Synchronisation Problem

with 2 MPPT 100/50
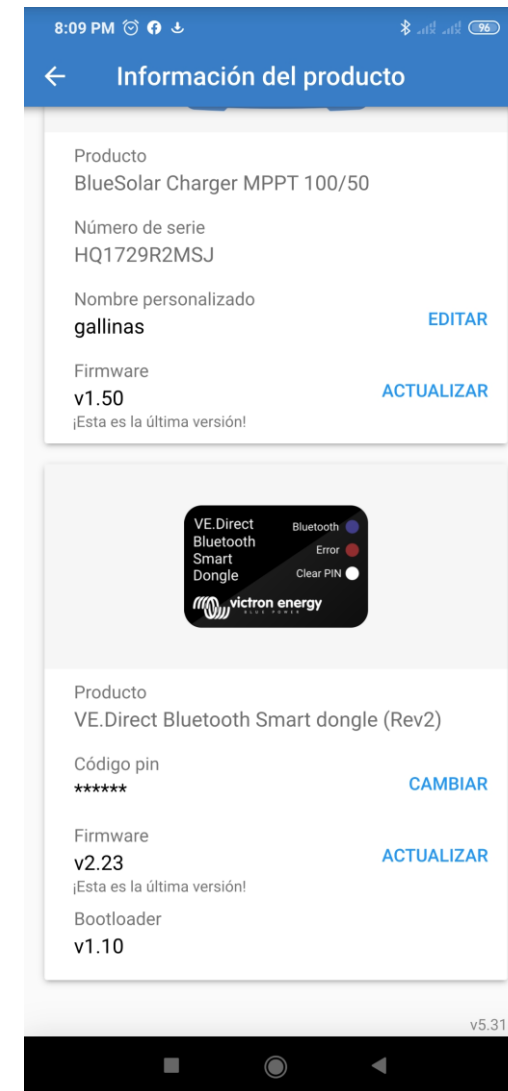
Devices (2 x MPPT 100/50)

- 1 New Smart Solar Charger (casa)

1 Bluesolar charger with BT dongle (gallinas)

Both Devices use the same setup, of Position 2:

System Setup

- 2 x MPPT's 100/50 with 4 Solar Panels connected to each

- 4 Vision 12 V Lead Batteries 200Ah, Parallel setup of 2 Batteries in series (24V)

- 1 Smart Voltage/Temperature Sensor

- 1 x BMV-702 (not connected to VE Smart Network)

- The only voltage/current sources are the panels and battery (isle system).
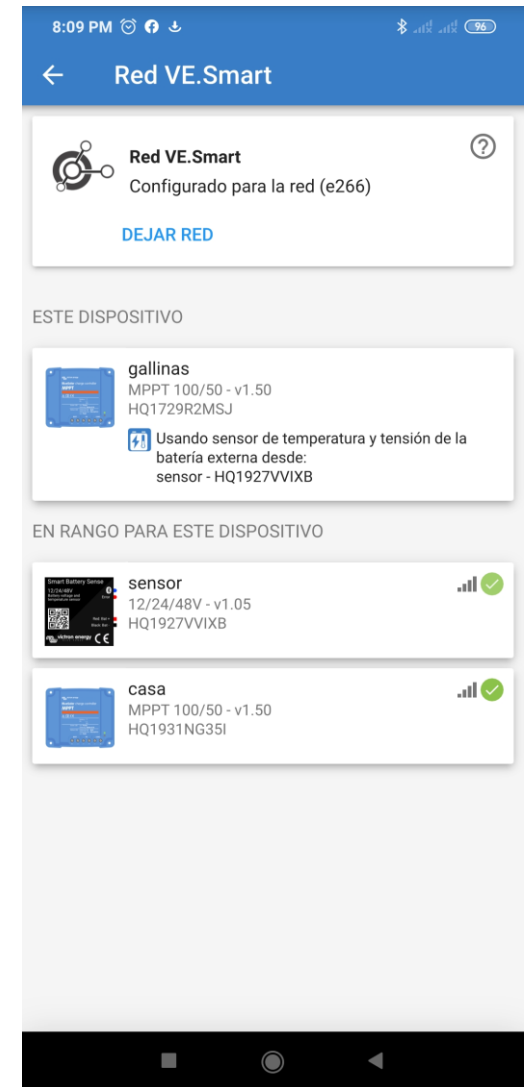
Problem

- The MPPT's do not synchronize as they should. Specially Absorption and Floating times differ. It leads to the case that often one device cannot deliver energy.

- The Devices are connected to the same VE.Smart network and seem to see each other.

- Batteries are getting discharged about 25-30% of their capacity each night, having a voltage of 25.2V before sunrise. It should result in an absorption time of not more than 2h. As the historial shows in the next slide, the devices are not only not synchronized, but differ sometimes drastically specially in the absorption and float times.

- It's rainy season here in Panama now. It means we have sun in the morning and very changing conditions on the afternoon, sometimes with very low solar voltage.
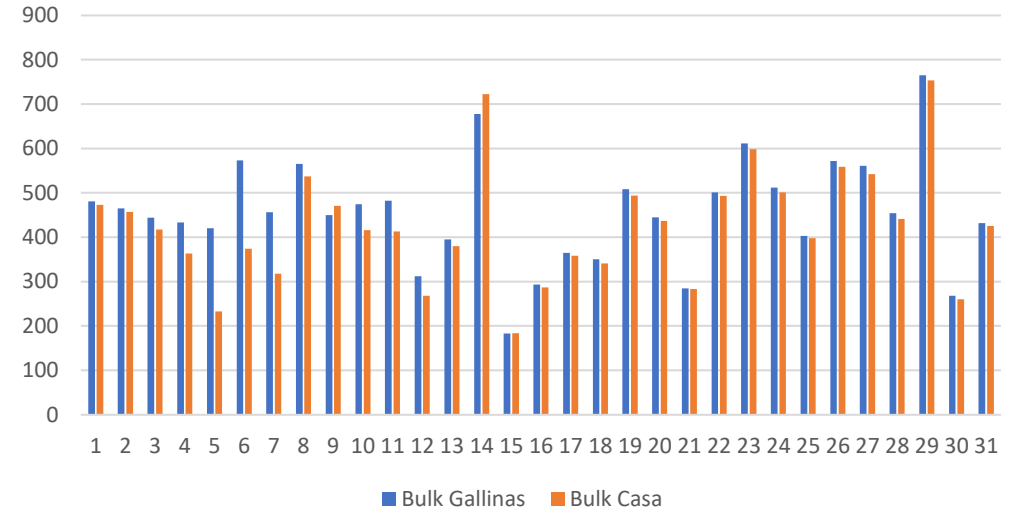
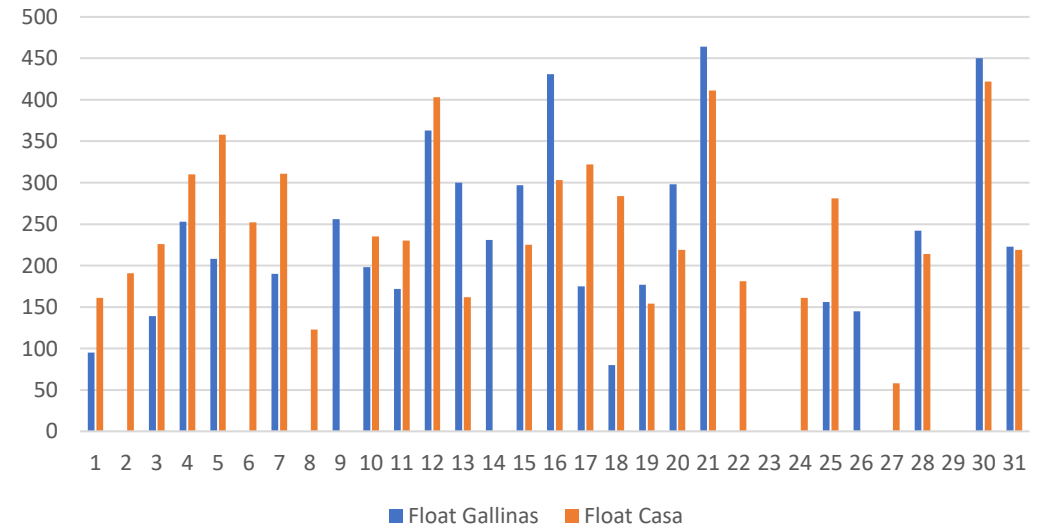# Historial Data

Daily Absorption Times
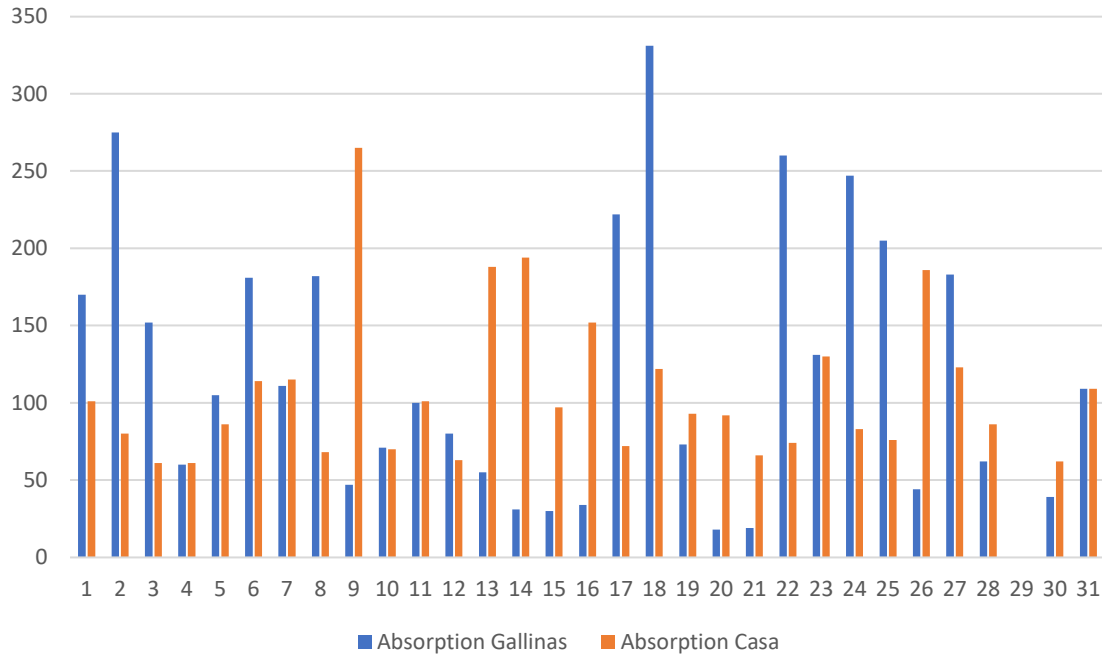
Observation: it is not always the same device with longer absorption times. 12 times the Bluesolar charger (Gallinas) had considerable longer absorption times, 7 times the other device.
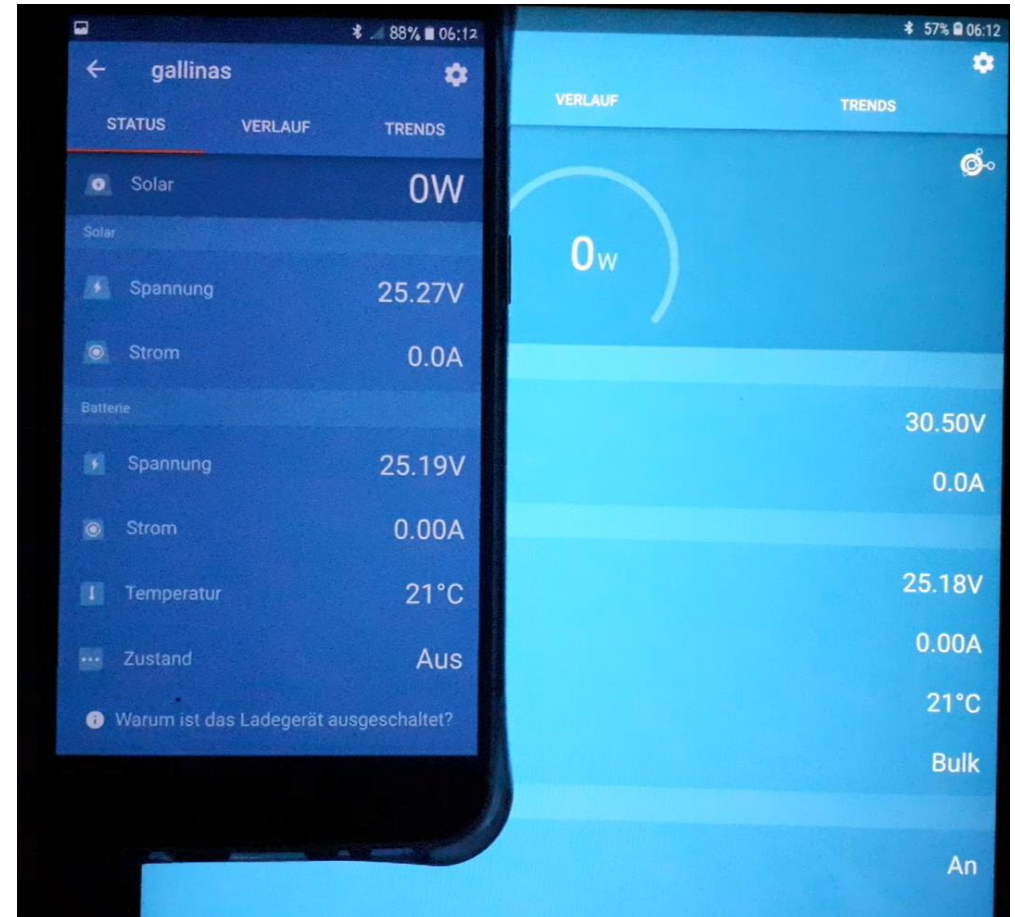
Daily Bulk Times

Daily Float Times

Observations/Debugging

- Setup: I recorded with a camera two cell phones, each one conected to another MPPT + 1 additional connected to the BMV.

- The Smarsolar device (casa) has panels which get the morning sun first, so it started charging a few minutes earlier. Voltage at this point was 25.2V.

- At a Voltage of 29V both devices switched simoultaneously into absorption mode (the voltage rose quite quickly at that moment). The BMV shows a charge level of 89%:


- So far they seem to be synchronized.

• At 12:15, about 1:39h after entering absorption mode, at 97% of charge, the smartsolar (casa) device enters float mode. As the other one remains in absorption mode, it stops delivering energy.
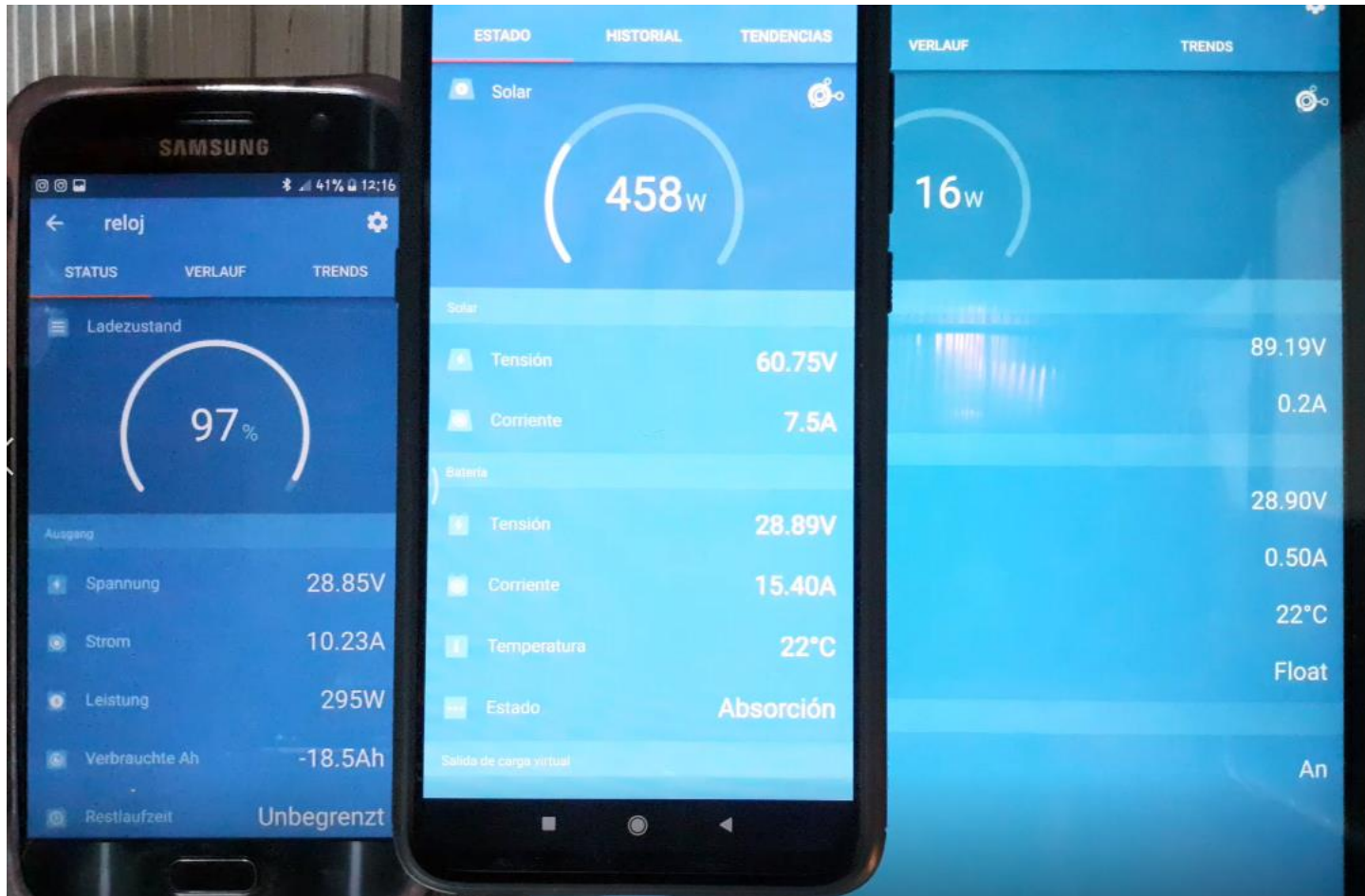
- At 13:23 the bluesolar device (gallinas) also goes into float mode after 2:47hours. It is clearly not synchronized. The day before it remained in absorption mode long after the BMV already showed 100%, as the MPPT output current remained above 3.0 Amps (as the house is drawing current).
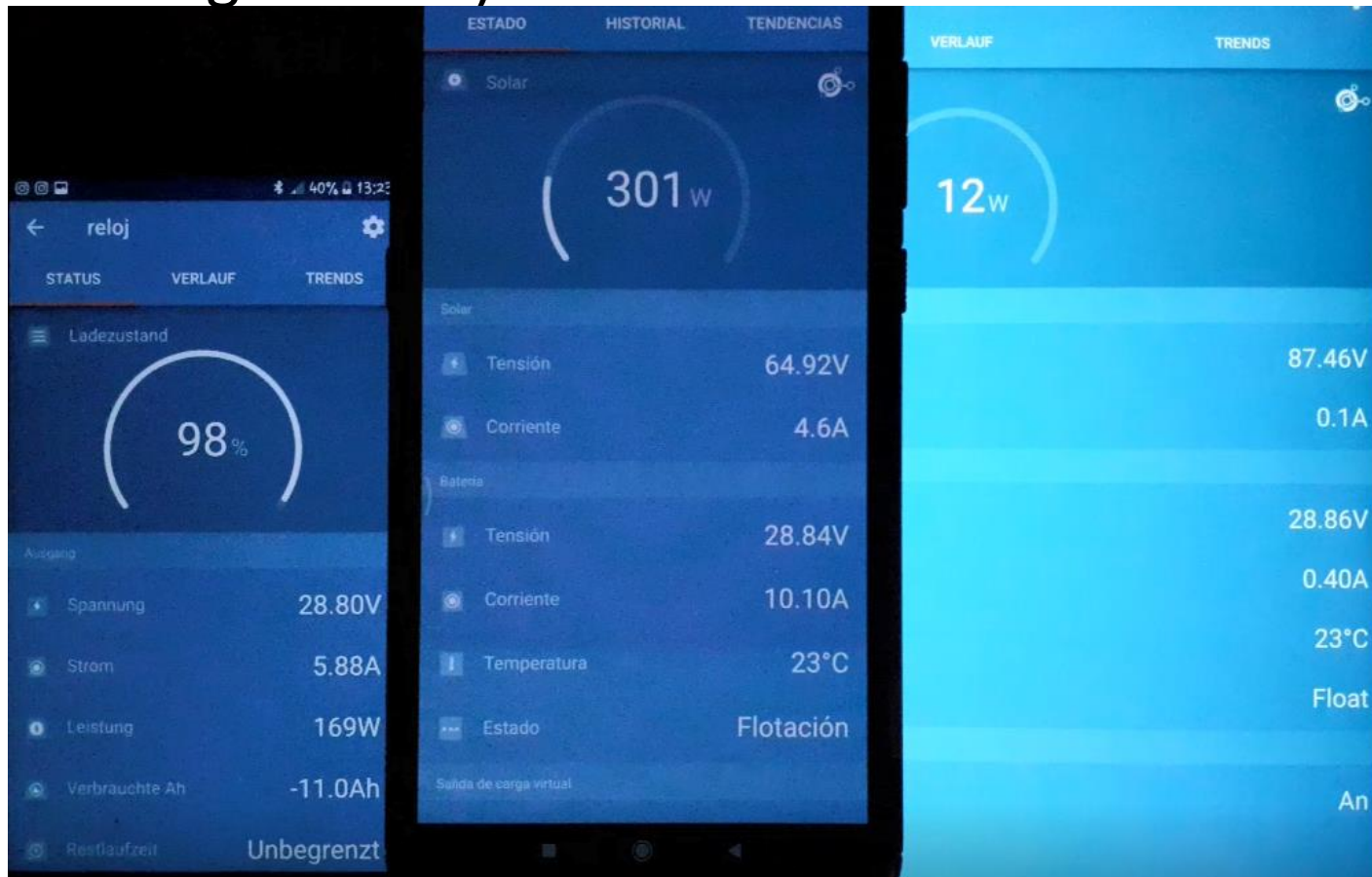
- In the afternoon it starts raining, the solar voltage drops and as there is some power being drawn from the battery, the battery voltage drops also. The Bluesolar (gallinas) charger switches into Bulk mode again at 14:57, but not the other one. At that point the BMV shows already a 100% charge.

- Later also the other charger (casa) goes into Bulk mode again.

- This issue with the going back into Bulk mode maybe unnecessarily is another issue where I probably need to play with some settings. However, it also shows that this devices are not playing together at all.

- I also observed that when one device was in float and the other in absorption mode, the voltage switched between float and absorption voltage. If it was raining or very cloudy and the solar voltage dropped, then it went down to float voltage. Depending on that the device in float or absorption mode would deliver energy.
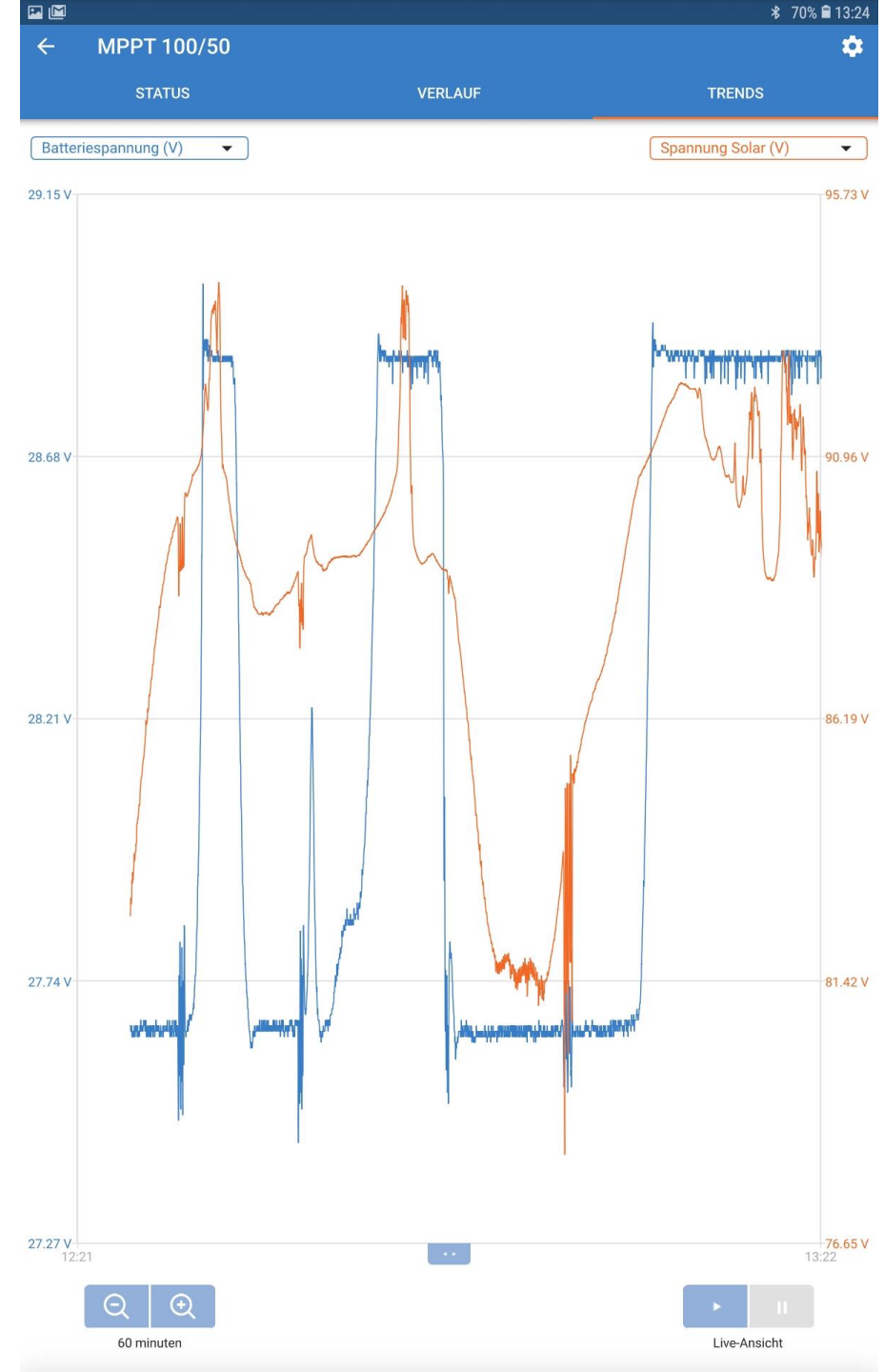
- Questions: How does it really work with the tail current setting? If they are not synchronized and withouth the BMV Input, I suppose each charger just uses it's own output to calculate it?
- That happens if I connect the BMV? Is then the current information used from there? (I tried already, they where also behaving differently each).