SPH Installation & Commissioning Quick Guide

Additional Resources

SPH 9.6–18K
Quick Guide · Manual

SPH 8–10K
Quick Guide · Manual

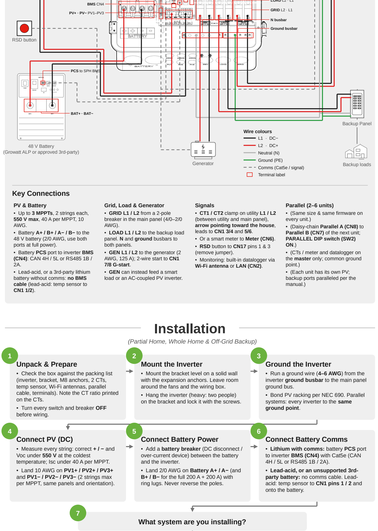
Approved Battery List
LV 48 V · setup codes

Shiner App
iPhone · App Store
Web: shiner-us.growatt.com

Shiner App
Android · Google Play
Web: shiner-us.growatt.com

Growatt Support: 1-866-686-0298

Wiring & Connection Terminals



Key Connections

PV & Battery
- Up to **3 MPPTs**, 2 strings each, **550 V max**, 40 A per MPPT, 10 AWG.
- Battery **A+ / B+ / A– / B–** to the BMS, 4 ft (16 AWG), use both pairs at full power.
- Battery **PCS** port to inverter **BMS** (CAN) 4H / 5L or RS485 1B / 2A.
- Lead-acid, or a 3rd-party lithium battery without comms; **no BMS cable** (lead-acid: temp sensor to **CN1 1/2**).

Grid, Load & Generator
- **GRID L1 / L2** from a 2-pole breaker in the main panel (40–20 AWG).
- **LOAD L1 / L2** to the backup panel. **N** and **ground** busbars to panel busbars.
- **GEN L1 / L2** to the generator (2 AWG, 1|5 A); 2-wire start to **CN1 7/8 G-start**.
- **GEN** can instead feed a smart load or an AC-coupled PV inverter.

Signals
- **CT1 / CT2** clamp on utility **L1 / L2** (between utility and main panel), **arrow pointing toward the house**, leads to **CN1 3/4** and **5/6**.
- Or a smart meter to **Meter (CN5)**.
- **RSD** button to **CN17** pins 1 & 3 (remove jumper).
- Monitoring: built-in datalogger via **Wi-Fi antenna** or **LAN (CN3)**.

Parallel (2–6 units)
- 2Same size & same firmware on every unit.)
- *Daisy-chain* **Parallel A (CN8)** to **Parallel B (CN7)** of the next unit; **last unit: LEL DIP switch (SW2) ON**.
- (CTs / meter and datalogger on the **master** only; common ground point.)
- (Each unit has its own PV; backup ports paralleled per the manual.)

Installation

(Partial Home, Whole Home & Off-Grid Backup)

1 Unpack & Prepare
- Check the box against the packing list (inverter, backup, M8 anchors, 2, CTs, temp sensor, Wi-Fi antenna, parallel cable, terminals). Note the CT ratio printed on the CTs.
- Turn every switch and breaker **OFF** before wiring.

2 Mount the Inverter
- Mount the bracket level on a solid wall with the expansion anchors, with room around the fans and the wiring box.
- Hang the inverter (heavy; two people) on the bracket and lock it with the screws.

3 Ground the Inverter
- Run a ground wire (**4–6 AWG**) from the inverter **ground busbar** to the main panel ground bus.
- Bond PV racking per NEC 690. Parallel systems: every inverter to the **same ground point**.

4 Connect PV (DC)
- Measure every string: correct **+ / –** and Voc under **550 V** at the coldest temperature; fuse under 40 A per MPPT.
- Land 10 AWG on **PV1+ / PV1–** / **PV2+ / PV2–** and **PV3+ / PV3–** / (2 strings max per MPPT, same panels and orientation).

5 Connect Battery Power
- Add a **battery breaker** (DC disconnect / over-current device) between the battery and the inverter.
- Land 2/0 AWG on **Battery A+ / A–** (and **B+ / B–** for the full 200 A = 200 A) with ring lugs. Never reverse the poles.

6 Connect Battery Comms
- **Lithium with comms:** battery **PCS** port to inverter **BMS (CN4)** with CatSe (CAN 4H / 5L or RS485 1B / 2A).
- **Lead-acid, or an unsupported 3rd-party battery:** no comms cable. Lead-acid: temp sensor to **CN1 pins 1 / 2** and onto the battery.

7 What system are you installing?

A - Partial home backup
Backup sub panel on LOAD.

B - Whole home backup
Main panel on LOAD.

C - Off-grid
No utility.

Wire: partial home
- **Run 4 wires from the main panel to the SPH:** L1 + L2 (40–20 AWG) from a **2-pole 240 V breaker** (100 A recommended) to **GRID L1 / L2**, **N** (2–4 AWG) to the **N busbar** and **ground** (4–6 AWG) to the **ground busbar**.
- **LOAD L1 / L2** to the backup sub panel.
- **CT1 / CT2** on the utility L1 / L2 feed, arrows toward the house, to **CN1 3/4 · 5/6**.

Wire: whole home
- **Run 4 wires from the service to the SPH:** L1 + L2 (40–20 AWG, up to 200 A pass-through) to **GRID L1 / L2**, **N** to the **N busbar**, **ground** to the **ground busbar**.
- **LOAD L1 / L2** feeds the main panel. Use a 200 A breaker upstream.
- **CT1 / CT2** on the utility L1 / L2 service conductors, **arrows toward the house**, to **CN1 3/4 · 5/6** (or a smart meter on **CN5**).

Wire: off-grid
- **LOAD L1 / L2** to the load panel.
- Generator on **GEN** (or on **GRID** for some setups: see manual Export Limit to Backup Load use case).
- No CTs needed.

8 Adding a generator, smart load or existing PV?

Generator
2-wire start

Smart load
e.g. water heater

Existing PV (AC couple)
Retrofit

None
Go to Step 9

Generator wiring
- **Run 4 wires:** generator L1 + L2 (2 AWG, 125 A) to **GEN L1 / L2**, **N** to the **N busbar**, ground to the **ground busbar**.
- Start signal to **CN1 7/8 (G-start)**: dry contact relay.
- Settings: **Step 20** (Shiner) or **26** (screen).

Smart load wiring
- Load on **GEN L1 / L2**.
- Turns on / off by battery SOC or V off-grid. Settings: **Step 20** or **26**.

AC couple wiring
- Existing grid-tied PV inverter output on **GEN L1 / L2**.
- Enable **AC Coupled Input** to **Gen** in **Step 20** or **26**.

9 Parallel (optional)
- 2–6 units, same size and firmware. **Parallel A (CN8)** to **Parallel B (CN7)** of the next unit. Turn the **PARALLEL DIP switch (SW2) ON** on every unit.
- CTs / meter and datalogger on the **master** only. Set each unit (master / slave, phase) before operation.

10 Rapid Shutdown & Wi-Fi
- RSD button wire through COM: remove the **CN17** jumper, land on pins **1 and 3**. Use the same RSD brand as the internal transmitter (e.g. Tigo TS4-A-F / 2P).
- Screw on the **Wi-Fi antenna**.

11 Check & Power On
- Secure, grounded, polarity right, unused ports sealed, cover on.
- Power on: **battery** breaker, then **PV switch**, then **grid** breaker. Shut down in reverse.

Commissioning

12 Download the Shiner App
- Scan the **Shiner App** code at the top of this guide (App Store for iPhone, Google Play for Android) and install it. Log in with your Growatt **installer account** (no account yet? call **1-866-686-0298** to set one up in a few minutes).
- Prefer a computer? The **Shiner web portal** is at **shiner-us.growatt.com** (monitoring, sites and reports).
- The SPH can be commissioned **two ways, with the same settings**: **Option A** in the Shiner app, or **Option B** directly on the inverter screen. Pick one. Know the site's **utility grid code** before you start.

How will you commission this SPH?

Option A - Shiner App
Steps 13–20

Option B - Inverter Screen
Steps 21–26 (Step 28 for monitoring)

Option A · Commission in the Shiner App

13 Connect to Your Device
- Open **Shiner** with the installer account and select the inverter (scan the datalogger code on the side of the inverter).
- **First check:** the inverter, battery and CTs / meter all report, with no alarms, before you change settings.

14 Quick Config: Wi-Fi
- Choose the network, enter the password and tap **Connect**.
- **4 G**: pick your APN (no S GHz), or plug in **LAN (CN3)**, *Step*.

15 Create & Bind Site
- Tap **Manage Your Site**, then **+**. Fill in the site information and tap **Create**.
- Select the new site to bind this inverter to it and to your installer account.

16 Grid Code & Time
- In the inverter **Setting** pages, pick the **Grid Code** your utility's interconnection approval names, **Grid Type** (120/240 split phase or 120/208) and **60 Hz**.
- Check the **date / time**.

17 Battery
- **Battery Mode = Lithium** and **Lithium Mode = the setup code** (Growatt ALP = **011**, or **Use Battery V** (battery without comm; also turn on **Revive Battery** and **BMS_Err_Stop**).
- Set **capacity (Ah)** and **Max Charge / Discharge** current. Values: see the battery cards below.

18 CT / Meter & Export
- **Check which CTs came in your box** and set the same **CT Ratio** in the SPH menu (e.g. 2000:1 on the SPH 10K). **CT direction**: arrows toward the house. Or turn on the **smart meter**.
- Set **PV Sell** and **Max Sell Power** if the utility limits export.

19 Operating Mode
- Pick the main mode, then **PV Priority** (Battery First / Load First), **Grid Peak Shaving** and **Time Of Use**. What each mode does: Step 27.

20 Generator & Charging
- Generator (rated power, **Automatic Start**, run time, **Gen Charge**), or **Smart Load / AC Coupled Input** to **Gen**.
- **Grid Charge** and charge rate; **Low Battery Cut Off** < **Alarm** < **Cut In**. Then go to **Step 29**.

Option B · Commission on the Inverter Screen

21 Basic Settings
- Tap the **gear** icon, then **Basic Settings**: set **date / time**, **language** and screen options.
- Advanced pages use password **7777**.

22 Grid Settings
- **Grid Settings**: pick the utility **Grid Mode** (grid code), **Grid Type** (120/240 split phase or 120/208) and **60 Hz**.
- Leave the voltage / frequency trip points at the grid-code defaults unless the utility asks.

23 Battery Mode
- **Battery Settings** page 1: **Battery Mode** = **Lithium** for a communicating battery, then **Lithium Mode** = the setup code (Growatt ALP = **011**). **Battery without comm**: **Use Battery V**, then turn on **Revive Battery** and **BMS_Err_Stop**.
- Set **Battery Capacity (Ah)** and **Max Charge / Discharge** current.

24 CT & Meter
- **Advanced** (7777): set **CT Ratio** to match the CTs that came in your box (e.g. 2000:1 on the SPH 10K; 1500:1–7500:1 on commercial CTs). **CT direction**: arrows toward the house.
- Smart meter instead of CTs: tick **Ex_Meter For CT** and choose **Meter Select**.

25 Operating Mode
- Gear icon, **Operating Modes**: pick the main mode, then **PV Sell**, **Max Sell Power**, **PV Priority** and **Grid Peak Shaving**. What each mode does: Step 27.

26 Generator & Charging
- **Generator Settings**: rated power, **Automatic Start** (G-start), warm-up / cool-down, max run time, **Gen Charge**; or **Smart Load Output** / **AC Coupled Input** to **Gen**.
- **Grid Charge** + rate. **Low Battery Cut Off** < **Alarm** < **Cut In** (e.g. 20 / 25 / 40 %).

Battery & Operating Mode Values (both options)

Which battery?

Growatt ALP
BMS communicates

3rd-party, on the list
BMS communicates

Battery without comm
Use Battery V

ALP settings
- Battery Mode **Lithium**, Lithium Mode **01** (CAN).
- Charge voltages and limits are **set automatically by the BMS**. Turn on **BMS_Err_Stop** so the output stops if comms fail.

3rd-party (with comms)
- Battery Mode **Lithium**, Lithium Mode = your battery's code on the **Approved LV Battery List** (scan the QR code at the top): **01** (CAN) (most batteries); **00 / 03** RS485; **02 / 04 / 05** other protocols.
- Charge voltages come from the BMS. BMS cable to **CN4**: CAN pins 4H / 5L or RS485 pins 1B / 2A.

Battery without comm
- Unplug the BMS cable. Battery Mode **Use Battery V**, set capacity (Ah) and Max Charge / Discharge. Then turn on **Revive Battery** (Battery Settings) and **BMS_Err_Stop** (Advanced, 7777).
- Example **51.2 V, 100 Ah**: Float **54.0 V**, Absorption = Equalization **56.4 V**, LBCO **48 V** < LBCO Alarm **49 V** < LBCI **51 V**, charge rate ≤ 100 A (40–45 A if unknown).

27 Operating Modes
- Same choices in Shiner (Step 19) and on the screen (Step 25). Pick the main mode, then the options: **PV Sell**, **Max Sell Power**, **PV Priority** (Battery First / Load First) and **Grid Peak Shaving**.

Self-consumption Quick Setup
One tap sets **Export Limit to Home Load** + **PV Sell** + **Load First**. Uses the CTs. **Best for:** offsetting the bill every day.

On Grid Mode
Exports excess PV (net metering). The battery only discharges during **Time of Use** windows. No CTs needed. **Best for:** net metering, PV-heavy sites.

Export Limit to Backup Load
PV powers the backup loads and battery only; nothing reaches the grid unless PV Sell is on. **Best for:** off-grid or whole-home backup.

Export Limit to Home Load / Zero Export Limit
Backup and on-grid home loads share PV and battery. CTs / meter at zero unless PV Sell is on. **Best for:** partial-home backup, zero export.

Grid Peak Shaving
In Export Limit to Home Load: caps grid draw at your setting (**3 000 W**). PV, then battery cover the rest. Uses Load First and turns on TOU. **Best for:** demand charges.

Time Of Use
Up to six windows with **Grid charge**, discharge **Power** and an SOC / V target. Above the target the battery discharges, below it charges. **Best for:** rate arbitrage.

Monitoring & Final Check

28 Shiner Wi-Fi & Site (Option B)
- Commissioned on the screen? Still do **Steps 13–15** in Shiner: connect, Wi-Fi (**2.4 GHz** or LAN), create and bind the site.

29 Check & Export Report
- On the LCD and in Shiner: PV, grid, battery and loads all read correctly; no alarms.
- Export the commissioning PDF from Shiner for the utility / AHJ if required, then **log out**.

30 Battery Care
- Charge to **60 % SOC or more** before leaving.
- If needed, top-balance the batteries periodically: charge to **100 %** and hold so the BMS can balance the cells.
- Turn on **Lock Out All Changes** if the homeowner shouldn't edit settings (password 9999).
- **Your installation is done!**

End User Hand Over

31 End User: Create A Growatt Account
- This is the **homeowner's** account.
- On the Shiner login page tap **Create A Growatt Account**, fill in the account information, set a password and log in.
- Prefer a computer? The installer can also create the site and add the device on the **Shiner web portal (shiner-us.growatt.com)**: **Site list** → **Create a New Site**, then **+** to add the serial number).

32 End User: Create Site
- Tap **Manage Your Site**, then **+**. Fill in the site information and tap **Create**.

33 End User: Add Device
- Tap **SiteHome**, then **Add Device**. Scan the datalogger code on the side of the inverter, connect **Wi-Fi** and tap **Add To Site**.
- You can now monitor your system: the **Home Page** shows PV, grid and battery.
- Help: **1-866-686-0298**.