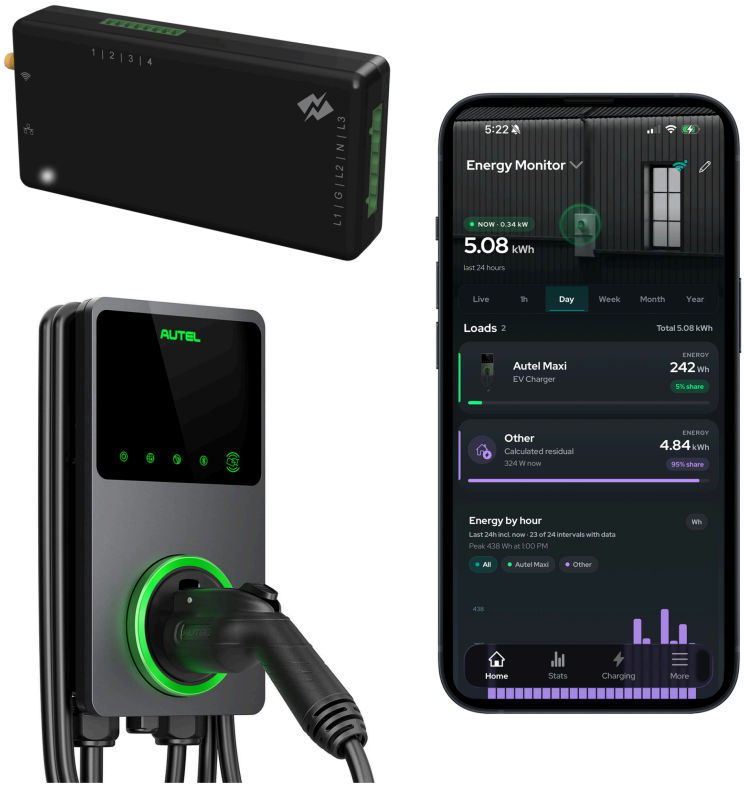
NEOCHARGE

NeoCharge Energy Monitor + EMS

Installer Guide

Rev 006 · 2026-11-09 · Model NCEM-NA



For licensed electricians and qualified installers. Split-core CT kit and flexible (Rogowski) kit.
NeoCharge install support +1 888 944 5581 · support@getneocharge.com · help.getneocharge.com · Autel 1 (844) 765-0150
Controlled copy: this PDF. Always use the latest revision.

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00 About this guide

This guide covers the full install of the NeoCharge Energy Monitor (model NCEM-NA) and its setup as an energy management system (EMS) with an Autel EV charger.

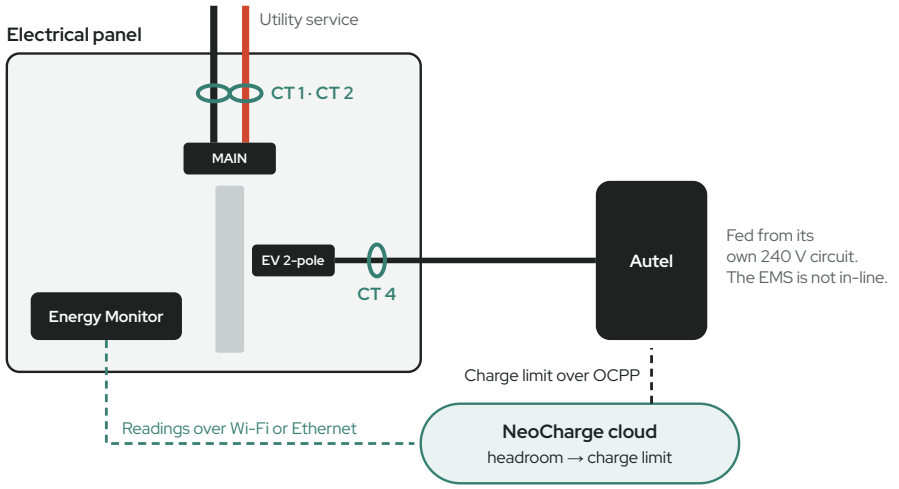
Who it's for

Licensed electricians and other qualified installers. It assumes you already know how to work safely in an energized panel. It doesn't teach basic electrical practice.

What "done" means

The job is complete when the homeowner's NeoCharge app has the Energy Monitor and the Autel charger both set up and paired, showing **Energy Management verified**. On the app's home screen, the Autel and Home Energy cards both carry a green **EMS** badge. See Before you leave.

How the system works



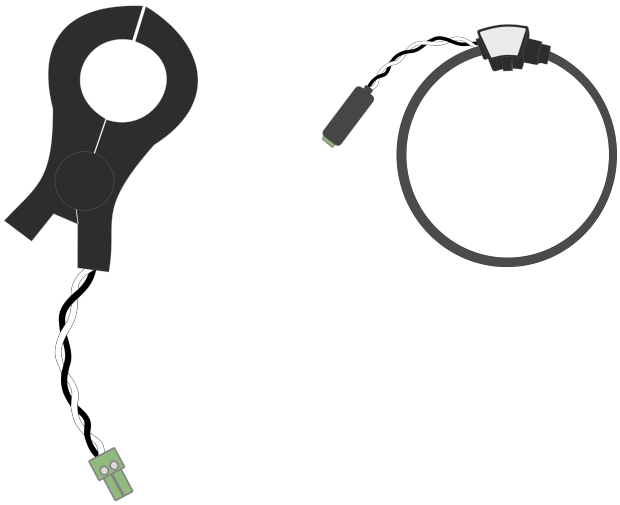
If the monitor or its connection drops, charging pauses after a short safety timeout.
It is designed to resume automatically when monitoring is back.

- **CT 1 and CT 2** attach to both feeder conductors of the panel the EMS protects (the main panel or a subpanel). They see every load in that panel.
- **CT 4** clamps the EV charger circuit. **CT 3** monitors a battery or solar line, the charger's second leg, or one other load.
- The monitor sends its readings to the NeoCharge cloud over Wi-Fi or Ethernet.
- The cloud works out the headroom left under the panel rating and sends the Autel a charge limit over OCPP. OCPP is a network protocol. There is no power wire between the monitor and the charger.
- The EMS holds total load to **100% of the panel rating** you enter in the app: the main breaker for a main panel, or the feeder breaker for a subpanel.
- If the monitor loses power or its connection, charging pauses after a short safety timeout. It is designed to resume automatically. See How the EMS behaves during interruptions.

Which sensor kit do you have?

Both kits use the same Energy Monitor, the same voltage harness and the same two 50 A branch CTs for ports 3 and 4. They differ only in the main sensors for ports 1 and 2.

	Split-core CT kit	Flexible (Rogowski) kit
Main sensors	Two 200 A split-core CTs	Two flexible Rogowski coils, each with an integrator
Extra parts	None	One 12 V sensor power supply and Wago lever connectors
Use it when	The CTs close fully around the service or feeder conductors	Split-core CTs won't fit, for example most meter-mains and tight gutters
Where it's covered	Install	Install and Flexible (Rogowski) sensors



How to read this guide

- Steps that are the same for both kits are written once.
- Where the kits differ, the step has two labelled blocks: **Split-core CT kit** and **Flexible (Rogowski) kit**. Follow the one that matches the box.
- Danger, warning, note and tip boxes carry the safety and field lessons. Read them.
- Site layouts (solar, battery, subpanel, two monitors) are in Wiring diagrams. Pick your case before you go.

Terms used

Term	Meaning
EM	The NeoCharge Energy Monitor
EMS	Energy management system: the Energy Monitor plus the Autel, paired in the NeoCharge app
CT 1–4	The sensor on port 1–4 of the monitor. CT 1 and CT 2 are the mains
Autel	The Autel EV charger used for EMS installs
Installer PIN	The 6-digit PIN on the back label of the Energy Monitor. It locks the panel rating

Term	Meaning
Charger PIN	The Autel's own PIN, in the Autel Quick Start booklet. It is not the installer PIN
Panel rating	The breaker the EMS protects: the main breaker (main panel) or the feeder breaker (subpanel)

Revision

This is **Rev 006, 2026-11-09**. The PDF is the controlled copy. Always use the latest revision from NeoCharge; printed copies may be out of date.

01 Safety information

⚠ This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

> ⚠ **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

> ⚠ **WARNING**
>
> The NeoCharge Energy Monitor requires installing transformers inside a home's electrical panel and working around dangerous voltage that could lead to injury or death. The installation should be performed by a skilled person, such as a licensed electrician or other qualified professional, in accordance with the regional electrical code where it is being installed.
>
> Improper installation or use of the equipment can be dangerous or even fatal. In no event shall NeoCharge be liable to you or any third party for any damages, either direct or indirect, arising from or related to any personal injury as a result of your failure to follow the safety information and instructions in this Installation Guide.

Warnings

⚠ WARNING

- Remove power from the electrical panel before inspecting. Wear protective eyewear and protective gloves before attempting to inspect the NeoCharge Energy Monitor system. Ensure no wiring for voltage measurement, current measurement, power, or data is frayed or has exposed conductors. Ensure there are no cracks, breaks, or other defects in the enclosure of the Energy Monitor, the CT clamps, the Rogowski coil sensors, the integrators, or the sensor power supply.
- If you believe any of the NeoCharge Energy Monitor components may have been damaged, do not attempt to use them. Contact support at support@getneocharge.com immediately.
- Do not use the NeoCharge Energy Monitor in any manner other than specified in this installation guide; otherwise, the protection provided by the equipment may be impaired.
- Do not attempt to open, disassemble, or repair any of the components of the NeoCharge Energy Monitor.
- Do not install the NeoCharge Energy Monitor in environments with explosive gas or vapors; nor in damp or wet environments; nor in direct sunlight; nor where temperatures are consistently below -40° F (-40° C) or above 122° F (50° C); nor where relative humidity consistently exceeds 90% (non-condensing).
- Ensure the NeoCharge Energy Monitor does not have power during any handling, including installation and disassembly.
- Do not perform any maintenance, service, or cleaning of the NeoCharge Energy Monitor after installation. Contact customer service for support.
- The NeoCharge Energy Monitor should only be used with the provided energy-monitoring current sensors (Rogowski coil sensors and CTs) and the provided sensor power supply.
- Basic Insulation: Use current sensors only on insulated conductors, secured from contacting live parts.
- Do not cut, shorten, splice, or extend the CT leads, the Rogowski coil, the integrator signal cable, or the 12V power cables. These are calibrated sensor components.
- To reduce the risk of electric shock, always open or disconnect circuits from the power-distribution system (or service) of a building before installing or servicing current sensors.
- The NeoCharge Energy Monitor should be wired to power using 16AWG, 600V, UL1015, 105° C (or higher) copper-only wires
- It is recommended that the NeoCharge Energy Monitor be wired to the breaker closest to the device.
- Do not position the NeoCharge Energy Monitor so that it is difficult to operate the disconnecting devices or breakers.
- Do not use 3rd-party accessories, current transformers (CTs), Rogowski coil sensors, integrators, or power supplies with the NeoCharge Energy Monitor. The NeoCharge Energy Monitor, its sensors, and its sensor power supply are customized and integrated. Third-party accessories may compromise the data accuracy and equipment safety.
- The current transformers may not be installed in equipment where they exceed 75 percent of the wiring space of any cross-sectional area within the equipment.
- Restrict the installation of current transformers in an area where it would block ventilation openings.
- Restrict the installation of current transformers in an area of breaker arc venting. Do not install the NeoCharge Energy Monitor in any area where breaker arc venting exhaust gases could be redirected as a result of submetering equipment installation.
- The NeoCharge Energy Monitor is not suitable for Class 2 wiring methods and is not intended for connection to Class 2 equipment. (Refer to NEC 2023, Section 725.)

- Secure current transformers and route conductors so that the conductors do not directly contact live terminals or buses.
- The NeoCharge Energy Monitor shall not be mounted within 50.8 mm (2 in) of any live parts, including primary conductors, primary terminals, and primary lugs, but excluding insulated cables. It's acceptable for the NeoCharge Energy Monitor to be mounted to the grounded panel box and near the neutral bus bar for installation. The NeoCharge Energy Monitor employs Class I wiring, allowing its wires to safely coexist with all other wires in the panel.
- If the NeoCharge Energy Monitor is attached to the enclosure, it shall not contact the panel interior insulation, such as the material that separates the GND and LIVE bus bars.
- NeoCharge Energy Monitor mounting provisions shall not be attached to any energized part.
- Voltage sensing and power supply connections to the primary voltage shall have overcurrent protection through connection to a breaker/MCB.

Service mains stay energized

DANGER: The service mains are energized! Turning off the main breaker shuts off power to the home's circuits, but the service conductors and line-side lugs stay live. Treat them as energized for the whole install.

Need help? help.getneocharge.com · support@getneocharge.com · +1 888 944 5581

02 Before you go

A checklist for the electrician or installer, so the EMS is completely set up for the homeowner.

Scope the job

- [ ] **Pick the site case** in Wiring diagrams: no solar, solar, battery, subpanel or two monitors. The case decides where the monitor and every sensor go.
- [ ] **Find the breaker the EMS protects.** CT 1 and CT 2 clamp both hots of that breaker, just above or just below it, with nothing tapped in between.
  - EM in the main panel: the main breaker. The app setting is Main panel.
  - EM in a subpanel: the feeder breaker for that subpanel. The app setting is Subpanel.
- [ ] **Confirm the Autel circuit is downstream of CT 1–2.** CT 3 and CT 4 must both sit downstream of the mains. If the Autel isn't downstream, the EMS can't protect the panel.
- [ ] **Check that the main sensors will fit.** Look at the panel photos for meter-mains, 4-pole service disconnects, alternating conductors or tight gutters. If split-core CTs won't close around the conductors, the job needs the flexible kit. See Flexible (Rogowski) sensors.
- [ ] **Check whether two monitors are needed.** If load management is needed on a panel other than the one the Autel is on, the job needs two Energy Monitors. See cases B1 and B2. Scope the project and make sure all required equipment is on hand.
- [ ] **Line-side (supply-side) tap solar or battery?** That is case A10. The mains go below the tap, between the tap and the main breaker. CT 3 never goes on the tap.
- [ ] **Budget 20 minutes for software configuration.** The Autel firmware update can take 5–10 minutes of that.
- [ ] **Plan for the homeowner.** Setup runs on the homeowner's phone and their accounts. They need the NeoCharge app, the Autel Charge app and their home Wi-Fi password.

Stock the truck

- [ ] 50 A 2-pole breaker for the Autel (or as scoped)
- [ ] Breaker for the Energy Monitor supply: two vertically adjacent single-pole breakers or one 2-pole breaker. 15 A is typical. Alternatively, splice into an existing breaker if there is no room for additional breakers. See Wire power to the monitor.
- [ ] EMT and fittings
- [ ] 1″ and ¾″ knockout reducers
- [ ] Wire nuts or Wago lever connectors listed for the conductors you'll join, and 16 AWG copper splicing wire
- [ ] Zip ties
- [ ] Insulated gloves, protective eyewear, a Phillips screwdriver and a work light



On arrival: check the equipment

- [ ] Open the Energy Monitor box and check the contents against What's in the box. If anything is missing or damaged, call NeoCharge before you start.
- [ ] **Photograph the Energy Monitor back label** (serial number and installer PIN) before anything goes in the panel. See Step 1.
- [ ] Check the Wi-Fi signal at the panel with a phone. The monitor and the Autel use **2.4 GHz** Wi-Fi. If the signal is weak, plan for Ethernet or a Wi-Fi extender.

Start the Autel firmware first

The Autel firmware update takes 5–10 minutes. Start it before any panel work and install the Energy Monitor while it runs.

1. Install the Autel and **set its rotary dial to the charger circuit** (for example, 40 A on a 50 A breaker) **before you close the cover and mount it**.
2. Power the Autel on.
3. On the homeowner's phone, open the **Autel Charge** app, add the charger over Bluetooth and join it to the home 2.4 GHz Wi-Fi.
4. Check the firmware version and start the update. The charger needs to be on **firmware version 1.36 or later**.

Full steps, including the factory reset that follows the update, are in EMS setup, Step 2.

> **Don't turn off the main breaker while the Autel is updating.** Use the time to unbox the monitor, photograph the back label and plan placement. If the update is still running when you're ready to kill the main, wait for it to finish.

> If the Autel app says **"the device serial number and PIN do not match"**, call Autel Customer Support at **1 (844) 765-0150** from site with the charger serial number. Autel gives you the correct PIN. Then remove the charger from the app and add it again.

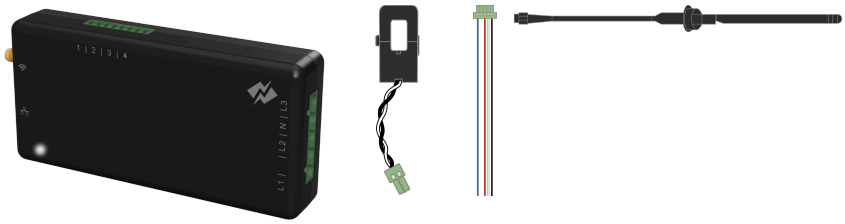
03 What's in the box

If anything is missing or damaged, contact NeoCharge support before you start: +1 888 944 5581, support@getneocharge.com.

Box contents

Both kits include:

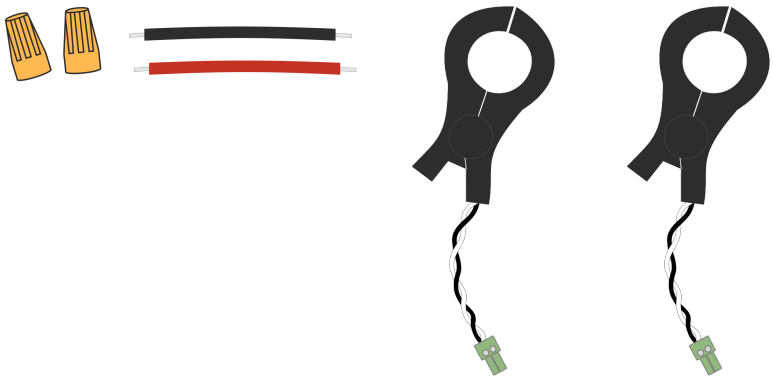
- NeoCharge Energy Monitor, with the back-label card (serial number and installer PIN)
- Two branch 50 A current transformers (CTs) with 22 AWG leads and screw-terminal plugs, for ports 3 and 4
- Voltage harness: 7.6 mm screw-terminal plug with four 16 AWG leads (black L1, red L2, white N, blue L3)
- Wi-Fi antenna assembly with knockout plug



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Also in the box:

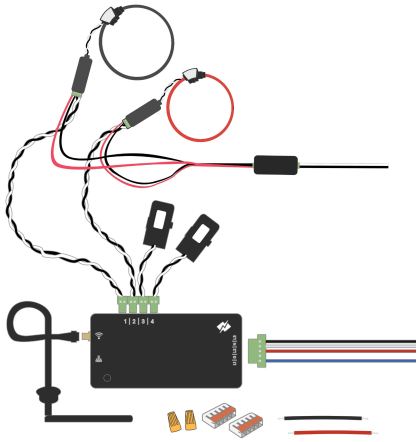
- Two main 200 A split-core CTs with 22 AWG leads and screw-terminal plugs, for ports 1 and 2
- Wire nuts and splicing wires



FLEXIBLE (ROGOWSKI) KIT

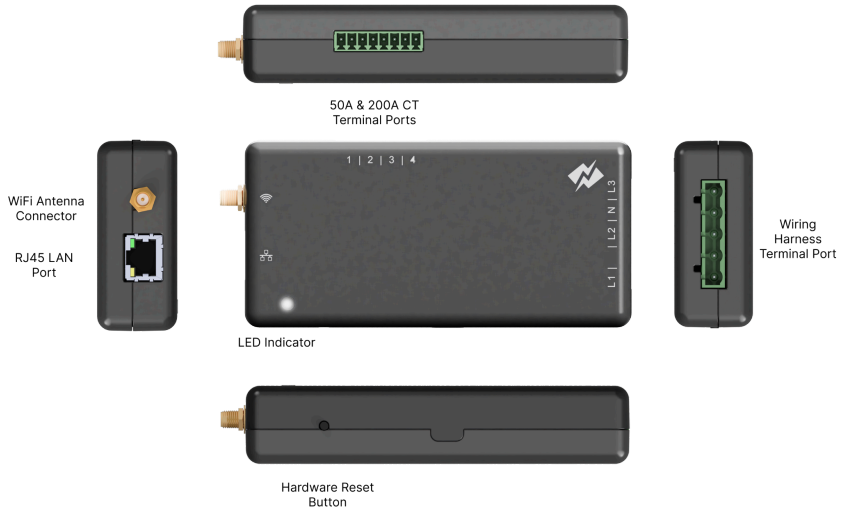
Also in the box:

- Two flexible Rogowski coils, each with an integrator and a twisted signal cable, for ports 1 and 2
- One 12 V sensor power supply: black and red 12 V output split to two signal wires (each with a 4-pin plug for an integrator and a 2-pin plug for port 1 or 2), and a black + white AC input (black to L1, white to L2)
- Two 5-port Wago lever connectors, two wire nuts, and black and red splicing wires



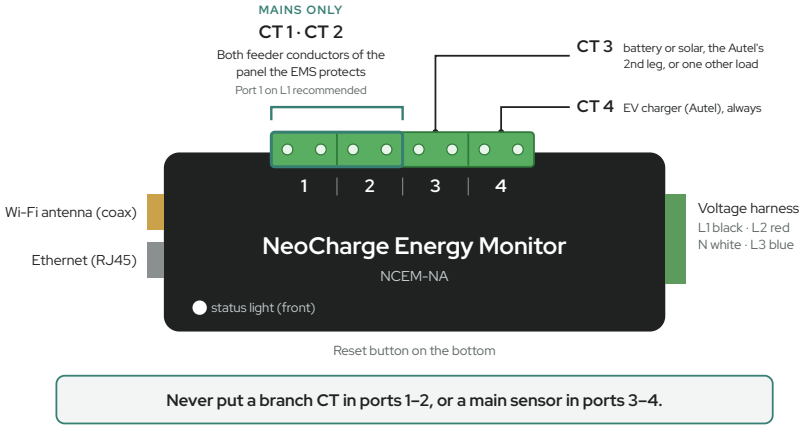
Use production kits only: the harness, power supply and integrators as shipped. Don't mix in parts from sample kits. More in Flexible (Rogowski) sensors.

Monitor connections



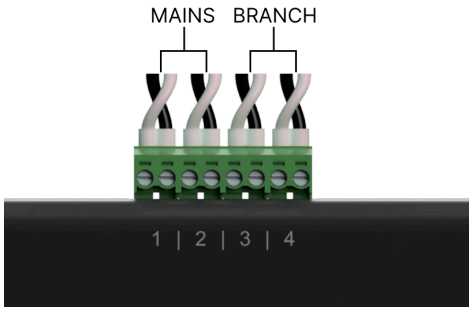
- **Top:** four sensor ports, numbered 1, 2, 3, 4.
- **Right side:** the voltage harness port (L1, L2, N, L3).
- **Left side:** the Wi-Fi antenna coax connector and the RJ45 Ethernet port.
- **Front:** the status light. See Status light.
- **Bottom:** the hardware reset button.

Port map

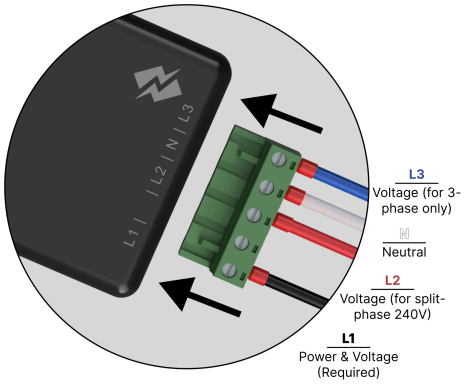


Port	Sensor	Goes on
1	Main sensor (200 A CT or flex coil via integrator)	L1 of the breaker the EMS protects (L1 recommended, not required)
2	Main sensor (200 A CT or flex coil via integrator)	L2 of the same breaker
3	Branch 50 A CT	A battery or solar line, the Autel's second leg, or one other load
4	Branch 50 A CT	The EV charger (Autel), always

Ports 1 and 2 are mains only. The app enforces this. Never put a branch CT in port 1 or 2, or a main sensor in port 3 or 4. On one early install the swap made the charger read as the mains; the EMS paused charging every minute and it took a revisit to fix.



Voltage harness



Lead	Role	Connect to
Black (L1)	Powers the monitor and gives the voltage reference for phase A	Required on every install. A breaker pole
Red (L2)	Voltage reference for phase B (split-phase 240 V)	The other pole: the stacked breaker directly above or below, or the second pole of a 2-pole breaker. Leave it off only on a single-phase 120 V service
White (N)	Neutral	Required on every install. The neutral bus bar (except on an AFCI/GFCI breaker, see Step 5)
Blue (L3)	Third phase, or battery direction reference	3-phase 208Y/120 V: the third phase. Split-phase: splice to L1 **only when CT 3 monitors a battery**. Otherwise cap it

The Energy Monitor is Class II (double-insulated) and doesn't need a ground wire, so one slot on the voltage harness plug is empty.

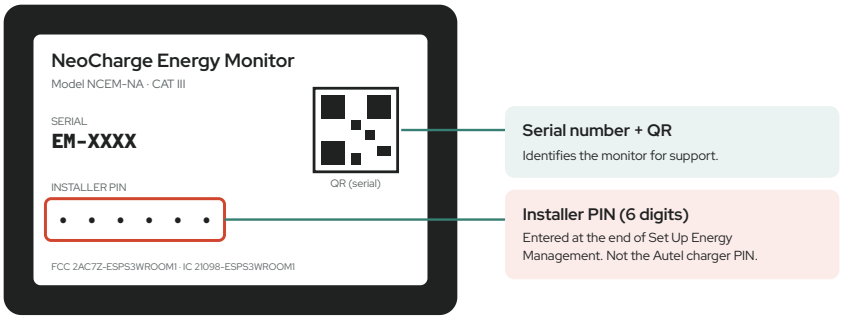
> L2 and L3 are voltage sensing only. Connect them to hot (line) conductors only, never to neutral.

04 Install the Energy Monitor

This is Step 3 of the EMS setup. Start the Autel firmware update first (see Before you go) and do this install while it runs.

Before you start, pick the site case in Wiring diagrams. It shows where the monitor and every sensor go for that site.

Step 1: Photograph the back label

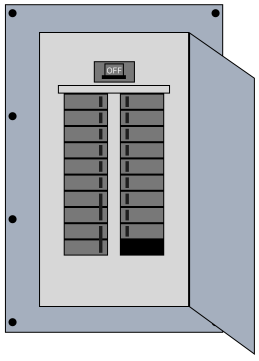


Photograph this label before the monitor goes in the panel.

1. Before the monitor goes in the panel, photograph its back label on the homeowner's phone. The label has the serial number and the 6-digit **installer PIN**.
2. Keep the photo. You enter the PIN at the end of Set Up Energy Management, and it's one of the required closeout photos.

> The installer PIN is not the Autel charger PIN. The charger PIN is in the Autel Quick Start booklet.

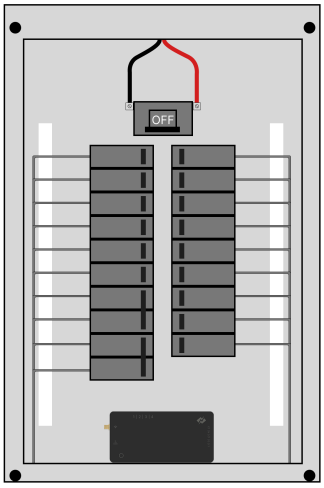
Step 2: Turn off the main breaker and remove the cover



1. Confirm the Autel firmware update has finished, or isn't due to start.
2. Turn off the service disconnect and/or main breakers feeding the panel. The disconnect may be outside this panel.
3. Remove the cover screws and the cover.

DANGER: The service mains are energized! They stay live with the main breaker off.

Step 3: Mount the monitor



1. Mount the monitor in **the panel whose load it manages**. That is usually the panel the Autel breaker is in, and it can be a subpanel.
2. Keep it at least **50.8 mm (2 in)** from live parts: primary conductors, primary terminals and primary lugs. Insulated cables are fine.
3. Mounting it to the grounded enclosure near the neutral bar is fine. Don't let it touch the panel's interior insulation, and never attach it to an energized part.
4. Leave the side ports reachable until the harness and antenna are connected.

SPLIT-CORE CT KIT

Nothing else mounts in the panel.

FLEXIBLE (ROGOWSKI) KIT

Also plan space for the **sensor power supply** and the **two integrators**, inside the panel near the monitor, with the same 2 in (50.8 mm) clearance from live parts. See Mount the power supply and integrators.

Step 4: Plug in the voltage harness

1. Push the harness's green screw-terminal plug into the port on the right side of the monitor until it clicks.
2. The 16 AWG harness leads can be cut to length to reduce clutter. (This applies to the voltage harness only. Never cut sensor leads.)

Lead roles are in the harness table. In short: black L1 and white N on every install, red L2 on split-phase, and blue L3 spliced to L1 when CT 3 monitors a battery (or on the third phase of a 3-phase service). Otherwise cap blue.

Step 5: Wire power to the monitor

The monitor draws less than 50 mA. With the flexible kit, the monitor and sensor power supply together draw less than 1.5 A.

Pick a supply breaker:

- Two vertically adjacent (stacked) single-pole breakers, or one 2-pole breaker, so L1 and L2 are on opposite legs.
- An empty breaker or a splice into an in-use breaker are both fine.
- Any rating works if the splice wire gauge matches the circuit wire and meets code. 15 A is typical.
- Wire to the breaker closest to the monitor where you can.

Then wire it one of three ways.

Battery on CT 3? Blue L3 joins the black L1.

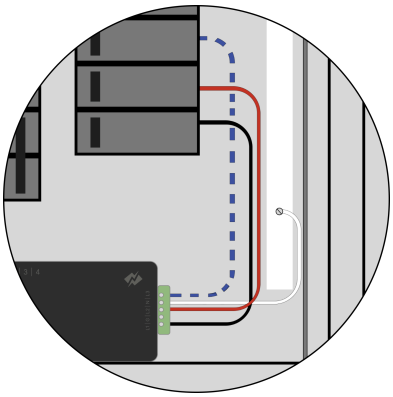
If CT 3 monitors a battery, splice blue (L3) to black (L1) in the same L1 connection, on the same breaker. L3 is CT 3's voltage reference: without it, the monitor can't tell the battery charging from discharging. Each of 5a, 5b and 5c below shows where L3 goes.

- **Main use, battery on CT 3:** splice L3 to L1.
- **Only other use, 3-phase 208Y/120 V:** land L3 on the third phase.
- **Anything else:** cap L3.

5a. Empty breakers

SPLIT-CORE CT KIT

1. Land white (N) on the neutral bus bar.
2. Turn off the two stacked breakers (or the 2-pole). Land black (L1) on one pole and red (L2) on the other.
3. **Blue (L3):**
   - **Battery on CT 3:** join black (L1), blue (L3) and a splicing wire with a wire nut. Land the splicing wire on the L1 pole in place of black.
   - **3-phase:** land blue on the third phase (Blue L3).
   - **Otherwise:** cap blue.

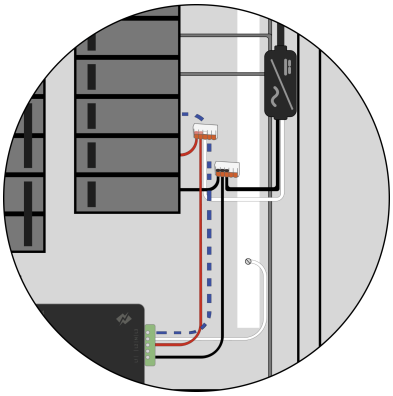


FLEXIBLE (ROGOWSKI) KIT

1. Land white (N) on the neutral bus bar.
2. Turn off the two stacked breakers (or the 2-pole).
3. Join black (L1), the power supply's **black** input lead and a splicing wire in a 5-port Wago. Land the splicing wire on the first pole.
4. Join red (L2), the power supply's **white** input lead and a splicing wire in the second 5-port Wago. Land the splicing wire on the second pole.

5. **Blue (L3):**
    - **Battery on CT 3:** put blue (L3) in a spare port of the **L1 Wago**.
    - **3-phase:** land blue on the third phase (Blue L3).
    - **Otherwise:** cap blue.

The power supply's input leads: **black to L1, white to L2**. See the harness drawing.

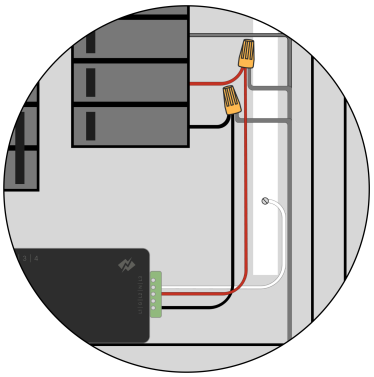


5b. Splice into in-use breakers

Most panels don't have empty breakers. Splice into two stacked in-use breakers.

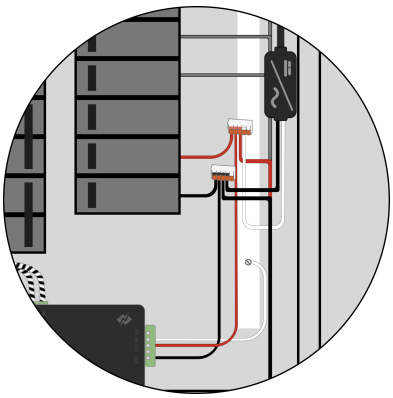
SPLIT-CORE CT KIT

1. Land white (N) on the neutral bus bar.
2. Turn off the two stacked breakers and remove their circuit wires.
3. First breaker: join the circuit wire, black (L1) and a splicing wire with a wire nut. Land the splicing wire on the breaker.
4. Second breaker: join the circuit wire, red (L2) and a splicing wire with a wire nut. Land the splicing wire on the breaker.
5. **Blue (L3):**
    - **Battery on CT 3:** add blue (L3) to the **first breaker's** wire nut, with black (L1). That nut then holds four conductors: use one listed for four.
    - **3-phase:** land blue on the third phase (Blue L3).
    - **Otherwise:** cap blue.

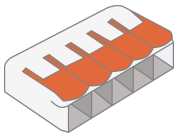


FLEXIBLE (ROGOWSKI) KIT

1. Land white (N) on the neutral bus bar.
2. Turn off the two stacked breakers and remove their circuit wires.
3. First breaker, **5-port Wago**: the splicing wire, black (L1), the power supply's black input lead and the circuit wire. One port stays spare. Land the splicing wire on the breaker.
4. Second breaker, **5-port Wago**: the splicing wire, red (L2), the power supply's white input lead and the circuit wire. One port stays spare. Land the splicing wire on the breaker.
5. **Blue (L3):**
    - **Battery on CT 3:** put blue (L3) in the spare port of the **first breaker's (L1) Wago**. All five ports are then full.
    - **3-phase:** land blue on the third phase (Blue L3).
    - **Otherwise:** cap blue.



To use a Wago: lift the levers, insert each stripped wire fully, snap the levers closed, then tug each wire to confirm it holds.



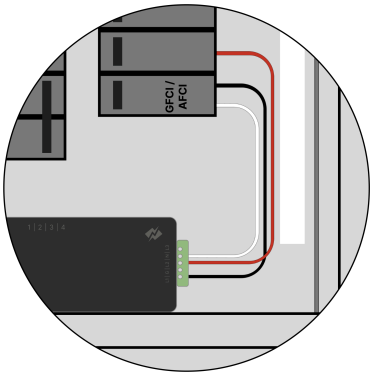
A breaker larger than 15 A is fine if the splicing wire gauge matches the existing circuit wire and meets national and regional codes.

5c. AFCI or GFCI breaker

On an AFCI/GFCI breaker, neutral lands on the breaker's neutral terminal, **not the neutral bus**.

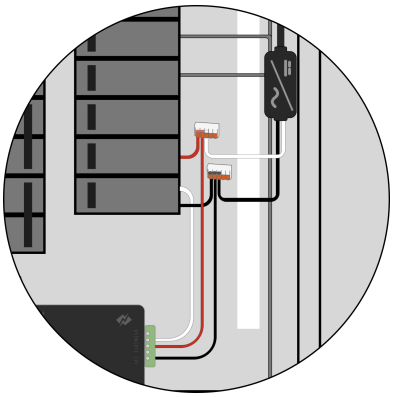
SPLIT-CORE CT KIT

1. Land black (L1) on the breaker's hot terminal.
2. Land white (N) on the breaker's neutral terminal. Not the neutral bus.
3. Land red (L2) on the adjacent single-pole breaker.
4. **Blue (L3):**
   - **Battery on CT 3:** join black (L1), blue (L3) and a splicing wire with a wire nut. Land the splicing wire on the breaker's hot terminal in place of black.
   - **3-phase:** land blue on the third phase (Blue L3).
   - **Otherwise:** cap blue.



FLEXIBLE (ROGOWSKI) KIT

1. Join black (L1), the power supply's black input lead and a splicing wire in a 5-port Wago. Land the splicing wire on the breaker's hot terminal.
2. Land white (N) on the breaker's neutral terminal. Not the neutral bus.
3. Join red (L2), the power supply's white input lead and a splicing wire in the second 5-port Wago. Land the splicing wire on the adjacent single-pole breaker.
4. **Blue (L3):**
   - **Battery on CT 3:** put blue (L3) in a spare port of the **L1 Wago** (the one on the breaker's hot terminal).
   - **3-phase:** land blue on the third phase (Blue L3).
   - **Otherwise:** cap blue.



Blue L3: battery on CT 3, or 3-phase

1. **Battery on CT 3 (the main use):** splice blue (L3) to black (L1) in the same L1 connection, on the same breaker. It is CT 3's voltage reference for reading whether the battery is charging or discharging. Split-core: add it to the L1 wire nut. Flex: use a spare port on the L1 Wago. Use a connector listed for the number of conductors.

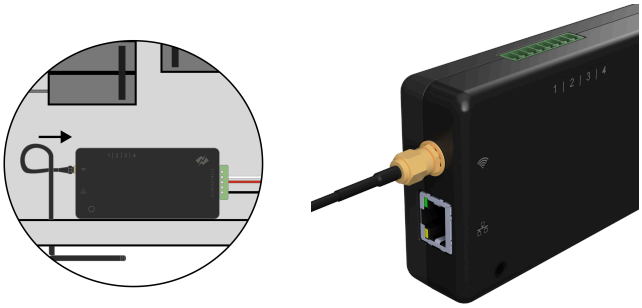
2. **3-phase 208Y/120 V (the only other use):** land blue (L3) on a third adjacent breaker pole, on the third phase.
3. **Anything else:** cap blue (L3). Solar alone never needs L3.

> **Never land blue (L3) on neutral.** L3 is voltage sensing only: hot (line) conductors only.

Step 6: Connect the internet

The monitor connects over Wi-Fi, Ethernet or both. If both are connected, it uses Ethernet. Wi-Fi is 2.4 GHz only.

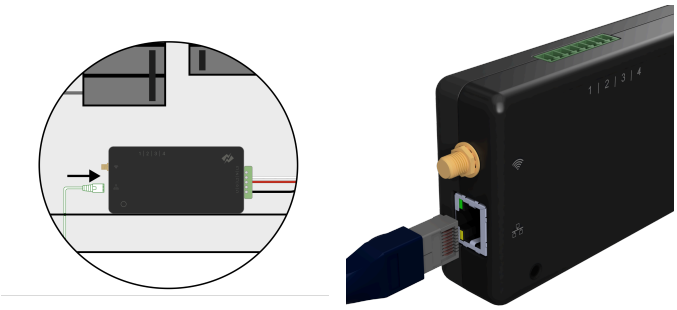
6a. Wi-Fi (most common)



1. Remove a knockout from the panel.
2. Feed the antenna through so the antenna itself is **outside the metal enclosure**. Inside a wall is fine.
3. Screw the antenna cable onto the coax connector on the left side of the monitor (marked with the Wi-Fi symbol). Make it finger-tight.
4. Seat the knockout plug on the antenna cable in the hole.

> An antenna left inside the metal panel may not reach the Wi-Fi.

6b. Ethernet



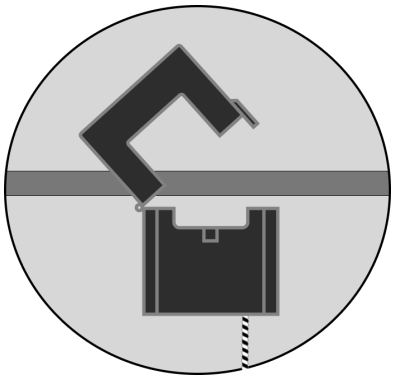
1. Run a Cat5e or better cable from the router, switch or modem to the panel.
2. Remove a knockout, feed the cable through and plug it into the RJ45 port on the left side of the monitor (marked with the Ethernet symbol).

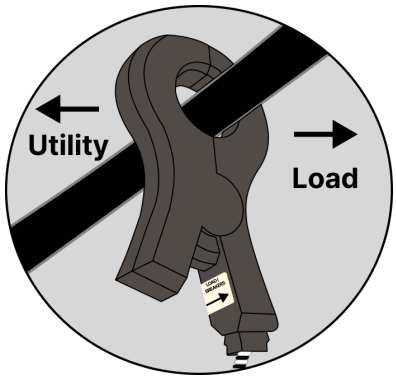
Step 7: Install the main sensors (CT 1 and CT 2)

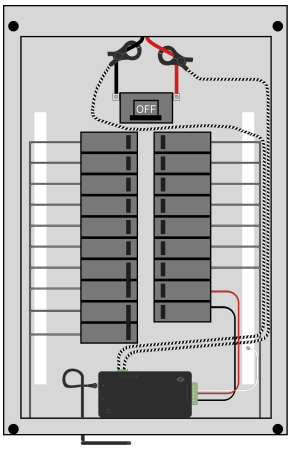
The rule: CT 1 and CT 2 clamp **both hots of the breaker the EMS protects**, just above or just below it. Nothing may be tapped in between. One sensor per hot conductor, never on the neutral.

- **Monitor in the main panel:** the main breaker. Usually the service conductors between the meter and the main breaker.
- **Monitor in a subpanel:** that subpanel's feeder conductors, at the feeder breaker or the subpanel lugs.
- **The arrow always points towards the load**, away from the utility. If CT 3 is on a battery, the battery is the load: the app shows a negative value while the battery exports.
- **CT 1 on L1 in port 1, CT 2 on L2 in port 2**, each on the same leg as the monitor's voltage lead. See Phase / leg match.
- Never clamp the mains on solar or battery conductors, a parallel feeder, or anything downstream of another breaker.

SPLIT-CORE CT KIT



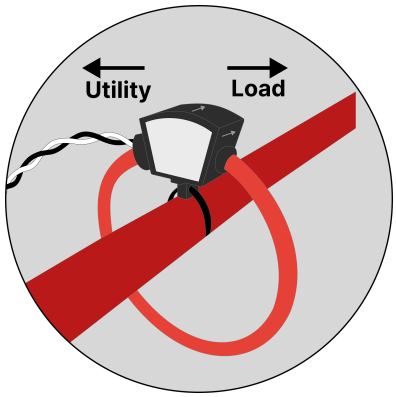


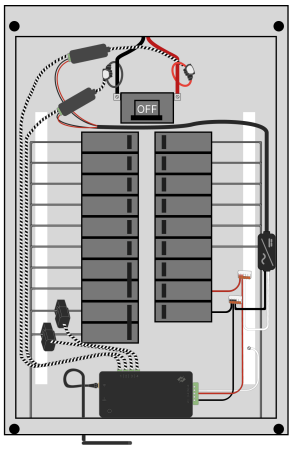


1. Open the clasp on a 200 A CT, place it around one hot conductor and snap it fully shut.
2. Turn it so the **arrow points towards the load**.
3. Repeat on the second hot conductor.
4. Plug the L1 CT into **port 1** and the L2 CT into **port 2**.

FLEXIBLE (ROGOWSKI) KIT

1. Plug a 12 V harness from the sensor power supply into each integrator.
2. Open a coil, wrap it around one hot conductor and lock the end back into the clasp.
3. Turn it so the **arrow points towards the load**.
4. Zip-tie the **coil head to the conductor**.
5. Repeat on the second hot conductor.

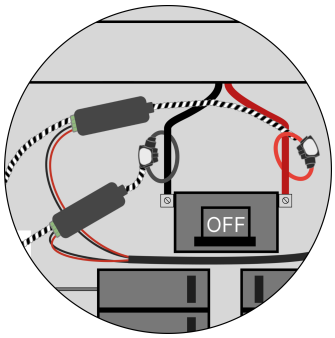


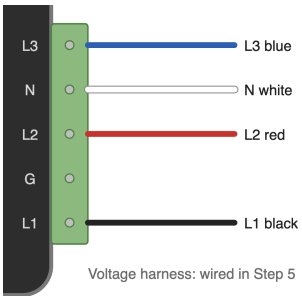


6. Plug the black coil's signal cable into **port 1** and the red coil's into **port 2**. Check each 2-pin plug: **white in the left terminal, black in the right**, looking down at the monitor. See Connect power and signal.

Full details in Flexible (Rogowski) sensors.

Phase / leg match





Each main sensor must sit on **the same leg as its voltage lead** on the monitor. A sensor on the wrong leg reads backwards even when its arrow is right, and in the data it looks exactly like a reversed sensor.

Sensor	Goes on	Plugs into	Must match the monitor's voltage lead
CT 1 (flex: black coil)	L1 conductor	Port 1	L1, black
CT 2 (flex: red coil)	L2 conductor	Port 2	L2, red

- If both service conductors are black, trace which one feeds the breaker pole the monitor's black (L1) lead lands on. That one gets CT 1.
- Never swap ports 1 and 2 to "fix" a reading. Move the sensor to the right leg.

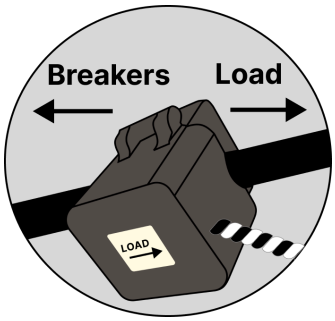
Solar or battery on site?

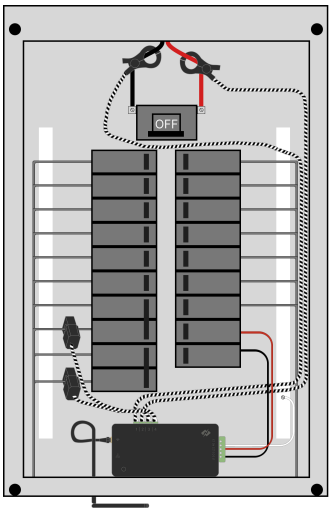
- **Breaker-fed (backfed) solar or battery in the panel:** the mains stay at the protected breaker, as above. They then read the home's net load.
- **Line-side (supply-side) tap, case A10:** the mains go **below the tap**, between the tap and the main breaker. CT 3 never goes on the tap.
- **Battery tied in between two breakers, cases A7a and A7b:** see the diagram before you clamp anything.

See Wiring diagrams for every case.

DANGER: The service mains are energized!

Step 8: Install CT 3 and CT 4



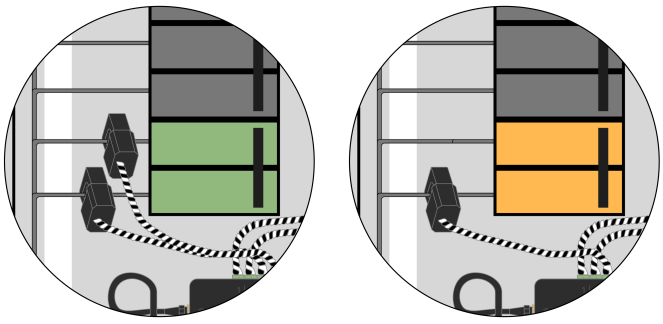


CT 4 always goes on the EV charger (Autel). CT 3 goes on one of these:

CT 3 on	When	App answer to "How are CT 3 and CT 4 installed?"
The Autel's second leg	No battery or solar to monitor, and no other load requested. The most accurate charger reading	**One 240V circuit**, then pick the Autel under "Is this your EV charger?"
A battery's L1 (black) conductor	A battery is installed. Arrow **toward the battery**: the battery is the load, and the app shows a negative value while it exports. Splice blue L3 to L1 (Step 5)	**Two different circuits**. CT 4 is the Autel
A solar inverter output	Solar only, no battery. Arrow **toward the inverter**: treat it as the load. It reads negative while producing. No L3	**Two different circuits**. CT 4 is the Autel
One other load	The homeowner wants a load such as a water heater, AC or a second EV charger monitored	**Two different circuits**. CT 4 is the Autel

1. Open the clasp on a 50 A branch CT and place it around a hot conductor (never the neutral) of the circuit. Snap it shut.
2. Turn it so the **arrow points towards the load**. On a battery or solar line, the battery or inverter is the load.
3. Plug CT 4 into **port 4** and CT 3 into **port 3**.
4. **Write down what CT 3 is on.** You enter it in the app.

- CT 3 and CT 4 must both be **downstream of CT 1–2**: the mains must carry everything CT 3 and CT 4 see.
- A CT 3 on a battery or solar line is for monitoring only. The EMS controls the Autel from CT 1–2.
- One CT on a 240 V load reads correctly only when that load is balanced, such as an EV charger. Set that circuit to **240 V** in the app. One CT on an unbalanced multi-pole load won't read accurately.



Step 9: Dress the leads

1. **Don't cut, shorten, splice or extend any sensor lead.** Coil the excess and tie it off.
2. Keep each CT's leads twisted and in their factory screw-terminal positions.
3. Route leads so they don't touch live terminals or buses, don't block ventilation openings and stay clear of breaker arc venting.
4. Keep every sensor lead inside the panel where the monitor is mounted. Never run leads between panels.

> Shortened and re-terminated leads have reversed the polarity on a live install: every channel read negative. Charging still worked, but the energy data was wrong and the EMS read import as export.

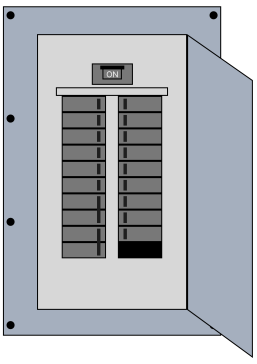
Step 10: Photograph the sensors

Before the cover goes on, take CT placement photos on the homeowner's phone:

- Wide enough to trace **each main sensor to its conductor** and **each lead to its port**.
- With every arrow or "Load" label readable.
- Leads that snake out of frame, or a plug that looks like it straddles two ports, fail review.

These are required closeout photos. See Before you leave.

Step 11: Cover on, power on



1. Finish all cabling first. Once the cover is on, the antenna connector, Ethernet port and sensor ports can't be reached.
2. Replace the cover and its screws.

3. Turn back on every breaker you turned off, then the main.
4. Check the status light within a few seconds: - **Purple with a blue blink:** powered and ready for setup. Continue. - **Orange:** the harness doesn't match the service type. Fix it now, before you leave the panel. Recheck Step 5. - **No light:** no power. Recheck the harness and the supply breaker.

Step 12: Set up the EMS

Continue with EMS setup, Step 4. Check the Autel app first: the firmware update should be finished and the factory reset done.

Two Energy Monitors (main panel + subpanel)

Some homes need two Energy Monitors. This applies only when both are true:

- The Autel circuit is in a subpanel, and
- Both the main service and the subpanel feeder need load management to stay within their ratings (the load calculation fails at both levels without it).

> If the subpanel feeder has enough calculated capacity for the charger under a standard load calculation, one Energy Monitor in the main panel is enough, even when the charger is in the subpanel. Use the standard steps and skip this section.

Install each monitor with Steps 1–11, one panel at a time. All sensors for a monitor stay inside the panel where that monitor is mounted.

Subpanel monitor

- CT 1–2 on the subpanel's feeder conductors, arrows toward the subpanel's breakers, so it measures the whole subpanel.
- CT 4 on the Autel.
- Voltage harness on breakers in the subpanel.
- App: Subpanel, rating = the feeder breaker.

Main panel monitor

- CT 1–2 on the service conductors per Step 7, including the solar and battery cases.
- CT 3 and CT 4 on other circuits in the main panel. Never on the subpanel's feeder breaker: the subpanel monitor covers the feeder.
- App: Main panel, rating = the main breaker.

Configuration

- Read each rating from the breaker label itself. The EMS enforces exactly what you enter.
- Both monitors need an internet connection. Check Wi-Fi at both panels, or run Ethernet to each.
- The charging limit is set by whichever panel has less headroom at that moment. If either monitor loses power or its connection, charging pauses after a short safety timeout.
- See cases B1 and B2. Call NeoCharge before scheduling a two-monitor job.

⚠ **WARNING:** This system supports one EV charger per branch circuit. Never connect two EV chargers to a single branch circuit. The EMS doesn't manage loads sharing one branch circuit, and doing so may overload the circuit.

05 Flexible (Rogowski) sensors

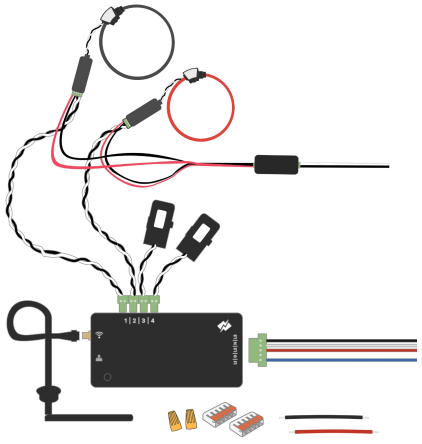
The flexible kit replaces the two 200 A split-core main CTs with two flexible Rogowski coils. Everything else (the monitor, harness, antenna and the two 50 A branch CTs on ports 3 and 4) is the same as the split-core kit. This section covers what's different. The shared steps are in Install the Energy Monitor.

When to use the flexible kit

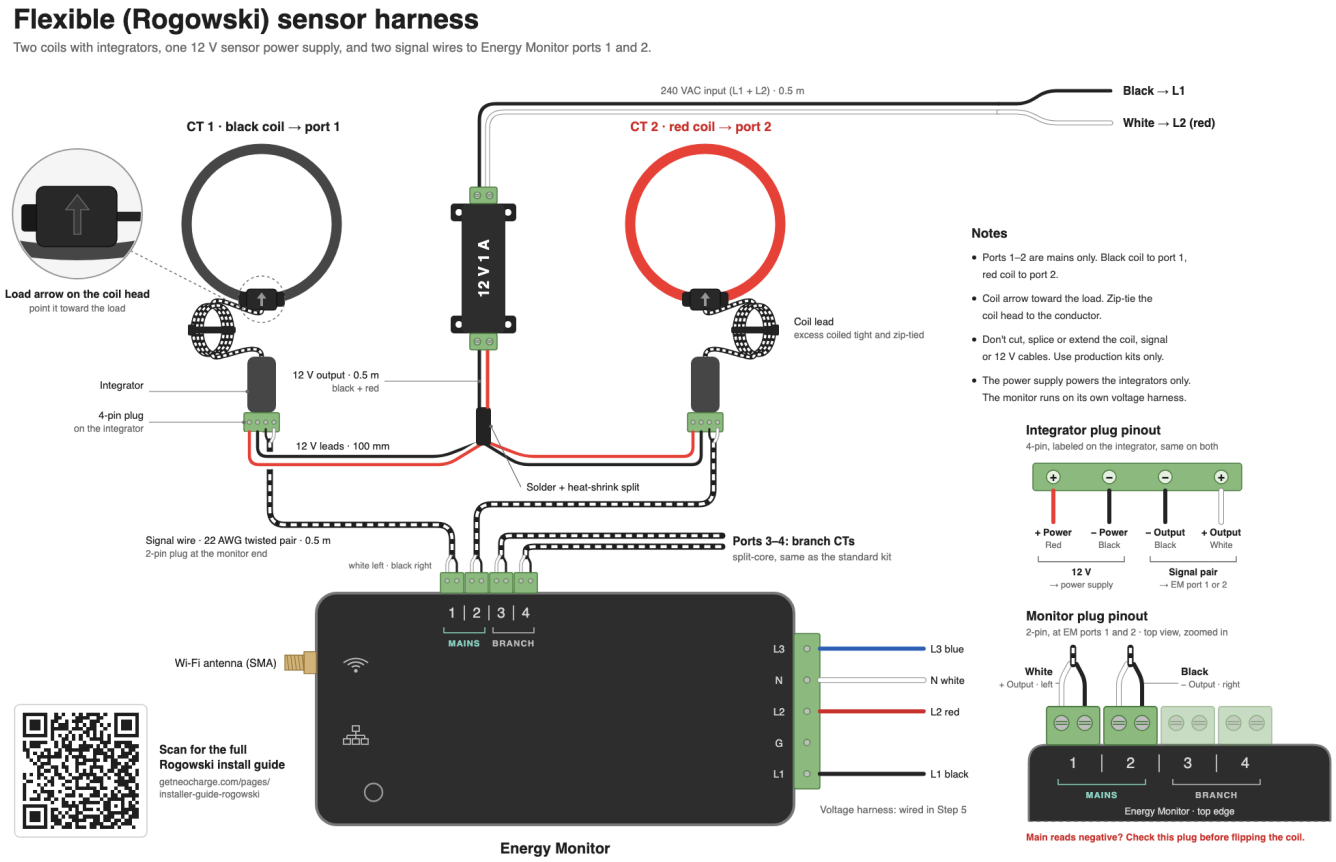
- Use it wherever split-core CTs won't close fully around the service or feeder conductors.
- Meter-mains usually need it. So do tight gutters, large or alternating conductors, and service disconnects that leave no straight run.
- Decide at scoping, from the panel photos. **Don't start a flex job until the flexible sensors are on site.**

Kit parts

Part	Qty	What it does
Flexible Rogowski coil with integrator	2	One coil per hot conductor. The integrator turns the coil signal into a reading for the monitor
Signal wire with 4-pin plug	2	Plugs into each integrator. Carries the twisted signal pair to port 1 or 2 (2-pin plug) and the 12 V red and black leads
12 V sensor power supply (Mean Well IRM-30-12ST)	1	Powers both integrators. Black and red 12 V output splits to both signal wires. Input: black to L1, white to L2
Wago lever connectors, wire nuts, splicing wire	—	Two 5-port Wagos: one for L1, one for L2



How the harness connects



- **Each 4-pin plug** goes into one integrator. It carries that coil's twisted signal pair and one red and one black 12 V lead.
- **12 V output:** one black and one red wire leave the power supply and split at a soldered, heat-shrunk joint, so each plug gets one black and one red.
- **AC input** (the other end of the power supply): black to L1, white to L2.
- **Signal pairs:** CT 1 to port 1, CT 2 to port 2. On the monitor, ports run 1 to 4.

> Use production kits only: the harness, power supply and integrators exactly as shipped. Don't mix in sample parts, and don't use any third-party coils, integrators or power supplies.

Mount the power supply and integrators

1. Plan the layout before you mount anything: the monitor, the power supply and the two integrators all go inside the panel.
2. Keep all of them at least **50.8 mm (2 in)** from live parts: primary conductors, terminals and lugs. Insulated cables are fine.
3. Put the integrators where each coil's cable reaches its integrator, and each signal cable reaches ports 1 and 2, **without strain and without cutting or extending anything**.
4. Don't mount anything to an energized part, over ventilation openings or in the path of breaker arc venting.

Wire the power supply

The power supply's AC input has two leads: **black to L1** and **white to L2**. Both land with the monitor's harness on the same two breakers. Full wiring with photos is in Step 5.

- **Black (L1):** join the black input lead with the monitor's black (L1) in the L1 Wago.
- **White (L2):** join the white input lead with the monitor's red (L2) in the L2 Wago. It never goes on the neutral bus.
- **AFCI/GFCI breaker:** black goes in the L1 Wago to the breaker's hot terminal; white goes in the L2 Wago with the monitor's red (L2) to the adjacent single-pole breaker.

The monitor and the power supply together draw less than 1.5 A.

> **Battery on CT 3? Blue L3 goes in the L1 Wago.**
>
> If CT 3 monitors a battery, the monitor's blue (L3) must connect to black (L1): put it in a spare port of the **L1 Wago**. L3 is CT 3's voltage reference: without it, the monitor can't tell the battery charging from discharging. The only other use for L3 is the third phase of a 3-phase 208Y/120 V service. Otherwise cap it. See Blue L3.

What goes in each Wago

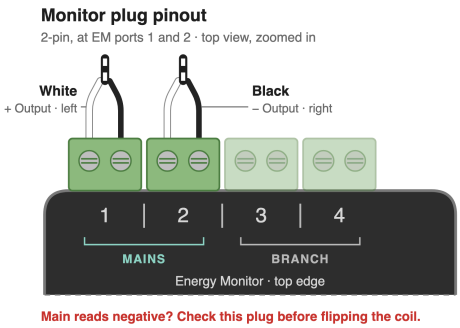
Step 5 case	L1 Wago (5-port)	L2 Wago (5-port)
5a. Empty breakers	Splicing wire to the L1 pole, black (L1), power supply black, **blue (L3) if a battery is on CT 3**	Splicing wire to the L2 pole, red (L2), power supply white
5b. Splice into in-use breakers	Splicing wire, circuit wire, black (L1), power supply black, **blue (L3) if a battery is on CT 3** (fills the last port)	Splicing wire, circuit wire, red (L2), power supply white
5c. AFCI or GFCI breaker	Splicing wire to the breaker's hot terminal, black (L1), power supply black, **blue (L3) if a battery is on CT 3**	Splicing wire to the adjacent single-pole breaker, red (L2), power supply white

White (N) never goes in a Wago: it lands on the neutral bus, or on the breaker's neutral terminal for 5c.

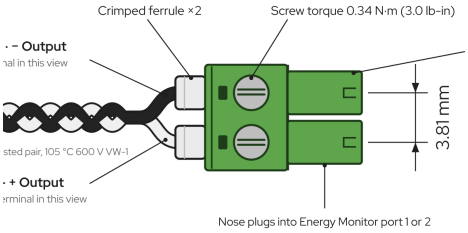
Connect power and signal

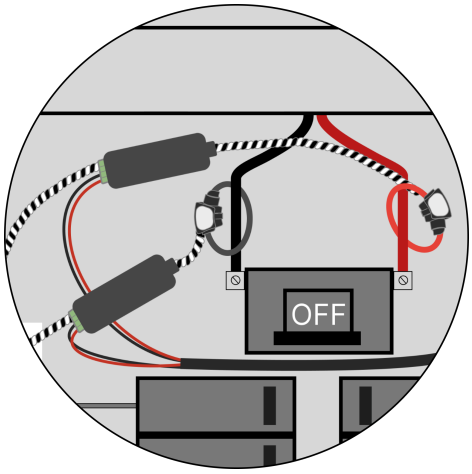
1. Plug a signal wire's **4-pin plug into each integrator**. Push it fully home and tighten the screws to 0.34 N·m (3.0 lb-in). The plug carries both the signal pair and the 12 V leads: slot 1 red (+12 V), slot 2 black (−12 V), **slot 3 black (− Output), slot 4 white (+ Output)**, as printed on the integrator.
2. Route each twisted signal pair to the monitor and plug its 2-pin plug into **port 1 (CT 1) or port 2 (CT 2)**. Ports 1 and 2 are for the mains on every install.
3. **Check the 2-pin plug polarity.** Looking down at the monitor, **white (+ Output) is in the LEFT terminal and black (− Output) in the RIGHT**. Tighten both screws to 0.34 N·m (3.0 lb-in) and tug each wire.
4. **Match each coil to its leg:** CT 1 (black coil) on the L1 conductor in port 1, CT 2 (red coil) on the L2 conductor in port 2. Each must be on the same leg as the monitor's voltage lead: L1 black, L2 red. See Phase / leg match.
5. Keep the signal cable leads twisted.

> **200A Flexible Sensor (Rogowski) kits may have the 2-pin plug wired backwards.** Please inspect and reverse the wires if needed.

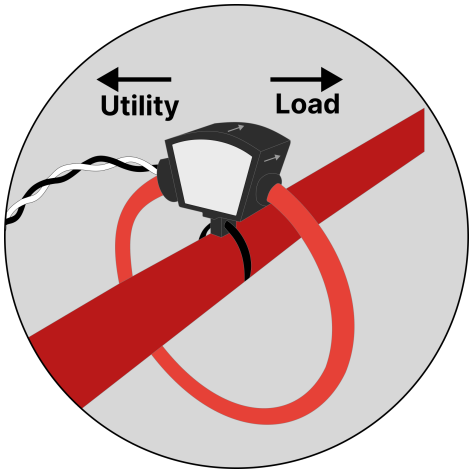


Main reads negative? Check this plug before flipping the coil.





Install the coils



1. Release the latch to open one end of the coil.
2. Wrap the coil around one **hot** service or feeder conductor. Never the neutral.
3. Lock the end back into the clasp. It must click closed: an open or half-latched coil reads low or erratic.
4. Turn the coil so **the arrow points towards the load**, away from the utility.
5. **Zip-tie the coil head to the conductor.** That keeps the coil from sliding or turning, so the arrow stays pointed towards the load.
6. Repeat on the second hot conductor.

The placement rule is the same as for split-core CTs: both hots of the breaker the EMS protects, just above or just below it, nothing tapped in between. See Step 7 and Wiring diagrams.

> **DANGER: The service mains are energized!** Wrapping a coil means working right at the live service conductors. Wear insulated gloves and eye protection.

Cabling rules

- **Don't cut, splice or extend** the coil cable, the integrator signal cable or the 12 V power cables. They are calibrated sensor components.
- Coil the excess and tie it off. Keep it away from live terminals and buses.
- Keep every cable inside the panel where the monitor is mounted.

Flex troubleshooting

Symptom	Likely cause	Fix
Both mains read zero	The power supply has no power	Check its breaker is on and both input leads are secure in the L1 and L2 Wagos
One main reads zero	That integrator's 12 V harness or signal cable isn't seated	Reseat the 12 V plug in the integrator and the signal plug in port 1 or 2
A main reads negative while the home is drawing power	In this order: the 2-pin plug is wired backwards, the coil is on the wrong leg, or the coil faces the wrong way	Check the 2-pin plug first (white left, black right), then the leg, then the arrow. Don't flip a coil until the plug and leg are checked. (With solar or a battery, rule out export first.) See Readings are negative
A main reads low or jumps around	Coil not fully latched, or the coil has slid or turned	Relatch the coil and zip-tie the coil head to the conductor
Mains read but the charger channel doesn't	CT 4 problem, not the flex kit	See Readings don't match

More symptoms are in Troubleshooting.

06 Wiring diagrams by site

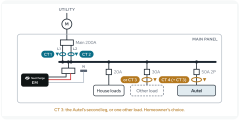
Every home in the pilot gets one new Autel. Find the case below that matches the panel layout, then follow it for sensor placement, app settings and commissioning. Any EV charger already on site is an existing load. It stays in the load calc and needs no sensor.

The diagrams are one-line drawings. Each hot conductor that carries CT 1–2 is drawn separately (L1 and L2). Branch circuits are drawn as a single line.

Diagram index

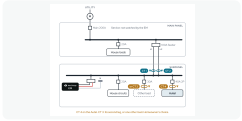
Pick the group that matches the equipment on site, then the case. Each card links to the full diagram and setup.

NO SOLAR OR BATTERY



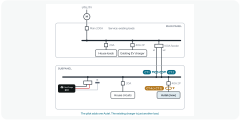
A1 Supported

Autel in the main panel



A2 Supported

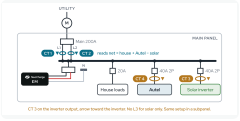
Autel in a subpanel



A8 Supported

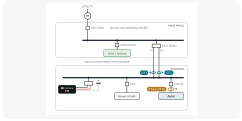
Existing EV charger + Autel in a subpanel

SOLAR, NO BATTERY



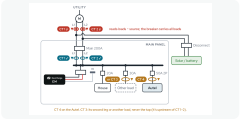
A3 Supported

Solar backfed in the Autel's panel



A4 Supported

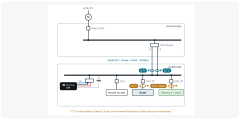
Source in the main panel, Autel in a subpanel



A10 Supported

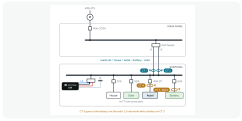
Line-side (supply-side) tap

BATTERY, WITH OR WITHOUT SOLAR



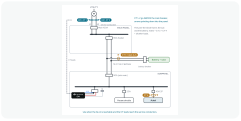
A5 Supported

Battery backfed in the Autel's panel



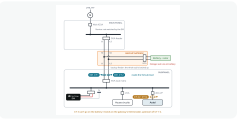
A6 Supported

Battery and solar on separate breakers



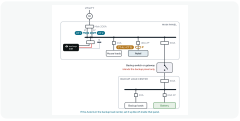
A7A Supported

Battery tie-in, mains upstream



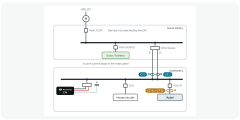
A7B Supported

Battery in a backup gateway, mains on the sub



A9 Supported

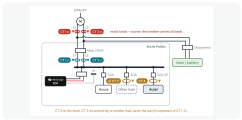
Battery in a backup panel, Autel in main



A4 Supported

Source in the main panel, Autel in a subpanel

also listed under Solar

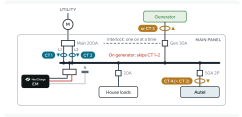


A10 Supported

Line-side (supply-side) tap

also listed under Solar

GENERATOR, BACKUP PANELS AND TWO-PANEL SITES



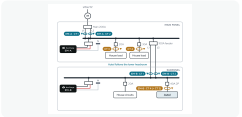
A11 Blocked

Generator via interlocked breaker



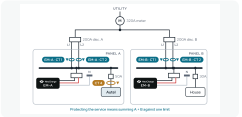
A12 Do not install

Autel in a critical-loads panel



B1 Two EMs

Service and subpanel both constrained



B2 Two EMs

Split service, two disconnects

LEGEND



Breaker (1-pole)



Utility meter



Two hot conductors, L1 and L2



CT 3 / CT 4 (branch monitoring)



Connected (dot)



Solar, battery or generator



EM power: black L1, red L2, white neutral; blue L3 spliced to L1 only when CT 3 is on a battery

Wrong or not allowed



2-pole breaker

Bus bar



CT 1 + CT 2 (EMS control), one per conductor; arrow = CT Load side faces the load



Monitor-only CT (never throttles)



Crossing, not connected (hop)



Autel EV charger

Mechanical interlock or EM CT leads



Energy Monitor, drawn in the panel where it's installed

The rules that apply to every case

1. **CT 1 and CT 2 go on both hot conductors of the breaker the EMS protects.** Clamp them just above or just below that breaker, one per leg. Nothing may be tapped in between. The EMS limit is that breaker's rating.
2. **Every CT arrow points towards the load.** Split-core CTs and flex coils alike.
3. **Ports 1–2 are mains only.** The app enforces this. Never put a branch sensor in port 1–2 or a mains sensor in port 3–4. Port 1 on L1 is recommended.
4. **CT 4 always goes on the Autel.**
5. **CT 3 is the only port for a battery or solar line.** With no source on site, CT 3 is the homeowner's choice: - the Autel's second leg (app: **One 240V circuit**), or - one other load they want to see (app: **Two different circuits**).
6. **CT 3 and CT 4 must sit downstream of CT 1–2.** The mains have to add up to at least CT 3 + CT 4 + every other load. A source that joins upstream of CT 1–2 never gets CT 3.
7. **On a battery or solar line, the battery or inverter is the load.** Point CT 3's arrow toward it. The app shows a negative value while it exports or produces.
8. **Battery on CT 3:** clamp the battery's black (L1) conductor, arrow toward the battery. Splice the EM's blue L3 onto its black L1 on the same EM breaker (splice kit). CT 3 then reads charging and discharging with opposite signs: negative when the battery discharges or exports.
9. **No battery on CT 3:** cap the blue L3. Solar alone never needs L3.

10. **EM power:** black L1 + red L2 on a 2-pole breaker (or two vertically adjacent single-pole breakers), white neutral to the neutral bar.
11. **A source inside the protected panel makes CT 1–2 read net** (loads minus the source). That is correct: it is what the protected breaker carries.
12. **The EMS limits on CT 1–2 only.** A source CT on CT 3 is for monitoring. It is never added into the control math, so it can't make up for mains sensors that miss part of the load.
13. **Commission with every source idle:** at night, with the inverter off, or with the battery set to backup-only for a few minutes. Run a test charge and confirm the sign: the mains rise by about the charger amps, with positive kW.
14. **Panel rating in the app is 100% of the protected breaker:** the main breaker for **Main panel**, the feeder breaker for **Subpanel**. The installer PIN locks it.
15. **Don't cut, shorten, splice or extend sensor leads.** Coil and tie off the excess. If the leads won't reach the conductors a case calls for, use that case's fallback or call NeoCharge install support.

> Reversed mains sensors make import look like export, so the EMS may never throttle. With a battery or solar on site, midday negative readings are normal and look exactly like reversed sensors. Always check the sign with a test charge while the sources are idle.

Find your case

Work down the questions and stop at the first one that matches.

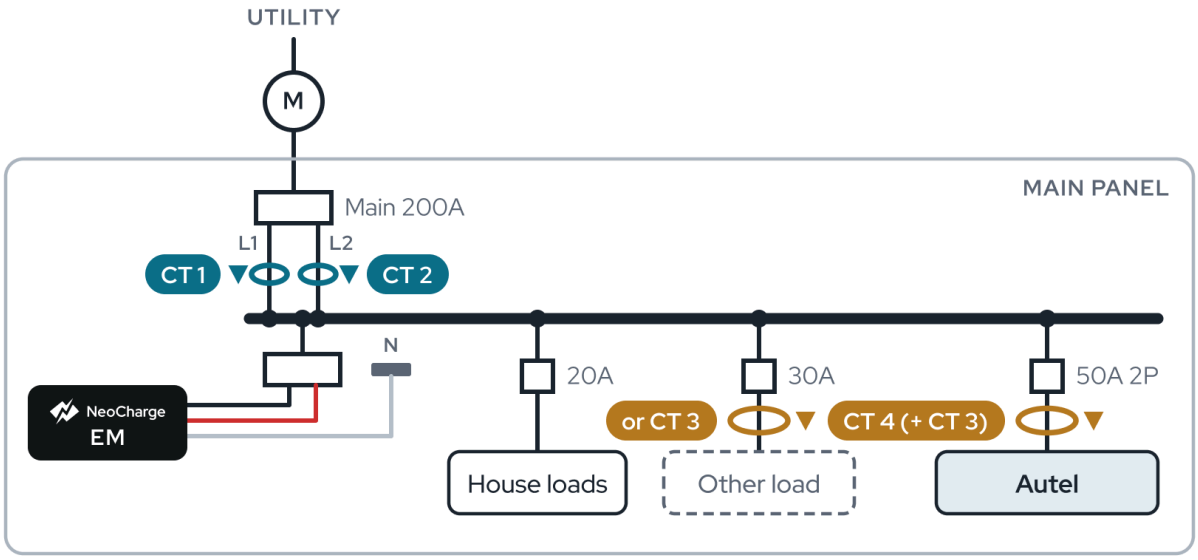
1. **Are both the service and the Autel's subpanel over their load calc?** Go to B1.
2. **Is the service split into two disconnects (for example, two 200 A) with no single main?** Go to B2.
3. **Is there a generator through an interlocked breaker?** Go to A11.
4. **Would the Autel land in a critical-loads panel fed by a hybrid inverter's backup output?** Go to A12.
5. **No solar and no battery?** - Autel in the main panel: A1. - Autel in a subpanel: A2. - An EV charger already on the main panel, Autel added in a subpanel: A8.
6. **Solar or battery on a line-side (supply-side) tap between the meter and the main breaker?** Go to A10.
7. **Solar or battery in a different panel from the Autel** (source in the main panel, Autel in a subpanel)? Go to A4.
8. **Source in the same panel as the Autel?** - Solar only: A3. - Battery (with or without solar) on one backfed breaker: A5. - Battery and solar on separate breakers: A6.
9. **Battery tied in on the feeder between two breakers** (a tap or gateway between the main panel and the Autel's subpanel)? - A backup gateway whose backup output feeds the whole subpanel: A7b. - A tap that's reachable, and the CT leads reach the service conductors above the main breaker: A7a. - Otherwise: A7b.
10. **Battery in a downstream backup load center (partial-home backup)?**
    - Autel in the main panel: A9.
    - Autel in the backup load center: set it up like A5 inside that panel.

Still no match? Stop and call NeoCharge install support at +1 888 944 5581 with photos of the meter, the main panel and every subpanel.

No solar or battery

The home has no solar and no battery. These are the most common installs.

A1: No solar, Autel in the main panel

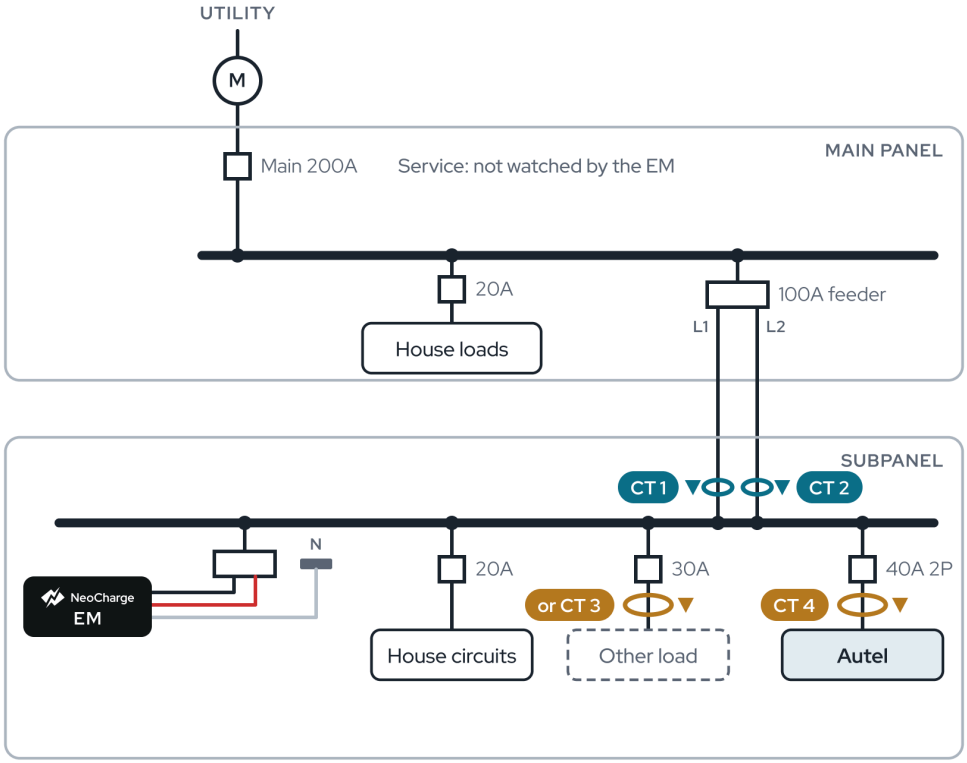


CT 3: the Autel's second leg, or one other load. Homeowner's choice.

When it applies: no solar, no battery. The Autel lands in the main panel.

- **CT 1–2:** the main breaker's load-side conductors, L1 and L2, arrows toward the bus.
- **CT 3:** the Autel's second leg, or one other load in the panel (homeowner's choice).
- **CT 4:** the Autel, one leg.
- **L3:** capped.
- **App settings: Main panel**, main breaker rating (for example 200 A). Sensors: **One 240V circuit** if CT 3 is on the Autel, **Two different circuits** if CT 3 is on another load.
- **Commissioning:** test charge. The mains rise by about the charger amps, positive kW.
- **Status:** Supported.

A2: No solar, Autel in a subpanel



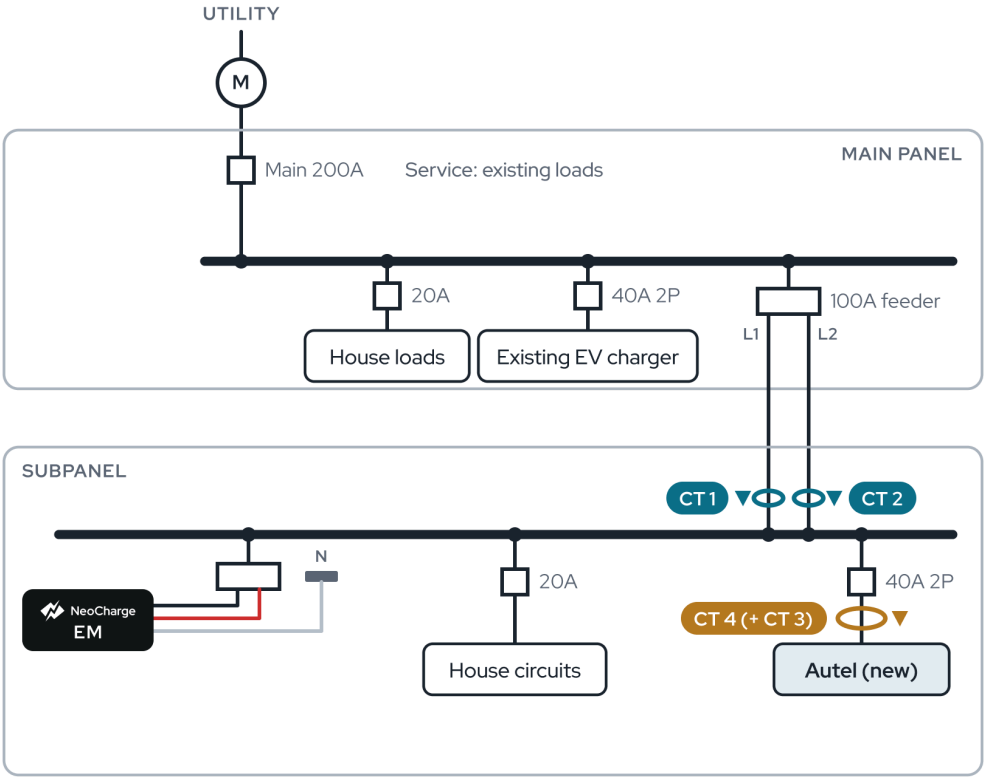
CT 4 on the Autel. CT 3: its second leg, or one other load. Homeowner's choice.

When it applies: no solar, no battery. The Autel lands in a subpanel.

- **CT 1–2:** the subpanel feeder conductors at the sub lugs, arrows toward the sub.
- **CT 3:** the Autel's second leg, or one other load in the subpanel.
- **CT 4:** the Autel.
- **L3:** capped.
- **App settings: Subpanel**, feeder breaker rating. Sensors as in A1.
- **Commissioning:** test charge, mains rise by about the charger amps.
- **Status:** Supported. The EM does not watch the service, so the service must pass a load calc on its own. If it doesn't, see B1.

Outdoor meter-main with nothing else on it. The feeder entering the interior panel carries exactly what the meter-main breaker carries. Put CT 1–2 on those feeders and use the meter-main breaker rating with **Main panel**. If the meter-main also feeds other loads or a source, the interior feeder misses them, and the service has to pass a load calc on its own. Meter-mains usually need the flex kit; see Rogowski (flex) sensors.

A8: Existing EV charger on the main panel, Autel added in a subpanel



The pilot adds one Autel. The existing charger is just another load.

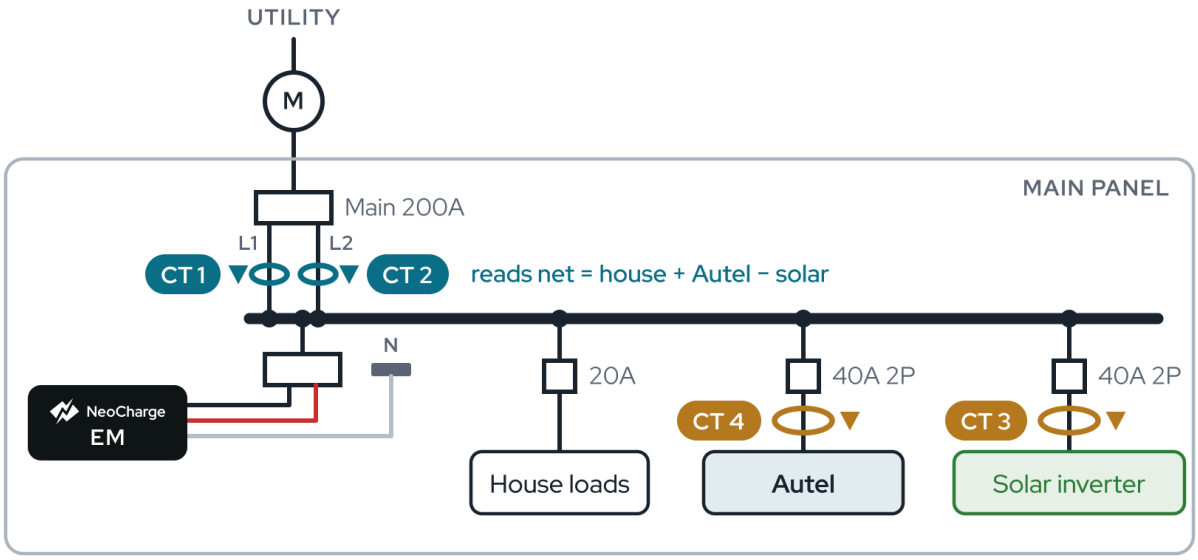
When it applies: the home already has an EV charger in the main panel and the new Autel goes in a subpanel.

- **CT 1–2:** the sub feeder at the sub lugs, arrows toward the sub.
- **CT 3:** the Autel's second leg, or another load in the subpanel.
- **CT 4:** the Autel.
- **L3:** capped.
- **App settings: Subpanel**, feeder breaker rating. Sensors as in A1.
- **Commissioning:** test charge, mains rise by about the charger amps.
- **Status:** Supported. The existing charger is part of the service load calc and needs no sensor. If the service fails the load calc with both chargers, the service is constrained too: see B1.

Solar, no battery

Solar on site, no battery. Solar never needs L3.

A3: Solar only, backfed in the Autel's panel

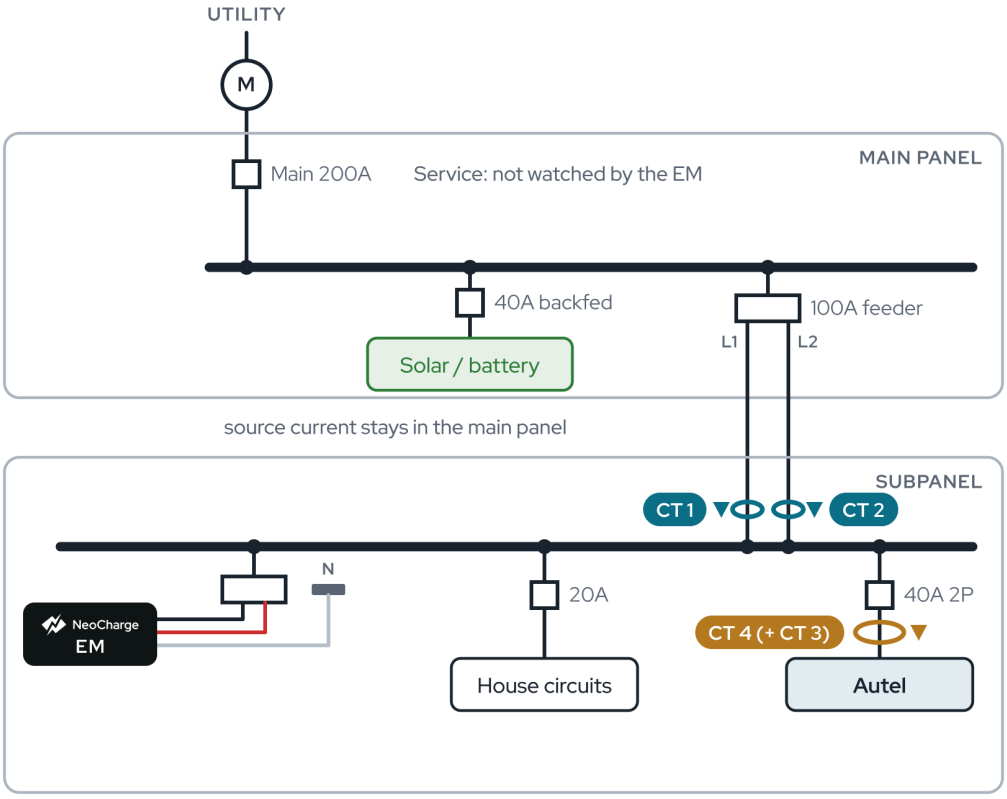


CT 3 on the inverter output, arrow toward the inverter. No L3 for solar only. Same setup in a subpanel.

When it applies: solar with no battery, on a backfed breaker in the same panel as the Autel (main panel or subpanel).

- **CT 1–2:** the protected panel's main breaker (or its feeder, if the Autel is in a subpanel), load side, arrows towards the load. They read net (loads minus solar), which is what that breaker carries.
- **CT 3:** the solar inverter output, one leg, arrow toward the inverter.
- **CT 4:** the Autel, one leg.
- **L3:** capped. Solar alone doesn't need it.
- **App settings: Main panel** or **Subpanel** with that breaker's rating. Sensors: **Two different circuits**, with CT 4 as the EV charger.
- **Commissioning:** at night or with the inverter off. Test charge, mains rise by about the charger amps.
- **Status:** Supported.

A4: Solar or battery in the main panel, Autel in a subpanel

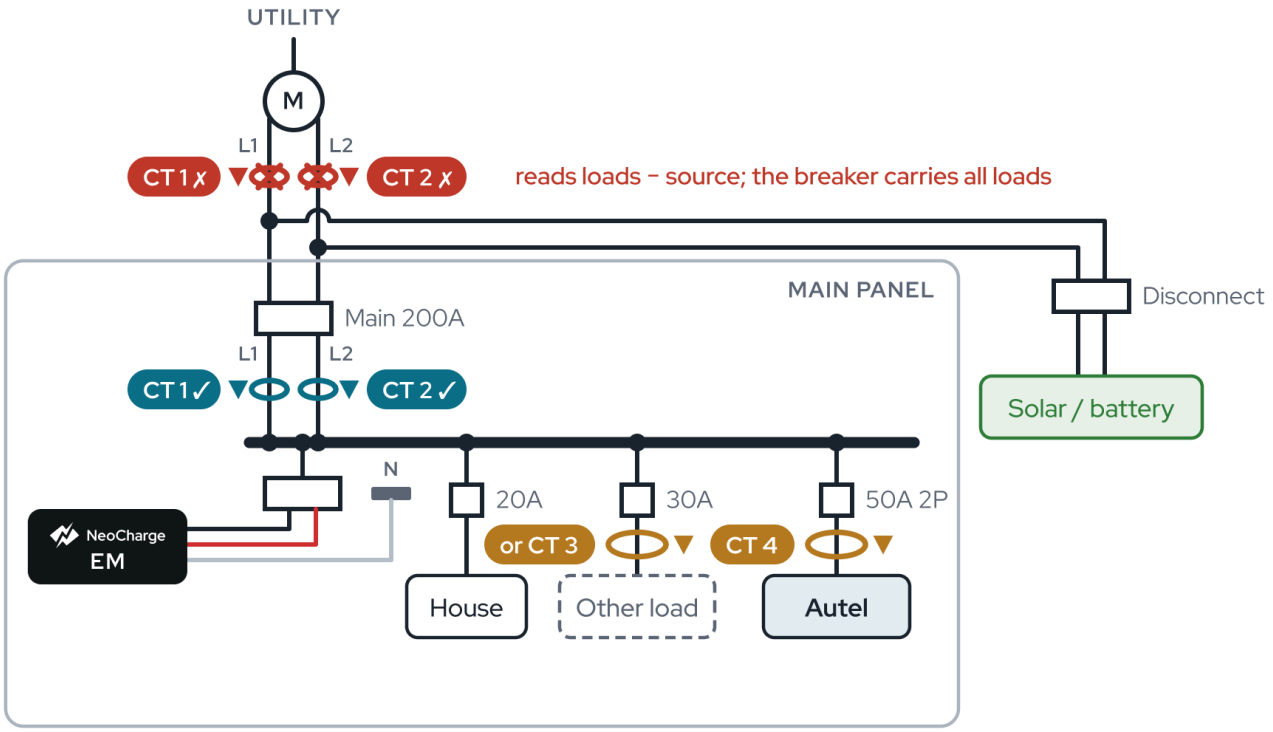


When it applies: the solar or battery is in the main panel and the Autel is in a subpanel. No source current flows through the sub feeder.

- **CT 1–2:** the sub feeder at the sub lugs, arrows toward the sub. They read the gross sub load.
- **CT 3:** the Autel's second leg, or another load in the subpanel. The source is in another panel and stays unmonitored.
- **CT 4:** the Autel.
- **L3:** capped. CT 3 can't reach the source here.
- **App settings: Subpanel**, feeder breaker rating. Sensors as in A1.
- **Commissioning:** test charge, mains rise by about the charger amps.
- **Status:** Supported. The service must pass a load calc on its own.

> With a battery and a backup device, the whole home may island in an outage. The battery's backup output is then the real limit.

A10: Solar or battery on a line-side (supply-side) tap



CT 4 on the Autel. CT 3: its second leg or another load, never the tap (it's upstream of CT 1–2).

When it applies: the solar or battery ties onto the service conductors between the meter and the main breaker, usually through its own fused disconnect. The EMS protects the service.

- **CT 1–2:** below the tap, either between the tap and the main breaker or just below the main breaker (as drawn), arrows towards the load. **Never on the service conductors above the tap.** Above the tap the sensors read loads minus the source while the main breaker carries every load, so the EMS reads low and won't protect the main.
- **CT 3:** the Autel's second leg, or another load. **Never on the tap conductors:** the tap is upstream of CT 1–2.
- **CT 4:** the Autel.
- **L3:** capped. CT 3 can't be on the battery here.
- **App settings: Main panel**, main breaker rating. Sensors as in A1.
- **Commissioning:** confirm where the tap is before you clamp anything. Then run a test charge: mains rise by about the charger amps.
- **Status:** Supported, with a placement trap.

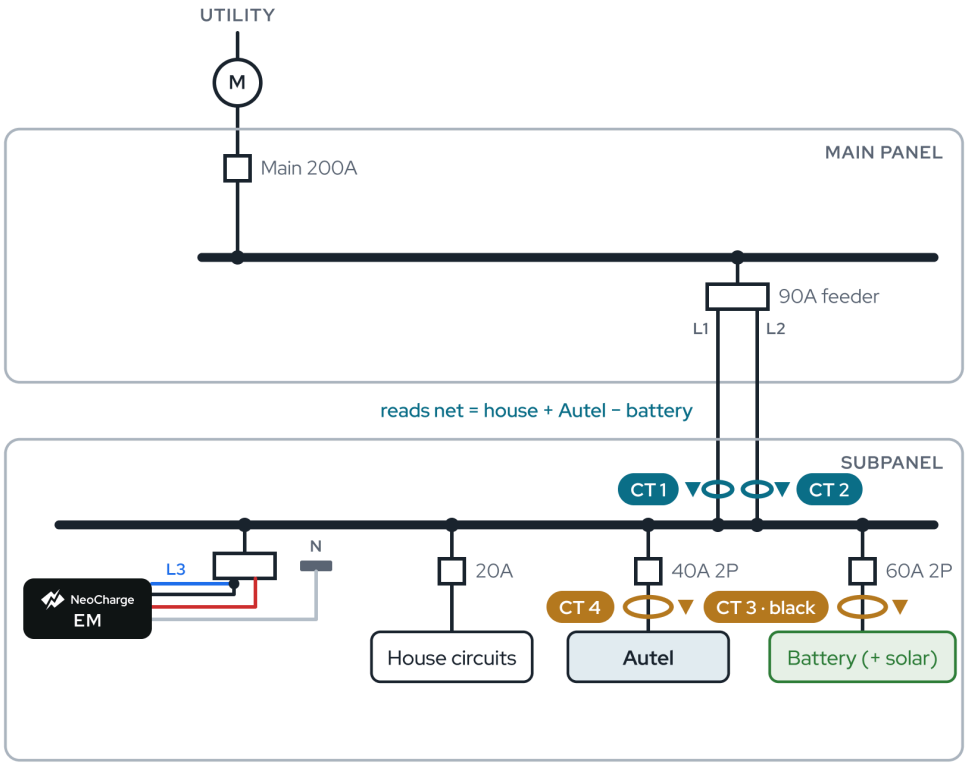
> A battery on a supply-side tap always comes with a backup device at the meter. In an outage the battery's backup output is the limit.

Battery, with or without solar

A battery is on site. CT 3 goes on the battery's black (L1) conductor with L3 spliced to L1, unless the case says otherwise.

Battery in a different panel from the Autel, or on a line-side tap: see A4 and A10. They cover solar and battery.

A5: Battery (with or without solar) backfed in the Autel's panel



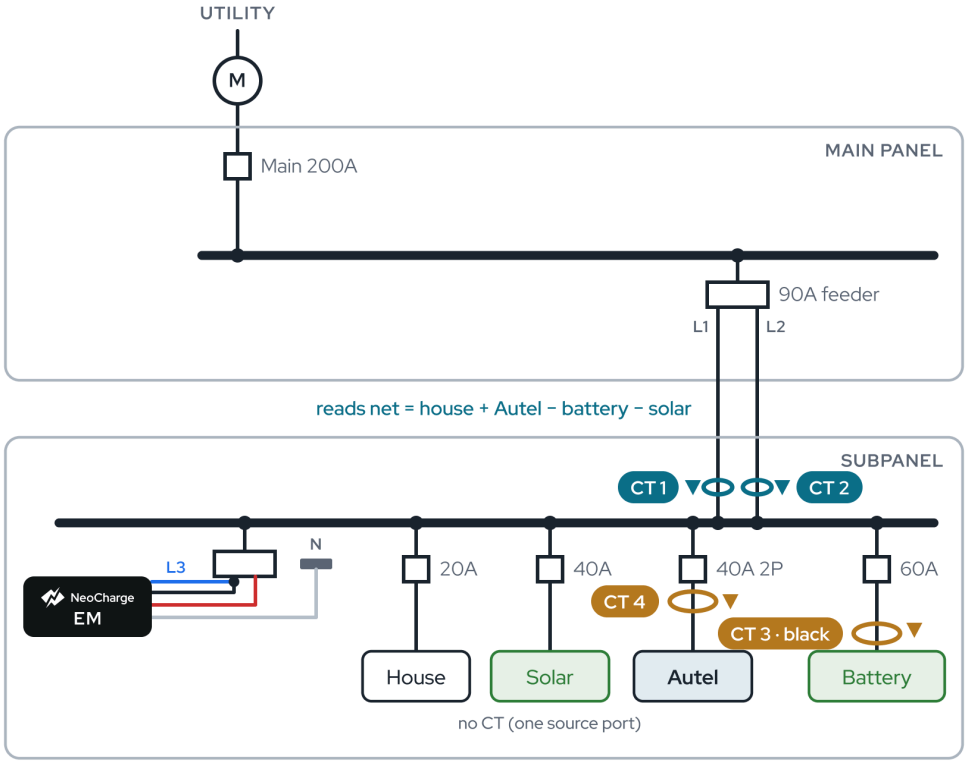
CT 3 on the battery's black (L1) leg, arrow toward the battery. Same setup in a main panel.

When it applies: a battery, with or without solar on its own inverter, on one backfed breaker in the same panel as the Autel (main panel or subpanel).

- **CT 1–2:** the protected panel's feeder (or main breaker, if the Autel is in the main panel). They read net (loads minus battery), which is what that breaker carries.
- **CT 3:** the battery breaker's black (L1) conductor, arrow toward the battery. It reads negative when the battery discharges or exports.
- **CT 4:** the Autel, one leg.
- **L3:** spliced to black L1 on the EM's breaker (splice kit).
- **App settings: Main panel** or **Subpanel** with the protected breaker's rating. Sensors: **Two different circuits**, with CT 4 as the EV charger.
- **Commissioning:** with the battery idle (at night, or set to backup-only for a few minutes). Test charge, mains rise by about the charger amps.
- **Status:** Supported.

> If a backup device sits upstream (a meter-collar backup switch or a whole-home gateway), the panel islands in an outage and the battery's backup output becomes the limit. The CT setup doesn't change.

A6: Battery and solar on separate breakers in the Autel's panel

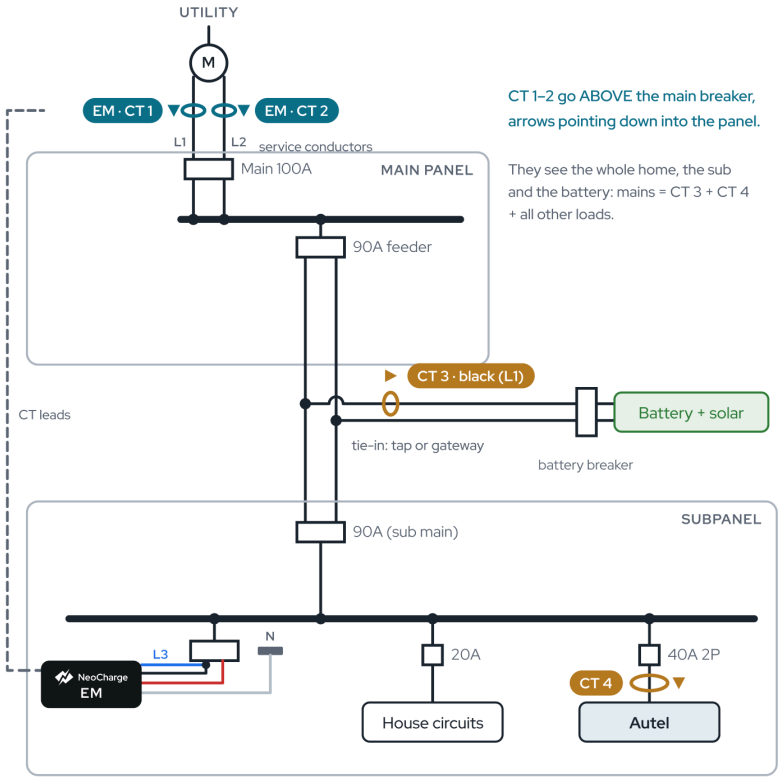


CT 3 goes on the battery, not the solar: L3 only works with a battery on CT 3.

When it applies: the battery and the solar each have their own breaker in the Autel's panel. This is common when a battery is added to existing solar. If the solar runs through the battery's own inverter (one breaker), use A5.

- **CT 1–2:** the protected panel's feeder (or main breaker). They read net (loads minus battery minus solar).
- **CT 3:** the battery breaker's black (L1) conductor, arrow toward the battery. The solar breaker gets no sensor: CT 3 is the only source port, and the battery needs it for L3.
- **CT 4:** the Autel, one leg.
- **L3:** spliced to black L1 on the EM's breaker.
- **App settings:** as A5.
- **Commissioning:** at night, or with the battery set to backup-only and the solar off. Test charge, mains rise by about the charger amps.
- **Status:** Supported.

A7a: Battery tied in between two breakers, mains upstream



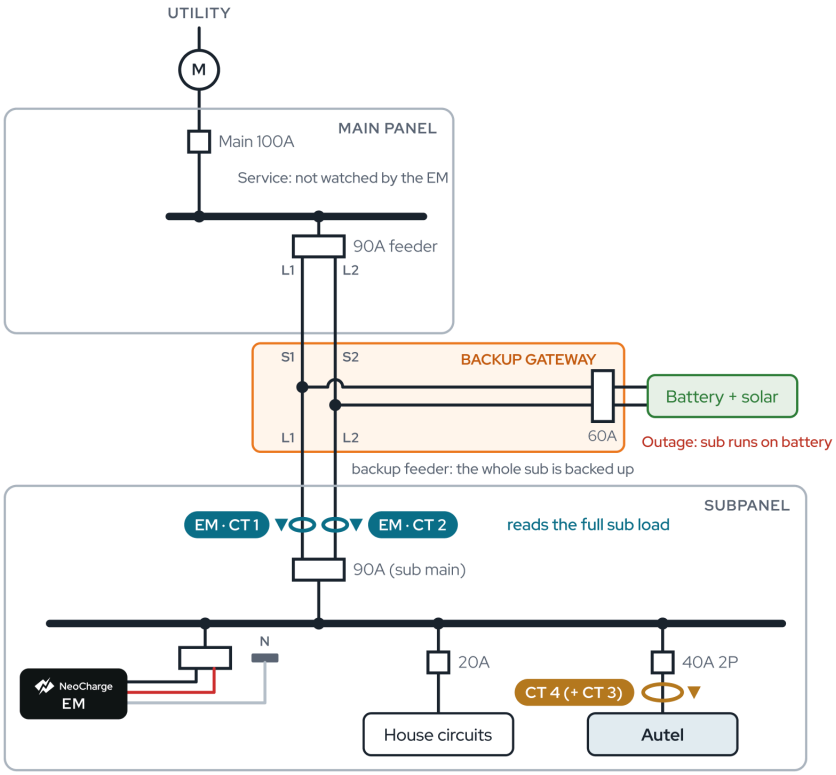
Use when the tie-in is reachable and the CT leads reach the service conductors.

When it applies: the battery (often with solar) joins the feeder between the main panel's feeder breaker and the subpanel's main breaker, through a tap or a gateway. The giveaway is two breakers of the same size on one feeder (for example 90 A at each end). Use A7a when you can reach the tie-in and the CT leads reach the service conductors. This gives the most data.

- **CT 1–2:** the service conductors just above the main breaker (between the meter and the main), one per leg, arrows pointing down into the main panel. Nothing may be tapped between the sensors and the main. They see the whole home, the sub and the battery.
- **CT 3:** the battery's black (L1) conductor between the tie-in and the battery breaker, arrow toward the battery.
- **CT 4:** the Autel, one leg.
- **L3:** spliced to black L1 on the EM's breaker.
- **App settings: Main panel**, main breaker rating. Sensors: **Two different circuits**, with CT 4 as the EV charger.
- **Commissioning:** with the battery idle. Test charge, mains rise by about the charger amps.
- **Status:** Supported. The EMS protects the main breaker. The subpanel's own breakers must pass a load calc on their own; if they don't, call NeoCharge install support before installing.

> If the tie-in is a backup gateway, the panel islands in an outage and the battery's backup output becomes the limit.

A7b: Battery in a backup gateway between the main panel and the sub



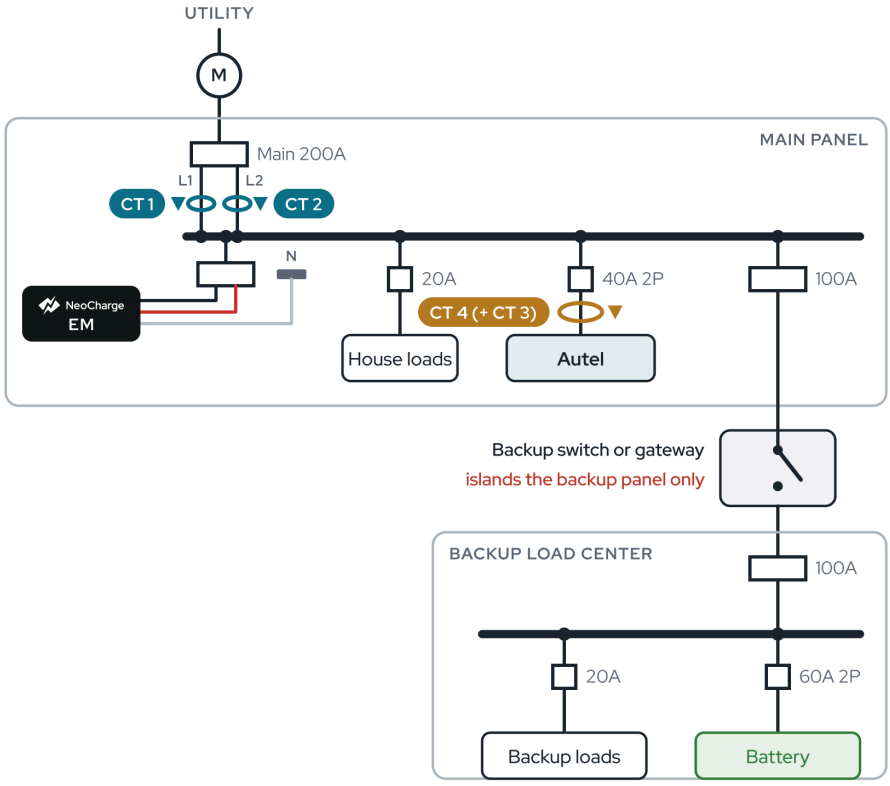
CT 3 can't go on the battery: it lands on the gateway's 60A breaker, upstream of CT 1–2.

When it applies: a backup gateway sits between the main panel's feeder breaker and the subpanel. Its supply terminals (S1/S2) are fed from the main panel, the battery and solar land on a breaker inside the gateway, and its backup output (L1/L2) feeds the subpanel, so the whole sub is backed up. Also use A7b for a feeder tap when A7a isn't possible: the tie-in can't be reached, the CT leads won't reach the service conductors, or it's a hard bus connection.

- **CT 1–2:** the gateway's backup feeder at the subpanel's main breaker, one per leg, arrows toward the sub. They read the full sub load, from the grid or the battery, which is what that breaker carries.
- **CT 3:** not on the battery. The battery joins inside the gateway, upstream of CT 1–2, so the mains wouldn't include it. Use the Autel's second leg or another sub load.
- **CT 4:** the Autel.
- **L3:** capped.
- **App settings: Subpanel**, rating of the subpanel's main breaker (the breaker CT 1–2 surround). Sensors as in A1.
- **Commissioning:** test charge with the battery idle or set to backup-only. The mains rise by about the charger amps and read positive.
- **Status:** Supported. The battery goes unmonitored, and the EM can't see the gateway's supply side, so whole-home grid exchange isn't measured. The service must pass a load calc on its own.

> In an outage the gateway islands and the whole sub runs on the battery, so the battery's backup output becomes the limit.

A9: Battery in a downstream backup panel, Autel in the main panel



If the Autel is in the backup load center, set it up like A5 inside that panel.

When it applies: partial-home backup. A feeder from the main panel runs through a backup switch or gateway to a backup load center that holds the battery. The Autel is in the main panel.

- **CT 1–2:** the main breaker's load side, arrows toward the bus. The battery is downstream through the feeder, so they read net.
- **CT 3:** the battery's black (L1) conductor, arrow toward the battery, but only if the CT 3 lead reaches the backup load center without extending it. Otherwise use the Autel's second leg or another load.
- **CT 4:** the Autel.
- **L3:** spliced to black L1 only if CT 3 is on the battery; otherwise capped.
- **App settings: Main panel**, main breaker rating. Sensors: **Two different circuits** with CT 3 on the battery or another load; **One 240V circuit** with CT 3 on the Autel.
- **Commissioning:** with the battery idle. Test charge, mains rise by about the charger amps.
- **Status:** Supported. The Autel here is not backed up, so it is off during an outage.

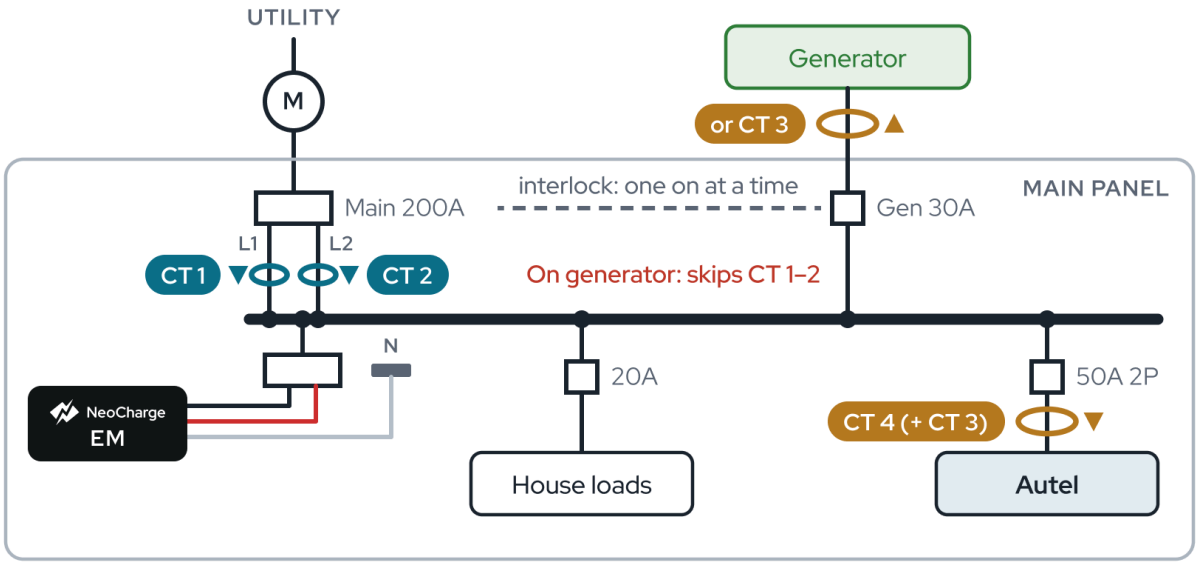
> The battery system's own sensors are often already on the main-panel conductors. Clamp ours beside them.

If the Autel goes in the backup load center instead, set it up like A5 inside that panel.

Generator, backup panels and two-panel sites

Check these before installing. Two-monitor sites (B1 and B2) are supported. The others need a call to NeoCharge install support first.

A11: Generator through an interlocked breaker



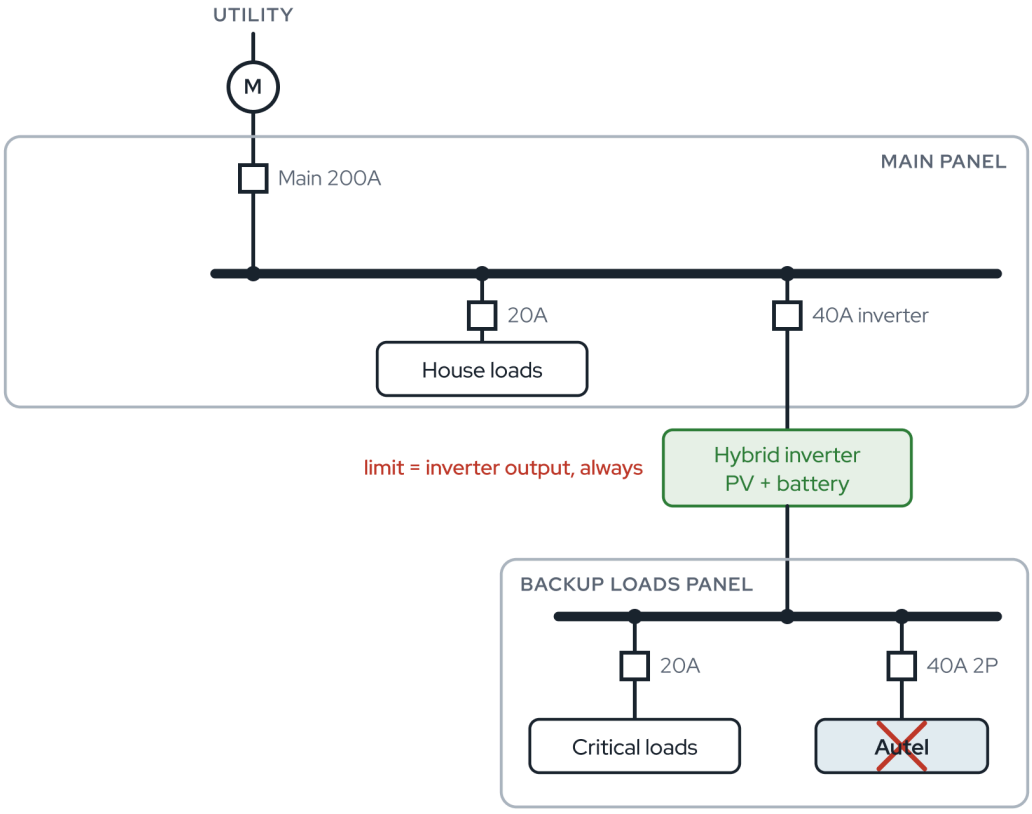
When it applies: a portable or standby generator backfeeds the panel through a breaker with a mechanical interlock against the main.

Why it's blocked: on generator power, current never passes CT 1–2. The EMS reads near zero and won't throttle the Autel against the generator's output.

Status: Blocked.

> Stop. Don't install the EMS on a site with an interlocked generator until NeoCharge confirms the setup. Call NeoCharge install support at +1 888 944 5581 with photos of the panel, the interlock and the generator inlet. Support will check whether the Autel can sit on a circuit the generator doesn't feed.

A12: Autel in a critical-loads (backup) panel

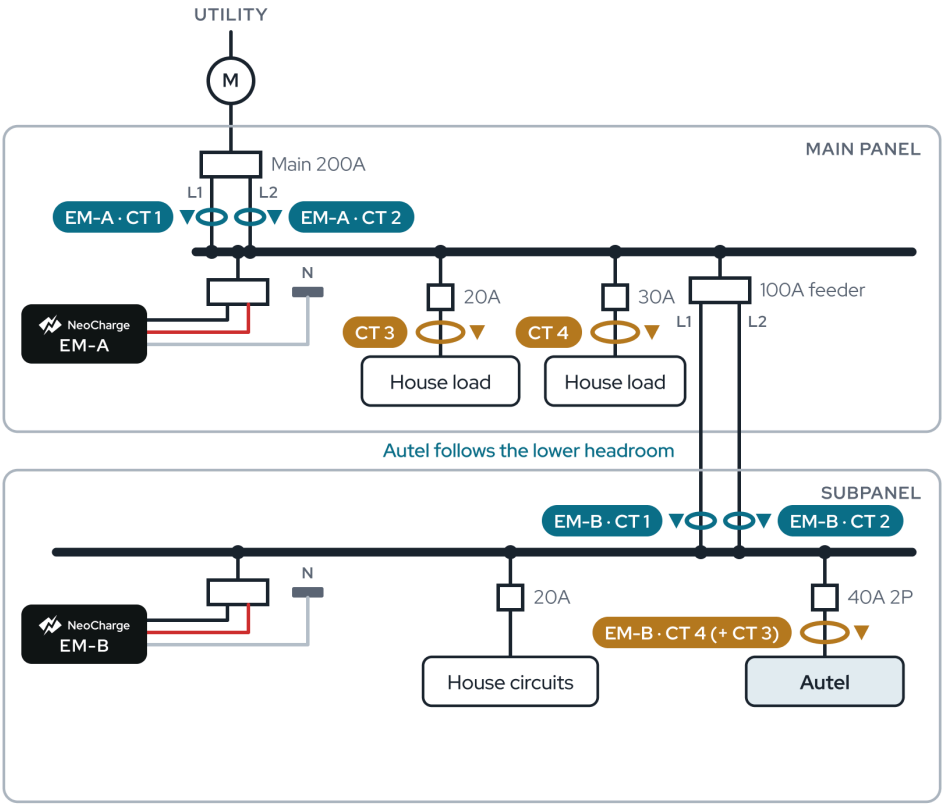


When it applies: a hybrid inverter (PV + battery) feeds a critical-loads panel from its backup output, and the Autel would land in that panel. The limit there is always the inverter's continuous output, on grid and off.

Status: Do not install.

> Don't install the Autel in a critical-loads panel. Move it to the main panel (A1 or A3) or to a subpanel that isn't backed up. If neither is possible, stop and call NeoCharge install support at +1 888 944 5581.

B1: Service and subpanel both constrained

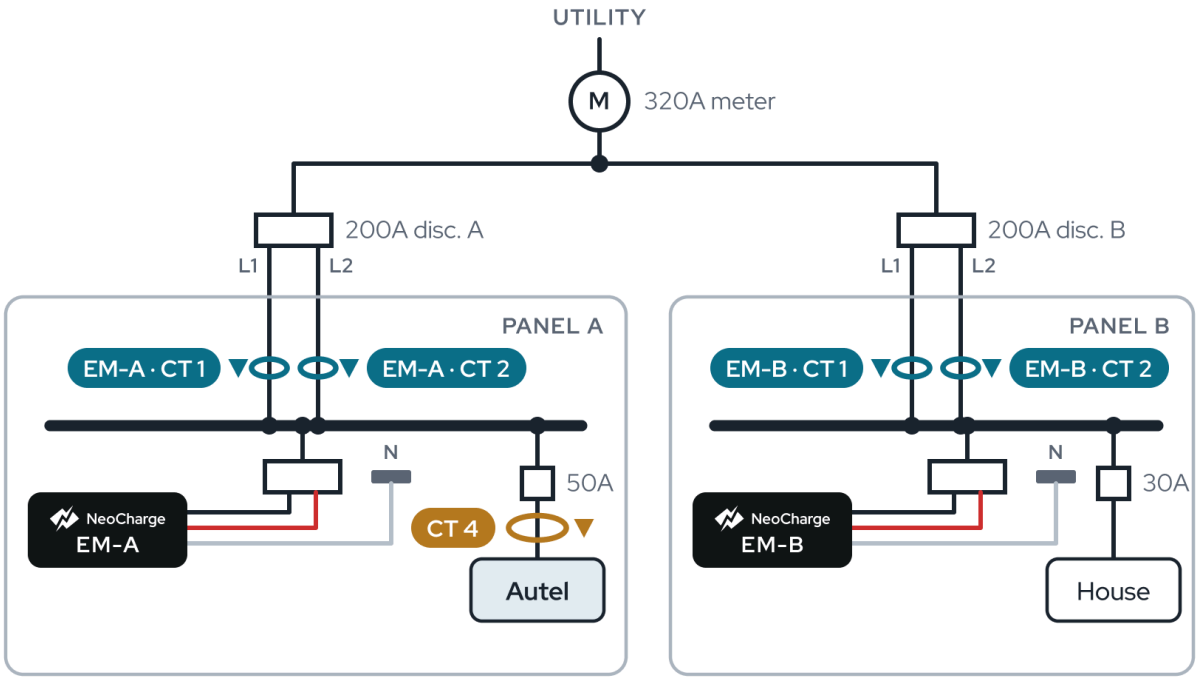


When it applies: the Autel goes in a subpanel, and both the service and the subpanel fail the load calc with the Autel added. Protecting both would take two EMs (EM-A on the main, EM-B on the sub feeder) controlling one Autel.

Status: Supported with two Energy Monitors.

Install EM-A in the main panel, set up as A1 with the main breaker rating, and EM-B in the subpanel, with CT 1–2 on the sub feeder and CT 4 on the Autel. See Two Energy Monitors and EMS setup. The charging limit follows whichever panel has less headroom.

B2: Split service, two disconnects



Protecting the service means summing A + B against one limit

When it applies: the meter feeds two service disconnects (for example two 200 A) with no single main breaker. Protecting the service means summing both feeders against one limit.

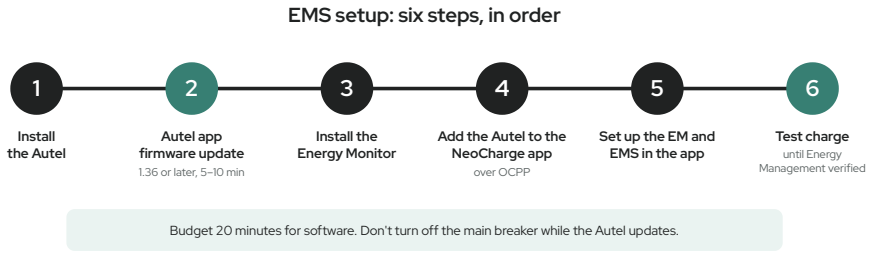
Status: Supported with two Energy Monitors.

Install one Energy Monitor in each panel, with CT 1–2 on that panel's feeder conductors from its disconnect. CT 4 goes on the Autel in whichever panel it's in. Set up both monitors as in Two Energy Monitors and EMS setup.

07 EMS setup

The electrician runs this setup, on site, before leaving. You know the panel rating and which circuit each sensor is on; the homeowner doesn't. The EMS is not commissioned, and the job is not done, until the NeoCharge app shows **Energy Management verified**.

Everything runs on the **homeowner's phone**, signed in to their NeoCharge and Autel accounts. The NeoCharge account uses the homeowner's phone number.



Step	What
1	Install the Autel: rotary dial set, wired and powered on
2	Autel app firmware update: connect over Bluetooth, update to 1.36 or later, factory reset, set max current
3	Install the Energy Monitor
4	Add the Autel charger to the NeoCharge app using OCPP: paste 3 fields into Autel app › OCPP Server › Custom
5	Set up the Energy Monitor and EMS in the NeoCharge app: More › Add Device › Set Up Energy Management
6	Test charge until the app shows "Energy Management verified"

Step 1: Install the Autel

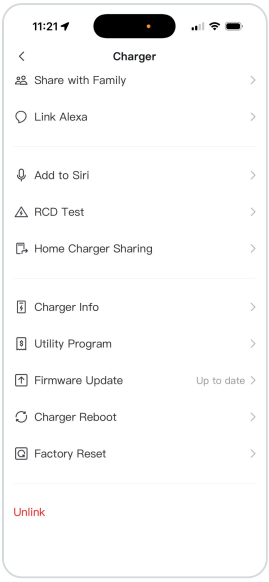
1. Install and wire the Autel per Autel's installation manual.
2. **Set the rotary dial inside the Autel to the charger circuit before you close the cover and mount the unit.** For example, 40 A on a 50 A breaker. Some units ship set to 50 A.
3. Power the charger on. It must be powered before Step 2.

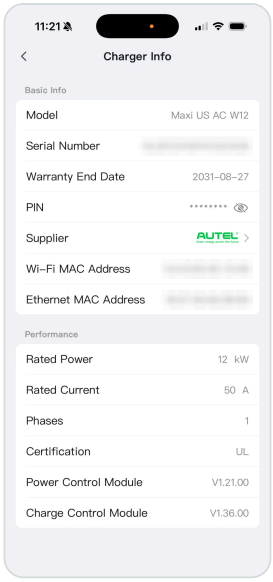
Step 2: Update and reset the Autel

On the homeowner's phone:

1. Download the **Autel Charge** app and sign in to (or create) the homeowner's Autel account.
2. Turn on Bluetooth and stand near the charger. Bluetooth range is typically 10–30 ft.
3. Add the charger by following the prompts, using the **charger PIN** from the Autel Quick Start booklet. Join it to the home **2.4 GHz** Wi-Fi.
4. Check the firmware version in **Charger › Charger Info**: the **Charge Control Module** needs to be on **V1.36 or later**. If it isn't, run **Charger › Firmware Update**. It takes 5–10 minutes: go to Step 3 while it runs.
5. When the update finishes and the charger reboots, confirm the version number, then **factory reset the charger** from **Charger › Factory Reset**. Reconnect to it and rejoin the Wi-Fi.

6. Set the charger's **maximum current** to match the dial and the circuit, for example 40 A on a 50 A breaker.
7. Confirm the charger's Internet light is on.





Don't turn off the main breaker while the Autel is updating. If the update is still running when you're ready to kill the main, wait.

- **Below V1.36, OCPP pairing won't work.**
- **The factory reset also fixes a charger stuck at 16 A.**
- **"The device serial number and PIN do not match":** the PIN in the booklet doesn't match that charger. Call Autel Customer Support at **1 (844) 765-0150** from site with the charger serial number. Autel gives the correct PIN (and can release a charger still on another Autel account). Then remove the charger from the app and add it again.

Step 3: Install the Energy Monitor

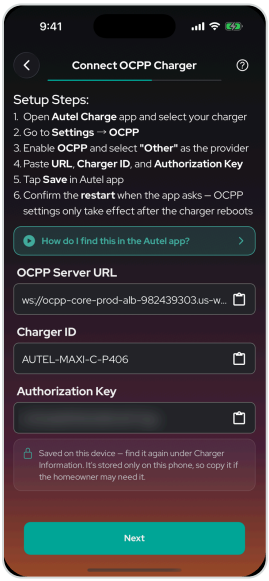
Do the hardware install in Install the Energy Monitor while the firmware updates. Before you continue:

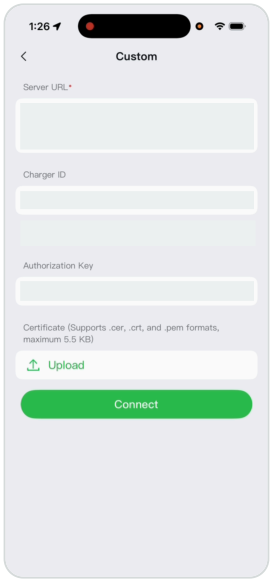
- [ ] The back label is photographed (serial and installer PIN).
- [ ] CT placement photos are taken.
- [ ] The cover is on, power is restored and the status light is purple with a blue blink.
- [ ] The Autel update has finished, the charger is factory reset, and it is back on the Wi-Fi.

Step 4: Add the Autel charger to the NeoCharge app (OCPP)

1. In the **NeoCharge app**, tap **Add Device › Add Your Smart Charger › Autel** and complete the checklist.
2. The app shows exactly **3 fields**: **Server URL**, **Charger ID** and **Authorization Key**. Leave this screen open.
3. In the **Autel Charge app**, open the charger › **OCPP Server › Custom**.
4. **Copy-paste** each of the 3 fields from the NeoCharge app into the Autel app, one at a time. Never retype them.
5. Tap **Connect** (or Save) and follow the restart prompt.

6. **Wait 60–90 s** for the charger to reboot and connect. It then shows online in the NeoCharge app.





A wrong key is the most common failure.

- Re-adding the charger in the NeoCharge app issues a **new Charger ID and Authorization Key**. Always paste what the app shows at that moment. Never reuse a key from an earlier attempt.
- Check that no leading or trailing space came along with the paste.
- If the Autel app shows separate **Server URL** and **Server Path** boxes: put the address up to the domain in Server URL, and everything after it in Server Path, **starting with "/"**.
- Don't tap verify before the 60–90 s are up.

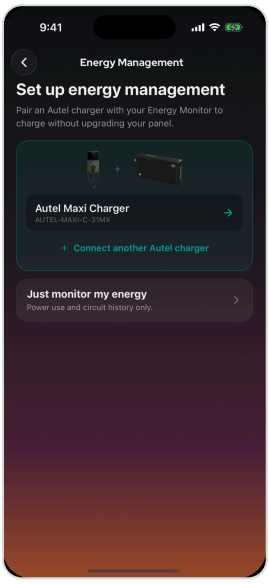
If the charger works in the Autel app, its Wi-Fi is fine. An OCPP failure with the charger online is firmware, the factory reset or the key. See Charger offline in the NeoCharge app.

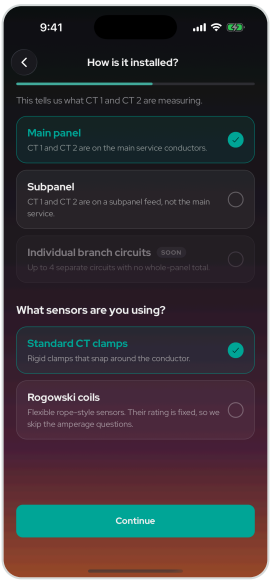
Step 5: Set up the Energy Monitor and EMS

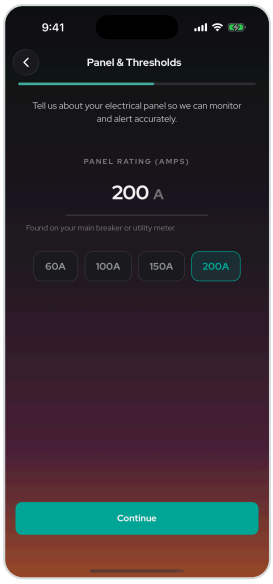
Stand **at the electrical panel** with the homeowner's phone.

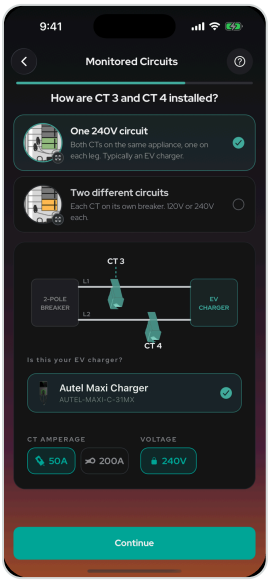
1. In the NeoCharge app, tap **More › Add Device › Set Up Energy Management**.
2. **Select the Autel** you connected in Step 4.
3. **Onboard the Energy Monitor over Bluetooth.** Stay near the panel and follow the prompts. Join it to the same **2.4 GHz** Wi-Fi as the charger, or confirm Ethernet.
4. **Panel:** choose **Main panel** or **Subpanel** and enter the rating of the breaker the EMS protects: - Main panel: the **main breaker** rating, for example 100 A or 200 A. - Subpanel: the **feeder breaker** that feeds that subpanel, for example 90 A. - Read it from the breaker itself. The EMS holds total load to **100%** of this number. Enter the real breaker rating, never a derated value.
5. **Sensors:** pick the sensor type (standard CT clamps or Rogowski coils). CT 1 and CT 2 are the mains.
6. **Solar or battery:** answer the solar and battery question accurately. A source in the panel makes the mains read net, and solar export reads negative.

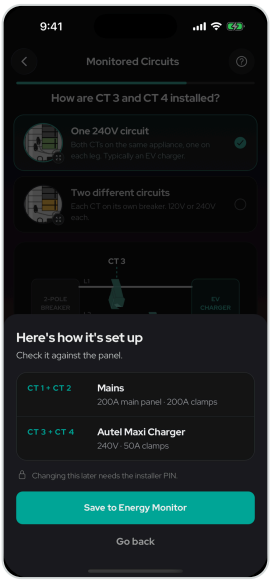
7. **"How are CT 3 and CT 4 installed?"** - **One 240V circuit:** CT 3 and CT 4 are both on the Autel, one per leg. Then answer **"Is this your EV charger?"** and pick the Autel. - **Two different circuits:** CT 3 is on its own circuit (a battery, solar or another load). Mark CT 4 as the Autel. Set each circuit to 120 V or 240 V to match.
8. **Enter the 6-digit installer PIN** from the Energy Monitor back label, or tap **Scan label QR code**. The PIN locks the panel rating, so the EMS keeps total load under it. Changing the rating later requires the PIN.

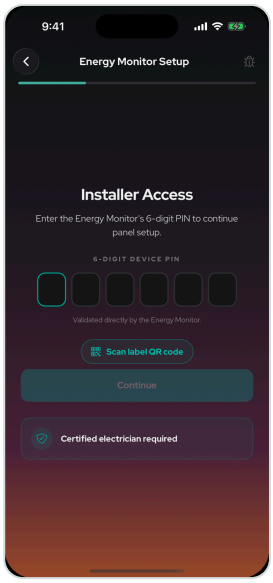










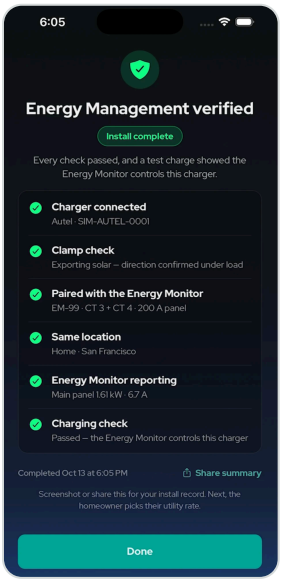


> **Bluetooth times out on the second try** ("Security1Handshake timeout"): turn the phone's Bluetooth off for 5 s and back on, power-cycle the Energy Monitor at its breaker, then retry. If the status light is purple with no blink, press the button on the monitor once to reopen Bluetooth.

Step 6: Test charge and verify

1. Plug the Autel into the car and run the **in-app test charge**. It takes about 2 minutes. Charging ramps up over 1–2 minutes while the monitor confirms there's headroom.

2. With a battery or solar on site, run the test with the sources idle: at night, with the inverter off, or with the battery set to backup-only for a few minutes.
3. Watch the readings. The charger channel (CT 4) should rise to about the charger current, and **the mains should rise by about the same amount**.
4. Confirm the charging current matches in **both** the Autel app and the NeoCharge app.
5. Continue until the app shows **Energy Management verified**, with all checks green and the **Install complete** badge.
6. Tap **Done**. On the app's home screen, the **Autel** and **Home Energy** cards both show a green **EMS** badge. That confirms the two devices are paired.





> "Continue anyway", "Finish without a check" and the earlier "Paired and reading" or "EMS pairing complete" screens don't count. If a check fails, fix it on site. The readings table in Readings don't match explains each failure.

During the test charge	Meaning	Fix
CT 4 rises to ~32–40 A **and the mains rise by about the same**	Correct	Continue
Mains jump, CT 4 stays ~0–1 A	Main and branch sensors swapped between ports	Ports 1–2 ↔ 3–4
Mains flat (~0–4 A) while the car charges	Mains not upstream of the Autel, or not plugged in	Re-place the mains per Step 7

During the test charge	Meaning	Fix
A reading is negative	Sensor backwards or polarity swapped, or a source exporting	Flip the sensor; idle the sources and retest
CT 3 / CT 4 reads about half	A 240 V circuit set as 120 V	Fix the CT 3 / CT 4 answer
Charging stuck at 7 A or 16 A	The Autel's own limit	Factory reset, then set the max current

Hand off to the homeowner

Show the homeowner the NeoCharge app: the Energy Monitor online, the charger online and the energy view. Then tell them:

- Charging may slow when the home is under heavy load. That's the EMS working.
- Charging ramps up over 1–2 minutes after the car is plugged in.
- EMS settings are locked. Changing the panel rating needs the installer PIN.
- Changing the Wi-Fi network or password later means re-onboarding both devices.
- Their phone's Wi-Fi is not the charger's or the monitor's. A phone off Wi-Fi doesn't affect charging.
- Keep the NeoCharge app updated.
- Charger PIN, Autel account or charger hardware issues: Autel Customer Support, 1 (844) 765-0150.

How the EMS behaves during interruptions

- **The Energy Monitor loses power or its connection, or the charger loses its connection:** charging pauses after a short safety timeout. The app shows **Charging paused**.
- **The charger loses power:** charging stops until power returns.
- **When it resumes:** charging is designed to resume automatically once power, the connection and monitoring are back, the vehicle is ready to charge, there is capacity available, and the schedule and settings allow it.
- **Charger fault codes** are covered by the Autel manual. Not every charger fault clears by itself.

Two Energy Monitors

For a main panel + subpanel install (B1) (see Two Energy Monitors), run Step 5 for each monitor: Main panel with the main breaker rating for one, Subpanel with the feeder breaker rating for the other. The charging limit follows whichever panel has less headroom.

08 Before you leave

NeoCharge reviews every install remotely: the monitor online, the charger online over OCPP and the sensor readings. A job that leaves site without "Energy Management verified" means a second visit.

Closeout checklist

Autel

- [ ] Rotary dial set to the charger circuit (for example 40 A on a 50 A breaker).
- [ ] Firmware 1.36 or later (actual version number checked), factory reset done.
- [ ] Max current in the Autel app matches the dial.
- [ ] On the home 2.4 GHz Wi-Fi, Internet light on.
- [ ] Online in the NeoCharge app over OCPP.

Energy Monitor

- [ ] Mounted in the panel whose load it manages, 2 in (50.8 mm) from live parts.
- [ ] CT 1–2 on both feeder conductors of the panel the EMS protects, nothing tapped in between.
- [ ] **Every CT arrow points towards the load** (CT 1–4). On a battery, the battery is the load.
- [ ] Main sensors in ports 1–2 only: CT 1 on L1 in port 1, CT 2 on L2 in port 2, each on the same leg as the monitor's voltage lead. CT 4 on the Autel. CT 3 recorded.
- [ ] Flex kit: each 2-pin plug has **white in the left terminal, black in the right** (looking down at the monitor).
- [ ] CT 3 and CT 4 downstream of CT 1–2.
- [ ] No sensor lead cut, shortened, spliced or extended.
- [ ] Blue L3 spliced to L1 only if CT 3 is on a battery; otherwise capped.
- [ ] Antenna outside the metal enclosure (or Ethernet connected).
- [ ] Status light white with a green pulse.

App

- [ ] Panel type and rating entered: 100% of the main breaker (Main panel) or the feeder breaker (Subpanel).
- [ ] CT 3 / CT 4 answer matches what is installed.
- [ ] Installer PIN entered.
- [ ] Test charge run: the mains rose with the charger, and the current matches in both apps.
- [ ] **Energy Management verified**, all checks green.
- [ ] Green **EMS** badge on both the Autel and Home Energy cards on the app's home screen.

Panel label

- [ ] NEC 750.30 EMS panel label applied, one per Energy Monitor. Write in the main or feeder breaker rating and the date set. The charger tag shows the Autel amps.

Polarity check

Do this on every install before you leave. Three different mistakes make a main read backwards (negative power), and in the data all three look the same.

1. **Wire polarity into the monitor** (flex kit): white left, black right in the 2-pin plugs on ports 1 and 2. See Connect power and signal.
2. **Sensor direction:** every arrow points towards the load. See Step 7.
3. **Phase / leg match:** CT 1 on L1 with the black voltage lead, CT 2 on L2 with the red. See Phase / leg match.

Verify:

- [ ] With a load running and no solar producing or battery discharging (turn them off for a minute if needed), **both mains read positive** power.
- [ ] Start the EV charger: **both mains go up**. If either goes down or reads negative, it's backwards. Fix it using Readings are negative before you leave.

Required photos

Take these on the homeowner's phone (or your job app) and upload them with the job. The job can't move past Installed without all four.

#	Photo	What it must show
1	**Energy Monitor back label**	Serial number and installer PIN, readable
2	**All CTs**	Placement and arrows. Wide enough to trace each main sensor to its conductor and each lead to its port, plus a close-up of the monitor's ports showing the wire colors in each plug
3	**Final verified screen**	NeoCharge app: "Energy Management verified", all checks green
4	**EMS panel label**	The NEC 750.30 label on the panel, with the rating and date filled in

Also useful: the Autel dial or the max-current setting in the Autel app, and the monitor with its status light on.

Who to call

Stuck on site? Call before you leave. Don't hand an unfinished setup to the homeowner.

Issue	Call
Energy Monitor, EMS, NeoCharge app	NeoCharge install support: **+1 888 944 5581**, support@getneocharge.com
Autel PIN mismatch, Autel account release, charger hardware	Autel Customer Support: **1 (844) 765-0150**, with the charger serial number

Help center: help.getneocharge.com

09 Troubleshooting

Find the symptom, then work down the checks in order. Most field problems so far were sensor ports, sensor direction, the Autel firmware or the OCPP key. If you're still stuck, call NeoCharge install support at +1 888 944 5581 before you leave site.

No status light

The monitor has no power.

1. Check that the main breaker and the monitor's supply breaker are on.
2. Check that the harness plug is fully seated in the right-side port.
3. Check black (L1) is on a hot breaker pole and white (N) on the neutral bar (or the breaker's neutral terminal on an AFCI/GFCI). See Step 5.

Status light is orange

The voltage harness doesn't match the service type: a missing or swapped phase, or the neutral isn't landed.

1. Check red (L2) is on the opposite leg from black (L1): the stacked breaker directly above or below, or the other pole of a 2-pole.
2. Check white (N) is landed.
3. Check blue (L3) is capped, on the third phase (3-phase only), or spliced to L1 (battery on CT 3 only). It must never touch neutral.

Fix it before you leave the panel. The full colour list is in Status light.

The app can't find the monitor

1. **Power:** the status light is on. If not, see No status light.
2. **Bluetooth open:** the light should be purple with a blue blink. Purple with no blink means Bluetooth has closed: press the button on the monitor once.
3. **Phone:** Bluetooth on. On Android, turn on Location Services so the phone can scan. On iPhone, allow Bluetooth for the NeoCharge app in Settings › NeoCharge.
4. **Distance:** stand at the panel. A metal panel cover shortens the range.
5. Restart the NeoCharge app, then the phone. Power-cycle the monitor's breaker.

Bluetooth times out on the second try

The first connection worked, but a retry fails with "Security1Handshake timeout".

1. Turn the phone's Bluetooth off for 5 s, then back on.
2. Power-cycle the Energy Monitor at its supply breaker.
3. Retry Set Up Energy Management from the start.

The monitor won't get online (Wi-Fi or Ethernet)

1. **2.4 GHz only.** The monitor and the Autel can't join a 5 GHz-only network. If the router combines bands under one name, pick the 2.4 GHz network or ask the homeowner to enable it.
2. **Antenna:** screwed fully onto the coax connector, and the antenna itself **outside the metal enclosure**. Inside a wall is fine; inside the box isn't.
3. **Signal:** check the Wi-Fi strength at the panel with a phone. Weak signal needs an extender or Ethernet.
4. **Password:** re-enter it. It is case-sensitive.
5. **Ethernet:** the cable is seated at both ends (monitor and router/switch). If Ethernet and Wi-Fi are both connected, the monitor uses Ethernet.
6. **Network:** a firewall or guest-network isolation can block new devices.
7. Power-cycle the monitor's breaker.

> A **red** status light can also mean the internet is down. It clears when the connection returns; a power cycle won't clear it.

The charger is offline in the NeoCharge app, or OCPP won't verify

If the Autel works in the Autel app, its Wi-Fi is fine. Don't leave blaming the network. Work through these in order:

1. **Firmware:** the actual version is **1.36 or later**. "Up to date" doesn't count.
2. **Factory reset:** done after the update, then the charger is reconnected to Wi-Fi.
3. **Fresh credentials:** in the NeoCharge app, use the Server URL, Charger ID and Authorization Key shown **right now**. Re-adding the charger issues a new ID and key; an old or retyped key is rejected.
4. **Right screen:** Autel app › OCPP Server › **Custom**.
5. **Paste, don't type:** paste all 3 fields. Check for leading or trailing spaces.
6. **Server Path box:** if the Autel app shows Server URL and Server Path separately (or says "Enter the correct path (Beginning with the character "/")"), put the address up to the domain in Server URL and the rest, starting with "/", in Server Path.
7. **Wait 60–90 s** after saving before you tap verify.
8. **Internet light:** the charger's Internet light must be on. If it isn't, rejoin the home 2.4 GHz Wi-Fi in the Autel app.

Still failing? Send NeoCharge a screenshot of each app's OCPP screen (hide the key) and the Autel firmware version.

The Autel app says the serial number and PIN don't match

The PIN in the Autel Quick Start booklet doesn't match that charger. Only Autel can fix this.

1. Call Autel Customer Support at **1 (844) 765-0150** from site, with the charger serial number.
2. Autel gives you the correct PIN. They can also release a charger still registered to another Autel account.
3. Remove the charger from the Autel app and add it again with the correct PIN.

> The **installer PIN** on the Energy Monitor back label is a different PIN. It goes in the NeoCharge app, not the Autel app.

The installer PIN is rejected

1. Check you're using the 6-digit PIN from the **Energy Monitor** back label, not the Autel charger PIN.
2. Check the serial on the label matches the monitor you onboarded.
3. Use **Scan label QR code** instead of typing.
4. If it still fails, call NeoCharge install support with the serial number.

Charging is stuck at 16 A, 7 A or another low value

The Autel's own limit is lower than what the EMS allows.

1. **Stuck at 16 A:** factory reset the Autel from the Autel app, then set the max current again.
2. Check the **max current** in the Autel app matches the circuit (for example 40 A on a 50 A breaker).
3. Check the **rotary dial** inside the Autel. A dial left at the default limits the charger whatever the app says.
4. If the home really is near its panel rating, low current is the EMS working. Check the mains reading in the NeoCharge app.

Charging paused

The app shows **Charging paused** when the EMS has lost monitoring or the charger has lost its connection. Charging pauses after a short safety timeout.

1. Check the Energy Monitor is online (white with a green pulse) and the charger is online in the NeoCharge app.
2. Fix whichever is offline: see The monitor won't get online or The charger is offline.
3. Charging is designed to resume automatically once power, the connection and monitoring are back, the vehicle is ready, capacity is available and the schedule allows it.

If the EMS pauses or throttles every minute, check the ports first: a branch CT in port 1 or 2 makes the charger read as the mains. See Readings don't match.

Readings don't match

Run the test charge and compare CT 4 (and CT 3 if it's on the Autel) with the charger's own current, and with the rise in the mains.

What you see	Cause	Fix
CT 3 / CT 4 reads **about half** the charger current	A 240 V circuit set as 120 V in the app	Fix the CT 3 / CT 4 answer: One 240V circuit, or set that circuit to 240 V
A channel reads **zero**	Sensor on the wrong breaker, in the wrong port, plug not seated, or clasp open. Flex kit: no 12 V power	Trace the sensor to its conductor and port. Reseat the plug. Flex: see Flex troubleshooting
The **mains jump** but CT 4 stays ~0–1 A	Main and branch sensors swapped between ports	Main sensors in ports 1–2, branch CTs in 3–4
The **mains stay flat** (~0–4 A) while the car charges	The mains aren't upstream of the Autel, are on the wrong conductors (a parallel feeder or a downstream panel), or aren't plugged in	Re-place CT 1–2 on both hots of the protected breaker. See Step 7 and Wiring diagrams

What you see	Cause	Fix
The mains rise **much less** than the charger, with a battery or solar on site	The source is covering the load, so the mains read net	Idle the sources (night, inverter off, battery backup-only) and retest
A reading is **negative**	See Readings are negative	

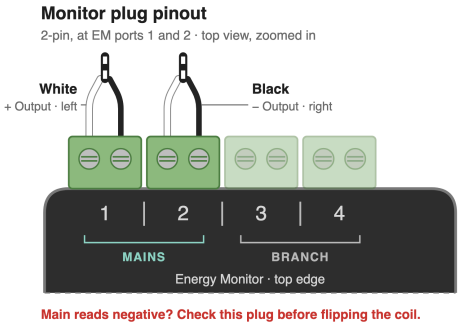
Readings are negative

First, rule out a source:

1. **Solar or battery exporting?** With a source in the panel, the mains read negative when it exports. Midday negative readings are normal and look exactly like reversed sensors. Idle the sources and retest. A main that reads negative **at night with a load running** (no battery discharging) is backwards.
2. **Battery on CT 3:** negative while the battery discharges is correct. It reads charging and discharging with opposite signs. Check blue L3 is spliced to L1 so the direction reads correctly.

Then check these three, **in this order**. A polarity mistake and a phase mistake look identical in the data, so check each one even if the first looks fine:

3. **Plug polarity (flex kit).** Looking down at the monitor, each 2-pin plug on ports 1 and 2 has **white in the left terminal and black in the right**. 200A Flexible Sensor (Rogowski) kits may have the 2-pin plug wired backwards: inspect and reverse the wires if needed. Both mains reading negative together usually means this. At the integrator, black is in slot 3 and white in slot 4. See Connect power and signal.
4. **Phase / leg match.** CT 1 on L1 in port 1 and CT 2 on L2 in port 2, each on the same leg as the monitor's voltage lead (L1 black, L2 red). A sensor on the wrong leg reads backwards even with its arrow right. One main negative and the other positive often means this. Move the sensor; don't swap ports. See Phase / leg match.
5. **Sensor direction.** Every arrow points towards the load: split-core main CTs, branch CTs and flex coils alike. On a battery or solar line, the battery or inverter is the load.



Confirm the fix: with a load running and no source exporting, both mains read positive, and both go up when the EV charger starts.

> Reversed mains make import look like export, so the power and energy numbers in the app are wrong. Fix it before you sign the site off, even if charging works.

Port or sensor mix-ups

- The app treats CT 1 and CT 2 as the mains, always. A branch CT in port 1 or 2, or a main sensor in port 3 or 4, breaks every reading.
- CT 4 is always the Autel. If CT 4 is on another load, move it.
- A plug straddling two terminals reads wrong on both ports. Reseat it.

Status light

The full list of colours is in Status light. Quick actions:

Light	Do this
Yellow	Open the app. A circuit is over its limit, or Wi-Fi is weak. It clears itself
Orange	Fix the harness. See Status light is orange
Red	Too hot, or the internet is down. Fix the cause; a power cycle won't clear it
Fast flashing (red ×3, or purple strobe)	Power-cycle once at the breaker. If it comes back, call support
White with a purple blink	Firmware updating. Don't cut power

Factory reset the Energy Monitor

Holding the button on the bottom of the monitor steps through: **blue** (release to reopen Bluetooth), **red** (release to do nothing), then **three red flashes at 3 s** (factory reset armed). Use a factory reset only when NeoCharge support asks for it.

10 Reference

Status light

One light on the front of the monitor. The steady colour is its health; a short blink on top adds information. Slow fades are normal. Fast, repeating flashes are a fault.

Light	Meaning	Action
White, green pulse	All good. Online and reporting every 30 s	Leave site seeing this
Purple, blue blink	Ready for setup. Unconfigured, Bluetooth open	Open the NeoCharge app
Purple, no blink	Bluetooth closed	Press the button once to reopen Bluetooth
White, purple blink	Firmware updating	Don't cut power
Blue blink over any colour	Bluetooth open (30 min)	—
Yellow	A circuit is over its limit, or Wi-Fi is weak	Check the app. Clears itself
Orange	The voltage harness doesn't match the service type	Recheck the harness (Step 5)
Red	Too hot, or the internet is down	Fix the cause. A power cycle won't clear it
Fast flashing (red ×3, or purple strobe)	Fault	Power-cycle once. If it comes back, call support

Button held: blue = release to reopen Bluetooth · red = release to do nothing · 3 red flashes at 3 s = factory reset armed.

Technical details

Energy Monitor (NeoCharge Energy Monitor)

Supported system configurations

- Split-phase, 3-wire systems (120/240 V), most US homes
- Single-phase, 2-wire systems (120 V L-N)
- Three-phase, 4-wire wye systems (208Y/120 V)

Electrical ratings

- Overvoltage Category: CAT III
- Isolation: 4kV galvanic isolation
- Power draw: less than 50 mA (Energy Monitor); less than 1.5 A for the Energy Monitor and sensor power supply together (flexible kit)
- Supply wiring: 16AWG, 600V, UL1015, 105° C (or higher) copper-only wires, through a breaker

Interfaces

- Ethernet: 10/100 Base-T

- Wi-Fi: 802.11b/g/n (2.4 GHz only) via SMA antenna connector
- Bluetooth: used for setup in the NeoCharge app

Operating conditions

- Temperature: -40°F to 122°F (-40°C to 50°C)
- Relative Humidity: Up to 90% RH, non-condensing
- Altitude: Up to 2,000 meters (6,562 ft)
- Environment: Indoor, dry location, Pollution Degree 2

Enclosure

- Material: 94-V0 rated flame retardant

Current sensors

SPLIT-CORE CT KIT

- Main: Split Core CT clamps, max primary current up to 200A (ports 1–2)
- Branch: Split Core CT clamps, up to 50A (ports 3–4)
- Accuracy: ±2%

FLEXIBLE (ROGOWSKI) KIT

- Main: Flexible Rogowski current sensors for up to 200A main service lines (ports 1–2), with integrators and a 12 V sensor power supply
- Branch: Split-Core CT clamps for up to 50A branch circuits (ports 3–4)
- Accuracy: ±2%

Applicable standards

- FTRZ Energy Usage Monitoring Systems
- UL 61010-1 and 61010-2-030
- ANSI/CAN/UL 2808

Certifications and compliance

C ETL US LISTED
Intertek

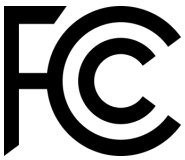
5038211
CONFORMS TO
UL STDS 61010-1, 61010-2-030
CERTIFIED TO
CSA STDS C22.2#61010-1-12, C22.2#61010-2-030

Measurement categories are defined by the CE and UL safety standard IEC 61010-1 and are used to indicate the ability of an instrument (like the NeoCharge Energy Monitor) to withstand voltage spikes without posing a shock hazard to the operator. An instrument should only be used at or below its rated measurement category and voltage. For example, the NeoCharge Energy Monitor is CAT III rated and can be used to monitor CAT I, CAT II, and CAT III circuits.

CAT III: This category is for measurements performed on equipment permanently installed in the building. Examples are measurements on motor control centers, circuit-breaker panels, junction boxes, switches, lighting fixtures, and wiring, including cables, bus-bars, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connections to the electrical distribution system.

There are situations where the NeoCharge Energy Monitor needs to monitor the main service entrance, which is classified as CAT IV. In this situation, the NeoCharge Energy Monitor voltage inputs (green screw terminal block) must be connected in a breaker panel or panel board, downstream of the main disconnect, breaker, or fuses. The line voltages at this location will be essentially identical to the voltages measured at the main disconnect, so the NeoCharge Energy Monitor's measurements will be accurate.

FCC compliance



FCC: 2AC7Z-ESPS3WROOM1
IC: 21098-ESPS3WROOM1
Model: NCEM-NA

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution: Any changes or modifications not expressly approved by NeoCharge void the user's authority to operate the equipment.

Designed by NeoCharge in San Luis Obispo, California
Manufactured by NeoCharge 75 Higuera St, Suite 120, San Luis Obispo, CA 93401

Support contacts

NeoCharge install support	+1 888 944 5581
Email	support@getneocharge.com
Help center	help.getneocharge.com
Autel Customer Support	1 (844) 765-0150. Have the charger serial number ready