

# EVBMW Tesla Gen 2 Charger Logic Board

## Overview

This logic board is a drop-in replacement for the logic board on the Tesla "gen 2" 10kW charger. It requires only a connection to your EVSE (you charge station) and your 12V battery, and a bit of configuration to get started.

These are basic instructions to run one charger with a logic board, with no external accessories. If you wish to have a more advanced configuration, please research on [YouTube](#), [GitHub](#), or ask for support on [EVBMW](#).

## Setup Instructions

### 1. Logic Board Configuration

Although the board is mostly plug-and-play, it must be configured with parameters like the phase configuration, charge port type, DC voltage, and an AC current limit.

The board is configured over serial via the USB Type B connector on the board. Connect to the board over USB from your computer, and open a serial communication app (such as the Arduino Serial Monitor or PuTTY) and connect to the board at a baud rate of 115200. You should see the board printing debug info once you connect.

- a. Send the character 'd' over serial. The board should stop outputting debug info, and output its current configuration. If this does not happen, ensure that you are sending a new line after each serial message.
- b. You may notice that each setting is labeled with a number or letter. You send that character, sometimes followed by other characters, to configure that setting. This will make more sense as you read on.
- c. Once in settings mode, make sure auto-enable is on. Send a '1' to toggle auto-enable on and off.
- d. Enable as many charger modules as you would like by sending a '2' followed by which modules to enable. For example, sending '2123' will enable all three, while sending '212' will enable only modules 1 and 2.
- e. Set the CAN mode to Master by sending '31'.
- f. Set the correct socket type. Send '41' for type 1 (J1772), or '42' for type 2 (European charger).
- g. The charger accepts single-phase and three-phase AC. If you are using three-phase, each charger module should be on its own phase, and you should enter '53' to configure the logic board for 3-phase AC. If you are using single-phase, each charger module should be paralleled to the single phase, and you should enter '51' to configure the logic board for single-phase.
- h. Your DC charge voltage depends on the voltage of your pack. With Tesla 18650 cells, we typically charge to 4.20 or 4.15V per cell.
- i. For your initial configuration, send '75' to set the AC current limit to 5A. You can raise this

- once you have confirmed that the charger and logic board are functioning correctly.
- j. You should leave the CAN speeds alone. I am not sure if changing the CAN speeds affects the performance of the board. You can enable or disable the debug modes as well.
  - k. After configuring the board, enter 'q' to exit the settings mode and go back to normal operation with debugging. **You must quit the Settings menu or else your configuration will not be saved!**
  - l. Fully power off the board, reconnect over serial, and enter the settings menu again to ensure that your configurations were saved to disk.

## 2. Swap Logic Boards

Unscrew and disconnect the stock logic board on the charger. Note that there is one mount for the board on the charger that is lower than the rest. It is recommended to put a spacer in as to not bend the new logic board. If you put a spacer in, you may need a longer bolt as well. The two connectors on the Tesla charger should snap right into the new logic board.

## 3. Wiring



Connector A

A1	A2	A3	A4	A5
Out2	Out3	IN1		9
A6	A7	A8	A9	A10
Out1	5,6		8 27,28	IN2

Connector B

B1	B2	B3	B4	B5	B6
12V+	Latch_EN		23 CAN H	Control Pilot	FC_CAN
B7	B8	B9	B10	B11	B12
GND		21	CAN L	EVSE Prox	29,30

Following the diagram above, connect your 12V+ to B1 (labeled 12V+) and A3 (labeled IN1). Connect your 12V- to B7 (labeled GND) and to the charger's casing (chassis ground). Connect the Proximity signal from your EVSE to B11, and connect the Control Pilot signal from your EVSE to B5.



Connect your AC to the modules inside the charger. The charger supports 3 phase and 1 phase AC. Each module gets its own phase connection. If you are running single phase, just connect all three in parallel. Connect AC ground to the charger case (chassis ground) as well.

The DC output from each module can be paralleled to your battery pack.

#### **4. Boot it up!**

Give the charger 12V power. The logic board should light up. You can connect over serial again if you want to see what the logic board is doing, or if you need to debug an issue. Connect the battery to DC out, and finally, connect your EVSE to the charger. The modules should light up in the charger, and your battery should begin charging.