

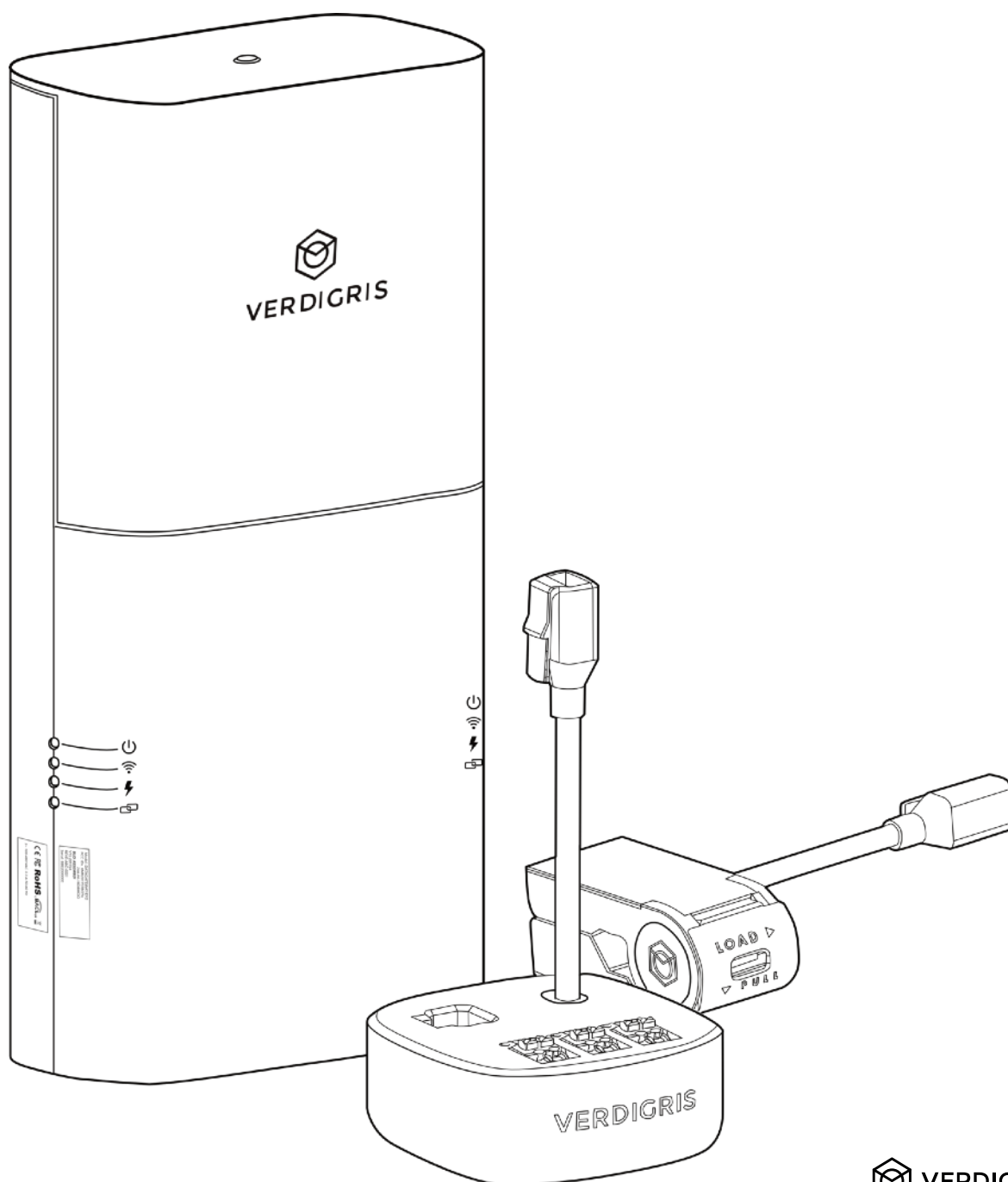
# How to Install Energy Data Gateway V2

This manual will guide you on how to install a new Energy Data Gateway V2 system at your site. 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 equipment 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.



# Table of Contents

---

- Overview ..... 3**
- Technical Specifications ..... 4**
  - Energy Data Gateway (EDG) ..... 4
  - Data Transmission ..... 4
  - Current Transformers (CTs) ..... 4
  - Symbols on Equipment ..... 4
- Component List ..... 5**
- Tools Required ..... 6**
  - Tools Required (Not Included in the box)..... 6
  - Non-Typical Parts (Only needed if indicated by Verdigris or Client)..... 6
  - Recommended Voltage Tap Cables for Specific Panel Voltage Configurations..... 6
- Prepare Installation ..... 7**
  - Determine Panel Type ..... 7
  - Select Mounting Location ..... 7
  - Select Breakers For Voltage Tap ..... 8
- Install Voltage Tap ..... 9**
  - For Single-Phase Panel ..... 9
  - For Split-Phase Panel ..... 9
  - For Three-Phase Panel ..... 9
  - Wire The Neutral ..... 9
  - Connect Voltage Cables to EDG .....10
- Install and Connect CTs ..... 11**
  - Select Appropriate CTs ..... 11
  - Verify CT Install Location ..... 11
  - Install CTs ..... 11
  - Large CTs & Interface Modules ..... 12
  - Connect Multiple CTs ..... 13
  - Connect Multiple Interface Modules ..... 13
  - Connect CTs ..... 14
  - Connect CTs to the EDG ..... 15
    - Installations Using Only CT Chains ..... 15
    - Installations Using Only Interface Modules ..... 16
    - Installations Using CTs and Interface Modules..... 17
- System Chain Check ..... 18**
  - Check the CTs ..... 18
  - Chain Check ..... 18
  - Terms And Definitions ..... 18
  - Diagnosing Chain Errors ..... 18
  - Steps ..... 19
- On-site Commissioning ..... 21**
- Error Codes ..... 22**
- Future Panel Modifications ..... 23**

## Overview

The intended use of Verdigris Energy Data Gateway (EDG) is to monitor electrical switchgear, motor control centers, and distribution panels.

### Breaker Panel Types Served

Energy Data Gateway V2 advanced energy meters work with a range of electricity mains, sub-panels, MCCs, and breaker boxes. The EDG (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 circuits/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\*\*
- \*Unearthed*
- \*\*Requires a power transformer and external power adapter*
- Frequency: 50-60 Hz
- Current measurement range (Amperage): 0.25 A-15,000 A

### Data Transmission

Data is transmitted securely via 4G LTE, WiFi, or Ethernet, stored on the cloud, and available 24/7 on any desktop web browser. Data also available through CSV export, API, and integration via BACnet IP or Modbus TCP.

- Frequency Characteristics: AC up to 8 kHz
- Precision: 10 mW
- Data access via API: unlimited
- Historical data available:
  - 1-minute
  - 15-minute
  - 1-hourly
  - Daily

## Major Steps for Installation and Commissioning

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

### 1. Installation

- a. Prepare Installation
- b. Mount EDG
- c. Install Voltage Tap
- d. Install and Connect CTs
- e. System Checks & Clean Up

### 2. Commission EDG

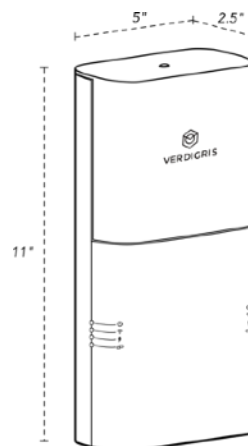
- a. Connect Smartphone to EDG Hotspot

(If commissioning is to be performed while power is shut off to panel, the EDG will require temporary power. Alternative power can be provided by 1. USB Battery pack via 5V Plug Adapter With 5.5mm Barrel Jack OR 2. Generator power.)
- b. Follow instructions on Page 21

## Technical Specifications

### EDG (Energy Data Gateway)

- Physical Size and Weight: 11 x 5 x 2.5 inch [280 x 127 x 64 mm], 4.4 lbs [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-145 °F [-40 °C-63 °C]
- ADC Accuracy: 16-bit
- Power Supply: 100-480 Vac 50/60 Hz, 20 W
- Temporary Power: 5V DC USB Battery Pack
- Degree of Protection: IP30



### Data Transmission

- Ethernet: 100/1000 Mbps (RJ-45)
- 4G/LTE Cat 4 and LTE Cat M1/NB-IoT  
(4G/LTE is only available in the US and select countries and areas, other areas will be wifi only. )
- 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

### Current Transformers (CTs)

There are three types of CTs: The Verdigris Smart CT is by far the most commonly used for branch circuits. The Smart CT is for individual circuit breakers (< 90 A) in tight spaces. High Current CT (Hinged or Coil) for larger amperage circuits. High Current CTs connect to the data chain using the High Current Interface Module. Each High Current Interface Module can support up to 3 High Current CTs.

	Smart CT	Hinged CT	4" or 7" Coil CT	High Current Interface Module
Max Circuit Ampacities	90 A per circuit	250A	Up to 15,000A per circuit (custom sizes available)	
Minimum Load (Amperage or %)	0.25 A	0.5% of CT load	5 A	
Sensor Accuracy	±2%	0.5%	0.5%	
Physical Dimensions	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]
CT Accuracy Range (% of rated current)	1%-100%	10%-120%	0%-100%	
Temperature Range	-40 °F-145 °F [-40 °C-63 °C]	5 °F-140 °F [-15 °C-60 °C]	-4 °F-158 °F [-20 °C-70 °C]	
Max Conductor Size	4 AWG [5.16 mm/20.91 mm²]	600 kcmil [19.68 mm/304.19 mm²]	4" or 7" window	2.4 x 2.4 x 1 in [60 x 60 x 25 mm]

### Symbols on Equipment

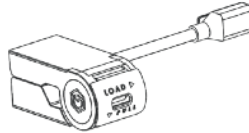


De-energize Verdigris system before  
accessing field wiring compartment.

## Component List



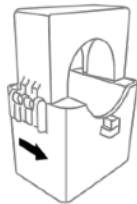
Energy Data Gateway  
(EDG) V2



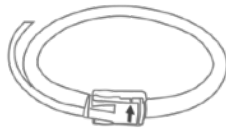
Smart CT  
(Up to 42 per system)  
# REVE-SUS-0030



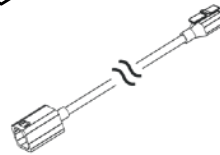
High Current Interface Module (HCIM)  
(Required for installation of Large CTs (Hinged or Coil).  
One HCIM supports up to 3 Large CTs.  
Up to 14 HCIMs per EDG.)  
# REVE-AJC-0033



or/and



Large CTs (Hinged or Coil)  
(\*Only for wire sizes greater than 4 AWG  
and/or ampacities greater than 90 A,  
Up to 42 per system)  
Hinged CT: # CT-AE-H200A



20 cm, 1 m, 3 m CT  
Chain Extension Cables  
20 cm: # REVE-SUS-0036-01  
1 m: # REVE-SUS-0036-02  
3 m: # REVE-SUS-0036-03



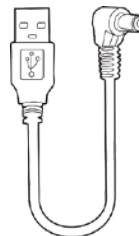
Splicing Connector  
\*Only for three-phase, 3 wire, 480 V delta  
electrical configuration  
(1 per system)  
WAGO 221



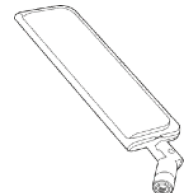
1" Chase Nipple  
(1 per system)  
# HALEX 90703



1" Locknut  
(1 per system)  
# HALEX 96193



5V DC Plug Adapter With  
5.5mm Barrel Jack  
(To power system independent of  
voltage taps)  
# 839-1020-ND



External Antenna  
(\*Only for Cellular EDG,  
up to 2 per system)  
Taoglas TG.30.8113

Items with "Verdigris logo" are custom parts made for Verdigris. All items without the logo can be purchased through a third party.  
If you need direct assistance, call our support line at 1-844-837-3447 or email [support@verdigris.co](mailto:support@verdigris.co)

# Tools Required

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

## Tools Required (Not Included in the box)

- Colored cables
- Cable ties (up to 25 per panel)
- Wire nuts (size dependent on size of panel breaker wires to be tapped)
- 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 (3/4" or 1") or knockout punch set (3/4" or 1")
- Hammer (used with screwdriver to punch prefabricated knockouts)
- Colored electrical tape and marker (for labeling voltage tap breakers, specific to panel phase color coding)
- 12 Gauge wire UL rated up to 600V. Color of wire matches phases of panel to be installed on.
- Breakers for Voltage Taps: One required for each monitored phase. Min. 5A per phase. Breaker type to match specs on panel label. Single 3 Pole breaker is approved. No breaker necessary for bonding to neutral bus bar.
- (Recommended) The 3 pole Miniature Circuit Breaker that is greater or equal to 5 amp.

## Non-Typical Parts (Only needed if indicated by Verdigris or client)

- Flex conduit connector (for recessed panels only)
- Flex electrical conduit (for recessed panels only)
- Disconnect switch
- Conduit
- Optional: Junction Box or Hoffman Enclosure (A16148PHC or Larger)
- Optional: Cellular antenna extension kit available for installations with low reception
  - Standard Polarity SMA Male to SMA Male Shielded Cable B09ZP8DXFJ
  - Standard Polarity SMA Female to SMA Female Bulkhead Adapter - for surface mounting antenna to outside of enclosure ADP-SMAF-SMAF-B-G
- Alternative Voltage Tap: ILSCO KUP-L-Tap® Insulation Piercing Connectors. Check local codes.

## 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> (1 Wire+1 Neutral)	Phases B typically marked by black or red colored wire and Neutral typically white colored wire.		
<b>Split-Phase Panel</b> (2 Wires +1 Neutral)	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.	<b>Wye</b> (3 Wires + Neutral)	Panels with 4 wires.
		<b>Delta</b> (3 Wires)	Panels with 3 wires (no neutral wire).

Contact Verdigris support if your panel type is out of the list.

Select Mounting Location for the Unit

EDG 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**

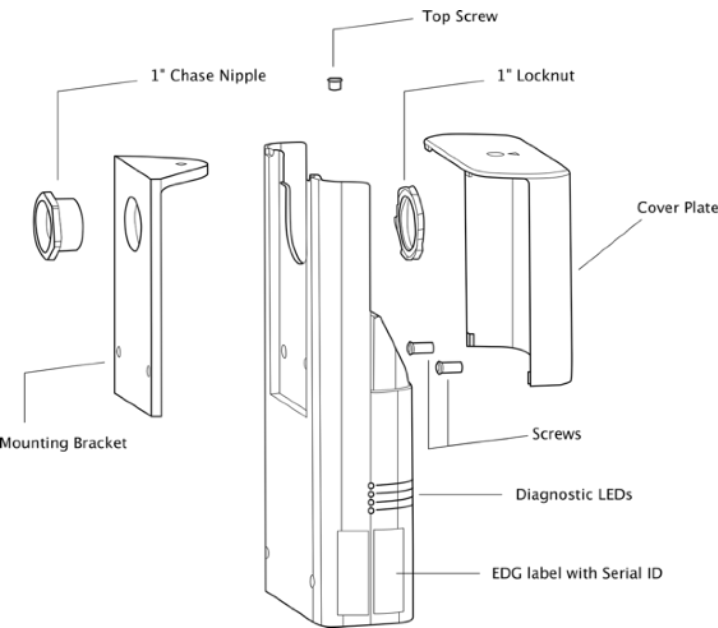


Fig 1 EDG's Exploded-view

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 the EDG body by removing top screw.
3. Mounting bracket is supposed to be attached on EDG body, place EDG 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 EDG body onto the panel.

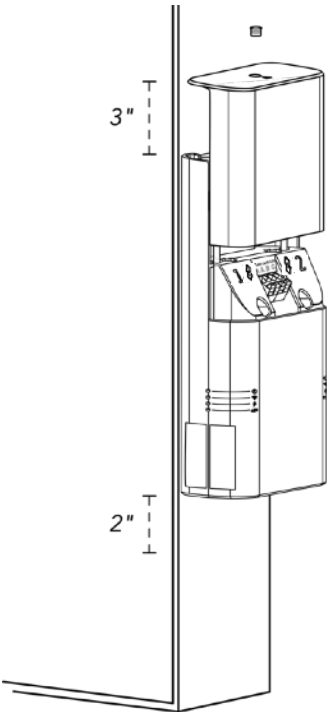


Fig 2

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. Breakers must be installed in "Off" position and power turned on once breaker is fully seated. If no spare breakers are present, but there are empty slots in the panel, spare breakers can be installed 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. Can purchase a separate breaker min 5amps
3. Label selected breakers 'Switch for Verdigris Gateway'.

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

IMPORTANT
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

### 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.

The voltage taps provide power to the EDG as well as allows the EDG to monitor each phase of the panel. The phases on the panel must match up with the phases on the EDG through the voltage taps.

Please refer to the panel documentation for the model number of the panel you're installing on to determine which breakers are on each phase.

### For Single-phase Panel (1 Wire + 1 Neutral)

Voltage tap using **breaker slots**:

1. Ensure the breakers are turned off. Connect 1 voltage tap cable to breaker.
2. Wire the neutral.
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.
3. Route wires through knockout and into the mounting bracket. **Fig 3.** Seat the hot wire into Terminal B of the EDG.

### For Split-Phase Panel (2 Wires + 1 Neutral)

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.
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.
3. Route wires through knockout and into mounting bracket. **Fig 4.**

### For Three-Phase Wye Panel (3 Wires + Neutral)

Voltage tap using **spare breaker**:

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



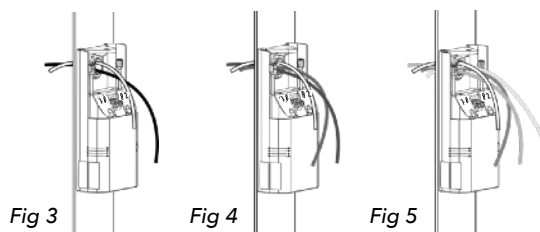
Fig 7

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.

### For Three-Phase Delta Panel (3 Wires)

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.
3. Route Wires. Route wires through knockout and into the mounting bracket. **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

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

### Connect Voltage Cables to EDG

- 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.

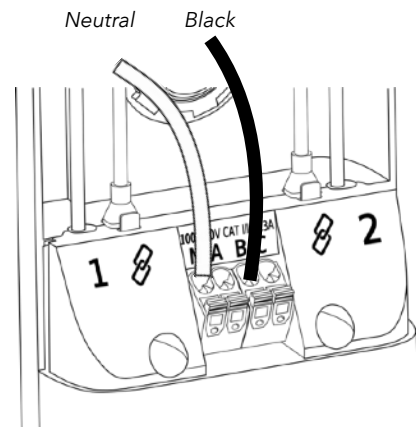


Fig 8

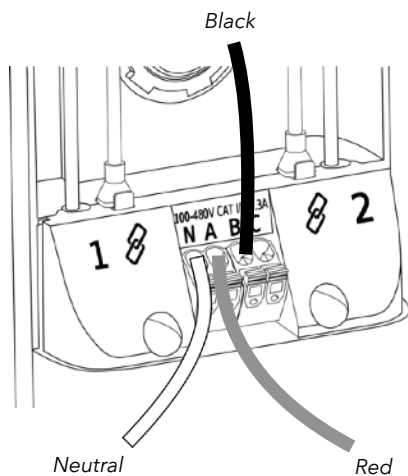


Fig 9

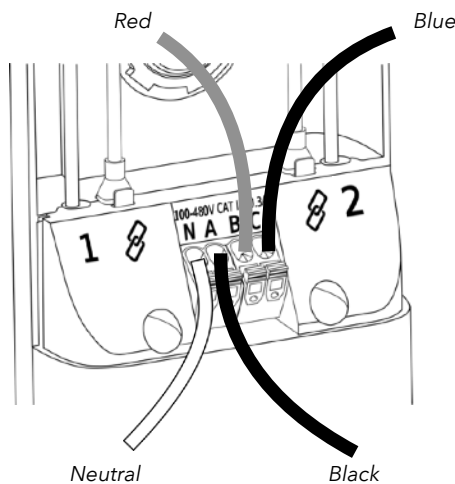


Fig 10

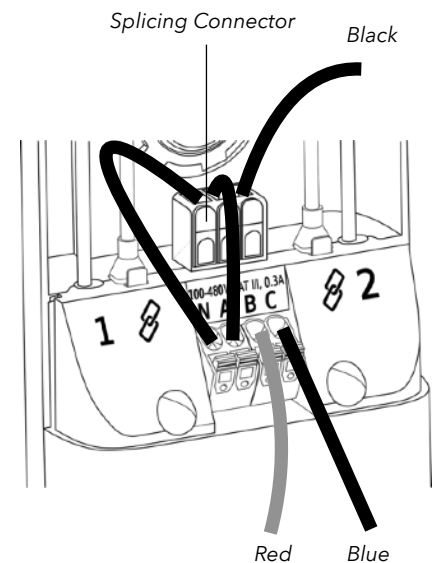


Fig 11

# 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 Interface Modules.

- Verdigris offers the following CT sizes (up to 21 per chain; 42 total per system):
- Verdigris Smart CT (typ. 90 A, max. 75 A)
  - Hinged CT (typ. 200 A, max. 225 A)
  - 4" Coil CT (typ. 500 A, max. 15,000 A)
  - 7" Coil CT (typ. 500 A, max. 15,000 A)

\* 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. The smart CTs having firmware in them that might need to be updated remotely with our support team.

## 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**.

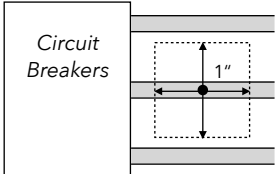


Fig 12

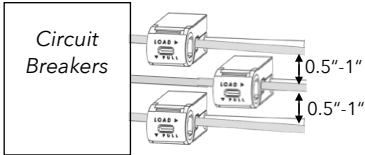


Fig 13

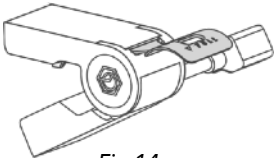


Fig 14

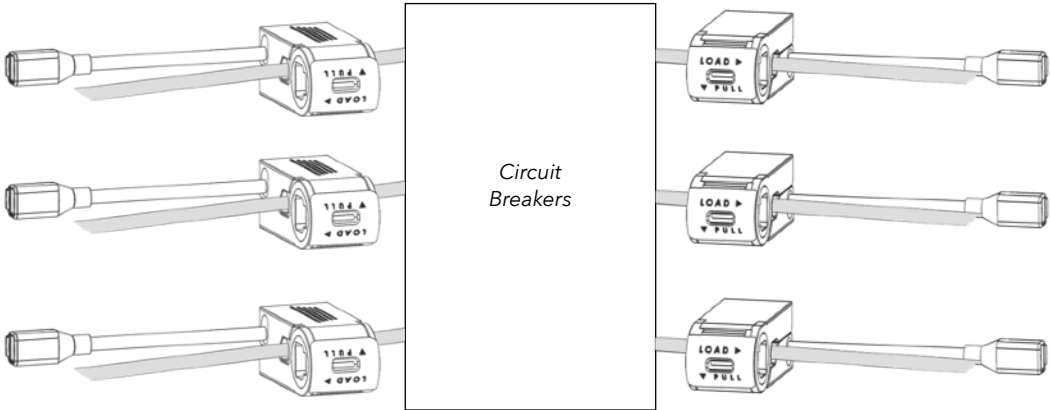


Fig 15

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 Interface Modules) may be mounted on either side of a panel, which covers a standard 42 circuit panel.

## CONTACT US

If you are not sure which CTs are right for your circuit, call our support line at **1-844-837-3447** or email **support@verdigris.co**.

## IMPORTANT

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.13).

CTs must be securely closed for accurate data collection.

## Large CTs & Interface Modules

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.

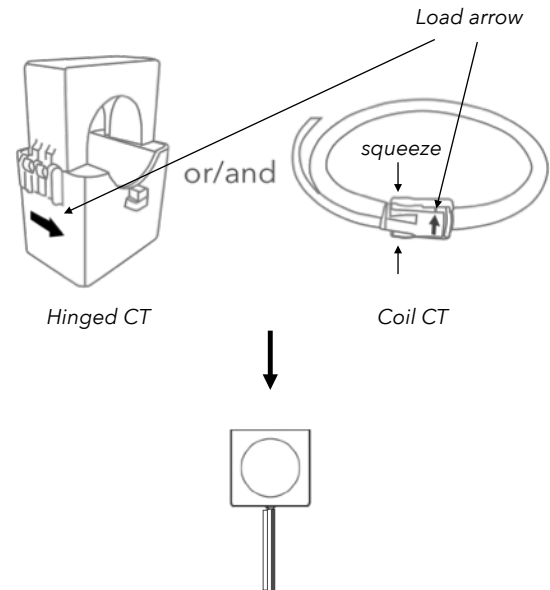
### IMPORTANT

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.

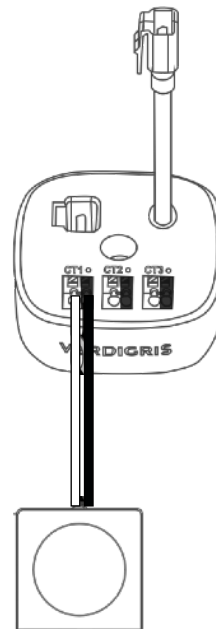
- Hinged CTs: Click the latch closed. Double check for the correct CT orientation via the load arrow or CT label.
  - Coils: Squeeze the ends to release the latch and insert end of the coil. Double check for correct CT orientation via the load arrow.
4. Insert the 2 wire leads from the large CT into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

**NOTE:** CT chains and large CTs/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 Interface Module, followed by another 3 CTs.

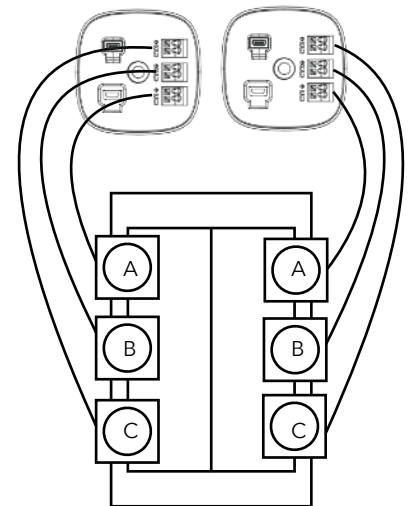


*In this installation manual, we will use this symbol to represent large CTs.*

**Fig 16**



**Fig 17**



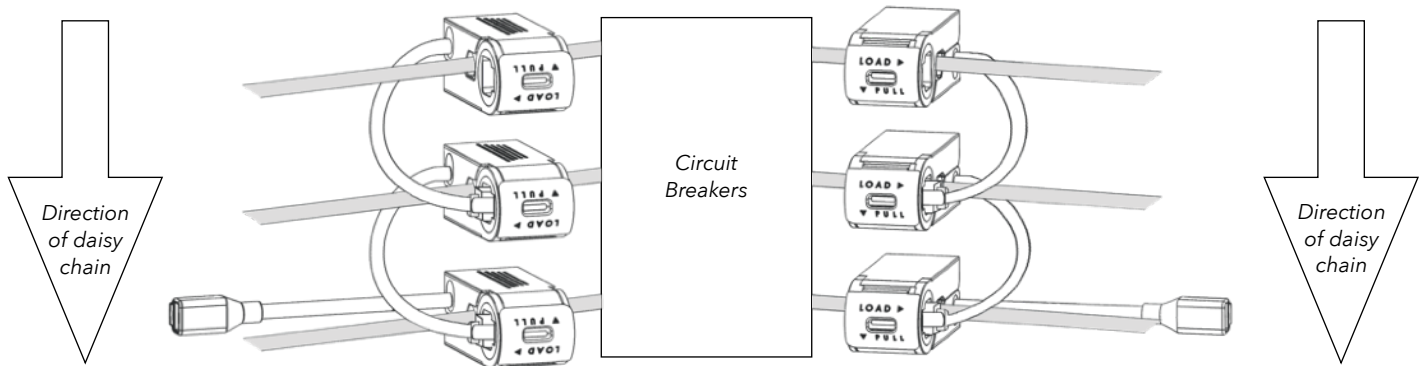
**Fig 18**

Large CT A goes to port 1  
Large CT B goes to port 2  
Large CT C goes to port 3

## Connect Multiple CTs

Daisy chain CTs together. *Fig 19.*

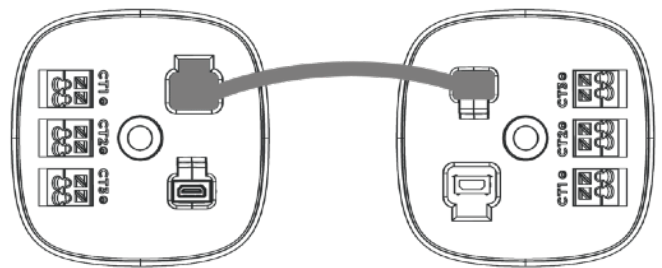
1. Starting at the top left breaker, insert CT cable latch into the female cable connector on the CT directly below.
2. Repeat until all CTs have been connected on the selected breakers. There should be an unattached female cable connector on top CT and an unattached CT cable on the bottom CT.
3. Repeat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



*Fig 19*

## Connect Multiple Interface Modules

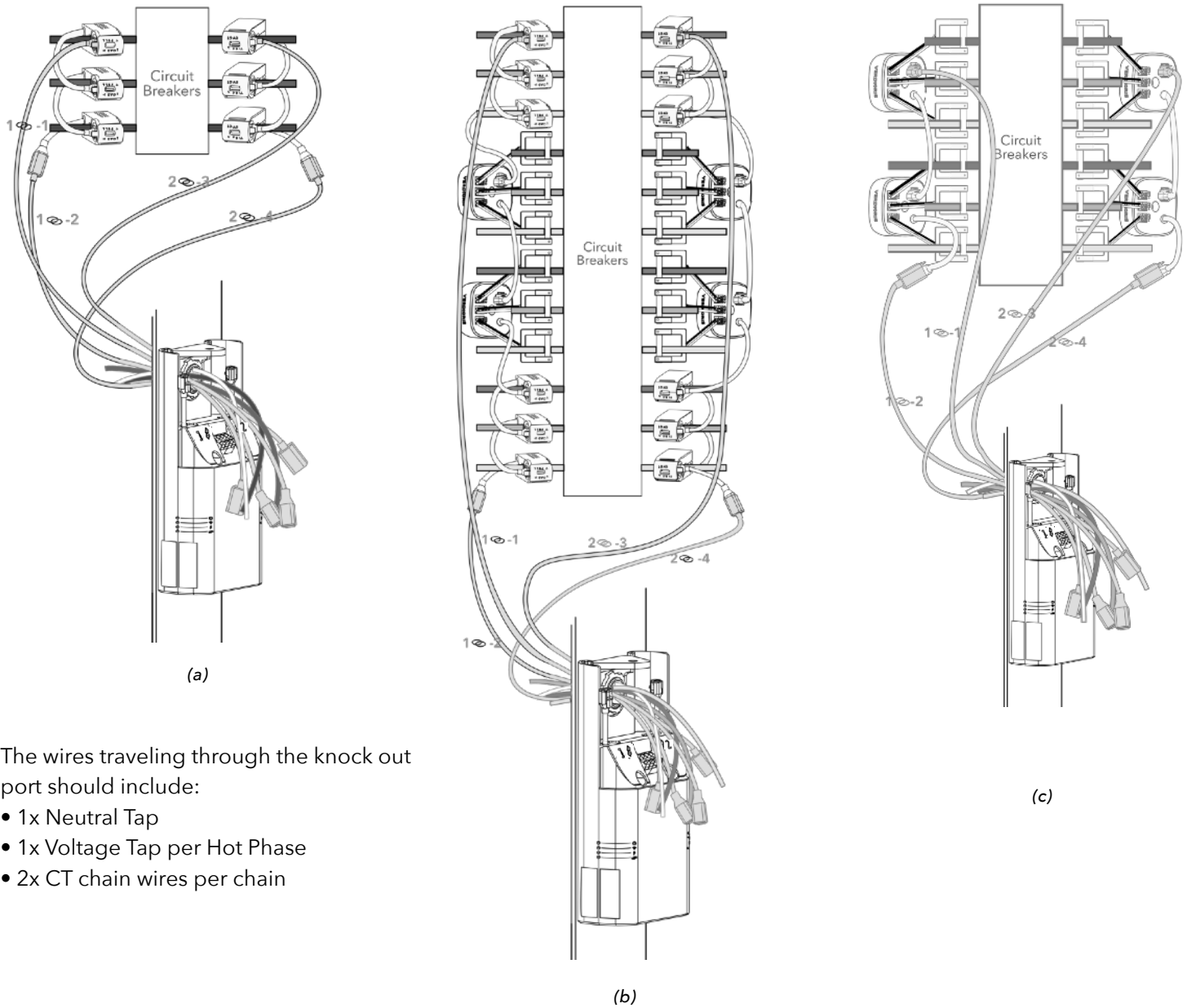
If your panel installation requires multiple Interface Modules: Connect the cable pigtail from the Interface Modules to the input port of the next Interface Module. A CT extension cable may be used if the Interface Modules are positioned such that the pigtails do not reach. *Fig 20.*



*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 EDG

### 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 EDG, as shown below. *Fig 22.*

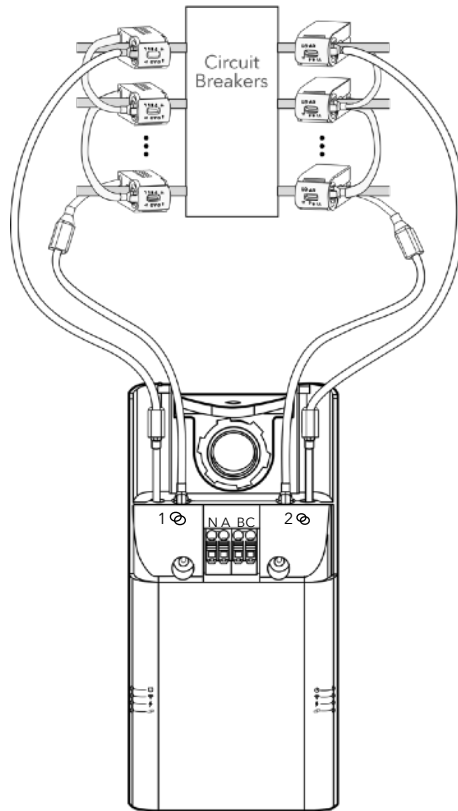


Fig 22

### 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

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 1 ♂ female and male connectors on the EDG. *Fig 23.*

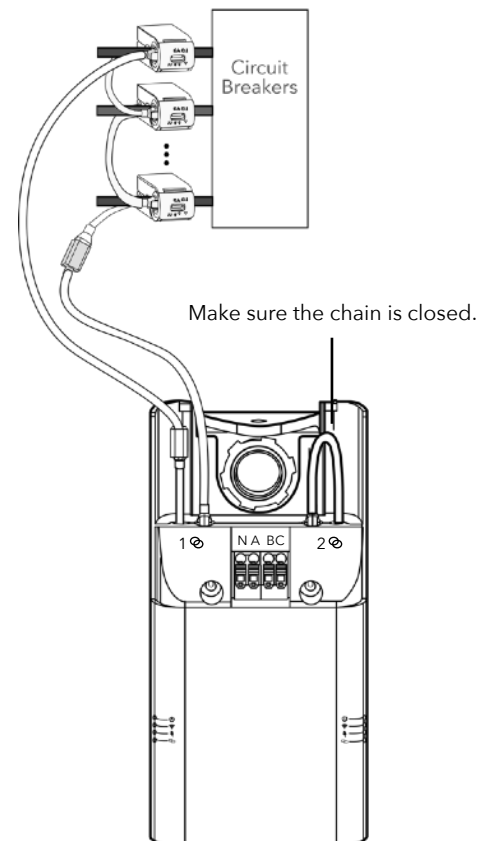
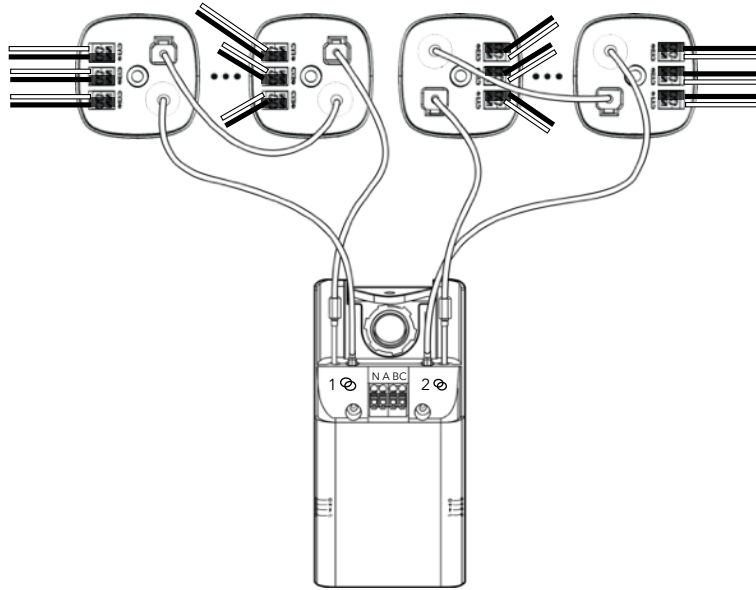


Fig 23

FOR INSTALLATIONS USING ONLY INTERFACE MODULES:

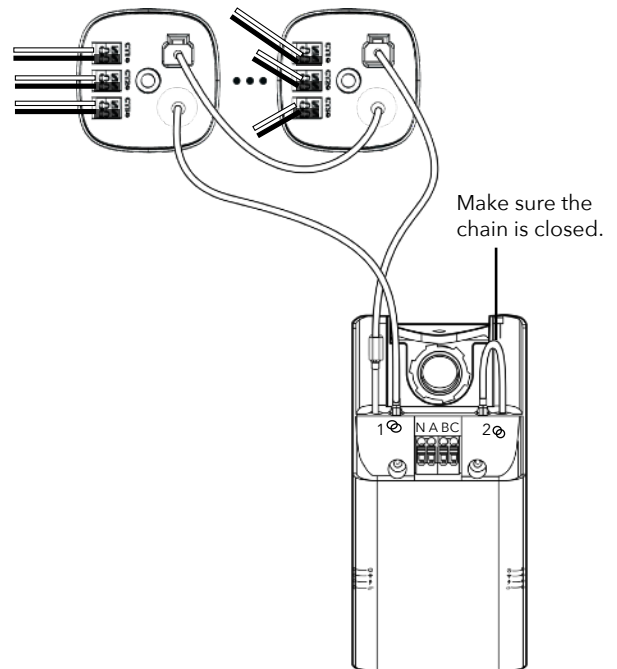
Use CT extension cables, connect Interface Module chains to the corresponding 1⌀ & 2⌀ male & female connectors on the EDG as shown below. *Fig 24.*



*Fig 24*

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

Use two CT extension cables to connect Interface Modules chain ends to the corresponding 1⌀ female and male connectors on the EDG. *Fig 25.*



*Fig 25*

**IMPORTANT**

Close the other chain loop when there is only one sensor chain.



## FOR INSTALLATIONS USING CTS AND INTERFACE MODULES:

Using CT extension cables, connect Interface Module/CT chains to the corresponding 1 ♂ & 2 ♀ female and male connectors on the EDG, as shown below. **Fig 26.**

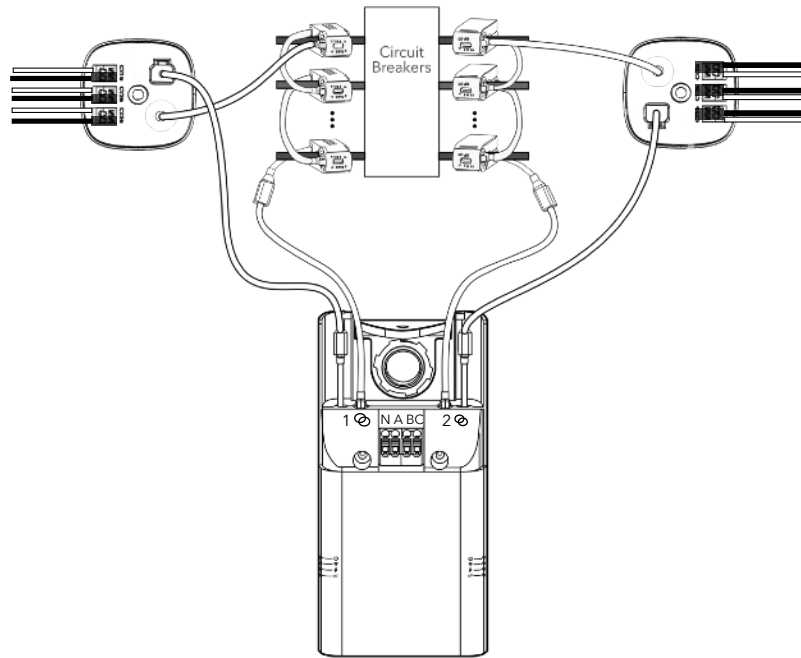


Fig 26

### For installations with Interface Module/CT(s) on only 1 chain

Use two CT extension cables to connect Interface Module/CT chain ends to the corresponding 1 ♂ female and male connectors on the EDG. **Fig 27.**

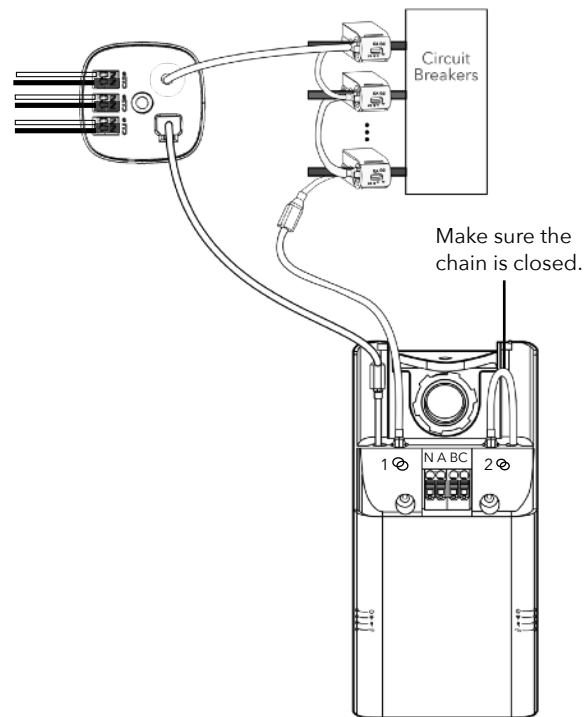


Fig 27

### IMPORTANT

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.

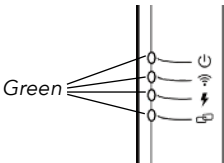
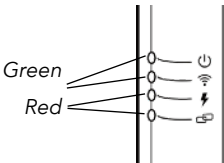
Check the CTs

- ❑ 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 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 Verdigris Meter includes data cables that carry power and digital signaling to and from its sensors. As there are a number of connections per system, it's possible some connections are not made properly. Built into the meter is a chain validation procedure to ensure a proper electrical connection is made.

On power-up, the system will run a chain check diagnostic procedure:

If this procedure is successful, the chain light will show <b>green</b> :	If this procedure fails, the chain light will turn <b>red</b> :
	

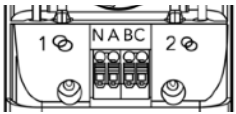
In the event the chain light is red, the procedure described here can help identify and repair any issues.

See "Error Codes" section on page 22 for more details.

Terms And Definitions

Chain 1 & Chain 2:

The cabling from the EDG to each of the sensors. There are two loops of cable here, marked with Chain 1 & Chain 2.

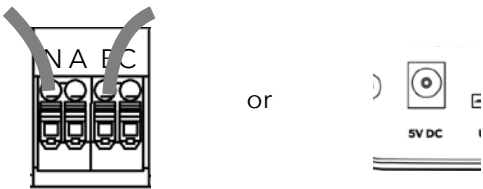


Sensor (Smart CT and Interface Module) LED Indicators:

- **Slow Blink:** a blink pattern on the Smart CT or Interface Module LED. This LED is white. This blink pattern is **1 second on, 1 second off**.
- **Fast blink:** a blink pattern on the Smart CT or Interface Module LED. This LED is white. This blink pattern **flashes 5 times per second**.
- **Solid:** The light on the Smart CT or Interface Module will be solid white.
- **Off:** The light on the Smart CT or Interface Module will be off.

Diagnosing Chain Errors

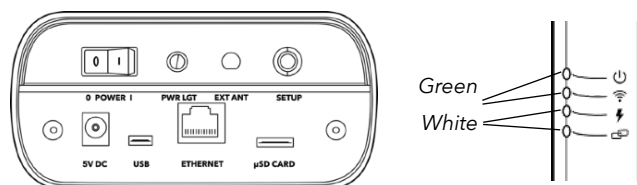
After current sensors and the EDG are installed, the system can be tested for proper connectivity through the sensor cable. The EDG during this time can be powered either through a **battery pack** or from the panel powering the device **through the voltage headers**. Avoid powering the device from both sources at the same time.



To perform the chain check procedure, the panel cover should be open. The lights on the back of the Verdigris Smart CTs or the High Current Interface Modules will indicate more information about where the error is occurring. While the system provides as much information as it can on the source of the disconnect, some work may be needed to locate a loose connector or failed component.

## Steps

1. Ensure the system is powered and you can visually see the LEDs on the sensors. We recommend using the battery pack, as it avoids needing to have the panel powered during the check.
2. Run chain check by pressing the "Setup" button on the bottom of the device. After pressing the button, the CT and voltage lights will turn White to indicate the test is in progress.

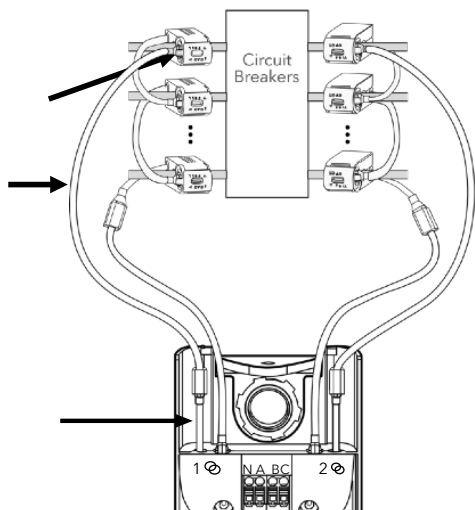


3. In about 3-5 seconds, the sensors lights will blink showing the test has run.
  - a. When in a **correct operation**, these lights will turn on solid for 2 seconds, fast blink for 2 seconds, then finally **turn off**.
  - b. In a **failed condition**, the sensor lights will either all stay "Solid", all "Slow Blink", or do a mix of the two.

The instructions that follow will refer to the sensor chain with the lights that remain on.

### A. All Solid Lights:

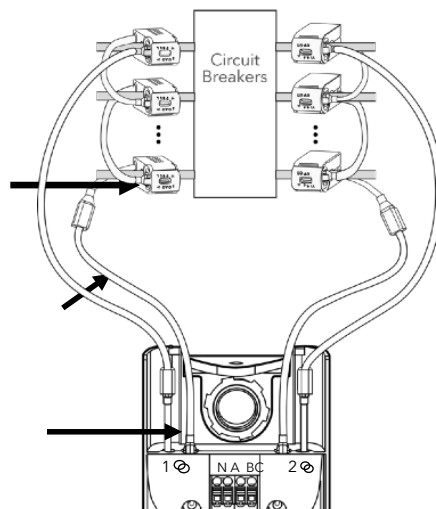
If all the lights are "**Solid**", there is a cabling issue at the **start of the chain**. This affects either the first sensor on the chain, the extension cable from the EDG (male plug from the Gateway), or the pigtail cable coming from the EDG.



- **Check that cables** are fully seated coming from the plug of the EDG to the first sensor. If any cables are found to be loose or not fully seated, fully insert the cable and press the "Setup" button to re-run chain check. If the CT light is green, the chain has been repaired.
- **Bypass the first sensor** on the chain by unplugging the extension (plug) from the first sensor and attach it to the second sensor. Re-run chain check. If this works, Find another sensor to replace the first sensor on the chain and connect the chain again as it was before. Re-run chain check again to verify and close the panel if the CT light turns green.
- **Take a spare 3-meter extension cable and replace the extension from the EDG** with the plug side going into the first sensor. You do not have to run the spare cable through the conduit yet. Re-run chain check after this cable is replaced. If the chain light shows green, the extension cable going to the first sensor needs to be replaced.
- Unplug both cables from the output and input on the EDG for this chain and loop the plug cable back into the socket of the EDG directly. Re-run chain check to verify the Chain light turns green. If the Chain light is still red, the EDG should be replaced.

### B. All Slow-Blinking Lights:

If all the lights show a "**Slow Blink**", there is a cabling issue at the **end of the chain** at the EDG (**socket connector** from the EDG to the plug of the last sensor). This affects either the last sensor on the chain, the extension cable to the EDG (female socket from the Gateway), or the pigtail cable coming from the EDG.



- **Check that cables are fully seated** coming from the **socket of the EDG** to the last sensor. If any cables are found to be loose or not fully seated, fully insert the cable and press the "Setup" button to re-run chain check. If the CT light is green, the chain has been repaired.
- **Bypass the last sensor on the chain** by unplugging the extension (socket) from the last sensor and attach it to the second to last sensor. Re-run chain check. If this works, Find another sensor to replace the last sensor on the chain and connect the chain again as it was before. Re-run chain check again to verify and close the panel if the CT light turns green.
- **Take a spare extension cable of a suitable size and replace the extension to the EDG** with the plug side going into the EDG. You do not have to run the spare cable through the conduit yet. Re-run chain check after this cable is replaced. If the chain light shows green, the extension cable going from the last sensor into the EDG needs to be replaced.
- Unplug both cables from the output and input on the EDG for this chain and loop the plug cable back into the socket of the EDG directly. Re-run chain check to verify the Chain light turns green. If the Chain light is still red, the EDG should be replaced.

### C. Solid Light And Slow-Blinking Lights:

If all the sensor lights show a mix of solid and slow blinking lights, there is a cabling issue at the **transition point where the lights go from solid to blinking on the chain**. This issue affects the sensor before or after the transition in light code.

- **Check that cables are fully seated** at the point where the light code transitions.
- **Bypass the sensor immediately before the light code transition** and re-run chain check. You can bypass the sensor by detaching it from the chain completely and connecting the sensor before and after.
- **Bypass the sensor immediately after the light code transition** and re-run chain check.

Once the offending sensor has been identified, replace the sensor and re-run chain check.

## On-site Commissioning

---

Once the installation is complete, and with the panel power turned off, use a battery pack and power the Verdigris Energy Data Gateway (EDG) by plugging in the DC cable into the 5V DC input at the bottom of the EDG. Alternatively, the EDG can be powered on by inserting a hot wire into "Terminal B" of the voltage tap. Once the EDG is powered on, follow the steps below to validate installation and complete the on-site commissioning process.

1. Connect to the EDG.
  - a. Once powered, the EDG starts emitting a local wireless hotspot. Connect to the hotspot via smartphone, tablet or laptop. Look for a wifi network called "Verdigris- BBEXXXXXXXX", which matches the serial number located on the side of the EDG. 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.
  - b. Open your preferred web browser and navigate to URL: **connect.verdigris.co** (or IP address: 192.168.8.1). The system should automatically connect to the setup screen.
  - c. Click on "Setup Gateway" to begin the commissioning process.
2. Setup Connectivity
  - a. For Cellular: Please ensure the external antenna is installed
  - b. For Wi-Fi: Please select or enter the SSID and enter the correct password
  - c. For Ethernet: For DHCP, the EDG automatically assigns an IP. For configuring a static IP, please refer to your training instructions or contact [support@verdigris.co](mailto:support@verdigris.co)
3. Verify chain integrity
  - a. Confirm that all CTs are clipped in or "seated" fully in their destination terminal
  - b. Confirm that there are no more than 21 CTs installed on each chain.
4. Complete labeling
  - a. Once network connectivity is secured, use the built-in QR code reader to scan and import the label information from the included scoping sheet. If QR code is unavailable or damaged, select the "Manual Input" option. The CT labels on the application must follow the order in which the CTs are installed, per chain.  
**Note:** The CT sizes are automatically detected by the application, but phase selection is not. You can change the associated label or create a new label in the dropdown menu. Phase selection must be completed for each CT.
  - b. Once labeling is accurately completed, go ahead and safely re-energize the panel to complete rest of the steps.
5. Once the panel is fully reenergized, restart the process from Step 1. All your previous inputs will be saved for you to re-confirm.
6. Verify voltage
  - a. Verify panel voltage reading is within expectation
  - b. Upon completion of the above steps, the installed EDG is ready to start transmitting data. Please inform your Verdigris representative to complete the activation.  
**Troubleshooting:** If you are unable to complete 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 [support@verdigris.co](mailto:support@verdigris.co), with the EDG serial number and site name as the email subject line. The serial number is located on the service panel near the indicator lights.
7. 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.
8. 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.

## Error Codes

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.

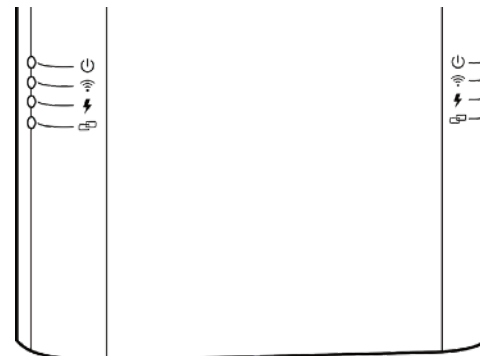






Fig 31

Service Panel Operation Mode	EDG Diagnostic LEDs	Description	CT or Interface Module Indicator	Troubleshooting Steps
 Power	Blinking Red	There is a problem with one or more devices within the system		Identify indicator lights on the sides of the panel pictured on the right. <b>Fig 31</b> , refer to the table below.
	White	Everything is good		
 Wireless (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.
 Voltage	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.
 CT Chain	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

---

In the event of panel modifications or changes to the circuits you are monitoring, your EDG may need to be recommissioned. Please repeat steps to Commission your EDG and contact Verdigris for additional support at **[support@verdigris.co](mailto:support@verdigris.co)**.

Moving an installed and setup EDG to an alternate panel is not recommended.

