

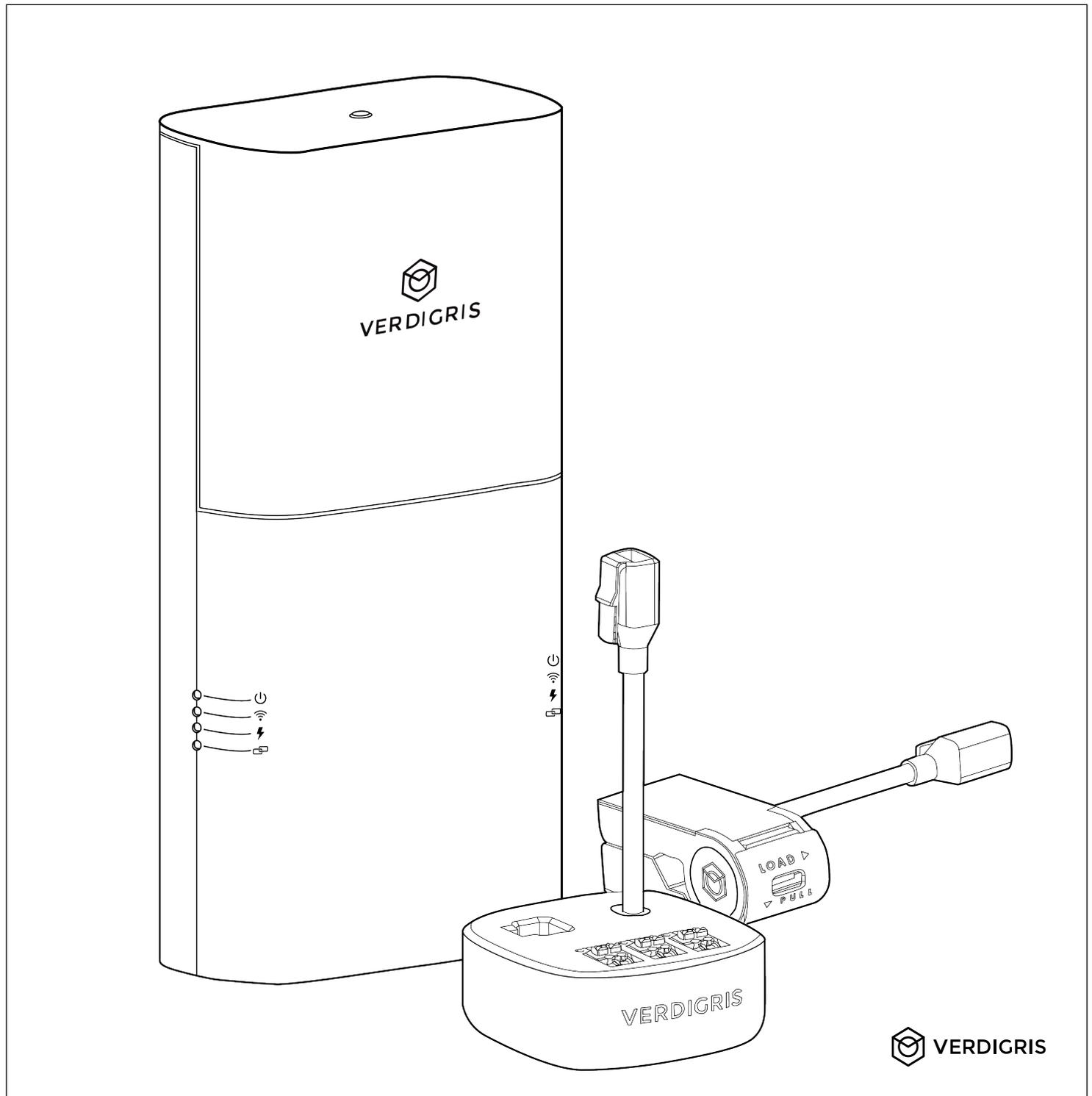
# How to Install Verdigris EV2



Welcome! This manual will guide you on how to install your new system. If you need direct assistance, call our support line at **1-844-837-3447** or email **support@verdigris.co**.

Check out our install videos:  
[installEV2.verdigris.co](https://installEV2.verdigris.co)

**WARNING:** Installation of Verdigris EV2 should only be performed by a licensed electrician. You should consult your local inspector for compliance with electric codes. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



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## Verdigris for Commercial and Industrial Buildings

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The intended use of Verdigris hardware systems is to monitor any motor control centers, distribution panels, or electrical panels in any building.

### Breaker Panel Types Served

EV2 advanced energy meters work with a range of electricity mains, sub-panels, MCCs, and breaker boxes. The Energy Data Gateway mounts external to the monitored breaker panel, or on a nearby wall or junction box.

- Panel and voltage types (up to 42 breakers/panel):
  - Single-phase 100-277 V
  - Split-phase 100-277 V
  - Three-phase 120/208 V
  - Three-phase 240/416 V wye
  - Three-phase 277/480 V wye
  - Three-phase 120/240 V delta
  - Three-phase 480 V delta
  - Three-phase 600 V wye
  - Three-phase 600 V delta\*

*\*600 V Delta metering requires an optional external power adapter.*
- Frequency: 50-60 Hz
- Current measurement range (Amperage): 0.25 A-15,000 A

### Data Available to You

Your high resolution data is transmitted securely via 4G LTE, WiFi or Ethernet, stored on the cloud, and is available 24/7 from any desktop web browser. You can also download a csv of your data, integrate via BACnet IP or Modbus TCP, or connect to our API at anytime.

*\*Data On-Premise also available for Enterprise purchase plans. Talk to a solutions architect.*

- Precision: 10 mW
- Sampling frequency: up to 7.68 kHz
- Data access via API: unlimited
- Historical data store and availability on the web:
  - 1-minute: forever
  - 15-minute: forever
  - 1-hourly: forever
  - Daily: forever

### Major Steps for Installation and Commissioning

Getting a Verdigris EV2 up and running consists of two parts: installation and commissioning. Both parts must be completed successfully for data to be monitored and accessible.

#### A. Installation

1. Prepare Installation
2. Mount Energy Data Gateway
3. Install Voltage Tap
4. Install and Connect CTs
5. System Checks & Clean Up

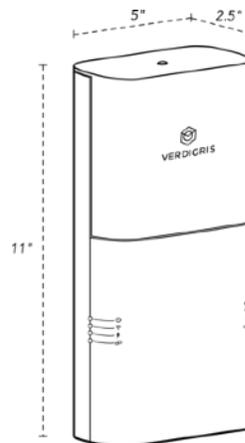
#### B. Setup, Connect and Commission Energy Data Gateway

Follow this instruction manual for both parts A and B.

## Technical Specifications

### Energy Data Gateway

- Physical Size and Weight: 11 x 5 x 2.5 inch [280 x 127 x 64 mm], 2 kg
- Voltage Range: 100-480 VAC CAT III (CAT III-rated instruments are primarily used on fixed installations, distribution boards, and circuit breakers and can withstand the specified voltage range.)
- Frequency Range: 50-60 Hz
- Current Rating: 300 mA
- BACnet / Modbus supported
- Cable Max Voltage: 600 V
- Temperature Range: -40 °F-158 °F [-40 °C-70 °C]
- ADC Accuracy: 16-bit
- Power Supply: 100-480 Vac 50/60 Hz, 20 W
- Degree of Protection: IP30



### Data Transmission

- Ethernet: 100/1000 Mbps (RJ-45)
- 4G/LTE Cat 4 and LTE Cat M1/NB-IoT
- Bands 3,4,8 and 13 (US and China, for more Band support inquire with your account representative.)
- WiFi: 802.11 b/g/n
- Local Networks: BACnet/IP, Modbus/TCP
- NBioT

### Current Transformers (CTs)

We offers two types of CTs: (1) Verdigris Smart CTs for sensor individual circuit breakers (< 60 A) in tight spaces and (2) High Current CTs (Hinged or Coils) for larger amperage circuits. High Current CTs connect to the data chain using the Verdigris High Current CT Interface Module adapter.

	Verdigris Smart CT	Hinged CT	Coil CT	Verdigris High Current CT Interface Module
<b>Max Circuit Ampacities</b>	60 A per circuit	250A	Up to 15,000A per circuit (custom sizes available)	
<b>Minimum Load (Amperage or %)</b>	0.25 A	0.5% of CT load	5 A	
<b>Sensor Accuracy</b>	±2%	0.5%	0.5%	
<b>Physical Dimensions</b>	2.2 x 1 x 1 in [56 x 25 x 25 mm]	2 x 2.76 x 1.52 in [50 x 70 x 39 mm]	Diameter is 0.61 in [15.5 mm]	2.4 x 2.4 x 1 in [60 x 60 x 25 mm]
<b>CT Accuracy Range (% of rated current)</b>	1%-100%	10%-120%	0%-100%	
<b>Temperature Range</b>	-40 °F-158 °F [-40 °C-70 °C]	5 °F-140 °F [-15 °C-60 °C]	-4 °F-158 °F [-20 °C-70 °C]	
<b>Max Conductor Size</b>	4 AWG [21.1mm <sup>2</sup> ]	1 in window for up to 900 kcmil or MCM [456 mm <sup>2</sup> ]	4 in or 7 in window	2.4 x 2.4 x 1 in [60 x 60 x 25 mm]
<b>Max Wire Size</b>	Including insulator 2.3 in [58.6mm]	Varies by amperage	23.62 in [600mm]	

### Symbols on Equipment



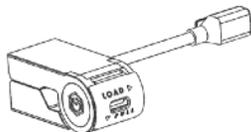
De-energize Verdigris system before accessing field wiring compartment.

**Component List (Provided by Verdigris)**

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Energy Data Gateway  
(1x per system)



Verdigris Smart CT  
(Up to 42x per system)



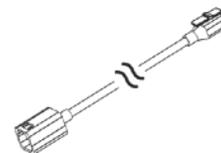
Verdigris High Current CT Interface Module  
*\*Only for wire sizes greater than 6 AWG  
and/or ampacities greater than 60A  
(Up to 14x per system)*



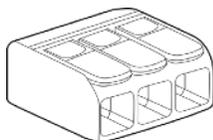
1" Chase Nipple  
(Up to 1x per system)



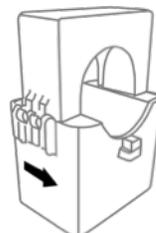
1" Locknut  
(1x per system)



200mm, 1m, 3m CT  
Chain Extension Cables  
(4x per system)



Splicing Connector  
*\*Only for three-phase, 3 wire, 480 V delta  
electrical configuration  
(1x per system)*



or/and



Large CT (Hinged CT or/and Coil CT)  
*\*Only for wire sizes greater than 4 AWG  
and/or ampacities greater than 60A  
(Up to 42x per system)*

## Tools Required

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For all installations, you will need the following tools in addition to Verdigris components:

### Tools

- Wire stripper
- Screwdrivers, including PH-2, SL-2, S-2 (needs may vary based on size of panel screws)
- Impact drill (to open the panel)
- Power drill with hole cutter ( $\frac{3}{4}$ " or 1") or knockout punch set ( $\frac{3}{4}$ " or 1")
- Hammer (used with screwdriver to punch prefabricated knockouts)
- Drywall saw (for recessed panels only)
- Colored electrical tape & marker (for labeling voltage tap breakers, specific to panel phase color coding)
- 5 V AC plug adapter with a 5.5 mm barrel jack (to power system on independent of voltage taps)

### Parts

- Colored cables
- Cable ties (up to 25 per panel)
- Wire nuts (size dependent on size of panel breaker wires to be tapped)
- 2- $\frac{3}{4}$ " flex conduit connectors (for recessed panels only)
- $\frac{3}{4}$ " flex electrical conduit (for recessed panels only)

### Recommended Voltage Tap Cables for Specific Panel Voltage Configurations

OPTION 1: Single-phase 120/240V panels, YOU WILL ALSO NEED:

- 12 gauge wire in black and white.

OPTION 2: Split-phase 120/240V panels, YOU WILL ALSO NEED:

- 12 gauge wire in black and red, and white wire for neutral.

OPTION 3: Three-phase 120/208V panels, YOU WILL ALSO NEED:

- 12 gauge wire in black, red, and blue, and white wire for neutral.

OPTION 4: Three-phase 277/480V wye panels, YOU WILL ALSO NEED:

- 12 gauge wire in brown, orange, and yellow OR black wire with colored tape (brown, orange, and yellow) to label the wire phases appropriately. You also need white wire for neutral.

OPTION 5: Three-phase, 3 wire 480 V delta panels:

- 12 gauge wire in brown, orange, and yellow OR black wire with colored tape (brown, orange, and yellow) to label the wire phases appropriately. Neutral will be served with brown (phase A).
- Splicing connector included in component list.

IMPORTANT
Cables selected should be UL rated to 600V.

## Prepare Installation

### Determine Panel Type

<b>Single-Phase Panel</b>	Phases B typically marked by black or red colored wire and Neutral typically white colored wire.		
<b>Split-Phase Panel</b>	Phases A and B, typically marked by 2 different colored wires going to the breakers.		
<b>Three-Phase</b>	Phases A, B, and C, typically marked by 3 different colored wires going into the breakers.	Wye	Panels with 4 wires.
		Delta*	Panels with 3 wires (no neutral wire).

### Select Mounting Location for the Unit

Energy Data Gateway parts are defined in **Fig 1**. Select a mounting location (side, top, or bottom of panel) for the unit. Make sure mounting location leaves 3" clearance above top cap for sliding Cover Plate and Top Screw. And leave 2" clearance on bottom for Ethernet port and Power Plug. **Fig 2**

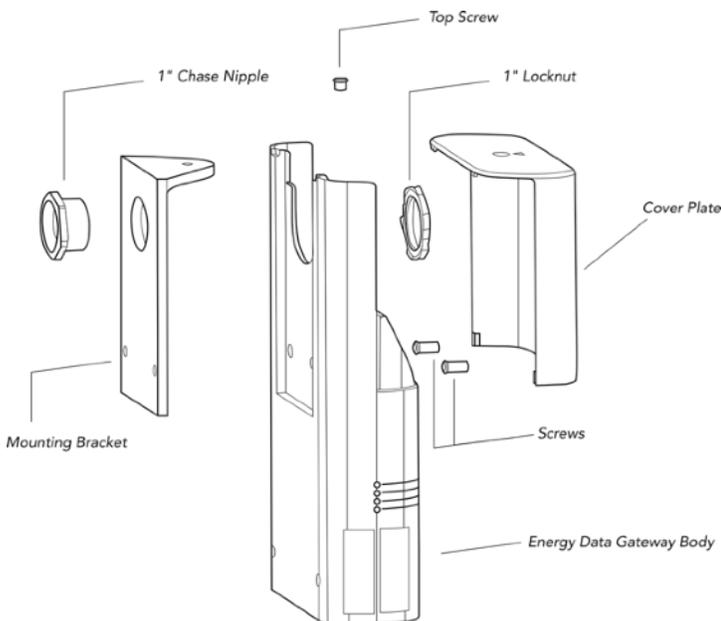


Fig 1

### Side of panel (for surface-mount panels)

1. Look for an existing 1" knockout in the panel or create a new 1" knockout, using the knockout punch or a power drill with a hole cutter.
2. Detach front cap from Energy Data Gateway body by removing top screw.
3. Mounting bracket is supposed to be attached on Energy Data Gateway body, place Energy Data Gateway body over panel knockout and insert 1" chase nipple into the knockout hole. This will protect cables from sharp edges. Fasten locknut onto nipple, securing Energy Data Gateway body onto the panel.

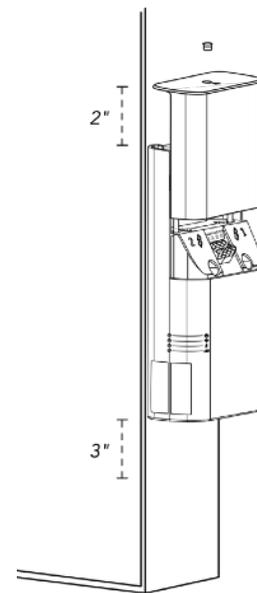


Fig 2

### CONTACT US

If you are not sure where to install, call our support line at **1-844-837-3447** or email **support@verdigris.co**.

## Select Breakers For Voltage Tap

Install one voltage tap on each phase of the panel. The voltage tap can be performed without shutting off any breakers if there is at least 1 spare breaker per phase. If no spare breakers are present, but there are empty slots in the panel, spare breakers can be inserted and used for the voltage tap as well.

*NOTE: If you do not have one spare breaker on each voltage phase, you will need to briefly shut down the voltage tap breakers to complete this step. Please confirm with building operators that this will not interfere with operations or safety protocols.*

1. Open panel and locate 1 spare breaker on each phase. Choose breakers as close to each other as possible to keep the wires organized.

*NOTE: If the panel does not have any spare breakers, shut off 1 breaker on each phase.*

2. Label selected breakers 'Switch for VS sub-metering'.

*NOTE: Energy Data Gateway voltage taps have a built-in in-line fuse; does not require additional fuse protection.*

<b>IMPORTANT</b>
For all installations: You should not insert the voltage tap cable leads in tandem with an existing branch circuit wire ("double lugging"), unless the breaker is identified for the termination of two conductors per NEC 110-14(a).

## Install Voltage Tap

### For Single-phase Panel

#### Voltage tap using **spare breakers**:

1. Ensure the breakers are turned off. Connect 1 voltage tap cable to breaker.
2. Wire the neutral. Attach the white voltage tap cable to the neutral bar.
3. Route wires through knockout and into the mounting bracket. *Fig 3.*

#### Voltage tap using **wall receptacle**:

1. If there are no spare breakers, you can power the system from a wall receptacle. Strip the cable, to identify neutral and power, you do not need ground. Please confirm with building operators and follow local jurisdiction.
2. Wire the neutral. Attach the white voltage tap cable to the neutral bar.
3. Route wires through knockout and into the mounting bracket. *Fig 3.*

### For Split-Phase Panel

#### Voltage tap using **spare breakers** (*Fig 6*):

1. Ensure the breakers are turned off. Connect 2 voltage tap cables to breakers.



*Fig 6*

2. Wire the neutral. Attach the white voltage tap cable to the neutral bar.
3. Route wires through knockout and into mounting bracket. *Fig 4.*

#### Voltage tap using **wired breakers**:

1. If you do not have one spare breaker on each voltage phase, you will need to briefly shut down the voltage tap breakers to complete this step. Please confirm with building operators that this will not interfere with operations or safety protocols. Please follow local jurisdiction requirements for tap installs.
2. Wire the neutral. Attach the white voltage tap cable to the neutral bar.
3. Route wires through knockout and into mounting bracket. *Fig 4.*

### For Three-Phase Panel

#### Voltage tap using **spare breaker**:

1. Ensure the breakers are turned off. Connect 3 voltage tap cables to breakers. *Fig 7.*

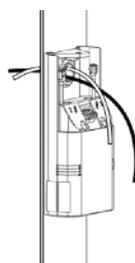


*Fig 7*

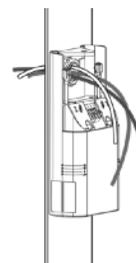
2. Wire The Neutral (for wye configuration).
3. Route Wires. Route wires through knockout and into the mounting bracket. *Fig 5.*
4. Splice Phase A (for delta configuration). Use splicing connector on Phase A.

#### Voltage tap using **wired breakers**:

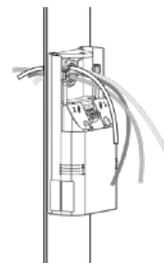
1. If you do not have one spare breaker on each voltage phase, you will need to briefly shut down the voltage tap breakers to complete this step. Please confirm with building operators that this will not interfere with operations or safety protocols. Please follow local jurisdiction requirements for tap installs.
2. Wire The Neutral. Attach the white voltage tap cable to the neutral bar.
3. Route Wires. Route wires through knockout and into the mounting bracket. *Fig 5.*



*Fig 3*



*Fig 4*



*Fig 5*

### Wire The Neutral

If the panel has a neutral bar (is a **wye configuration panel**), attach the white voltage tap cable to the neutral bar.

#### IMPORTANT

Warranty will be breached and considered void in connection to loss or damaged equipment due to improper wiring.

See Connect Voltage Cables to Energy Gateway for connecting Voltage Tap on next page.

## Connect Voltage Cables to Energy Data Gateway

- Single Phase Panel. *Fig 8.*
  - Connect Neutral to 'N' terminal.
  - Connect remaining 1 wire into 'B' terminal.
- Split Phase Panel. *Fig 9.*
  - Connect Neutral to 'N' terminal.
  - Connect remaining 2 wires into 'A', 'B' terminals. Be sure to match each wire to the correct phase.
- Three-Phase Wye Panel. *Fig 10.*
  - Connect Neutral to 'N' terminal.
  - Connect remaining 3 wires into 'A', 'B', 'C' terminals. Be sure to match each wire to the correct phase.
- Three-Phase Delta Panel. *Fig 11.*
  - Use splicing connector on Phase A. There will be 2, Phase A wires.
  - Connect one Phase A wire to the "N" terminal.
  - Connect second Phase A wire to the "A" terminal.
  - Connect remaining 2 wires to 'B' and 'C' terminals. Be sure to match each wire to the correct phase.

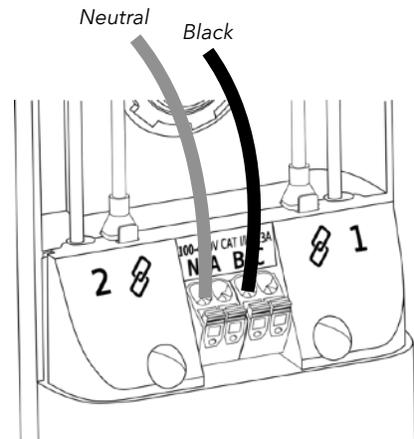


Fig 8

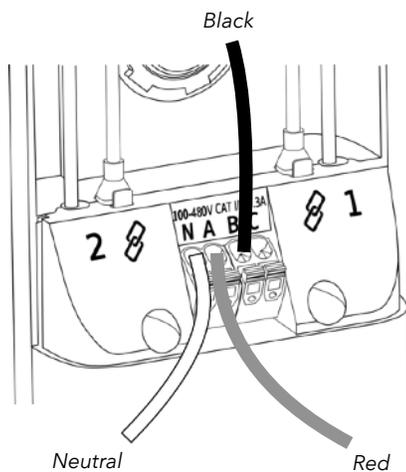


Fig 9

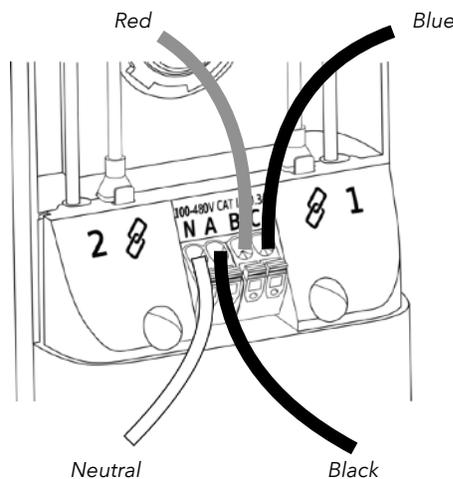


Fig 10

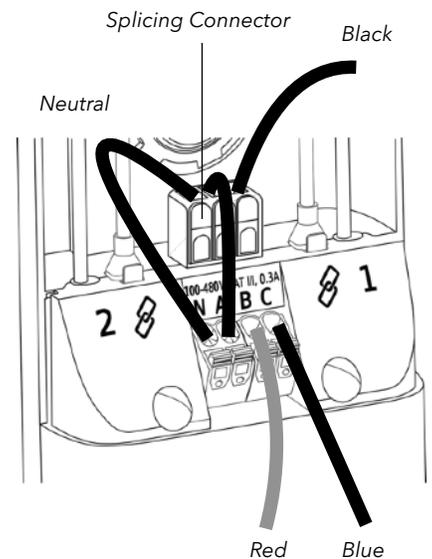


Fig 11

### IMPORTANT

DO NOT connect phase B to the 'N' terminal as this will result in short circuiting the energy data gateway

# Install and Connect CTs

## Select Appropriate CTs

*NOTE: Select the appropriate CTs for breaker ampacity. Larger amperage circuits may require the use of Large CTs in combination with high current CT interface modules.*

Verdigris offers the following CT sizes (up to 21 per chain; 42 total per system):

- Verdigris Smart CT
  - 60A
- Large CTs
  - 200 A Hinged CT
  - 4" 500 A Coil CT
  - 7" 500 A Coil CT
  - Larger sizes available by custom order

## Verify CT Install Location

Make sure there is a vertical and horizontal clearance of 1" around each cable at the point of desired CT installation as shown in **Fig 12**. If clearance between adjacent cables is 0.5"-1.0", stagger CT installation as shown in **Fig 13**. If a 0.5" clearance does not exist, this product may not be suitable for your installation. Please contact your local building inspector for final determination.

## Install CTs

1. Open the CT loop by pulling plastic tab up and out towards 'PULL' arrow direction. **Fig 14**.
2. Starting from the top of the panel, position CT window around circuit breaker wire making sure CT cable is facing away from the breaker.
3. Close CT loop by snapping CT ends together. It may be easier to close CT by pulling plastic tab with one hand while applying pressure on CT top & bottom surfaces with the other hand. **Fig 15**.

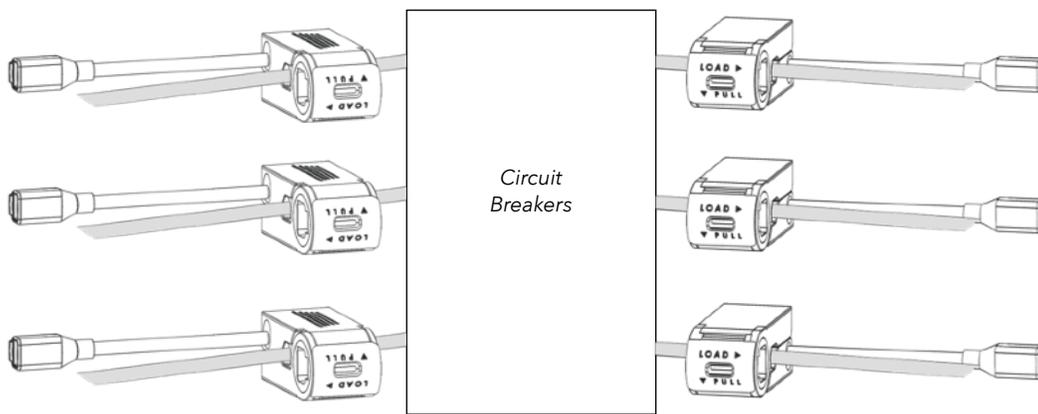


Fig 15

4. Repeat steps 1-3 with more CTs until all desired circuit wires have a CT attached. Spare breakers with no wires installed can be skipped.

*NOTE: A maximum of 21 CTs may be installed in continuity. This means up to 21 CTs (or up to 7 high current CT interface modules) may be mounted on either side of a panel, which covers a standard 42 circuit panel.*

<b>CONTACT US</b>
If you are not sure which CTs are right for your breaker, call our support line at <b>1-844-837-3447</b> or email <b>support@verdigris.co</b> .

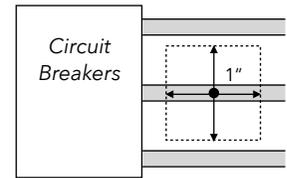


Fig 12

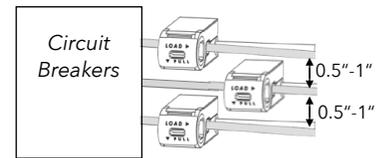


Fig 13

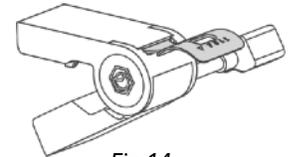


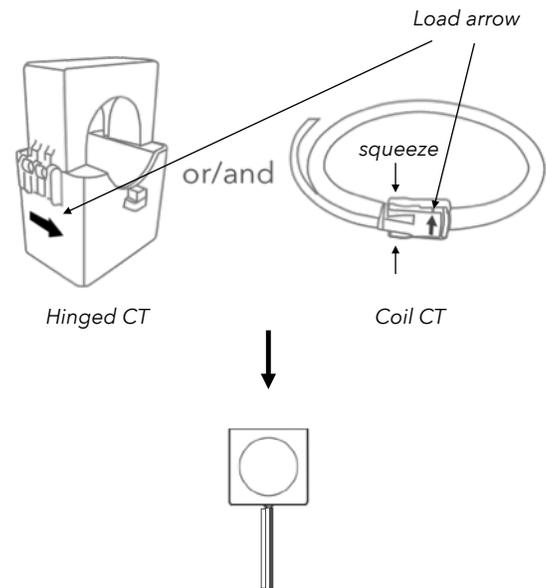
Fig 14

<b>IMPORTANT</b>
The 'LOAD' arrow should point in the direction of current flow (i.e. left breaker CT 'LOAD' arrow should point to the left, and vice versa for the right breaker CTs).  Make sure individual CTs are attached to desired circuit wires before daisy chaining CTs together (see Connect Multiple CTs section on p.11).  CTs must be securely closed for accurate data collection.

## Large CTs & Verdigris High Current CT Interface Module

Large CTs can be installed around a conductor. There are two types of CTs: hinged CTs and coil CTs. **Fig 16.**

1. Open the large CT:
  - Hinged CTs: Unlatch the CT at the opposite end of the hinge by lightly pulling up and lifting the latch.
  - Coils: Squeeze the ends to release the latch and open the coil.
2. Wrap the opening of the CT around the large circuit wire.
3. Securely close the CT.



*In this installation manual, we will use this symbol to represent large CTs.*

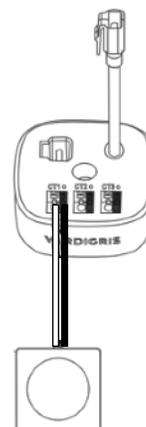
**Fig 16**

### IMPORTANT

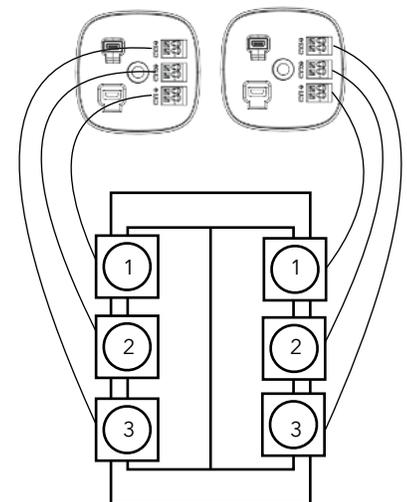
Large CTs must be oriented properly, otherwise inaccurate data may result. Large CTs should be mounted such that the load arrow points in the direction of the load on the circuit. In most cases, the arrow points away from the breaker.

For hinged CTs, if it is difficult to see the load arrow, the CT label should be mounted with the label towards the source.

- Hinged CTs: Click the latch closed. Double check for the correct CT orientation via the load arrow or CT label.
  - Coils: Squeeze the ends to release the latch and insert end of the coil. Double check for correct CT orientation via the load arrow.
4. Insert the 2 wire leads from the large CT into the Verdigris high current CT interface module terminal block. Match the colors of the wire leads with the black and white ports in the high current CT interface module (black on the right, white wire on the left). **Fig 17.**
  5. Orient the high current CT interface module terminal blocks on each side of the panel as shown in **Fig 18.**
  6. Attach large CTs to the high current CT interface module in order of 1, 2, 3 as shown in **Fig 18.**
  7. Using the magnet on the bottom of the high current CT interface module, mount it to any grounded metal surface in the panel, such as the side or back walls.



**Fig 17**



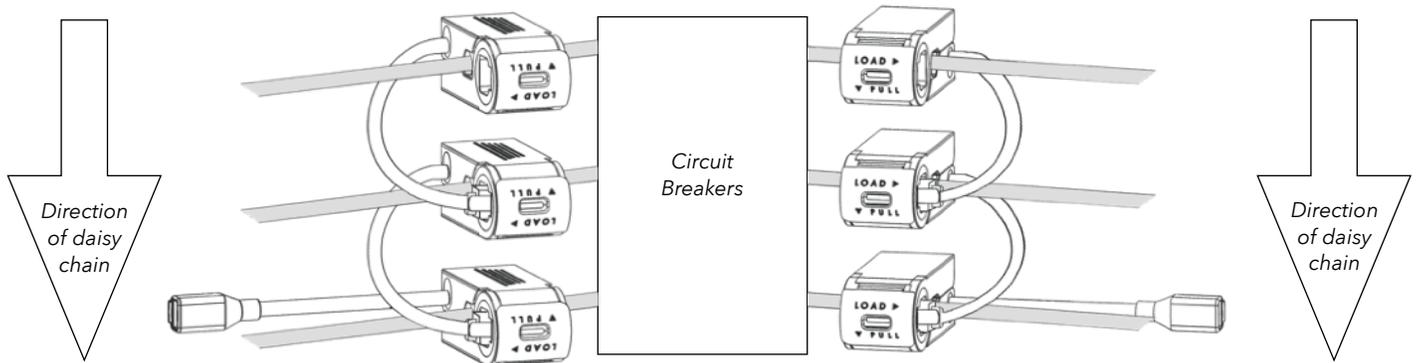
**Fig 18**

*NOTE: CT chains and large CTs/high current CT interface modules can be used interchangeably in terms of order. For example, on the left side of a panel, the installation could begin with 15 CTs, followed by 3 large CTs with a high current CT interface module, followed by another 3 CTs.*

## Connect Multiple CTs

Daisy chain CTs together. *Fig 19.*

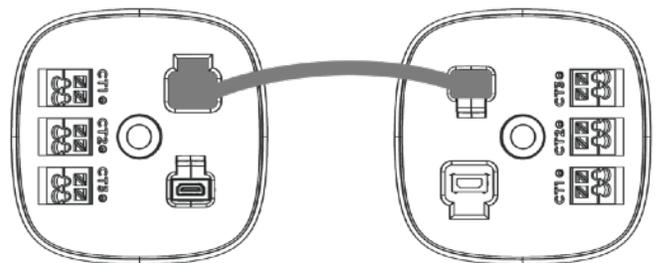
1. Starting at the top left breaker, insert CT cable latch into the female cable connector on the CT directly below.
2. Repeat until all CTs have been connected on the selected breakers. There should be an unattached female cable connector on top CT and an unattached CT cable on the bottom CT.
3. Repeat steps 1 & 2 for the right breakers, starting at the top CT.



*Fig 19*

## Connect Multiple Verdigris High current CT interface modules

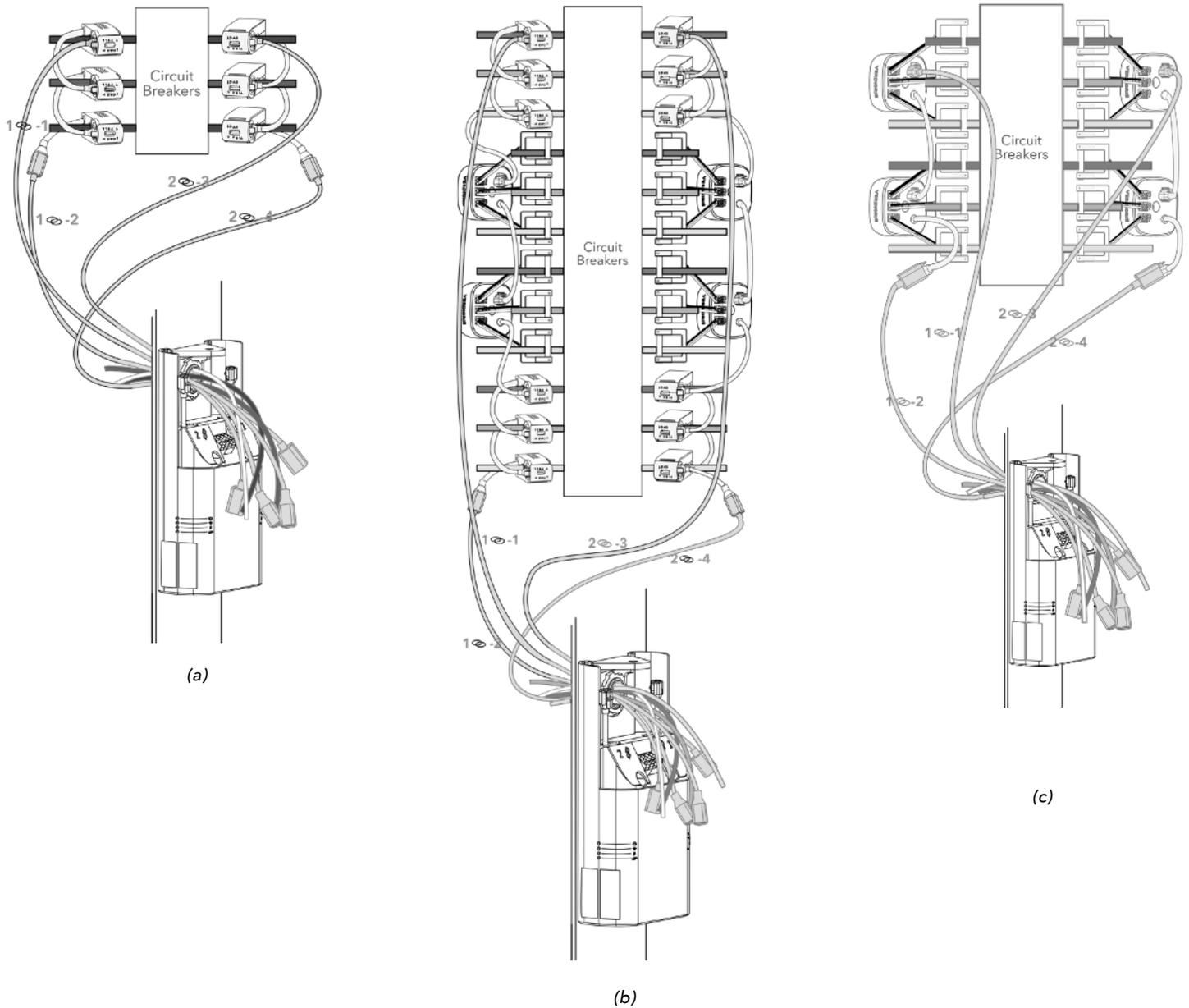
If your panel installation requires multiple high current CT interface modules: Connect the cable pigtail from the high current CT interface modules to the input port of the next high current CT interface module. A CT extension cable may be used if the high current CT interface modules are positioned such that the pigtails do not reach. *Fig 20.*



*Fig 20*

## Connect CTs

Connect CT chain using extension cables and route wires through knockout into mounting bracket. *Fig 21.*



*Fig 21*

### IMPORTANT

The maximum cable length for an entire chain loop is 8m or approximately 26ft.

## Connect CTs to the Energy Data Gateway

### FOR INSTALLATIONS USING ONLY CT CHAINS:

Using the CT extension cables to connect left & right CT chains to the corresponding 1 Ⓜ & 2 Ⓜ female and male connectors on the Energy Data Gateway, as shown below.  
 Fig 22.

IMPORTANT
1 Ⓜ Male connector must connect to the TOP LEFT CT
1 Ⓜ Female connector must connect to the BOTTOM LEFT CT

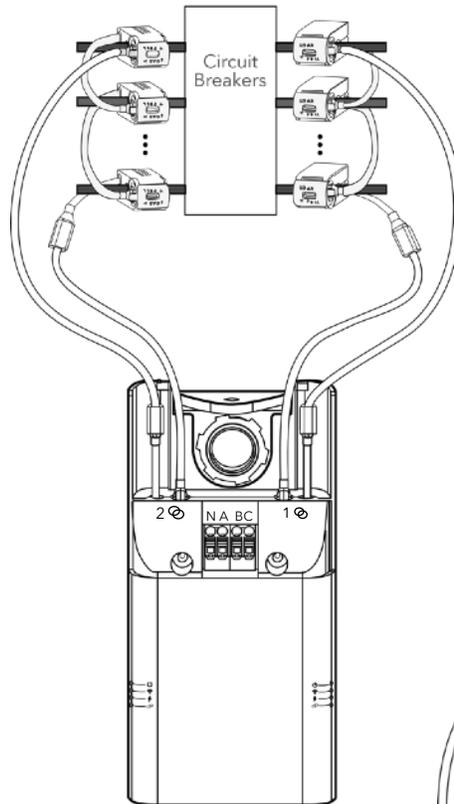
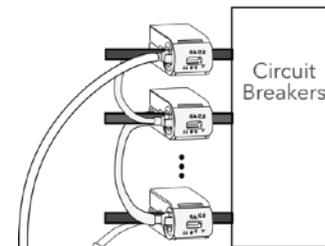


Fig 22

IMPORTANT
2 Ⓜ Male connector must connect to the TOP RIGHT CT
2 Ⓜ Female connector must connect to the BOTTOM RIGHT CT



Make sure the chain is closed.

### For installations with CTs on only 1 chain

When there are not CT(s) for 1 Ⓜ, connect 1 Ⓜ male connector to 1 Ⓜ female connector.

IMPORTANT
Use chain two (2 Ⓜ ) if you are only use one chain.
Close the other chain loop when there is only one sensor chain.

Use two CT extension cables to connect CT chain ends to the corresponding 2 Ⓜ female and male connectors on the Energy Data Gateway. Fig 23.

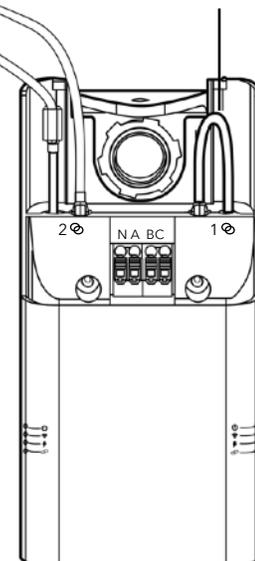
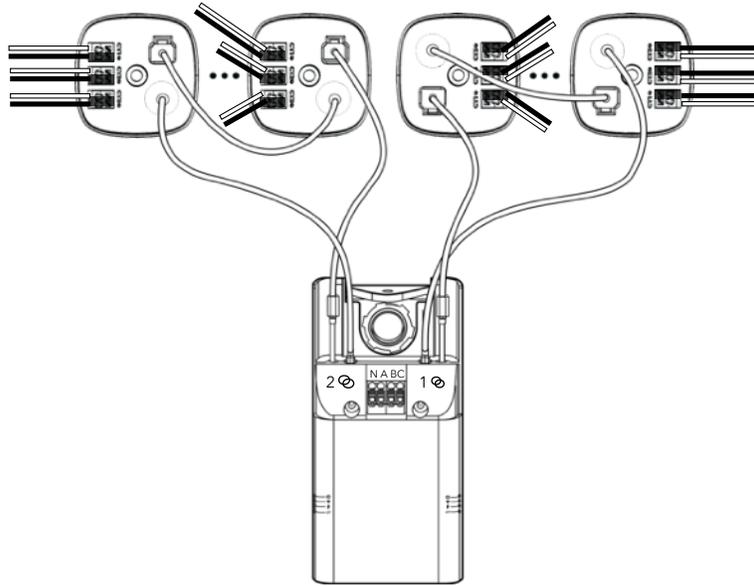


Fig 23

FOR INSTALLATIONS USING ONLY HIGH CURRENT CT INTERFACE MODULES:

Use CT extension cables, connect high current CT interface module chains to the corresponding 1 Ⓜ & 2 Ⓜ male & female connectors on the Energy Data Gateway as shown below. *Fig 24.*



*Fig 24*

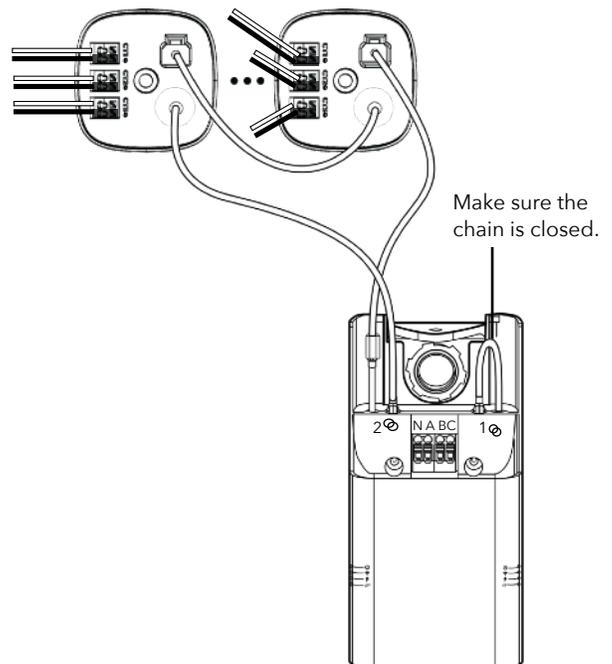
**For installations with High Current CT Interface Module(s) on only 1 chain**

When there are not high current CT interface module(s) for 1 Ⓜ, connect 1 Ⓜ male connector to 1 Ⓜ female connector.

Use two CT extension cables to connect high current CT interface modules chain ends to the corresponding 2 Ⓜ female and male connectors on the Energy Data Gateway. *Fig 25.*

**IMPORTANT**

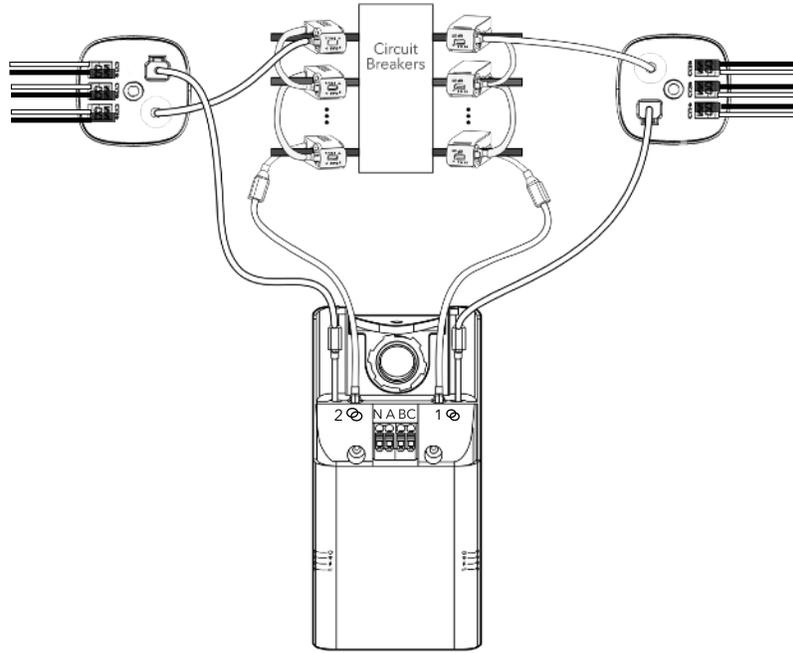
Use chain two (2 Ⓜ) if you are only use one chain.  
Close the other chain loop when there is only one sensor chain.



*Fig 25*

**FOR INSTALLATIONS USING CTS AND HIGH CURRENT CT INTERFACE MODULES:**

Using CT extension cables, connect high current CT interface module/CT chains to the corresponding 1 Ⓜ & 2 Ⓜ female and male connectors on the Energy Data Gateway, as shown below. *Fig 26.*



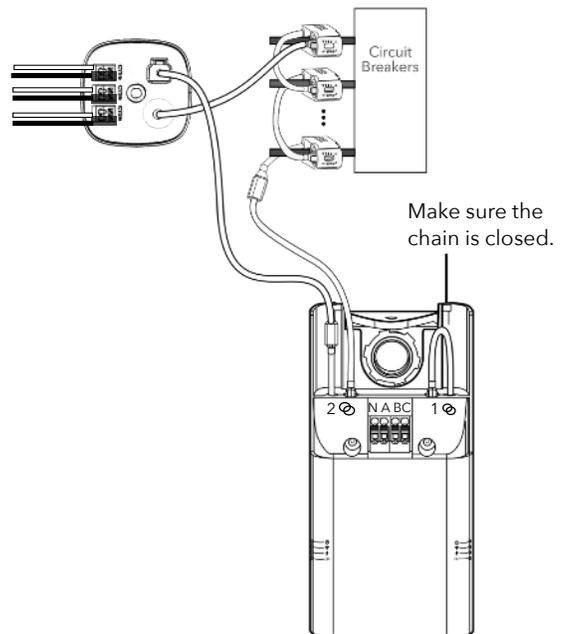
*Fig 26*

**For installations with High Current CT Interface Module/CT(s) on only 1 chain**

When there are not High Current CT Interface Modules/CT(s) for 1 Ⓜ, connect 1 Ⓜ male connector to 1 Ⓜ female connector.

Use two CT extension cables to connect High Current CT Interface Modules/CT chain ends to the corresponding 2 Ⓜ female and male connectors on the Energy Data Gateway.

*Fig 27.*



*Fig 27*

**IMPORTANT**

Use chain two (2 Ⓜ ) if you are only use one chain.  
Close the other chain loop when there is only one sensor chain.

## System Chain Check

### IMPORTANT

Double-check the installed CTs, as the physical movement of items inside of the panel from CT installation and data cable connection can cause CTs to become loose.

### Check the CTs

- Check each CT to ensure that they are closed properly.
- Check the load arrow on the CTs points in the direction of the load.
- Check all High Current CT Interface Modules to ensure Large CT leads are properly inserted into the terminal blocks, and all large CTs are snapped closed.
- Check all data cable connections to ensure they are properly seated.

### Chain Check

The following procedure tests whether digital sensor data can flow to the Verdigris Energy Data Gateway by checking whether the connections are seated properly and the physical integrity of the CT and high current CT interface module chain. It is recommended to follow this procedure 1) after a Verdigris system has been installed, and 2) while the panel remains open to access the CTs and high current CT interface modules. Failure to verify the physical integrity of the sensor chain through Chain Check may result in inability to gather any data from the system.

1. Power on the gateway using one of the three options below to provide power:
  - a. Panel Breaker: Switch on breakers that are powering the Energy Data Gateway. If the panel is de-energized for installation then follow option b or c below.
  - b. Plug Receptacle with Available Power: Use a power cord with a 5V AC connector with a 5.5mm barrel jack. Plug power cord into a wall receptacle, battery, or battery powered work lights that have an available plug. Plug the barrel jack into the bottom of the Energy Data Gateway (**Fig 29**).
  - c. USB plug to Available Power: Use a USB plug to an external battery such as a cell phone battery.

2. Turn on Energy Data Gateway using the rocker switch at the bottom of the unit. When the gateway is energized, the light next to the switch will be green. Wait for 2 minutes. Indicator lights on the side of the gateway will turn on.

### IMPORTANT

Please note that Verdigris will not assume liability for damage or injury incurred from the use of portable battery and inverter packs.

### Battery Specification:

- I. Portable and capable of being moved around easily.
  - II. Battery: battery pack or emergency power source for accessories.
3. CT Chain Check runs automatically when the system is first powered on and when the Setup button is pressed once. The CTs and high current CT interface modules have LED lights which will display a diagnostic lighting sequence. The CT chain indicator light will change from blinking blue to red or green during chain check. Please check the Error Code table on page 21 for guidance. The LED indicator light on the Energy Data Gateway will display blinking red if the break is on chain 1 and solid red for a break in chain 2.
  4. A broken, unplugged, or poorly seated CT or high current CT interface modules cable will cause a difference in the flashing light patterns on the broken sensor chain. The point at which the light pattern differs indicates the area of the chain break. **Fig 28** shows an example of these differing light patterns. The possible light patterns displayed by the CT/ high current CT interface modules are: On, Off, or Blinking.
    - a. Reseat the cables in the chain for the 2 CTs or high current CT interface modules where the LED light pattern changes. Do not increase force or pressure when reseating the cables, instead re-insert at slightly upward angle and listen for a click.

- Click the "Setup" button once to repeat the CT lighting sequence for Chain Check as needed. **Fig 29.**
- Chain check is complete when the LED indicator light on the Energy Data Gateway for the CT chain is solid green.

### Powering Energy Data Gateway

Once chain check has been performed and validated, unplug the alternate power source. Once the voltage tap cables have been connected to the terminal blocks, turn breakers used for voltage tap on. Turn on the Energy Data Gateway using the rocker switch at the bottom. A green light next to the switch will indicate that the unit is receiving power. An indicator light at the side of the unit will be green if the system is working correctly.

### Clean Up and Close the Panel

- Excessive cable lengths can be coiled to save space, and to keep the interior of the panel neat and tidy.
- Excessively long wires from voltage tap cables can be cut.
- Close the cover plate (**Fig 30**) and proceed to commission Energy Data Gateway.

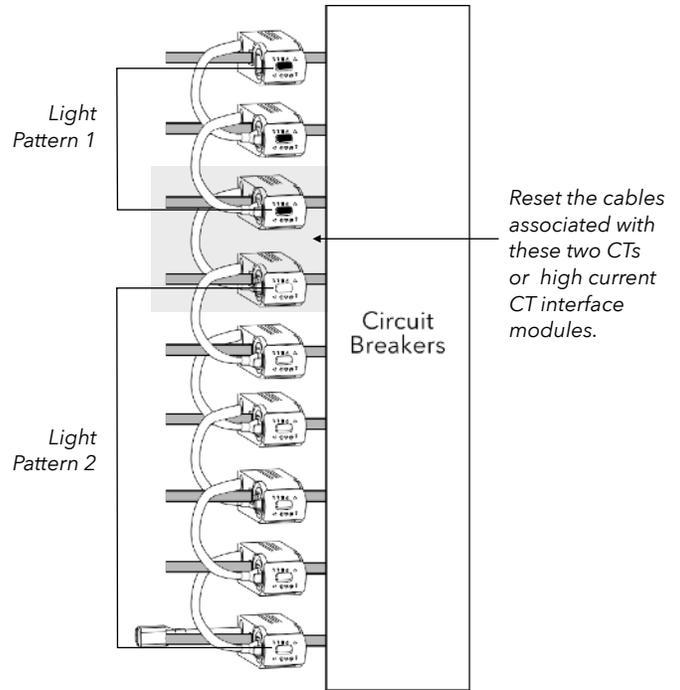


Fig 28

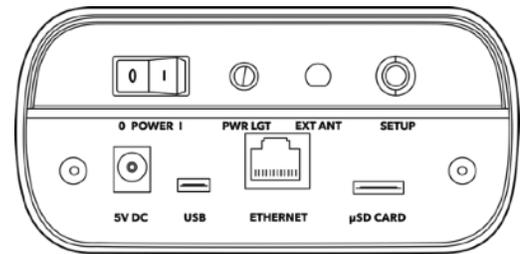


Fig 29

<b>IMPORTANT</b>
Click the "Setup" button once to repeat the CT lighting sequence for Chain Check as needed.

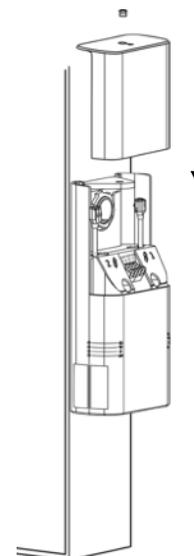


Fig 30

## Setup & Commission Energy Data Gateway

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### Commissioning

Once installation is complete, power on the system safely. Begin setting up the system with our setup application. This final process associates the Energy Data Gateway to a panel and the circuits to equipment. Setup ensures the metered data is transmitted to the cloud.



1. The Energy Data Gateway is emitting a local wireless hotspot. Connect to the hotspot via smartphone, tablet or laptop. Look for a wifi network called "Verdigris- BBEXXXXXXXX", with the serial number of the specific Energy Data Gateway. It may be necessary to disconnect the regular mobile data network on your mobile device which can also be achieved by switching to airplane mode, and even enabling wifi.
2. Open any web browser and navigate to **connect.verdigris.co** (URL address: 192.168.8.1). The system should automatically connect to the setup screen.
3. Select a network connectivity option of Wifi, 4G LTE, or Ethernet.
  - **Wifi:** Be prepared to identify the network name and enter the password.
  - **4G LTE:** The system should connect automatically. For a reliable connection, the signal should be greater than -58 dBm (e.g. -32 dBm). A value of -96 dBm indicates no signal.
  - **Ethernet:** The system should connect automatically using DHCP IP. If a static IP is required, contact [support@verdigris.co](mailto:support@verdigris.co).
  - **Troubleshooting:** If not able to complete in the setup application, please take a series of detailed, high-resolution images or video of in side the panel and installation. Be sure breakers and CTs are visible in the photo taken. Email images to [installations@verdigris.co](mailto:installations@verdigris.co), with the Energy Data Gateway serial number as the email subject line. The serial number is located on the service panel near the indicator lights.
4. Select Check Connected Sensors on the Menu- Check the number of CTs connected on each chain with Scoping sheet. Make notes to associate the breakers on the Scoping Sheet so that it equals the number of installed CTs per chain. Mismatches will result in inaccurate data.
5. Follow the onscreen instructions to complete the commissioning process. This process will associate each CT to an electrical circuit, and is necessary to retrieve Verdigris data from the system.

### Congratulations!

Your Verdigris system is now installed and set-up, contact us for user access and login information.

IMPORTANT
Double click Setup button to re-surface the hotspot and setup menu.

## Error Codes

If you need direct assistance, call our support line at 1-844-837-3447 or email [support@verdigris.co](mailto:support@verdigris.co)

The top indicator light serves as a guide to overall system health. If the light starts blinking red, there is a problem with one or more devices within the system. The solid white means everything is good.

To troubleshoot system: Identify indicator lights on the sides of the panel pictured on the right. **Fig 31**, refer to the table below.

Wait for at least 1 minute for the system to cycle through diagnostics. If the indicator lights are blinking white for greater than 2 minutes, please contact support.

To reboot the system: Hold the system Setup button for approximately 8 seconds.

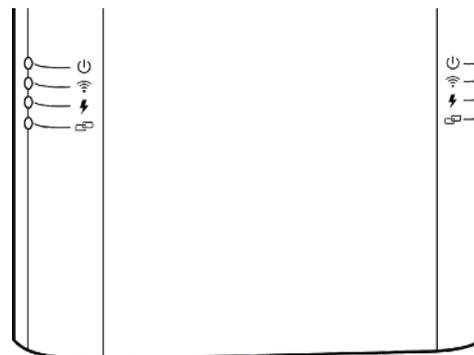


Fig 31

Service Panel Operation Mode	Energy Data Gateway LED Indicator	Interpretation	CT or high current CT interface module Indicator	Troubleshoot
 <b>Wireless</b> (LTE, Ethernet and/or WiFi)	Blinking Red	Cannot connect to Internet, system WiFi hotspot is broadcasting		Error with connectivity, please connect to the system via your mobile device to debug wireless connectivity. (See page 20)
	Red	Cannot connect to Internet, no system hotspot is broadcasting Not connect to building LAN		Error with connectivity, please press the reset button for 1second to bring up setup-tools and debug wireless connectivity. (See page 20)
	Blinking White	Busy system		
	Blinking Green	Connected, system hotspot broadcasting		
	Green	Connected, no system hotspot broadcasting		To broadcast hotspot press the reset button for one second.
 <b>Voltage</b>	Red	Two voltage phases and Neutral attached		Confirm panel is a three-phase delta 240V, split-phase, or two-phase 120V configuration.
	Blinking White	Busy system		System is processing. CT chain indicator must be green first for LED indicator to change.
	Blinking Green	Single voltage phase and Neutral attached		Panel is connected as a single phase configuration.
	Green	Three voltage phase and Neutral attached		Panel is connection as a three-phase wye configuration.
 <b>CT Chain</b>	Blinking Red	Break in CT chain 1	Chain 1 lights are on until break.	CT chain is not completely connected. Check for a break in the CT chain based on a difference in CT LED lights (on or off). Reseat the cables in the chain for the 2 CTs where the CT LED light pattern changes. System will cycle to check CT chain integrity every 10 seconds.
	Red	Break in CT chain 2	Chain 2 lights are on until break.	
	Blinking White	System is performing chain check.	Blink White	Wait for LED indicator to change. System will cycle to check CT chain integrity every 10 seconds.
	Green		Off	

## Future Panel Modifications

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In the event of panel modifications or changes to the circuits you are monitoring, your Energy Data Gateway may need to be recommissioned. Please repeat steps to Commission your Energy Data Gateway and contact Verdigris for additional support at **support@verdigris.co**.

Moving an installed and setup Energy Data Gateway to an alternate panel is not recommended nor supported and will void warranty.

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