BOPV.mini

Supplementary manual for the **PLUS version**.

MINI Display for
HUAWEI SUN2000 & LUNA2000

Manual English Version March 2024 / Device Version P1.31

Foreword

This quick start guide only covers the addition of the PLUS functions. The normal functions are explained in the main manual.

With the PLUS version, you can use the PV surplus to control an electronic switch (Shelly, MyStrom or go-e Wallbox) in order to switch on additional consumers.

Roland, developer and PV owner

Surplus control switches - what are the options:

1 **Battery SOC dependent**
Switch on from X percent and off again from Y percent. Control via the battery is the recommended option.

2 **Smart meter dependent**
Switch on from X kW grid feed-in and off again from Y kW grid feed-in. For those who don't have a battery but a smart meter.

3 **DC power dependent**
If the roof (incl. balcony / PV2) comes over X kW, then switch on. If the yield falls below X, turn it off again. For those who do not have a smart meter installed.

The following devices are supported as local switching actuators:

* Shelly PLUG S
* Shelly PLUS PLUG S
* Shelly PRO 4 MP
* myStrom switch

Functionality:

In the middle of the BOPV.mini display you can see if the circuit is activated by means of the "SWX" indicator. If the indicator is white, then the switch is switched off, if the indicator is green, then switched on.

Example "SW1" in white color:
Excess control configured via the battery, Shelly Plug off.

Example "SW3" in green color:
excess control configured via the DC power (incl. balcony power plant), Shelly Plug on.

Additional package contents:

In addition to the normal scope of delivery, there is also a
Shelly PLUS Plug S Switch in the scope of delivery in the PLUS starter package.

Configuration of the Shelly Plug:

Follow the instructions of the Shelly APP, which is available for Android and iOS. After integrating the Shelly plug into
your WiFi network, you can use the Shelly APP or your router to read out the IP address of the Shelly plug. This is
required for the configuration. Make sure that BOPV.mini and Shelly Plug are in the same WiFi network and that
both can communicate unhindered (watch out for a firewall). You need the local IP address of the Shelly switch.

Configuration of the config.txt:

Add the following 5 parameters to your config.txt. To enable the parameters, remove the // in front of them.

// ** Optional switch logic for using surplus energy with Shelly and myStrom switches (BOPV.mini PLUS combi only)
// ** Optional SWITCHTYPE: 0: Shelly Plug S, Shelly PLUS Plug S and Shelly Pro 4 PM (channel 0) | 1: myStrom Switch
// ** Optional SWITCHIP: full local IP address of the switch (i.e. xxx.xxx.xxx.xxx)
// ** Optional WORKINGMODE: 0 = off | 1 = battery SOC (%) | 2 = smartmeter (kW) | 3 = DC power + Balcony Power
(kw) | (dont use decimals!)
// ** Optional SWITCHON: Value from which the switch is switched on
// ** Optional SWITCHOFF: Value from which the switch is switched off again

//SWITCHIP=192.168.0.203
//SWITCHTYPE=0
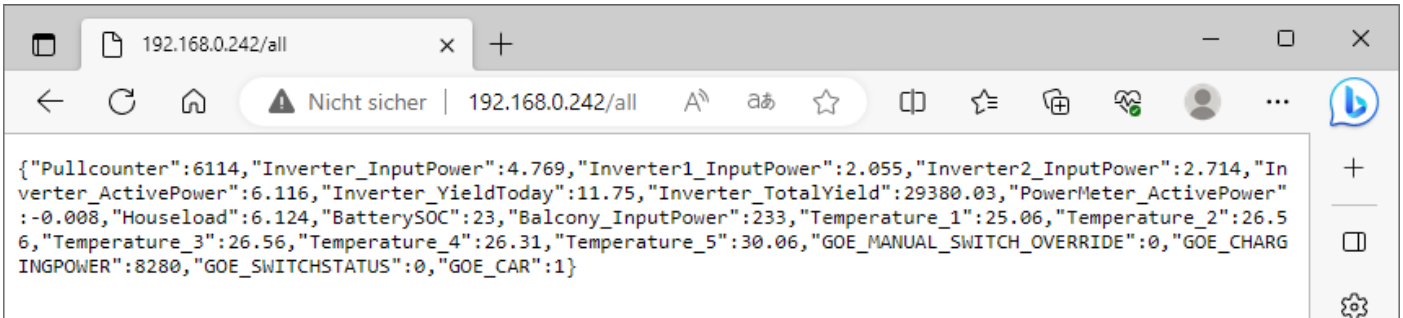//WORKINGMODE=1
//SWITCHON=100
//SWITCHOFF=90

```
// ** Optional switch logic for using surplus energy with Shelly and myStrom switches (BOPV.mini PLUS combi only)
// ** Optional SWITCHTYPE: 0: Shelly Plug S, Shelly PLUS Plug S and Shelly Pro 4 PM (channel 0) | 1: myStrom Switch
// ** Optional SWITCHIP: full local IP address of the switch (i.e. xxx.xxx.xxx.xxx)
// ** Optional WORKINGMODE: 0 = off | 1 = battery SOC (%) | 2 = smartmeter (kW) | 3 = DC power + Balcony Power (kw) | (dont use decimals!)
// ** Optional SWITCHON: Value from which the switch is switched on
// ** Optional SWITCHOFF: Value from which the switch is switched off again
//SWITCHIP=192.168.0.203
//SWITCHTYPE=0
//WORKINGMODE=1
//SWITCHON=100
//SWITCHOFF=90
```

Zeile 59, Spalte 28 | 100% | Windows (CRLF) | UTF-8

In this example, the Shelly Plug (SWITCHMODE=0) is controlled via the battery charge level (WORKINGMODE=1). As
soon as the battery level has reached 100% (SWITCHON=100), the Shelly Plug switches on. As soon as the battery
level is 90% or less (SWITCHOFF=90), the Shelly Plug switches off again.

SWITCHIP=192.168.0.203
SWITCHTYPE=0
WORKINGMODE=1
SWITCHON=100
SWITCHOFF=90

If you have activated the internal web server (IsServer=1), then you can use the address http://xxx.xxx.xxx.xxx/switch to query the set parameters and the switching status. Replace xxx.xxx.xxx.xxx with the IP address of your BOPV.mini.

{"Pullcounter":6114,"Inverter_InputPower":4.769,"Inverter1_InputPower":2.055,"Inverter2_InputPower":2.714,"Inverter_ActivePower":6.116,"Inverter_YieldToday":11.75,"Inverter_TotalYield":29380.03,"PowerMeter_ActivePower":-0.008,"Houseload":6.124,"BatterySOC":23,"Balcony_InputPower":233,"Temperature_1":25.06,"Temperature_2":26.56,"Temperature_3":26.56,"Temperature_4":26.31,"Temperature_5":30.06,"GOE_MANUAL_SWITCH_OVERRIDE":0,"GOE_CHARGINGPOWER":8280,"GOE_SWITCHSTATUS":0,"GOE_CAR":1}

Examples

Battery Mode Shelly Plug 100% = ON, 90% = OFF

//SWITCHIP=192.168.0.203
//SWITCHTYPE=0
//WORKINGMODE=1
//SWITCHON=100
//SWITCHOFF=90

SmartSensor Mode Shelly Plug 3kW or more output = ON, 1kW or less output = OFF

//SWITCHIP=192.168.0.203
//SWITCHTYPE=0
//WORKINGMODE=2
//SWITCHON=3
//SWITCHOFF=1

DC-Power Mode myStrom switch 1kW or more output = ON, 0kW or less output = OFF

//SWITCHIP=192.168.0.203
//SWITCHTYPE=1
//WORKINGMODE=2
//SWITCHON=1
//SWITCHOFF=0

Go-e Wallbox Charging Surplus

As of firmware version P1.19, you can also control a go-e wallbox for charging your electric vehicle via surplus. Prerequisite for this function is an installed LUNA2000 battery and a go-e gemini wallbox, which is located in the same IP network as the BOPV.mini.

Preparing the go-e

Integrate the go-e wallbox into your home network according to its instructions and activate local http API access. Determine the local IP address of the go-e wallbox, which you will need below for configuration.

Functional description of the circuit (using an example):

As soon as the LUNA2000 battery reaches a level above 95% (then the sun should be shining), the BOPV.mini switches the go-e wallbox into charging mode. I set the charging power to 12 amps, which is 8.28 kW. Since my LUNA can deliver a total of 10 kW, the system does not draw any additional power from the grid when the sun is gone and the LUNA still has enough energy. Ideally, however, the LUNA2000 SOC does not sink if enough power comes from the roof.

If the battery level of the LUNA drops below 85% (because the sun is no longer shining or not shining strongly enough), the BOPV.mini stops the charging function of the go-e wallbox. These switch-on and switch-off limits can be configured from 1-100%.

The LUNA2000 battery serves as a buffer for hysteresis, so to speak. So buffers small clouds and above-average solar yield. If you were to control the excess charge directly via DC power or the smart meter, the go-e would switch on or off every few minutes. This is neither for the go-e, nor for the electric car.

In the colder seasons I will reduce the charging current a bit (6-32A possible) and/or lower the switch-off limit.

Via the BOPV.mini (and also via the BOPV.App) you can switch the surplus function to three modes:
a) automatically (as described above
)b) always off
c) always on

Since the BOPV.mini controls all three modes, simultaneous manual control via the go-e app is not possible. If you want to use it, you have to completely deactivate the surplus function in the BOPV.mini config .txt or temporarily switch off the BOPV.mini.

Commands for mode switching via BOPV.App take up to 2 minutes to execute. Switching commands that are switched directly on the BOPV.mini are implemented immediately.

Configuration of the config .txt:

Add the following 3+5 parameters to your config .txt. To enable the parameters, remove the // in front of it. Lines with // at the beginning are either comments or disabled parameters

```
// GO-E Wallbox integration in P1.19 or higher
// by using the go-e charger (SWITCHTYPE=2) the Workingmode is set
// automatically to 1 = battery SOC
// GO-E FRC = force charging: 0=Neutral | 2 = ON
// example for using the go-e charger (SWITCHTYPE=2 | WORKINGMODE=1
// | SWITCHON=95 | SWITCHOFF=70 | GOEPHASES=1 (1 or 3) | GOEAMPERE=6 (6-32)
GOEPHASES=3
GOEAMPERE=12
GOEFRC=0
```

In addition, we need the parameters of the surplus function to configure the IP address of the go-e wallbox (SWITCHIP). SWITCHTYPE must be 2. WORKINGMODE must be 1 and SWITCHON and SWITCHOFF can be set individually:

```
SWITCHIP=192.168.0.215
SWITCHTYPE=2
WORKINGMODE=1
SWITCHON=95
SWITCHOFF=85
```

Notes on charging power:

Depending on the discharge power of the installed LUNA2000 battery, the charging power of the wallbox should be selected accordingly. If your LUNA2000 battery can be discharged with 10 kW, then you can set it to 12 amps and 3-phase (8.28 kW charging power). If you have a smaller battery with less discharge power, then you should choose the charging power correspondingly lower.

In the end, the LUNA2000 should ideally not be emptied or only marginally emptied if there is enough sunlight. After all, it only serves as a buffer to prevent the charging process from being switched on and off unnecessarily frequently. This would not be good for either the wallbox or your electric vehicle in the long run.

Service:

In the main image of BOPV.mini you will find the "GO-E" icon. If it is green, then the wallbox is charging, if it is gray, then it is not charging. To the right of "GO-E" is the current status of the wallbox (idel, wait, charging, error).
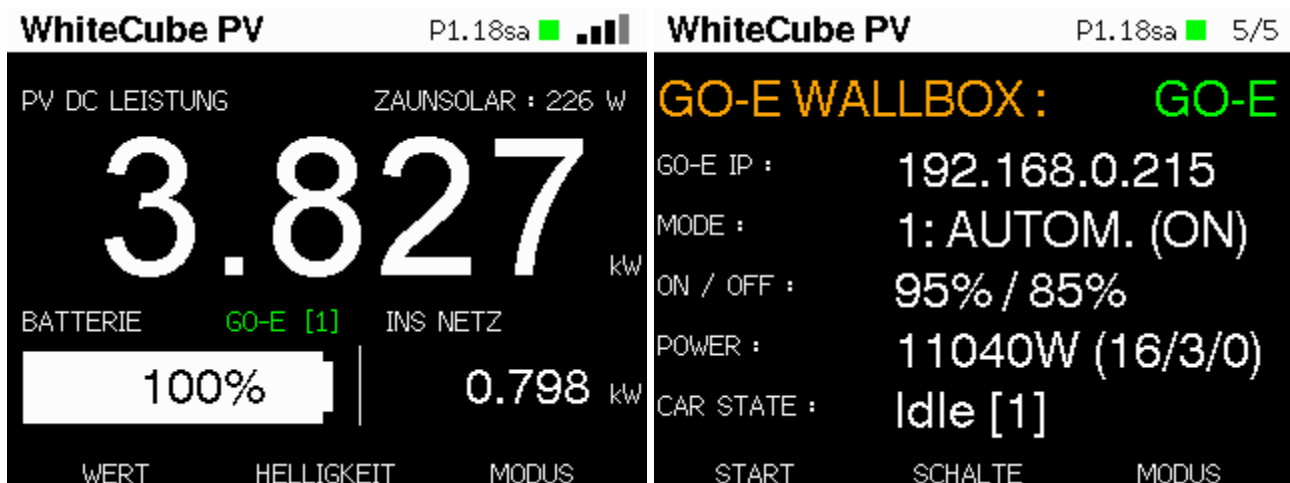
If you scroll to page 5 with the "MODE" button, you will see the parameters currently set for the go-e excess charge. With the "SWITCH" button you can set the charging mode from 1:AUTOMATIC to 2:OFF or 3:ON. This allows you to deactivate or activate the charge regardless of the excess function.

In the BOPV.App (if you use it), you can also switch the three modes. Everything you need to know about configuring the BOPV.App can be found in the main manual.