VarianHOME EV Energy Management System

USER MANUAL

V2.1

Safety Notice

VarianHOME must be installed and configured by a qualified electrician, and in compliance with the applicable local and national electrical codes.

If the equipment is installed or used in a manner other than specified in this manual, it may void your warranty or impair the protection of the electrical panel.
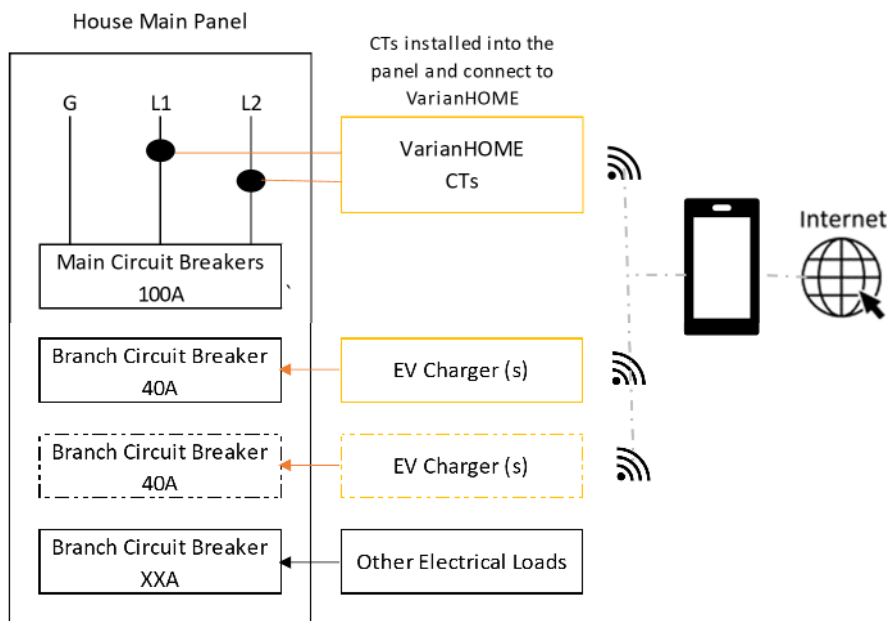
Product Overview

The VarianHOME EV Energy Management System continuously monitors the house panel's load. During peak periods, it automatically and safely reduces the power allocated to EV chargers, ensuring the house load never exceeds its permitted maximum.

Up to 4 EVs can be charged simultaneously, and faster charging can be accomplished by wiring multiple chargers to 2 circuit breakers.

VarianHOME and the EV charger(s) continuously communicate over Wi-Fi using a provided USB Wi-Fi adapter. If the connection between VarianHOME and the charger is disrupted, the charging session will be suspended until the connection is reestablished.
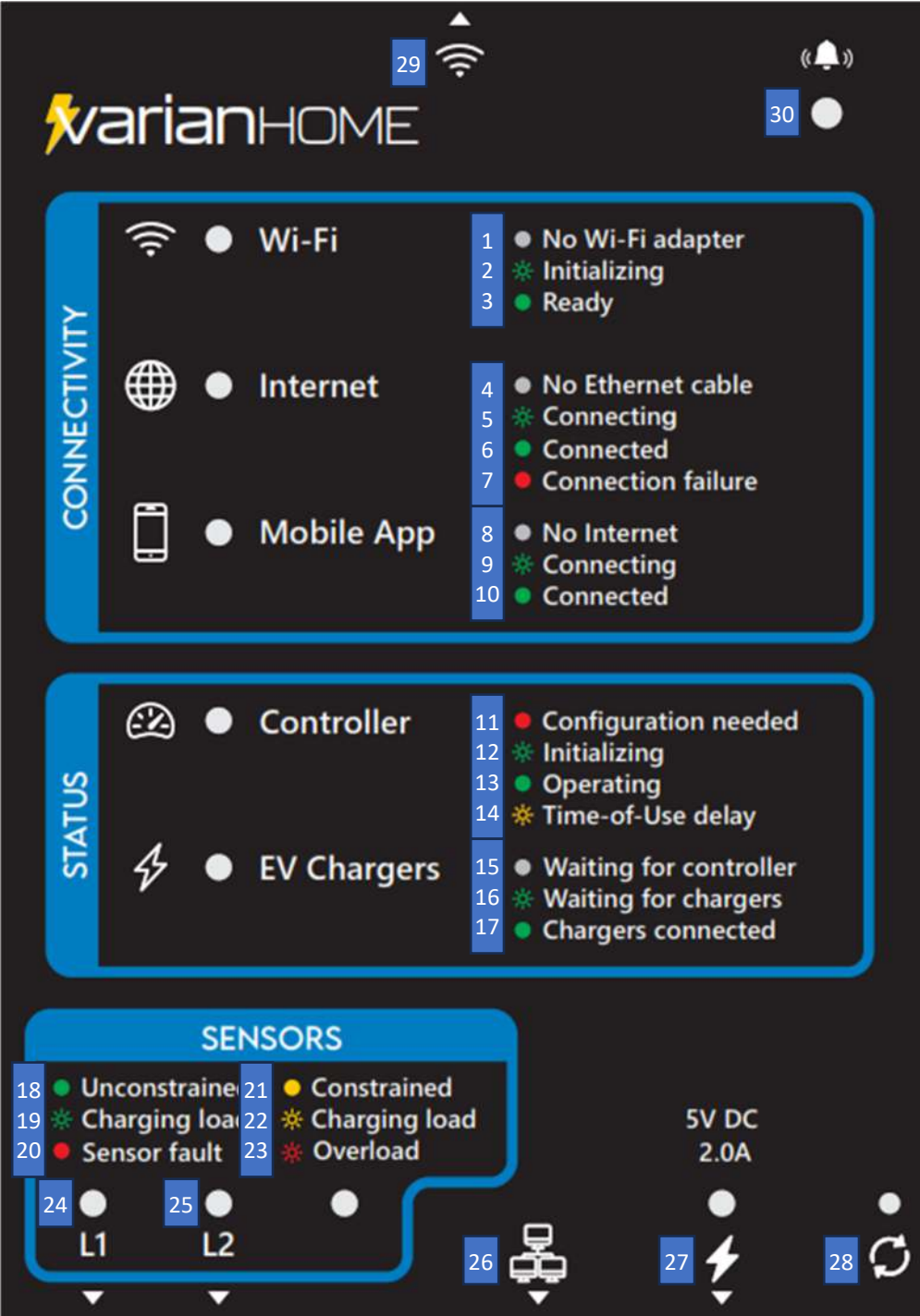
An optional Internet connection allows EV charging to be monitored and controlled remotely using the Varian Mobile App for iOS and Android.

Block Diagram

Indicators and Buttons

VarianHOME has 9 LEDs which provide status information to the user. For more information refer to the legend on the next page.

Legend

Wi-Fi

1	No Wi-Fi adapter inserted in the USB port
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 using webform required
12	Controller is initializing
13	Controller is operating normally
14	Time-of-Use delay period in effect - Override with SIGNAL button (30)

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 - Controller is not restricting charging
19	EVs are charging without restrictions
20	Sensor is faulty - Contact your installer
21	Building load is high - Controller is restricting charging
22	EVs are charging with restrictions
23	Building load has reached the limit - Controller is suspending charging
24	L1 sensor input jack - Green LED detected, flashing Red LED undetected
25	L2 sensor input jack - Green LED detected, flashing Red LED undetected

Other

26	Ethernet jack
27	5V power adaptor jack - Red LED indicates power detected
28	Reset button
29	USB Wi-Fi jack
30	SIGNAL button - Long-press used to launch the web interface - Short-press to override the current or next Time-of-Use delay period

Installation

(1) Connect VarianHOME to home Internet router and apply power (Optional)

VarianHOME does not require an Internet connection to operate, but this step will allow it to automatically update its firmware and provide access to the latest available features. This temporary connection to the Internet can be repeated as desired to obtain the latest firmware.

(2) Turn off main panel power

Open your electrical panel and turn off your main breaker. This helps protect you during installation.

(3) Remove panel cover

Remove the screws securing the panel cover to access the circuit breakers.

WARNING: The service mains are always live!

(4) Connect the current sensors

Carefully remove the bars on the top edge of the sensors, clamp the sensors around the service mains so that both labels are facing the same direction, and reinsert the bars. The direction of the labels on the sensors should be facing towards the power source.

(5) Route sensor cables

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

(6) Close the panel

Before closing the electric panel, take photos of the installation, in case you need to contact our support desk.

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

(7) 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 to a 120VAC power outlet which the provided AC adapter can reach.

(8) Insert the USB Wi-Fi dongle

Plug the USB Wi-Fi Dongle into the USB slot on the top of VarianHOME. Check the alignment with the USB slot and be sure to position it correctly.

(9) Apply power to VarianHOME

Plug the AC adapter into the power jack on VarianHOME and into the power outlet.

(10)   Plug in the sensors

Fully insert the two sensor plugs into the L1 and L2 jacks on VarianHOME. The LEDs should change from flashing Red to solid Green.

(11)   Plug in the network cable (Optional)

Plug a network cable between the Ethernet socket on the bottom of VarianHOME and your home router. This will allow the use of the Driver Mobile App for iOS and Android.

Confirming Charger Connection

The Controller LED will blink for 5 to 7 minutes as the firmware loads and then turns Green. The EV Chargers LED will then blink and turn Green when the charger(s) connects.

Troubleshooting Charger Connection

If the EV Chargers LED does not turn green within 10 minutes the Wi-Fi connection between VarianHOME and the EV charger(s) may be too weak.

Using a mobile phone at the EV charger, search for the SSID varianhome and confirm there is a viable signal. If there is not, a Wi-Fi extender may be required to extend the signal from VarianHOME to the charger(s). Variablegrid's support desk can assist with the selection of an inexpensive Wi-Fi extender.
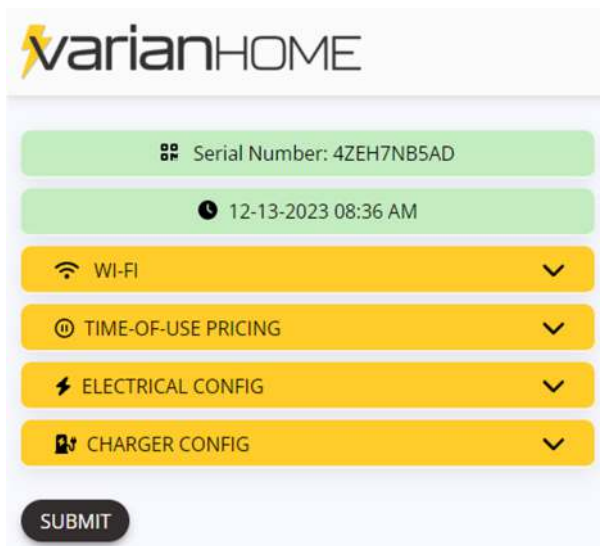
NOTE: To avoid reconfiguring the charger, a Wi-Fi extender must be configured to use the same SSID and password as VarianHOME.

Configuration

VarianHOME is configured through a web interface. To access the web interface:

(1) Within 5 minutes of powering on, using a mobile phone or tablet, search and connect to SSID "varianhome" with network key "variansecure".

(2) Open a web browser and enter 10.11.11.1 into the address bar.

(3) If the web interface does not load, press the SIGNAL button on the top right corner of VarianHOME for 1 second (until the beep stops), wait 10 seconds and try again. The web interface will remain available for 10 minutes.

The configuration screen will display:

Wi-Fi Settings

To make changes to the Wi-Fi SSID/password, open the WI-FI bar.

NOTE: The VarianR40 charger is preconfigured to access SSID varianhome with the password variansecure. If these settings are changed the charger will require manual configuration.

Electrical Configuration

To make changes to the electrical configuration, open the ELECTRICAL CONFIG bar.

The default settings are correct for most installations. Do NOT change Sensor Amps. VarianHOME ships only with 200A sensors.

If 2 breakers are being installed for EV chargers, enter the second breaker rating under Breaker B Amps.

Charger Configuration

To make changes to the charger configuration, open the CHARGER CONFIG bar. VarianHOME will not operate until at least one EV charger is configured.

Enter the OCPP Name for the first charger under EV Charger 1. For VarianR40 chargers this is the 10-digit serial number on the side label. Enter the maximum amps the first charger may draw under Max Amps. For VarianR40 chargers this can be 40 if a 50A breaker is installed.

If there are multiple chargers, touch the sliders to activate fields for up to 4 chargers.

Saving Settings

After entering changes press SUBMIT to save settings.

Technical specifications

WEIGHT AND DIMENSIONS
0.36 kg (0.8 lbs.)
139.7 x 133.35 X 44.45 mm (5.5 x 5.25 x 1.75 in)

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

POWER ADAPTER
120V 50/60Hz, output 5V DC 2.0A
Cable length: 1.5 m (5')

COMMUNICATIONS
USB Wi-Fi Adapter (50' range)

CURRENT SENSORS
Clamp-on current transformer
Maximum current: 200A
Opening diameter: 19 mm (0.75")
Dimensions: 70 mm x 44 mm (2.75" x 1.73")
Cable length: 2.4 m (8')

Limited Warranty

For a period of three (3) years from the date of purchase, Variablegrid warrants that the Equipment shall be free from defects in material and workmanship under normal use and service.

Determining if Warranty Applies

If, during the applicable warranty period, the user returns defective Equipment to Variablegrid, accompanied by Variablegrid's return material authorization (RMA) form, and examination of such Equipment is determined by Variablegrid, at its sole discretion, that such products are defective and such defects are not caused by abuse, misuse, neglect, alteration, improper installation, repair, improper testing, accident, natural disaster, or use contrary to any instructions issued by Variablegrid, Variablegrid shall, at its sole option, either repair, replace, or refund to the user the lesser of the standard retail purchase price of such Equipment or the purchase price paid as shown on proof of purchase. No Equipment may be returned to Variablegrid without Variablegrid's RMA form.

Obtaining Limited Warranty Service

For warranty service, contact Variablegrid for shipping instructions and a return authorization form at support@variablegrid.com. Please ship the Equipment to Variablegrid with proof of purchase, which is required to obtain repairs, replacement, or refunds under this statement of limited warranty. The user must pay for shipment of the Equipment to Variablegrid. Variablegrid will pay for the shipment of any repaired or replacement Equipment.

Warranty on Returned Product

90 days or remainder of original warranty based on proof of purchase date.

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