contactor or wiring open.	Check the output breaker and BMS contactor. If unresolved, contact AERL service.	-360
22	Low Bat Temp Cut-off	AUTO	No	2.0.1	Battery below the configured charge cut-off temperature.	If you supply battery temperature, keep sending msg 31. Heater if fitted.	-1103
23	High Bat Temp Cut-off	AUTO	No	2.0.1	Battery above the charge cut-off temperature.	Check battery cooling. Keep sending msg 31.	-1102
24	Current Flow Disrupted	AUTO	No	2.0.1	Sudden current change: breaker or contactor opened under load, or a burst of sun through cloud.	None for occasional trips. Treat as Service only if it trips very often, day after day. Don't open the contactor while charging.	-1157, -1162, -1163 (2.19.5)

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CHAPTER 03 · CONTINUED

BIT	FLAG	CLASS	HALT CHARGING	MIN FW	TYPICAL CAUSE	WHAT TO DO	EVENT CODES
25	Pre-charge Failure	SERVICE	No	2.0.1	PV pre-charge didn't complete during start-up.	None for brief, intermittent trips in low irradiance: this is normal. If it latches on, service is required: contact AERL.	−365
26	PV Pre-charge Failure	SERVICE	No	2.8.4 R 2.9.4	As bit 25. Min FW is 2.8.4 on the SRX-R, 2.9.4 on the SRX.	As bit 25.	−380
27	PWM Regulation Failure	CRITICAL	Yes	2.19.5	Current flowing while the output should be off: possible power-stage failure. The unit may lock out for the rest of the day. **Firmware before 2.19.5 logs −390 but raises no flag bit: rely on the current cross-check (rule 7).**	Stop all system charging until service can attend or the controller is physically isolated. Don't keep resetting. Contact AERL.	−390
28	PWM Corruption	SERVICE	No	2.19.5	Internal integrity check.	If it recurs, contact AERL with the firmware version (msg 11).	−367, −372
29	Stack Overflow	SERVICE	No	2.19.5	Internal integrity check.	As bit 28.	−368
30	Clock Failure	SERVICE	No	2.19.5	Internal integrity check.	As bit 28.	−369
31	Brownout	SERVICE	No	2.19.5	Unit's internal supply dipped.	As bit 28.	−371

CHAPTER 04

Stops with No Flag

If the flags read 0 and the status shows the output is off with no output current, follow these checks:

CHECK	CAUSE	WHAT TO DO
1	Your Power Targets stopped or arrived late.	Review the EMS for correct function. The units should resume when the next target is received.
2	A Shutdown was sent, or another unit's fault turned the bus off.	Send Enable. If units don't resume, send Reset.
3	The battery BMS is alarming (where the SRX listens to the BMS; from 2.4.2).	Clear the BMS alarm, then send Reset if units don't resume.
4	Inhibit Reason 3: a unit on the bus runs firmware earlier than 2.19.6, so units on 2.19.6 or later hold off.	Put every unit on the bus on the same firmware: contact AERL.
5	Routine self-restart.	Normal. Ignore a single short dropout.
6	None of the above.	Contact AERL with the unit's event log.

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CHAPTER 05

Controller Checklist

- [ ] Send Power Targets every 1 to 5 s.
- [ ] Throttle with the current limit, not the voltage target.
- [ ] Alarm when a unit's broadcasts stop (no msg 0 for more than 5 s).
- [ ] Latch earth fault (bits 13, 14, 20) and bit 27 alarms.
- [ ] Halt all system charging on bit 27.
- [ ] Count repeats per serial for Service flags.
- [ ] If you supply battery temperature, send msg 31 regularly.
- [ ] **Mandatory:** alarm on output current while the unit reports output off, and treat it as bit 27. Firmware before 2.19.5 never raises bit 27 (it logs −390 only).
- [ ] **Mandatory:** alarm when measured battery current exceeds the total current requested from all charge sources (rule 7).
- [ ] Use Reset only when restarting every unit on the bus is acceptable.

CHAPTER 06

Revision History

REV.	DATE	CHANGE
1.0.0	21/10/26	First release
1.0.1	08/11/26	Target timeout 34 s (as the CAN protocol); inhibit reason from 2.19.2; version-gate stop (check 4); bits 4, 10 and 20 per firmware 2.19.6.
1.0.2	09/11/26	Items that need firmware later than 2.17.9 marked.
1.0.3	16/11/26	Minimum firmware for every flag, from 2.0.1; bit 27 added in 2.19.5 (rely on the current cross-check, now mandatory); event codes from later firmware marked; target timeout about 32 s.

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