

# Wall Connector Application Note: Dynamic Power Management

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## OVERVIEW

As described in the [Wall Connector Installation Manual](#), the Gen 3 Wall Connector should be installed with a 40A circuit breaker for maximum power output. In the event that there is not enough capacity for a 40A breaker in the electrical panel, a smaller breaker can be installed with a lower amperage configuration as follows:

Circuit Breaker (Amps)	Maximum Output (Amps)	230V Single-phase power output (kW)	400 V Three-phase power output (kW)
40	32	7.4	22.1
32	25	5.8	17.3
25	20	4.6	13.8
20	16	3.7	11
16	13	3	9
16	10	2.3	6.9
10	8	1.8	5.5
10	6	1.4	4.1

The alternative to a smaller breaker is a costly panel upgrade.

Dynamic Power Management is a new feature that enables Wall Connector to dynamically adjust EV charging power based on live readings of the overall load in the panel. An energy meter is installed to monitor live current in the panel; when panel loads are reduced, Wall Connector is able to increase charging current up to a limit set by the installer.



**NOTE:** This feature is not supported on three-phase delta (typically 230V L-L) or open wye grid connections. The most common grid connections are supported:

- 1-phase 230V L-N
- 3-phase 400V L-L (wye with neutral)



**NOTE:** If Neurio loses connection with Wall Connector, the maximum output defaults to 6A so as not to overload the system.

### Supported System Configurations

Dynamic Power Management is compatible with single or three-phase systems where a single Wall Connector is installed. Other system configurations are not supported at this time.



## REQUIRED EQUIPMENT

The following equipment is required:

- Energy meter kit:
  - Tesla P/N 1938241-01-A (includes (1) CT)
  - Tesla P/N 1938241-02-A (includes (3) CTs)



1	Energy meter
2	Current Transformers (CTs)
3	Voltage line harness
4	RS-485 communication harness



**NOTE:** The energy meter must be procured from Tesla as it ships with firmware required for this application


- Wago 3-, 4-, and 5-position lever nuts for splicing communication harness and energy meter voltage harness




**NOTE:** The Wi-Fi antenna included in the energy meter kit is not used.




## INSTALL THE ENERGY METER

 **CAUTION:** Never perform work on live circuits. De-energize the electrical panel before continuing.

1. Attach the energy meter's mounting plate to the inside of the electrical panel, and push the meter onto the plate.

 **NOTE:** The energy meter requires 203 x 203 x 102 mm of space inside the electrical panel. This clearance allows for the space required for routing wiring to the energy meter.


 **NOTE:** The maximum distance the energy meter can be installed from the Wall Connector (wired RS-485 connection) is 120 m.

2. Wire the meter voltage taps:

- a. Connect the voltage line harness leads to a dedicated circuit breaker (not exceeding 20A) of corresponding phase inside the distribution board:

Voltage Harness Port/Wire Color	Distribution Board Connection
A/Brown	L1 breaker terminal
B/Black	L2 breaker terminal
C/Gray	L3 breaker terminal
N/Blue	Neutral bus bar

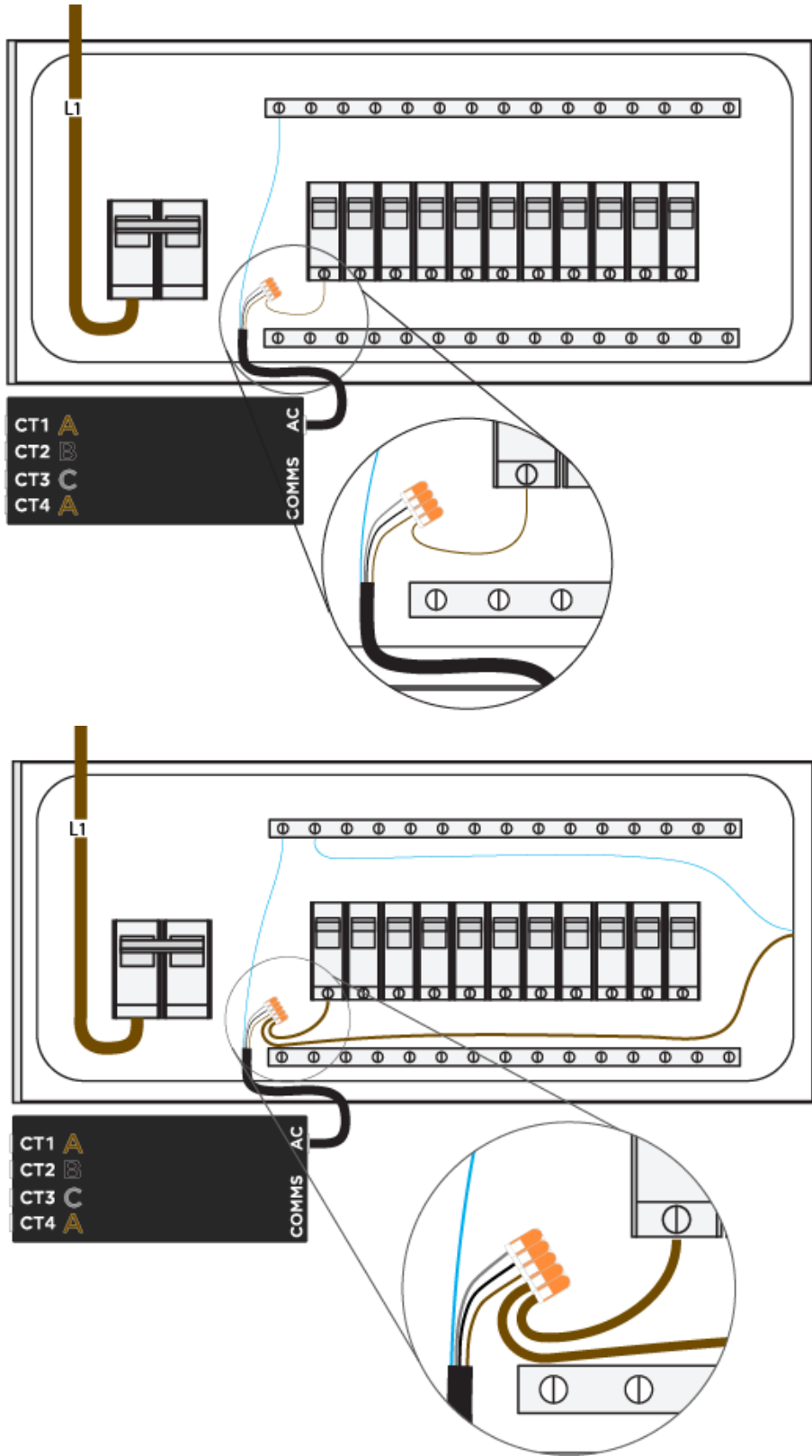
- b. Plug the voltage line harness into the meter.

 **NOTE:** If a dedicated breaker is not available, the voltage line harness can be spliced to existing breakers if allowed in your jurisdiction.



# INSTALL THE ENERGY METER

Figure 1. Voltage Line Harness Wired to Dedicated Breaker (Top) or Spliced to Existing Breaker (Bottom) (Single Phase)







# INSTALL THE ENERGY METER


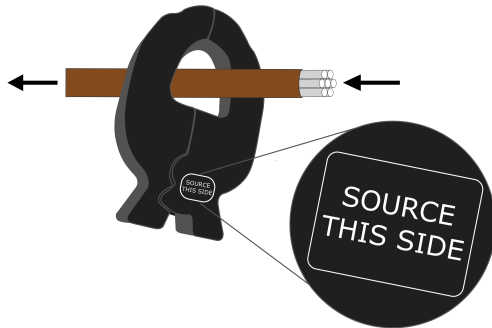
 **NOTE:** Ensure the "Source this Side" label faces away from the breakers, and towards the grid.

Figure 3. CT Orientation in Relation to Power Flow (Label to Face Power Source, in this Case Grid)



b. Plug the CTs into the meter:

- i. The CT measuring Line 1 can be plugged into either Port 1 or Port 4.
- ii. The CT measuring Line 2 must be plugged into Port 2.
- iii. The CT measuring Line 3 must be plugged into Port 3.


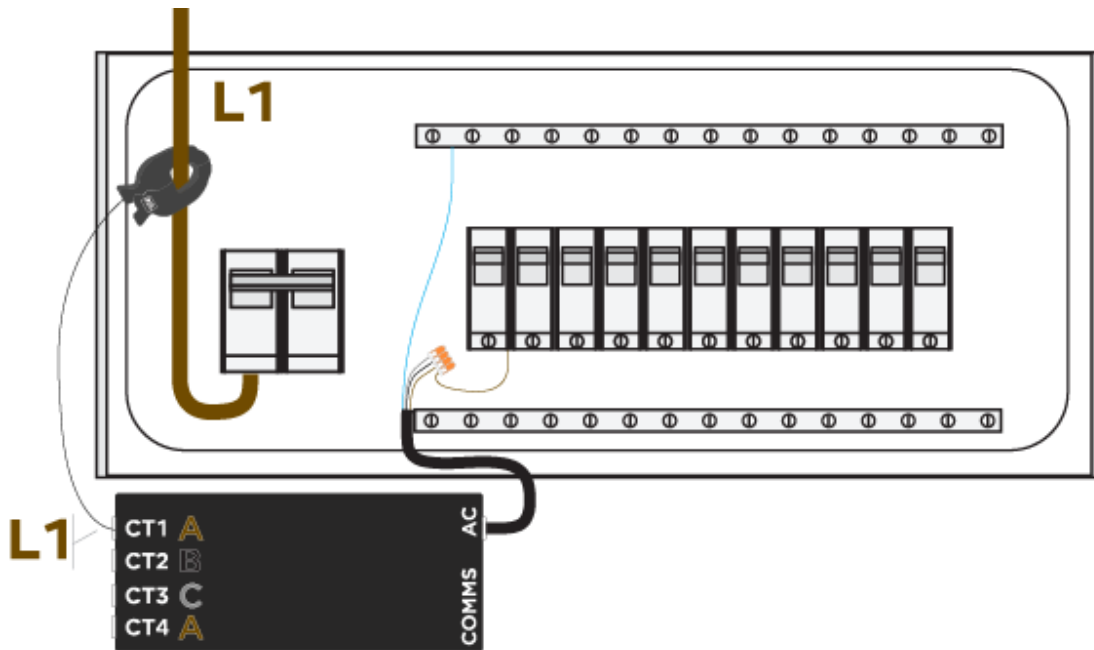
 **NOTE:** It is critical that each CT have the correct voltage reference. Ensure the CT is plugged into the correct port based on the phase it is measuring.

Figure 4. CT Measuring Single Phase System (CT on L1, Plugged into Port 1)



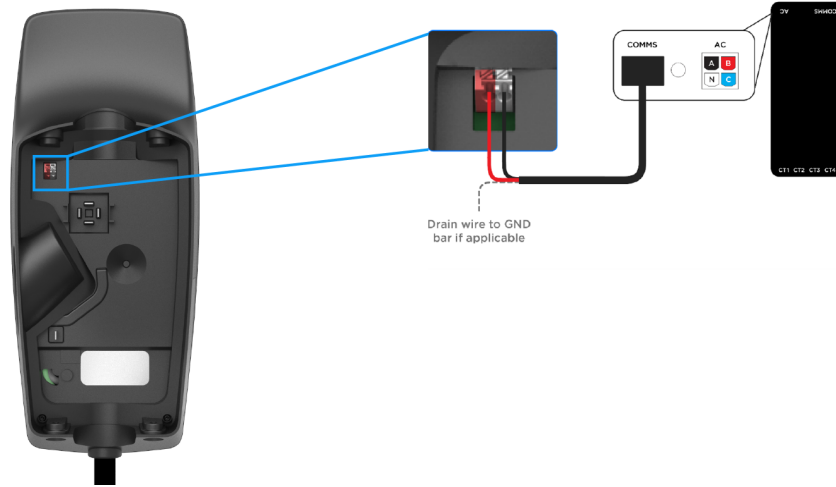
4. Establish a hardwired RS-485 connection between the Energy Meter and Wall Connector using the included 2-conductor wire harness:
  - a. Plug the provided wire harness into the port.
  - b. Extend the harness leads by splicing 1.5 mm<sup>2</sup> shielded twisted pair cable to the harness.
  - c. If applicable, land the drain wire on the ground bar in the panel.





# INSTALL THE ENERGY METER

- d. Locate the terminals on the backside of Wall Connector.
- e. Land the wire corresponding to the red lead of the harness to the red port, and the black lead to the white port.



- f. Manage the communication wires so that they are not pinched when mounting the Wall Connector to the wire box.

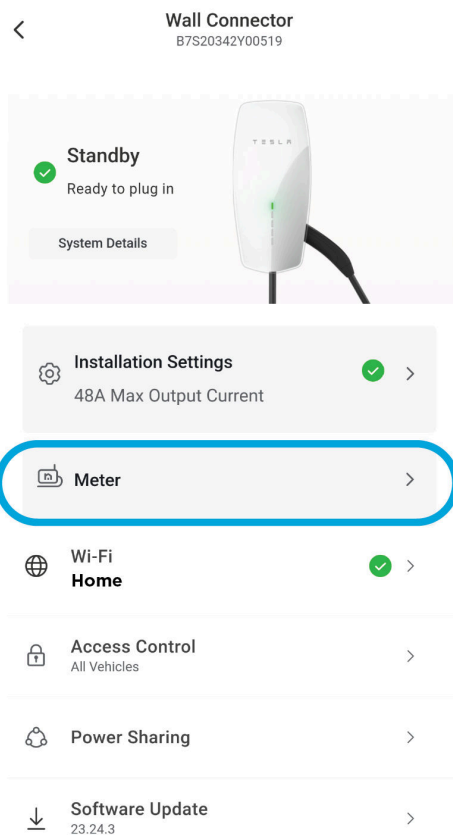


- 5. Energize the panel and turn on the circuit breaker(s). The energy meter will chime when it has powered on.



## COMMISSION THE SYSTEM

1. Turn off any solar inverter(s) prior to commissioning. Turning off solar production ensures CT function can be confirmed as all CT measurements should be positive when there is no solar.
2. Confirm the breaker feeding the Neurio meter has been turned on.
3. Follow the standard procedure to commission Wall Connector in Tesla One (see [Wall Connector Device Setup in Tesla Pros](#) for complete instructions).
4. Ensure Wall Connector has been updated to firmware version **23.8.1** or greater. If Wall Connector is not connected to Wi-Fi, follow the [offline firmware updates procedure](#).
5. Once connected, the Neurio meter will automatically be detected. Select **Meter** to configure CTs and set the Max Conductor Limit.





# COMMISSION THE SYSTEM

6. Select the Neuroio meter to configure the CTs.



Meter

## Meter Configuration

Neuroio · VAH4635AB2553  
Tap to Configure



## Max Conductor Limit

Wall Connector will limit charging to prevent exceeding the Max Conductor Limit.

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To set a Max Conductor Limit, configure conductor CTs in Meter Configuration above.



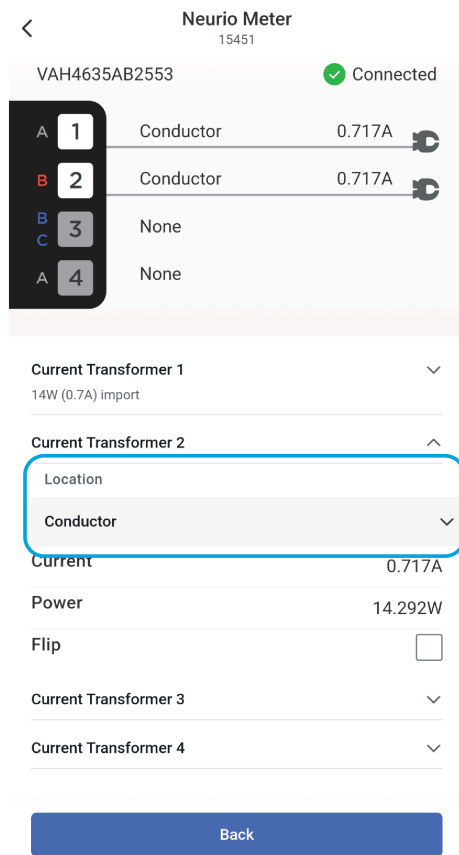
Overcurrent protection is your responsibility

Back



# COMMISSION THE SYSTEM

7. For each of the connected CTs, select the CT and set the **Location** to **Conductor**.

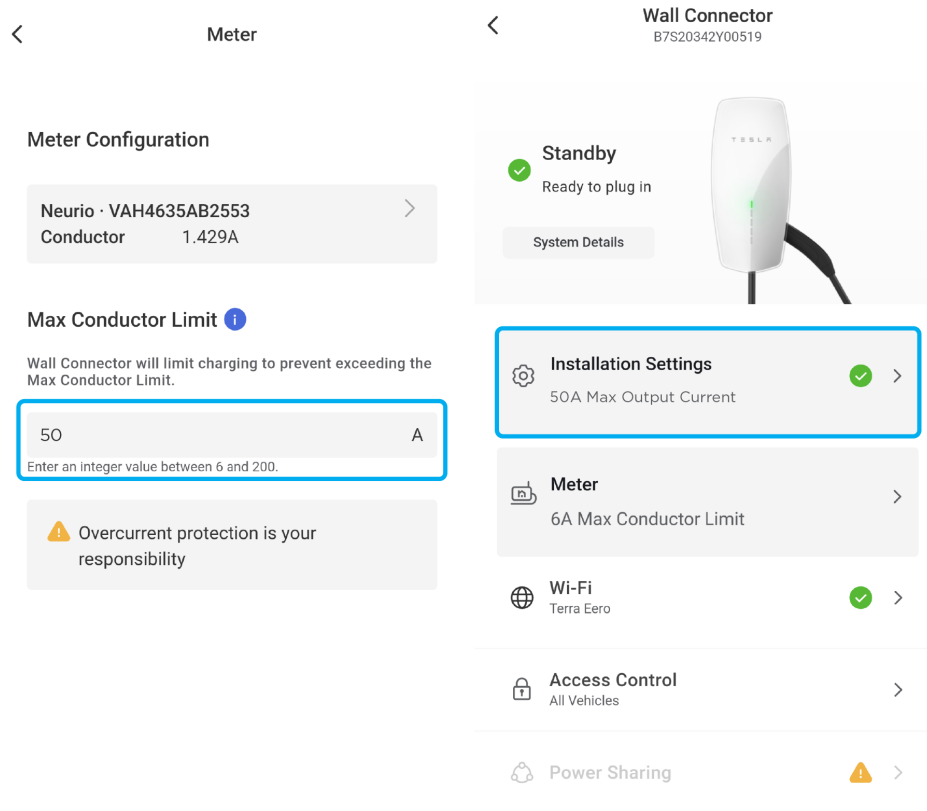


8. On the **Meter** screen, set the **Max Conductor Limit**. This value should be 80% of the electrical panel's rated limit.

- See [Overview on page 2](#) for circuit breaker size options and the associated max conductor current ampacity for each circuit breaker size.
- For example, the max conductor current ampacity for a 63A breaker would be 50A.



# COMMISSION THE SYSTEM








9. Test the system by turning on large loads in the panel and ensuring Wall Connector properly adjusts its charge rate. Alternatively, temporarily set the max conductor current lower than the actual limit of the electrical panel being measured. For example, if the conductor limit is 50A, temporarily set it to 32A. Confirm that this current limit is maintained by the Wall Connector by turning on some loads that would exceed the limit.



# TROUBLESHOOTING

## Energy Meter Chime Indication

Table 1.

Tone	Indication	Description
Short Beeps 	Voltage check	One beep for each voltage wire that is connected.
Short Chime 	Energy meter Wi-Fi network started	Energy meter has started hosting its own Wi-Fi network. You can join this network to configure the energy meter and connect it to your own Wi-Fi network.
Long beep 	Voltage warning (conditional)	Indicates that two wires are connected to the same phase.
Long Chimes 	Energy meter joined network successfully	Energy meter successfully joined your Wi-Fi network.
Failing tone 	Energy meter failed to join network	Energy meter was unable to join your Wi-Fi network. Energy meter will now start hosting its own Wi-Fi network again to allow you to re-connect to the energy meter and re-enter the Wi-Fi credentials.



## Energy Meter LED Indication

Table 2. Energy Meter LED Indication

LED	Status	Behavior
Blue, then Green	Flashes blue, then turns solid green (whether or not comms wire is connected)	Energy Meter is Powered On
Green and Red	Flashes green and red	Energy meter is communicating with Wall Connector

## Negative Site CT Value

The CT values in the Commissioning Wizard should be positive. If a CT value is negative:

1. Confirm **all** solar production has been turned off. Solar production greater than home consumption may result **in** negative readings
2. Confirm the CT is oriented correctly, with the "Source this Side" label facing toward the grid. If the CT is not oriented correctly, physically **flip it** or check the **Flip** box **in** the Commissioning Wizard.



## REVISION HISTORY

Revision	Date	Description
1.0	2023-09-13	Initial publication
1.1	2023-11-21	<ul style="list-style-type: none"><li>• Updated to reflect Dynamic Power Management as name of feature</li><li>• Updated to reflect Tesla One commissioning experience</li></ul>
1.2	2024-01-22	<ul style="list-style-type: none"><li>• Updated <a href="#">Overview on page 2</a> to include note and new section on supported system configurations</li><li>• Updated <a href="#">Energy Meter LED Indication on page 14</a>, removing old states and adding states when powered on and communicating with WC</li></ul>