



VarianHOME and Wallbox Pulsar Plus Installation Guide

V2.5

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NOTE: This guide does not provide instructions for the physical installation of the Pulsar Plus Charger. Please refer to the instructions accompanying the charger and at https://support.wallbox.com/wp-content/uploads/ht_kb/2021/01/Pulsar-Plus-N.-A.-Installation-Guide.pdf

1) VarianHOME Important Safety Information

Professional Installation Required

VarianHome Electric Vehicle Energy Management System (EVEMS) must be installed by a licensed and qualified electrician in accordance with all applicable electrical codes and standards.

Improper installation can create hazards that may result in severe injury, death, or equipment damage. Read and understand all instructions completely before beginning installation.

Critical Safety Warnings



DANGER - ELECTRICAL SHOCK AND FIRE HAZARD

- Risk of electrical shock or fire if installed improperly
- Disconnect all power sources before installation or maintenance
- Install only in suitable indoor locations
- Follow all applicable electrical codes and standards

Installation Restrictions

- Installation must comply with National Electrical Code (NEC), Canadian Electrical Code (CEC), and all local codes
- Install only as part of an approved EVEMS installation
- Install only after verifying panel rating is under 200A and voltage is under 240V
- Maintain specified clearances and environmental conditions

Precautions During Installation and Operation

- Use appropriate personal protective equipment (PPE)
- Use proper tools rated for electrical work
- Do not modify or attempt to repair the unit
- Keep all covers and protective elements in place
- Maintain proper ventilation and operating conditions
- Follow all lockout/tagout procedures during installation and maintenance

Response to Failures or Malfunctions

- Immediately disconnect power if any abnormal conditions are observed
- Contact Variablegrid technical support for assistance
- Do not attempt repairs or modifications
- Document any observed issues or error codes
- Resume operation only after authorized service personnel have resolved the issue

2) Installation Support

Variablegrid tech support is available to provide priority telephone support to installers Monday to Saturday from 6 am to 6 pm PT (9 am to 9 pm ET) at 800-645-2314. If not answered immediately please leave a voicemail and your call will be returned as soon as possible.

Support resources are also available at support@variablegrid.com and online at <https://support.variablegrid.com>.

3) VarianHOME Kit Components

Check to ensure the following are part of your VarianHome kit:

- 1 x VarianHome EVEMS
- 2 x 200A Current sensors (CTs)
- 1 x AC adapter (5V)
- 1 x Wi-Fi extender
- 1 x Ethernet cable (1m)
- 1 x Bag mounting screws and Velcro pads
- 1 x VarianHOME installation guide (specific to EV charger model)

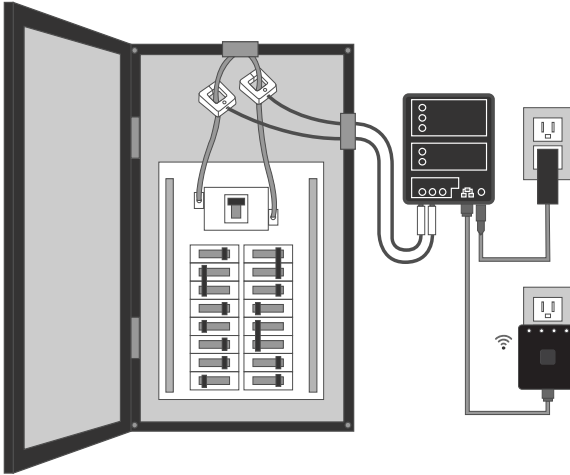
If any components are missing contact Variablegrid tech support.

NOTE: The current sensors provided must be installed only in main panels rated 200A or less.

4) VarianHOME Physical Installation

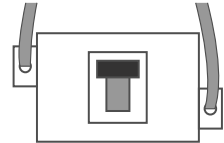
Block Diagram

The block diagram below provides an overview of the physical installation.



Turn off main panel power

Open the electrical panel and turn off the main breaker.



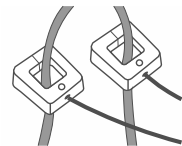
Remove panel cover

Remove the screws securing the panel cover to access the service mains.

WARNING: The service mains are always live!

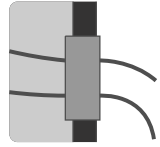
Install the current sensors

Carefully remove the bars on the top edge of the sensors, clamp the sensors around the service mains so that the arrows on the sensors are both facing towards the power source.



Route sensor cables

Carefully route the two sensor cables through an opening in the panel close to where VarianHOME will be mounted. Ensure that there is no pressure on the sensor cables that could damage them over time.

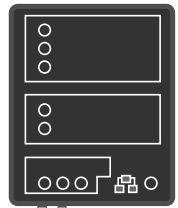


Replace panel cover and close the panel

Replace the panel cover carefully to ensure that there is no pressure on the sensor clamps that would cause them to open.

Mount VarianHOME

Using the provided screws or Velcro pads, mount VarianHOME close enough to the electrical panel for the sensor plugs to reach the L1 and L2 jacks on the bottom of VarianHOME, and in a location where the provided AC adapter can reach a power outlet.



Plug in the network cable

Plug a network cable between the Ethernet port on the bottom of VarianHOME and the Wi-Fi extender (or directly into your home router). If using the Wi-Fi extender, plug it into a power outlet.

NOTE: The supplied Variablegrid extender must be configured using the instructions accompanying the extender. When configured and operating correctly the extender LED will turn Green.

Power on VarianHOME

Plug the AC adapter into the power jack on VarianHOME and into the power outlet. VarianHOME may perform a firmware update when it powers on, indicated by a temporary Orange LED.

Plug in the sensors

Fully insert the two sensor plugs into the L1 and L2 jacks on the bottom of VarianHOME. The LEDs should change from Red to flashing Red/Green (no current detected) or solid Green (current detected).

5) Confirming Correct Sensor Operation

After plugging sensors into VarianHOME, it is essential to confirm the sensors are properly connected and providing valid readings.

Method 1: Controller Webform

View Live Sensor Data using the webform on the controller:

- 1) Using a notebook, tablet or phone connected to the home Wi-Fi network, open a browser and go to *varian.local*

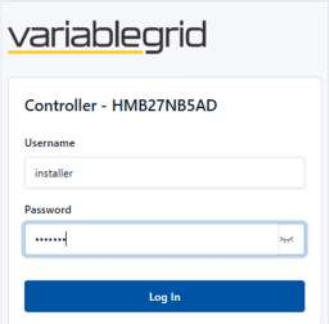
NOTE: Some older networks require entry of the IP address assigned to the controller by the home network router.

- 2) Enter *installer* and *Varian1* into the Login form and press Log In
- 3) Display menu items by pressing the 3-bars icon at the top left and click on Live Sensor Data
- 4) On the Live Sensor Data screen, confirm the SA (Sensor Amps) group is displaying data appropriate to the installation

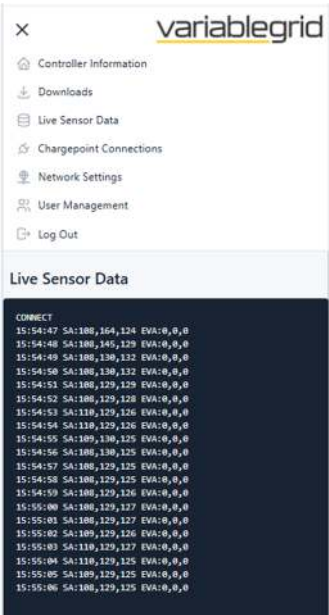
NOTE: The third value in the SA group will be 0.

If any value is 0 or outside the expected range unplug and plug in the sensor cable. If in doubt, contact Variablegrid tech support immediately for assistance.

NOTE: Swapping cables between jacks can aid in troubleshooting, but confirm cables are in the correct jacks before leaving the site.



The image shows the login interface for the Variablegrid Controller. At the top, the 'variablegrid' logo is displayed. Below it, the text 'Controller - HMB27NB5AD' is shown. There are two input fields: 'Username' with the text 'installer' and 'Password' with masked characters. A 'Log In' button is at the bottom right.



The image shows the 'Live Sensor Data' screen in the Variablegrid webform. It features a sidebar menu with options: Controller Information, Downloads, Live Sensor Data (selected), Chargepoint Connections, Network Settings, User Management, and Log Out. The main content area is titled 'Live Sensor Data' and displays a 'CONNECT' status with a list of sensor readings. Each line shows a timestamp, a sensor ID (SA), and three numerical values (164, 124, 0).

Timestamp	SA	Value 1	Value 2	Value 3
15:54:47	SA:100,164,124	164	124	0
15:54:48	SA:100,164,124	164	124	0
15:54:49	SA:100,130,132	130	132	0
15:54:50	SA:100,120,132	120	132	0
15:54:51	SA:100,120,125	120	125	0
15:54:52	SA:100,120,126	120	126	0
15:54:53	SA:110,120,126	120	126	0
15:54:54	SA:110,120,126	120	126	0
15:54:55	SA:100,130,125	130	125	0
15:54:56	SA:100,130,125	130	125	0
15:54:57	SA:100,120,125	120	125	0
15:54:58	SA:100,120,125	120	125	0
15:54:59	SA:100,120,126	120	126	0
15:55:00	SA:100,120,127	120	127	0
15:55:01	SA:100,120,127	120	127	0
15:55:02	SA:100,120,126	120	126	0
15:55:03	SA:110,120,127	120	127	0
15:55:04	SA:110,120,125	120	125	0
15:55:05	SA:100,120,125	120	125	0
15:55:06	SA:100,120,125	120	125	0

Method 2: Controller LEDs

Examine the L1, L2 LEDs on VarianHOME.

NOTE: The L3 LED will be off when no sensor is plugged in and Red when a sensor is incorrectly plugged in.

For each phase:

- 1) A blinking Red/Green LED indicates the Sensor Amps detected is less than 2% of the sensed panel maximum. This warns of a potential sensor fault.

NOTE: Very low readings are uncommon but can occur if the sensed panel is inactive. In this case, turn on some loads on the panel and confirm the LED turns Green.

- 2) A solid or blinking Green LED indicates the sensor is detecting Amps. The blink rate indicates the Sensor Amps detected as a percentage of the sensed panel maximum:
 - a. Solid – 2% to 10%
 - b. Slow Blink – 10% to 40%
 - c. Fast Blink – 40% to 80%

NOTE: Until the controller is fully configured, the sensed panel maximum defaults to 100A on VarianHOME.

- 3) A blinking Red LED indicates Sensor Amps detected are greater than 80% of the sensed panel maximum. If this occurs, unplug any EV from the EV charger and contact Variablegrid tech support immediately for assistance.

If any LED is blinking Red/Green and the load on the sensed panel is reasonably expected to be above 2%, unplug and plug in the sensor cable. If the issue remains, contact Variablegrid tech support immediately for assistance.

NOTE: Swapping cables between jacks can aid in troubleshooting, but confirm cables are in the correct jacks before leaving the site.

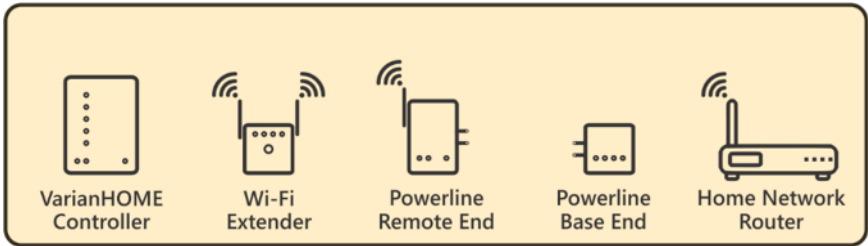
NOTE: Once a sensor is detecting Amps and displays a Green LED, the LED will remain Green even if the detected Amps falls to 0. To reset the sensor fault test, restart the controller or remove and reseal the sensor.

6) VarianHOME Network Connection

VarianHOME connects to the home network using Ethernet only. It ships with a Variablegrid Wi-Fi extender and Ethernet cable to facilitate a Wi-Fi connection to the network.

NOTE: VarianHOME connects to the Internet for initial and periodic configuration, and to allow users to manage the EV Charger using the Variablegrid mobile app.

Key to Method Diagrams



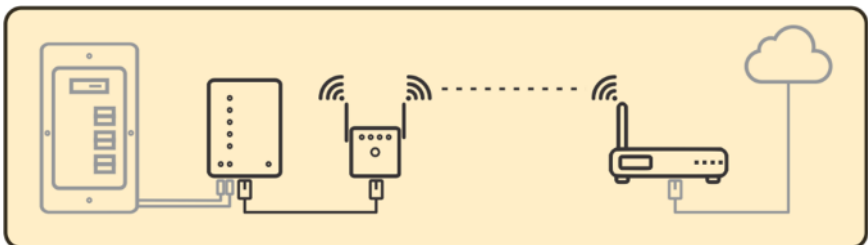
There are three methods of connection. Only one is required:

Method 1: Wi-Fi extender

The supplied Variablegrid or user-supplied Wi-Fi extender must be plugged in at a location within Wi-Fi range of the home network router and within Ethernet cable range of VarianHOME.

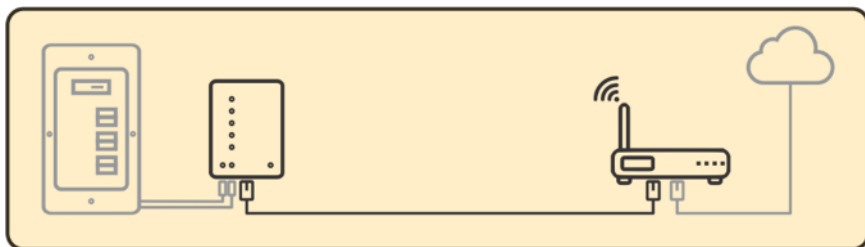
NOTE: A user-supplied extender must be configured and operating properly. The extender must have an available Ethernet port, such as TP-Link RE550.

Plug the supplied 1m or user-supplied Ethernet cable between VarianHOME and the extender.



Method 2: Direct cable connection

Plug a user-supplied Ethernet cable (100m maximum) between VarianHOME and the home network router.

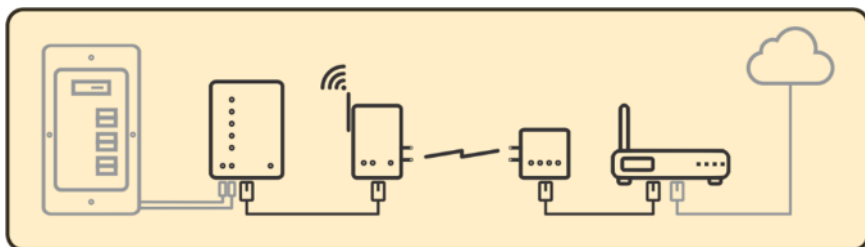


Method 3: User-supplied powerline extender

If the distance between VarianHOME and the home network router is too great for a Wi-Fi extender to function properly, a powerline extender may be used. This method transmits data through the existing home wiring and requires that both outlets used by the powerline extender be on the same subpanel.

To set up, connect an Ethernet cable between VarianHOME and the powerline extender's remote unit. Then, connect another Ethernet cable between the powerline extender's base unit and the home router.

NOTE: The extender must be configured and operating properly. If the extender is also to be used for EV Charger connectivity then it must have Wi-Fi capability, such as TL-WPA7517KIT.



7) Confirming VarianHOME Connection

The Internet LED will turn Green when VarianHOME connects to the Internet. If the LED turns RED, check:

- 1) The Ethernet cable is securely connected (the Ethernet port on VarianHOME will display a blinking LED)
- 2) If using an extender, the LEDs on the extender indicate it is connected to the home network
- 3) The home Internet is working correctly

8) VarianHOME Indicators

Wi-Fi

- 1 No Wi-Fi adapter inserted
- 2 Wi-Fi initializing
- 3 Wi-Fi connected

Internet

- 4 No Ethernet cable installed
- 5 Ethernet initializing
- 6 Internet connected
- 7 Internet connection failure

Mobile App

- 8 No Internet connection
- 9 Connecting to the cloud server
- 10 Connected to the cloud server

Controller

- 11 Initial configuration required
- 12 Controller is initializing
- 13 Controller is operating normally
- 14 Time-of-Use delay period in effect

EV Chargers

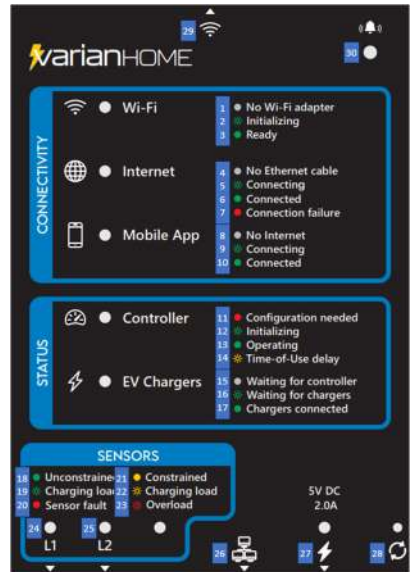
- 15 EV chargers waiting for the controller
- 16 Controller waiting for EV chargers
- 17 EV chargers detected

Sensors

- 18 Building load is low
- 19 EVs are charging without restrictions
- 20 Sensor is faulty - Contact tech support
- 21 Building load is high - Controller is restricting charging
- 22 EVs are charging with restrictions
- 23 Building load is very high - Controller is suspending charging
- 24 L1 sensor input jack - Green LED detected, Red LED undetected
- 25 L2 sensor input jack - Green LED detected, Red LED undetected

Other

- 26 Ethernet jack
- 27 5V power adaptor jack - Green LED power detected, Orange LED updating firmware
- 28 Reset button - Long-press to shutdown controller
- 29 USB Wi-Fi jack
- 30 SIGNAL button - Short-press to override the current or next Time-of-Use delay period



9) VarianHOME Configuration

After powering on VarianHOME, and waiting for the Internet LED to turn Green, follow these steps to configure settings:

- 1) Using a notebook, tablet or phone, open a browser and go to setup.variablegrid.com/VH

NOTE: Alternatively, scan the QR code printed on the back of VarianHOME.

- 2) Enter the Controller ID from the label on the back of VarianHOME (without "-") and press SUBMIT
- 3) Press the signal button at the top right corner of VarianHOME and press SUBMIT
- 4) Enter the settings in each section of the configuration form

NOTE: Determine the local subnet for the home network and choose an available IP address on the same network. Enter this in Static IP Address, eg. 192.168.1.251

NOTE: The Pulsar Plus serial number is the digits after SN on the case

- 5) Click to accept Terms and Conditions and press SUBMIT
- 6) Make note of the Access Code provided for linking to the Variablegrid mobile app

After VarianHOME has been on 6 to 8 minutes the Controller LED will turn Green to indicate the configuration has loaded successfully.

The screenshot shows the VarianHOME Configuration web interface. At the top, it says 'varianHOME Configuration' and 'Controller ID : JVZWISB44B'. Below this is the 'Location Settings' section with dropdown menus for Country, Region, and Time Zone. The 'Time-of-use Pricing' section has a dropdown for TOU Plan. The 'Network Settings' section has a text input for Static IP Address. The 'Electrical Settings' section includes a note about electrical settings and a note about breaker amperage, followed by input fields for Panel Amps (100), Sensor Amps (200), Breaker A Amps (40), and Breaker B Amps (0). The 'Breaker A Chargers' section has a note about serial numbers and input fields for Serial Number 1 and Serial Number 2. The 'Breaker B Chargers' section has input fields for Serial Number 3 and Serial Number 4. A blue 'Submit' button is at the bottom.

varianHOME
Configuration

Controller ID : JVZWISB44B

Location Settings

Country

Region

Time Zone

Time-of-use Pricing

Choose a TOU plan for your region to disable charging due to Time-of-use pricing. To override and enable charging, briefly press the signal button on the VarianHOME.

TOU Plan

Network Settings

Enter the static IP address to be used by the chargers. Leave blank unless required by some older home networks. This address must be manually configured in each charger.

Static IP Address

Electrical Settings

IMPORTANT: Electrical settings must be made by a qualified electrical contractor. Incorrect settings will result in improper operation and can result in injury and severe damage to the electrical system.

NOTE: Breaker Amps will be derated to 80%, i.e. 40 will allocate a maximum of 32 Amps.

Panel Amps

Sensor Amps

Breaker A Amps

Breaker B Amps

Breaker A Chargers

IMPORTANT: For Variablegrid RS40 Chargers enter ONLY the last 8 digits of the serial number.

Serial Number 1

Serial Number 2

Breaker B Chargers

Serial Number 3

Serial Number 4

Submit

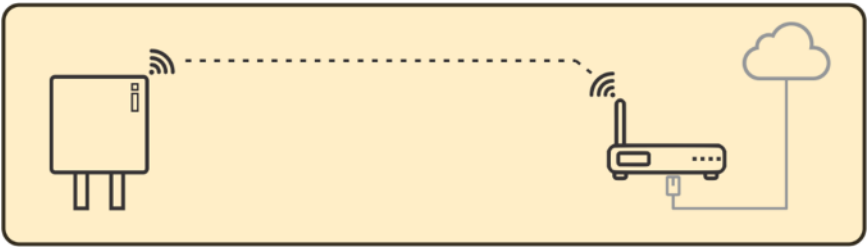
10) Pulsar Plus Network Connection

The EV Charger connects to the home network using Wi-Fi or Ethernet. EV Charger configuration is explained in the next section.

NOTE: The EV Charger does not connect to the Internet, but requires a Wi-Fi connection to the home network to receive power allocations from VarianHOME.

Method 1: Direct Wi-Fi connection

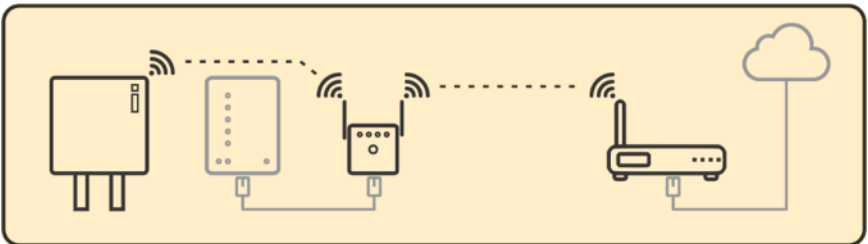
When the distance between the EV Charger and the home network router is short, the signal strength of the home network may be adequate for a direct Wi-Fi connection.



Method 2: Wi-Fi extender

The supplied Variablegrid or user-supplied Wi-Fi extender must be plugged in at a location within Wi-Fi range of the EV Charger and the home network router. It may also be shared by VarianHOME.

NOTE: The extender must be properly configured and functioning. If a user-supplied extender is also used for VarianHOME connectivity, it must have an Ethernet port.

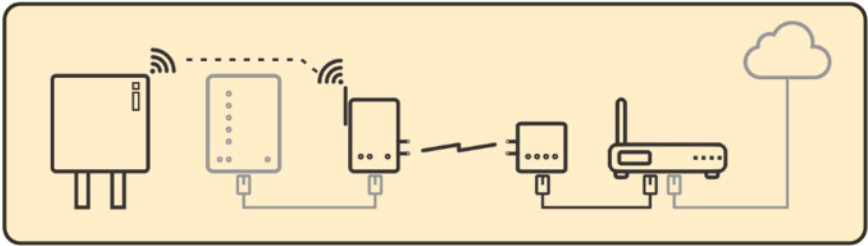


Method 3: User-supplied powerline extender

If the distance between the EV Charger and the home network router is too great for a Wi-Fi extender to function properly, a powerline extender may be used. This method transmits data through the existing home wiring and requires that both outlets used by the powerline extender be on the same subpanel.

Connect a user-supplied Ethernet cable between the powerline base unit and the home router. If the extender is also used for VarianHOME, connect another Ethernet cable between VarianHOME and the powerline remote unit.

NOTE: The extender must be properly configured and functioning. The extender must have Wi-Fi capability, such as TL-WPA7517KIT.



11) Pulsar Plus Configuration

The EV Charger connects to the home network using Wi-Fi.

Configuration requires a phone with Bluetooth and the Wallbox mobile app.

After powering on the EV charger, follow these steps:

- 1) On a tablet or phone, search for Wallbox in the app store, then install and launch the app
- 2) Register and create a personal account, or Login if you already have a Wallbox account
- 3) Tap "Add charger" and follow the app instructions to add the EV Charger to your account
- 4) Click "Connect" to connect the EV Charger, then "Set up Internet connection" to configure the network
- 5) Once successfully connected to the Wi-Fi, a network icon will appear next to the added charger

Select a charger



- 6) Tap on the added charger to complete the configuration
- 7) On the next screen, click the Gear icon at top right to open Settings, and click External Management
- 8) Turn on Enable OCPP if required

External management

< Settings

OCPP

Enable OCPP



- 9) Enter `ws://[chosen IP address]:8887/` into URL. For example, if the IP address chosen in Section 7 is 192.168.111.251 enter the URL as shown
- 10) Enter the serial number entered in Section 7 into Charge point identity
- 11) Accept the Terms and Conditions and click Save
- 12) Power the EV Charger off and on

URL
ws://192.168.111.251:8887/

12) Confirming Pulsar Plus Network Connection

On the Wallbox app:

- 1) On the Select a Charger screen, the Wi-Fi icon will be Green to confirm connection to the home Wi-Fi Network
- 2) After selecting the Charger, the OCPP icon will show Connected to confirm connection to VarianHOME

The LED on the EV Charger will remain Yellow when not charging.

13) Confirming Pulsar Plus Connection to VarianHOME

The EV Charger requires a continuous connection to VarianHOME controller to receive the power allocations needed to charge the EV.

VarianHOME is ready to accept a connection from the EV Charger 6 to 8 minutes after powering on. The Controller LED will turn Green.

NOTE: If the Controller LED remains Red then VarianHOME has not received the configuration. Power VarianHOME off and on and wait 6 to 8 minutes.

When VarianHOME accepts a connection from the EV Charger the EV Chargers LED on VarianHOME will turn Green. If it remains off, check:

- 1) The serial number entered during VarianHOME configuration matches the Serial number field on the EV Charger configuration screen, and correct if needed
- 2) The Internet LED on VarianHOME is Green, indicating it is connected to the home network

NOTE: The EV Chargers LED on VarianHOME will blink Green when VarianHOME is allocating power to the EV Charger.

If any checks fail power off the EV Charger and VarianHOME, power on VarianHOME and wait 6 to 8 minutes for the Controller LED to turn Green, then power on the EV Charger and wait 2 minutes.

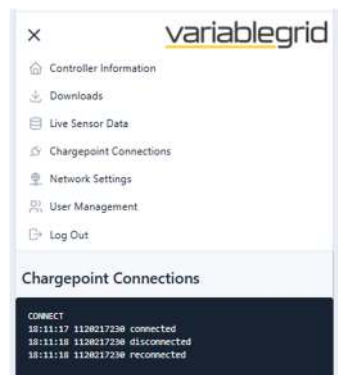
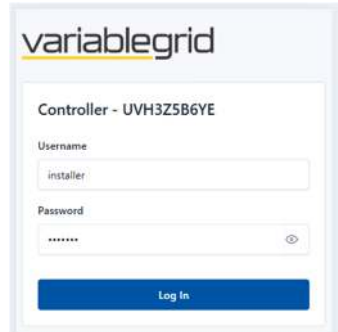
14) VarianHOME Advanced Troubleshooting

If the EV Chargers LED remains off, then advanced troubleshooting is available using the webform on VarianHOME.

- 1) Using a notebook, tablet or phone, open a browser and go to *varian.local*

NOTE: Some older networks require entry of the IP address assigned to VarianHOME by the home network router in place of varian.local

- 2) Enter installer and Varian1 into the Login form and press Log In
- 3) The Controller Information screen provides basic information about the controller
- 4) If using a phone, display additional menu items by pressing the 3-bars icon at the top left
- 5) On the Live Sensor Data screen, the SA group displays the sensor current readings, and the EVA group displays the amps allocated to EV Chargers. The third value in each group will be 0
- 6) The Chargepoint Connections screen displays the Serial Number of EV Chargers as they connect and disconnect from VarianHOME. If this screen is empty then no EV Chargers have yet connected to VarianHOME. Contact support@variablegrid.com for assistance



15) Additional Troubleshooting Tips

Sensor Issues

⚠ Loose Sensor Clamps

- Problem: Intermittent readings due to poorly secured sensor clamps
- Prevention: Ensure locking bars are fully reinserted after installation
- Solution: Check and reseal sensor clamps, verify secure fit

⚠ Loose Sensor Cables

- Problem: Intermittent readings due to poorly seated sensor cables
- Prevention: Ensure plugs are fully plugged into jacks
- Solution: Unplug and replug sensor cables into jacks

Network Configuration Issues

⚠ Weak Wi-Fi Signal

- Problem: Intermittent connection between VarianHome and charger
- Prevention: Test signal strength before finalizing installation locations
- Solution: Install Wi-Fi extender or use powerline extender

⚠ IP Address Conflicts

- Problem: Network connection issues due to static IP conflicts
- Prevention: Only use static IP when specifically required and verified with Variablegrid tech support
- Solution: Reconfigure EV charger with correct URL

⚠ Incorrect Wi-Fi Settings

- Problem: Failed Wi-Fi connection due to invalid SSID or password
- Prevention: Double-check settings before submission
- Solution: Reconfigure EV charger with correct credentials

Configuration Issues

⚠ Incorrect Panel Capacity Settings

- Problem: VarianHOME using wrong maximum amp settings
- Prevention: Verify panel ratings before configuration
- Solution: Update configuration with correct panel rating

⚠ EV Charger Not Connecting to VarianHOME

- Problem: Missing or incorrect charger serial numbers in configuration
- Prevention: Confirm serial numbers before completing setup
- Solution: Update configuration with correct serial numbers

⚠ Time Zone Misconfiguration

- Problem: Incorrect charging schedules due to wrong time zone
- Prevention: Verify time zone during initial setup
- Solution: Update configuration with correct time zone

Troubleshooting Response Protocol

If issues cannot be resolved by the installer:

- Document the specific problem
- Take photos if applicable
- Contact Variablegrid tech support immediately for assistance
- Whenever possible, the installer should remain at the installation site until the problem is resolved or has received clearance from Variablegrid tech support

16) Variablegrid Mobile App

VarianHOME allows users to monitor and control EV charging using the Variablegrid Mobile App for iOS and Android. Installation steps:

- 1) Using a tablet or phone, search the Apple App Store or the Google Play Store for Variablegrid
- 2) Install and open the Variablegrid app
- 3) Click Allow Notifications if asked
- 4) Click Sign up at the bottom of the screen
- 5) Enter the 8-digit Access Code provided during VarianHOME configuration into the invitation code and press Continue
- 6) Complete the Create Account form and press Sign-up
- 7) Enter the chosen email and password and press Login

VarianHOME Technical specifications

WEIGHT, DIMENSIONS, OPERATING TEMPERATURE

0.36 kg (0.8 lbs)

140 x 133 x 45 mm (5.5 x 5.25 x 1.75 in)

-40C to +50C (-40F to +122F)

POWER ADAPTER

120V 50/60Hz, Output 5V DC 2.0A

Cable length: 1.5 m (5 ft)

CURRENT SENSORS

Clamp-on 200A current transformers

Opening diameter: 19 mm (0.75 in)

Cable length: 2.4m (8 ft)

Contact Information



Address

Variablegrid Adaptive Power Inc.

969 W 1st St

North Vancouver, BC V7P 1A4



Phone

1-800-645-2314



Support Email

support@variablegrid.com



Website

www.variablegrid.com