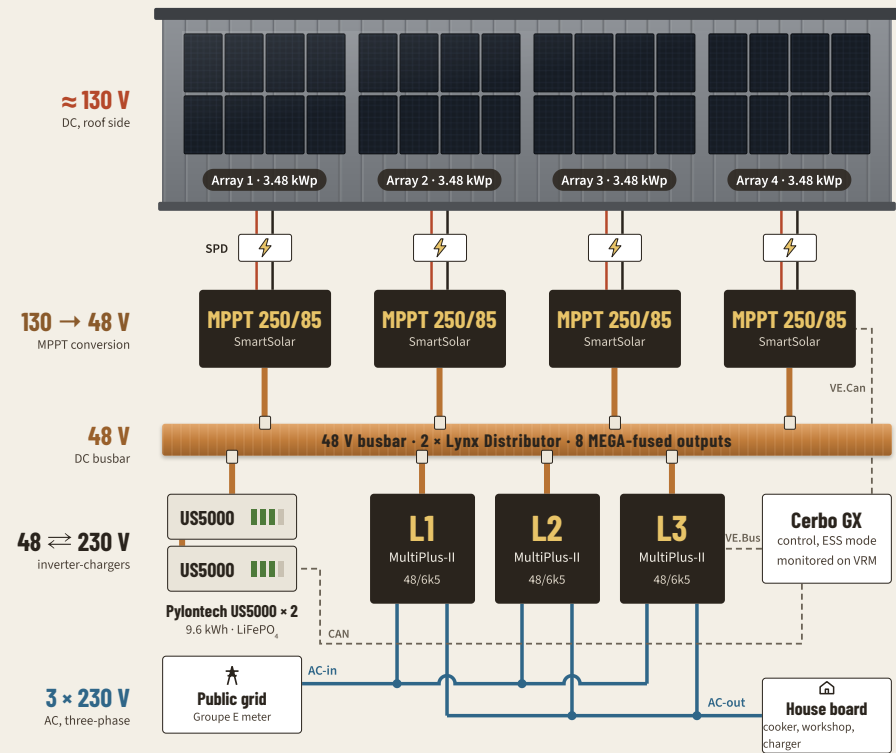


Our solar PV system

32 panels on the roof, 4 MPPT charge controllers, a 48 V busbar, 9.6 kWh of batteries and three inverters on three phases: the path of electricity, from the sun to the sockets.

FROM ROOF TO FUSE BOARD

DC ≈ 130 V DC 48 V AC 230 V --- communication



13.92

kWp

32 SoliTek Blackstar 435 Wp glass-glass panels, made in Europe · N-type TOPCon cells

Panels (peak)	13.9 kW
4 MPPT (rated)	19.6 kW
3 inverters (continuous)	18 kW

Each stage keeps a margin over the one feeding it.

9.6 kWh

Storage, ≈ 9.1 usable

18 kW

Three-phase, continuous

< 20 ms

Switchover on outage

SE · 40°

Azimuth ≈ 126°, pitch

≈ 270 A

On the busbar in full sun

8 000+

Rated battery cycles

THE CERBO GX DECIDES · ESS MODE

DAYTIME

- The sun powers the house first
- The surplus charges the batteries
- Batteries full: the rest goes to the grid

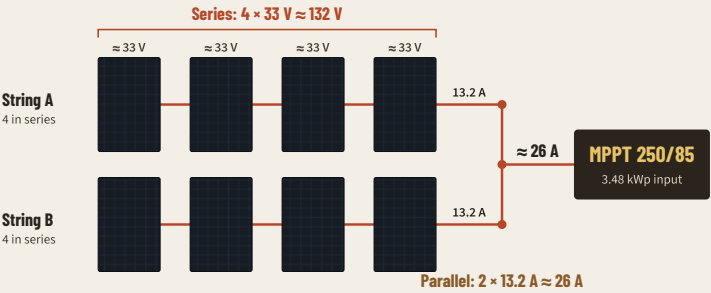
EVENING AND NIGHT

- The batteries take over
- The grid only tops up if sun and batteries are not enough

The whole house is on the MultiPlus-II output: they measure what flows in and out of the grid themselves, with no extra meter.

SERIES-PARALLEL WIRING

One array: 2 strings of 4 panels



WHY NOT 8 PANELS IN SERIES?

Voltage rises in the cold: 38.9 V open-circuit at 25 °C becomes ≈ 42.3 V on a winter morning at -10 °C (-0.25 %/°C).

4 in series	MPPT limit: 250 V	≈ 170 V
8 in series		≈ 340 V

With 8 panels in series, the controller would be destroyed.

SAFETY

≈ 130 V is safer to handle than several hundred volts, for a partly self-built installation.

NO STRING FUSE

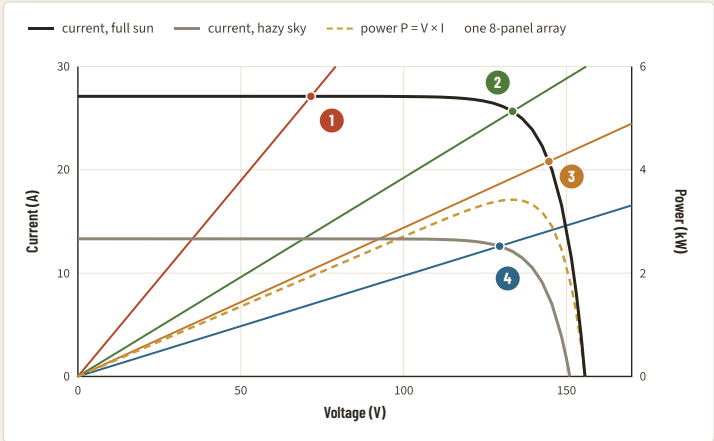
With 2 strings, the maximum reverse current (13.8 A) stays below the 22 A a panel can take.

ISOLATED SHADE

One MPPT per array: if shade hits one array, the other three still produce at maximum.

MPPT CONTROLLER

Tracking the maximum power point



1 Load too heavy · 1.94 kW

— on the plateau: lots of current, too little voltage.

2 Matched load · 3.42 kW

— the line passes through the knee: the panel gives its all.

3 Load too light · 3.01 kW

— on the slope: high voltage, little current.

4 Hazy sky · 1.63 kW

— the optimum point drops, the MPPT swings the line to follow it.

INPUT · PANELS

132 V × 26 A

OUTPUT · BATTERIES

≈ 52 V × 66 A

Same power, to within 1-2 %. Regularly sweeping the curve avoids a false maximum under partial shade.

ONE FUSE PER DEVICE

Two coupled Lynx Distributors, 1,000 A copper busbars. A short circuit only blows the faulty device's fuse, and an indicator light shows it.

THE BATTERY MANAGES ITS OWN CHARGING

The Pylontech BMS reports its limits to the Cerbo GX, which enforces them on the MPPTs and inverters. Modular: more US5000s can be added in parallel.

BACKUP & ANTI-ISLANDING

If the grid goes down, the house carries on with batteries and sun. The MultiPlus-II then never feed into the line, for the safety of line workers.