MIN XH2 Installation & Commissioning Quick Guide

Additional Resources

MIN XH2 Quick Guide
Dialup (2G) us.growatt.com

MIN XH2 User Manual
Growatt Sub - MIN TL-XH(US)

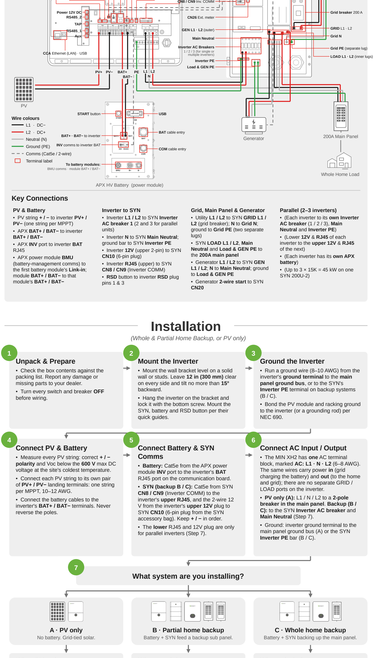
Commissioning Guide
MIN XH2 · Shine Inverter

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
- PV string + / − to inverter **PV+ / PV−** (one string per MPPT)
- APX **BAT+ / BAT−** to inverter **BAT+ / BAT−**
- APX **INV** port to inverter **BAT** RJ45
- APX power module **BMU** communication connect to the first battery module's **Link-in**, module **BAT+ / BAT−** to that module's **BAT+ / BAT−**.

Inverter to SYN
- Inverter **L1 / L2** to SYN **inverter AC breaker** L2 and N (or parallel units)
- Inverter **N** to SYN **Main Neutral**; ground bar to SYN **inverter PE**
- Inverter **12V** (Cat6e 2-pin) to SYN **CN10** (6-pin plug)
- Inverter **RJ45** (upper) to SYN **CN8 / CN9** (Inverter CAN#)
- **RSD** button to inverter **RSD** plug pins 1 & 3

Grid, Main Panel & Generator
- Utility **L1 / L2** to SYN **GRID L1 / L2** (grid breaker) & to **Grid N**, ground to **Grid PE** (two separate lugs)
- SYN **LOAD L1 / L2**, **Main Neutral** and **Load & GEN PE** to the **200A main panel**
- Generator **L1 / L2** to SYN **GEN L1 / L2**, **N** to **Main Neutral**, ground to **Load & GEN PE**
- Generator **2-wire start** to SYN **CN20**

Parallel (2–3 inverters)
- Attach inverter to its **own inverter AC breaker** (L1 / L2 / Neutral / Ground) and **inverter PE** terminal
- S-Lower **12V & RJ45** of each inverter to the **upper 12V & RJ45** of the next
- Attach inverter fan to **own APX battery**
- 8-Up to 3 × 15K = 45 kW on one SYN 2000-2)

Installation

(Whole & Partial Home Backup, or PV only)

1 Unpack & Prepare
- Check the box contents against the packing list. Report any damage or missing parts to your dealer.
- Turn every switch and breaker **OFF** before wiring.

2 Mount the Inverter
- Mount the wall bracket level on a solid wall or studs. Leave **12 in (300 mm)** clear on every side and tilt no more than **15°** backward.
- Hang the inverter on the bracket and lock it with the bottom screw. Mount the SYN, battery and RSD button per their quick guides.

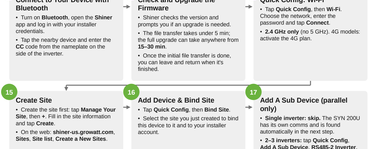
3 Ground the Inverter
- Run a ground wire (8–10 AWG) from the inverter's **ground terminal** to the **main panel ground bus**, or to the SYN's **inverter PE terminal** for Backup systems (BYPASS).
- Bond the PV module and racking ground to the inverter (or a grounding rod) per NEC 690.

4 Connect PV & Battery
- Measure every PV string: correct **+ / − polarity** and Voc below the **600 V** max DC voltage at the site's coldest temperature.
- Connect each PV string to its own pair of **PV+ / PV−** landing terminals: one string per MPPT, 10–12 AWG.
- Connect the battery cables to the inverter's **BAT+ / BAT−** terminals. Never reverse the poles.

5 Connect Battery & SYN Comms
- **Battery:** Cat6e from the APX power module **INV** port to the inverter's **BAT** RJ45 port on the communication board.
- **SYN (backup B / C):** Cat5e from SYN **CN8 / CN9** (Inverter COMM) to the inverter's **upper RJ45**, and the 2-wire 12 V from the inverter's **upper 12V** plug to SYN **CN10** (6-pin plug from the SYN accessory bag). Keep **+ / −** in order.
- The **lower** RJ45 and 12V plug are only for parallel inverters (Step 7).

6 Connect AC Input / Output
- The MIN XH2 has **one** AC terminal block, marked **AC L1 · N / L2** (6–8 AWG). The same wires carry power in (grid charging the battery) and **out** (to the home and grid); there are no separate GRID / LOAD ports on the inverter.
- **PV only (A):** L1 / N / L2 to a **2-pole breaker in the main panel. Backup (B / C):** to the SYN **inverter AC breaker** and **Main Neutral** (Step 7).
- Ground: inverter ground terminal to the main panel ground bus (A) or the SYN **Inverter PE** bar (B / C).

7 What system are you installing?



Wire: PV only
- Connect the inverter to the grid with a **2-pole 240 V breaker** in the main panel: **L1** and **L2** (6–8 AWG) to the grid, **N** to the AWG) and **ground** wire (8–10 AWG).
- Breaker size per the datasheet: **40 A** (7.6K), **50 A** (10K / 12.4K).
- 5-point limit reached? Add the **SM-US-200** meter. CTs on the grid feed **L1 / L2** and **ground** at the grid, the main panel, **arrow pointing toward the main panel (house)**.

Wire: partial home
- **Run 4 wires from the inverter to the SYN:** L1 + L2 (6–8 AWG) to SYN **Inverter AC breaker**, **N** to SYN **L1 / L2**, **N** to the SYN **Main Neutral** bar, and **ground** to the SYN **Inverter PE** bar.
- **Run the AC output from SYN GRID L1 / L2** (plus **Grid N** and **Grid PE**) to a 2-pole breaker in the main panel. And from **SYN LOAD L1 / L2** (plus Main Neutral and Load & GEN PE) to the backup sub panel.
- **SM-US-200** meter: CTs on the main panel's grid feed **L1 / L2**, **arrow pointing toward the main panel (house)**; meter RS485 to SYN **CN26**.

Wire: whole home
- **Run 4 wires from the inverter to the SYN:** L1 + L2 (6–8 AWG) to SYN **Inverter AC breaker**, **N** to the SYN **L1 / L2**, **N** to the SYN **Main Neutral** bar, and **ground** to the SYN **Inverter PE** bar.
- **Run the service conductors** (utility L1 / L2, N, ground) to the SYN **200 A grid breaker** and **Grid N** and **Grid PE**, and **SYN LOAD L1 / L2** (plus Main Neutral and Load & GEN PE) to the main panel.
- Meter and CTs are **built into the SYN** (factory installed and oriented).

Parallel comms wiring



- **Upper** RJ45 and upper 2-pin: **cable** in from the SYN (or the previous inverter).
- **Lower** RJ45 and lower 2-pin: cable **out** to the next inverter.
- Connect the 2-pin wires in the correct order.

Signal wire (Cat6e + 12 V)

How many inverters?



Parallel wiring
- Up to **3 × 15K (45 kW)** on one SYN 2000-I. Same ratings apply.
- **Comms:** daisy-chain the Cat5e and 12 V 2-pin as shown on the left.
- **DIP switch:** Growatt's MIN XH2 quick guide and commissioning guide call for no DIP change for parallel, the units are linked in Shiner (Step 17).

Adding a generator?



Generator wiring
- **2-wire-start** generator, up to **20 kW**.
- Wire the start signal to SYN **CN20** (GEN start) **first**, then generator **L1 / L2** to SYN **GEN L1 / L2**, **N** to **Main Neutral** and **PE** to the SYN **Load & GEN PE** bar.
- Settings are in **Step 24**.

Skip if there is no existing PV inverter

Existing PV Inverter? (AC-Coupled Retrofit)
- For homes that **already have a grid-tied PV inverter**: it stays wired into the main panel and the XH2 reads its output with a CT.
- Run the CT cable through the COM conduit into the XH2 wiring box and land it on the inverter's **CT** terminal (marked **CT 1+ 1− 2+ 2−**, just right of the communication board): use **1+** and **1−**.
- Clamp the CT ring around the existing PV inverter's **L1** wire with the **arrow pointing toward the main panel**. Turn **AC Couple** ON during commissioning (Step 23).

8 Antenna, RSD & LAN
- Screw the **Wi-Fi** antenna onto **ANT1**, and the **4G** antenna onto **ANT2**, on the bottom of the inverter (some models ship with one).
- **RSD:** Tigo TSA-4-F / ZP or APS RSD modules. Wire the RSD button to pins **1** and **3** of the 3-pin plug marked **RSD** (left end of the communication board, beside the CT).
- **LAN (optional, instead of Wi-Fi):** Ethernet cable to the **CC4 Ethernet** port, lower left of the wiring box.

9 Check Before Power-On
- Installed securely; cables routed, tied and connected correctly; ground secure.
- Unused ports capped; conduits sealed; wiring box clean; DC switch and all breakers **OFF**.

10 Power On
- Confirm PV / AC voltage is in range.
- Turn on the **battery** switch, then the inverter **DC switch**, then all **SYN** breakers, then the grid / PV-side breaker.
- LEDs: POWER green steady = feeding grid, COMM green = Wi-Fi / 4G OK; FAULT red = fault.

Commissioning

11 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 just a few minutes.
- Know the site's **utility grid code** before you start.

12 Connect to Your Device with Bluetooth
- Turn on **Bluetooth**, open the **Shiner** app and log in with your installer credentials.
- Tap the nearby device and enter the **CC** code from the nameplate on the side of the inverter.

13 Check and Upgrade the Firmware
- Shiner checks the version and prompts you if an upgrade is needed.
- The file transfer takes under 5 min; the full upgrade can take anywhere from **15–30 min**.
- Once the initial file transfer is done, you can leave and return when it's finished.

14 Quick Config: Wi-Fi
- Tap **Quick Config**, then **Wi-Fi**. Choose the network, enter the password and tap **Connect**.
- **2.4 GHz only** (no 5 GHz). 4G models: activate the 4G plan.

15 Create Site
- Create the site first: tap **Manage Your Site**, then **+**. Fill in the site information and tap **Create & Next**.
- On the web: **shiner-us.growatt.com**, **Sites**, **Site list**, **Create a New Sites**.

16 Add Device & Bind Site
- Tap **Quick Config**, then **Bind Site**.
- Select the site you just created to bind this device to it and to your installer account.

17 Add A Sub Device (parallel only)
- **Single inverter: skip.** The SYN 2000 has its own comms and is found automatically in the next step.
- **2–3 inverters:** tap **Quick Config**, **Add A Sub Device**, **RS485-2 Inverter**. Add each other inverter by **Device Code** (the **CC** number on the nameplate on the side of that inverter) or **Enter SN**, tap **Keep Adding**, then **Save**.

18 Installation Diagnosis (first check)
- Now that energy is connected, tap **Quick Config**, then **Installation Diagnosis**, then **Scan**. Every component must be found: inverter(s), SYN, battery and meter.
- Check the device count, tap **Diagnosis**, wait about 10 min and tap **I Know**. Fix anything flagged before you go on. The SYN meter turns on automatically after this scan.

19 Grid Code
- The default is **IEEE1547-240**. In **Quick Config**, set the **Grid Code** your utility's interconnection approval names (each code comes in a **-240** split-phase and a **-208** version).
- Don't change it during grid connection: reconnecting takes about 300 s.

IEEE1547: Default, most US utilities (IEEE 1547-2018)

RULE21: California (Rule 21: PG&E, SCE, SDG&E)

HECO: Hawaii (Hawaiian Electric)

ISO-NE: New England: CT, MA, ME, NH, RI, VT

NEWYORK: New York (NY SIR)

NEWYORK-ORU: Orange & Rockland (NY)

CENHUD: Central Hudson (NY)

PRC-West / East / Quebec: NERC PRC-024 ride-through by interconnection

AMEREN-CGN: Ameren (IL / MO)

BGE: Baltimore Gas & Electric (MD)

PHI: Pepco, Delmarva, Atlantic City Electric

SMECO: Southern Maryland Electric Co-op

PNM: PNM (New Mexico)

LUMA: Puerto Rico (LUMA Energy)

PE: Confirm the territory with your utility

20 Smart Meter & Export Limitation
- The SYN's built-in meter turns on **automatically** after Installation Diagnosis. Check **Quick Config** → **Smart Meter** shows **ON**.
- **Whole home (C):** nothing else to set. **Partial home (B):** also turn on **Setting** → **EMS** → **External Meter Enable**, **Save** (reads the SM-US-200 on the grid feed).
- **PV only (A):** Smart Meter **ON** if an SM-US-200 is fitted. **AC couple:** the CT on the PV inverter needs **AC Couple** ON (Step 23).
- Utility limits export? Set **Export Limitation Power Ratio** and **Fail-safe Power Ratio**.

21 Pre-PTO Mode
- No **Permission to Operate** yet? Enable **Pre-PTO mode**: all settings are adjustable and PV only charges the battery.
- Once PTO is granted, turn it off remotely in the **Shiner app** or on the **Shiner web portal**.

Battery & Backup Settings · PV only: skip to Step 25

22 Set Operation Mode
- Tap **Setting**, then **EMS**, then **Quick Battery Mode Setup**. Pick the mode that fits the homeowner's use case, tap **Confirm**, then **Save**.

Load First / Self-Consumption (Default)
Solar powers the home first and extra solar charges the battery. At night the battery powers the home down to its minimum reserve, then the grid takes over. **Best for:** lowering bills every day.

Battery First (TOU Charging)
Charges the battery as fast as possible from solar, and from the grid if AC Charging is on. The battery then stays full for outages, extra solar covers the home, then exports. **Best for:** outage prep or charging on cheap rates.

Grid First (Peak Shaving / TOU Discharge)
Maximum output. Solar first, then the battery, then the home and export to the grid until the inverter or battery reaches its limit. **Best for:** maximum selling to the grid under time-of-use rates.

Solar Only Backup
The battery charges only from solar and stays full for outages. The grid powers the home. **Best for:** emergency backup without paying to charge from the grid.

TOU Idle / Idle (Charge From Clipped Solar)
The battery neither charges nor discharges while the grid is up, so the system runs like PV only and the battery is held for outages. **Best for:** emergency battery backup while excess PV is still sold to the grid.

Time of Use Schedule / Disabled
Build your own daily schedule: 1) set **Quick Battery Mode Setup** to **Disable**. 2) Open **Time of use**, tap + and pick **Period 1**. 3) Set its **StartTime**, **EndTime** and the mode for that window. 4) Tap **Save**, then **Confirm**. Add more periods the same way; they can't overlap. **Best for:** custom rate plans.

23 Charging & AC Couple
- **AC Charging** (in the battery): lets the grid charge the battery (Disabled by default). Turn it on for Battery First on cheap rates.
- **AC Couple**: only for an existing third-party PV inverter with its CT installed (Disabled by default).
- To turn either on: **Setting** → **EMS** → AC Charging or AC Couple → **ON** → **Save**.

24 Off-Grid Function & Generator
- Tap **Setting**, **General Settings**, **Off-Grid Function** and turn **Off-Grid Enable** ON (SYN systems).
- **Generator:** Generator Control **Not Enable** (auto start / stop), Generator Charge **Enable**, Generator Rated Power = nameplate. In **EMS**, set Battery Charge Stop SOC and Battery Discharge Stop SOC.

25 Battery Care
- Charge the battery to **60 % SOC or more** before leaving, especially while waiting for PTO.
- Install not finished? Unplug battery power and comms and switch the battery off.

Final Check

25 Installation Diagnosis (final)
- Run **Quick Config** → **Installation Diagnosis** → **Scan** again now that all devices are online.
- All components (inverters, SYN, battery, meter) must be found with no errors. Fix anything flagged and scan again until it's clean.

26 Export Reports & Home Page
- **Grid Profile Settings Report** and **Installation Information**: tap **Export PDF** on each and send them to the utility / AHJ if required.
- The **Home Page** should show PV, grid import / export and battery. Then **log out** of the installer account.
- **Your installation is done!**

End User Hand Over

27 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 create the site and add the device on the **Shiner web portal (shiner-us.growatt.com**: **Sites** → **Site list** → **Create a New Site**, then **+** to add the serial number).

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

29 End User: Add Device
- Tap **Site/Home**, then **Add Device**. Input the **CC** number from the nameplate 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**.