Sezibwa SRNE inverter: proven behaviour register

> Copy of the register kept in the microgrid-gateway repo: `docs/sezibwa-srne-proven-behaviour.md`. The repo copy is the master; this page is refreshed when it changes. Owner: Hillary (with Claude). Reviewer: Aaron.

Site: Sezibwa Rentals, gateway gw-pi2. Inverter: SRNE ASP48120SH3, with 1 battery and 8 × 600 W panels.

This register lists what we have **seen happen** on this unit, with the date and the evidence. A control rule may depend only on rows under *Proven*. Anything under *Not proven* needs a planned test, with a clear pass and fail, before a rule relies on it.

Rules for keeping it

- Add a row only when the data shows it, and cite the evidence (Influx field and time, driver log line, or register read).
- A result counts only if no other cause can explain it. On 11 Nov the charge stopped near 50% because the 00:40 window ended, not because of E03B. That case did not separate the two causes.
- When a rule changes, its PR lists the rows it relies on.

Times are EAT (Africa/Kampala).

Proven

#	Behaviour	Date	Evidence
P1	The output mode changes only when E204 is written; the manual's implied mode is not applied	3 Nov	Stayed SUB until E204=2 was written (v29)

#	Behaviour	Date	Evidence
P2	SBU runs the houses from sun plus battery, with the grid unused, **when SoC is at or above E020** (after a drop to E01F the unit stays on the line until SoC reaches E020, see P4/P5). Every SBU observation so far was at or above E020; below it is N5	4–5 Nov, 12 Nov 16:00	MachineState 3, meter shows no grid draw
P3	In a grid cut the unit runs on battery, and **stays on battery after the grid returns** until the battery reaches E01F	6 Nov 00:37, 11 Nov	SoC timeline; stayed in state 3 with the grid at 230 V
P4	At E01F with the grid present, it moves the houses to the grid (state 2)	11 Nov 23:05, 12 Nov 22:15	MachineState 2 at 10–12% SoC
P5	With E20F = 2 (hybrid), the grid charges the battery at about 120 A **at any hour** while the unit is on the line	11 Nov 23:05–23:50 (to E020 = 50%); 12 Nov 14:00–16:00 (SUB, solar near 0, 116 A)	BatteryCurrent −117 to −120 A, solar about 0
P6	The timed charge (E00E = 1, window E026/E027) charges from the grid at about 120 A, about 1% SoC per minute	13 Nov 00:05–01:50	SoC 11 → 99 %
P7	**E03B (window stop SoC) does not end the timed charge**	13 Nov	E03B = 50, charged to 99% inside a 00:00–06:00 window
P8	The solar panels keep charging while the unit is on battery during a cut	6 Nov 10:22	PV 1.4–2.0 kW, battery charging at +0.7–1.3 kW
P9	In SUB with the battery near full, the solar input is shut down (PV voltage 0)	10 Nov (94%)	Pv1Voltage 0 at midday
P10	The panels can reach about 98% of nameplate (4.7 kW of 4.8 kWp), so the panels and wiring are fine	11 Nov 12:50	charger0/Pv1Power max

#	Behaviour	Date	Evidence
P11	Settings are written only in MachineState 2, except the ModeSchedule SUB write, which is allowed in state 3 when the grid is present on all phases (#45, `gridPresentMinVoltage` 180), and the E20F safe value (#48, not yet deployed)	design, logs, Influx	Writes stayed queued all day on 11 Nov while the grid was off. State-3 SUB write: 12 Nov 14:00 EAT, MachineState 3 / OutputPriority 2 at 13:40–14:00, then state 2 / priority 3 at 14:00–14:20 with the grid at 234 V (Influx, 20-min means; driver log lost when the container was recreated on 13 Nov)
P12	A charge-window change can stall after the disarm or window write; a controller restart while in state 2 completes it	11 Nov 18:11, 12 Nov 14:00	Log shows the disarm or window write with no follow-up; after the 14:31 restart, enable = 1 at 14:34
P13	ModeSchedule times are Kampala local time, not UTC	10 Nov	v35b fix
P14	At E01F on the line, the unit sometimes does **not** grid-charge (stays at about 0 A)	12 Nov 22:15–24:00	SoC 11%, BatteryCurrent about 0, state 2. Compare with P5; see N2

Not proven (test before relying on it)

#	Question	Why it matters	Planned test
N1	Does E20F = 3 (PV only) stop **all** grid charging, including the timed window? Is E20F re-read during an active timer?	D138 (openems #48) depends on it	First night after #48: log E20F, the window and BatteryCurrent from 23:50 to 00:30 and at any E01F transfer. Pass: no grid charge outside 00:00–06:00, and the night charge runs
N2	Why did P5 happen on 11 Nov but not on 12 Nov (P14)?	Predicting evening grid buying	Compare the registers (E20F, E205, E020, OutputPriority) logged on both nights
N3	Cause of the 5 Nov solar stall (PV fell from 2.8 kW to under 0.7 kW on the switch to battery)	Daytime SBU switching	Watch every daytime SBU switch for a PV drop greater than 50%

#	Question	Why it matters	Planned test
N5	Does an SBU write below E020 move the unit to battery, or does it stay on the line until SoC reaches E020?	#114 (daytime SBU from 30%) depends on it	After the first daytime SBU write below E020, watch MachineState for 5 minutes. Pass: state 3 within a minute
N4	Real daily solar compared with PVGIS (about 18 kWh/day expected)	The business case	One full month of charger0/PvEnergyToday against PVGIS for the same days

Change log

- 13 Nov 2026: register created from 3–13 Nov site data.
- 13 Nov 2026 (Aaron's review): P2 limited to SoC at or above E020; P11 lists the state-3 exceptions, with evidence; N5 added.

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