

AIO-3 Module Installation Guide (rev 2.1)

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AIO Kit

AIO (All In One) module is a multifunctional controller, operating on CAN bus.

Implemented features:

- Front Camera Switch
- Smart Mirror Controller
- Warning Timer for Turn Signal
- Fuel Level Reminder

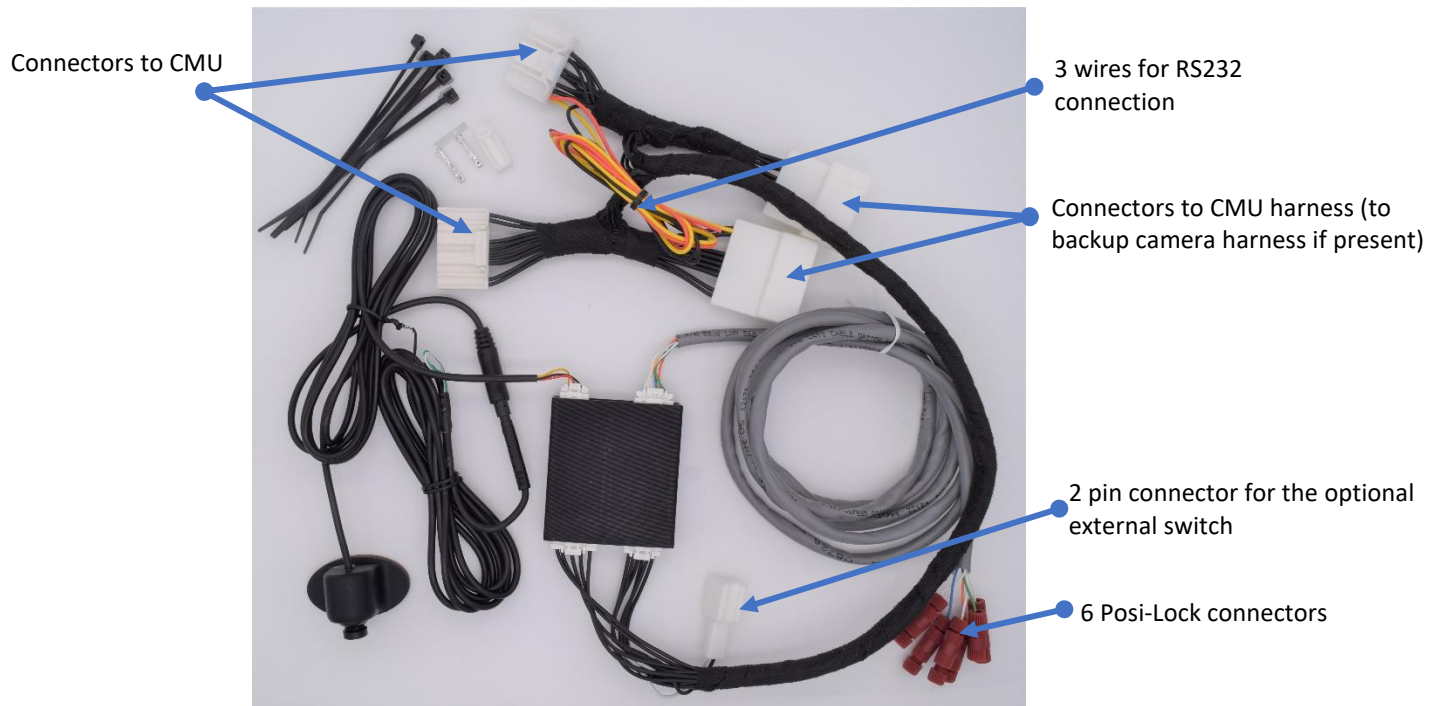
AIO Kit includes:

1. AIO module -1pc
2. Main harness – 1pc
3. Front Camera with extended cable and 4 pin connector – 1pc (optional)
4. 2 pin female connectors with terminals – 1 set.
5. Cable with 6 Posi-Locks connectors (with “Smart Mirror Controller” option only)
6. 6” Zip-tie – 6 pc
7. USB programing cable – 1pc

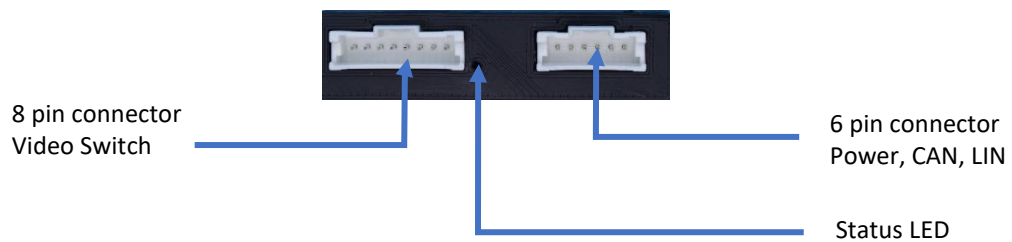
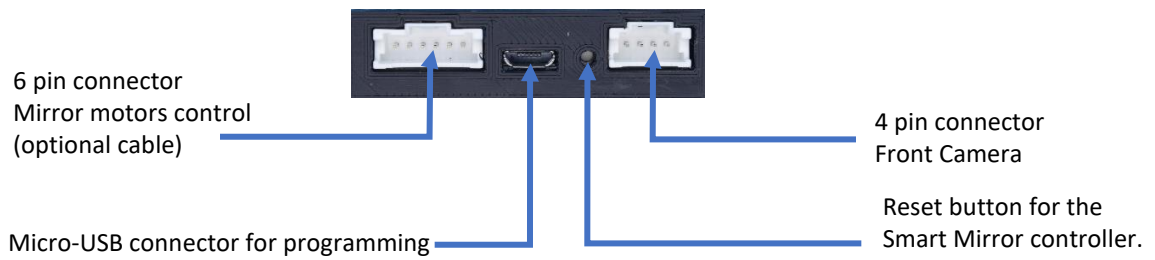
Estimated installation time is about two hours.

Tools required:

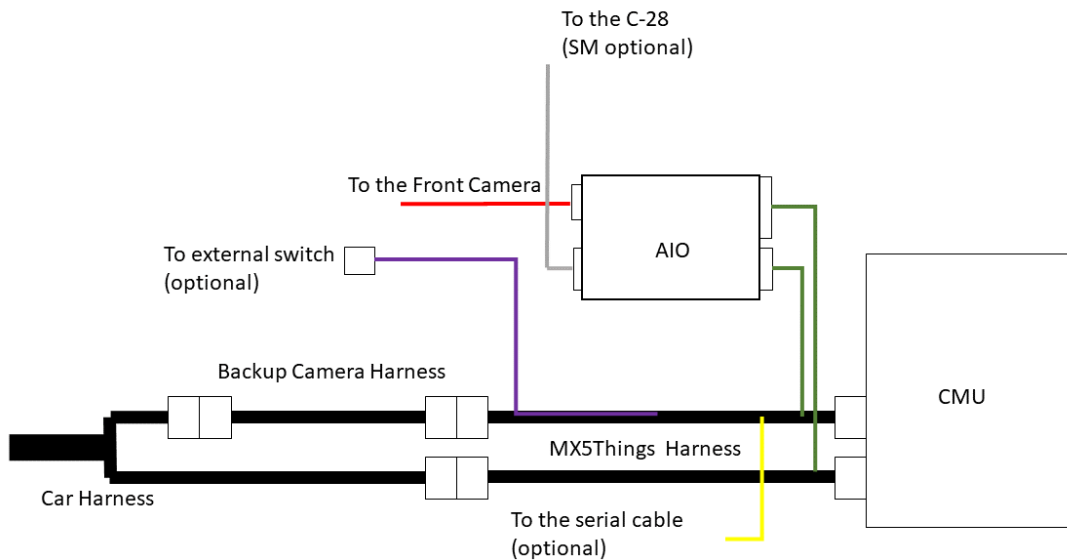
1. Good light.
2. 10mm Socket wrench with extender.
3. Wire cutter/stripper 20-22 AWG (only for Smart Mirror Controller installation)
4. Panel removal tools (optional)



AIO3 kit

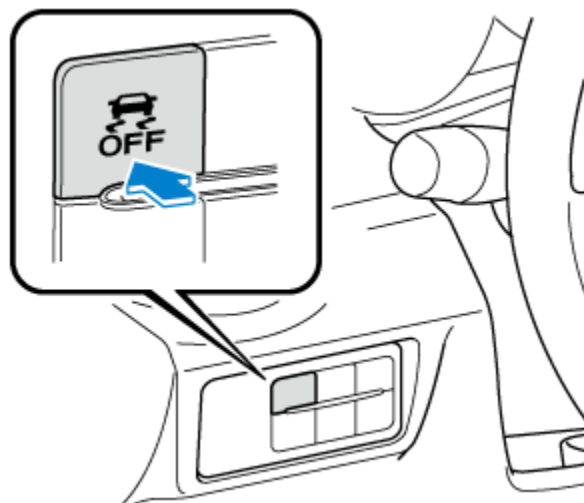


The Front Camera switch module harness must be installed between the CMU and the CMU harness. If the OEM Backup Camera is installed with an additional harness, this harness must be attached to the switch harness (28 pin female connector).



The Front camera can be activated either by external momentary switch (not included with the kit) or by the mute button on the central console. One click will turn the camera on, a second click will turn it off. See demo [clip](#).

Alternatively, the TCS/DSC button can be used for switching the front camera on and off. When TCS is off, and speed is below 5mph, the front camera will show up on the screen.



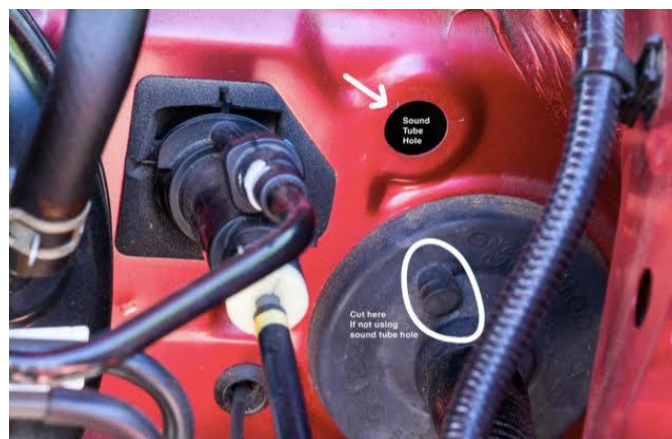
Front Camera Module Installation



1. Disconnect the round connector between the camera and the long cable. Install the camera on the front grill.



2. Route the long camera cable from the CMU through the firewall using either the sound tube hole or the rubber gromet.



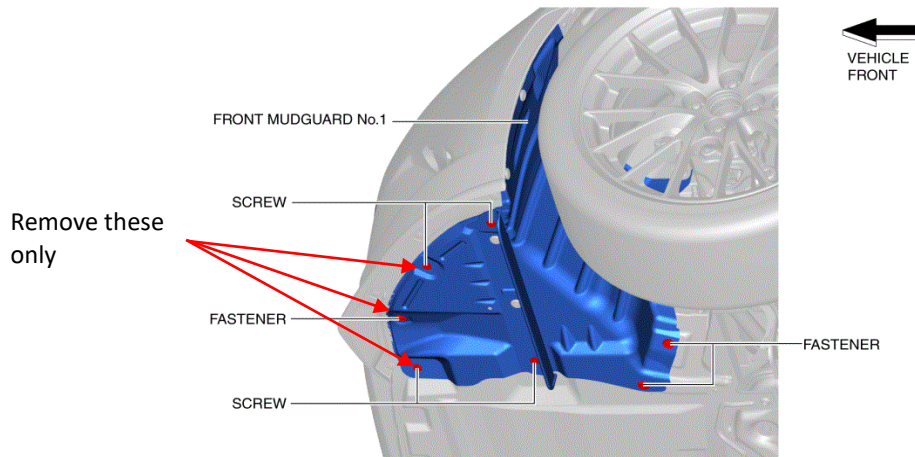
3. If you have the rubber plug for the sound tube hole, slice it with a knife and put it on top of the long cable.



4. Route the long cable to the front corner on the driver side, using zip ties to bundle with the main harness.



5. To access the long cable from the camera location and connect it to the short camera cable, release the mudguard on the driver side(pry open just enough to fit your hand inside). Connect the round connectors.



6. After installation, remove protective plastic cover from the lens.

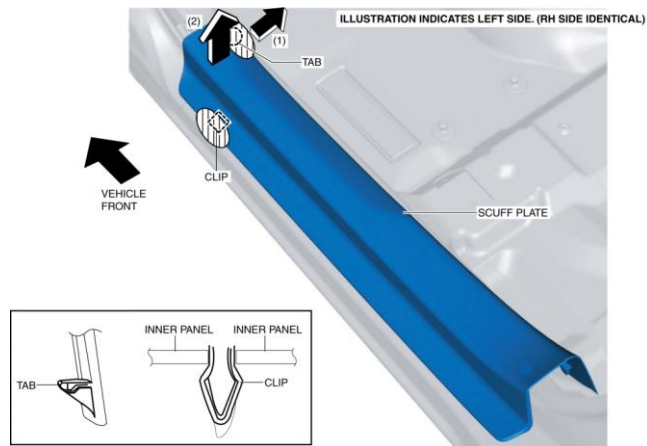
Front Camera Switch installation

There are a few good public sources that have a documented process of the CMU removal. It is highly recommended to review them before proceeding with installation. See links below:

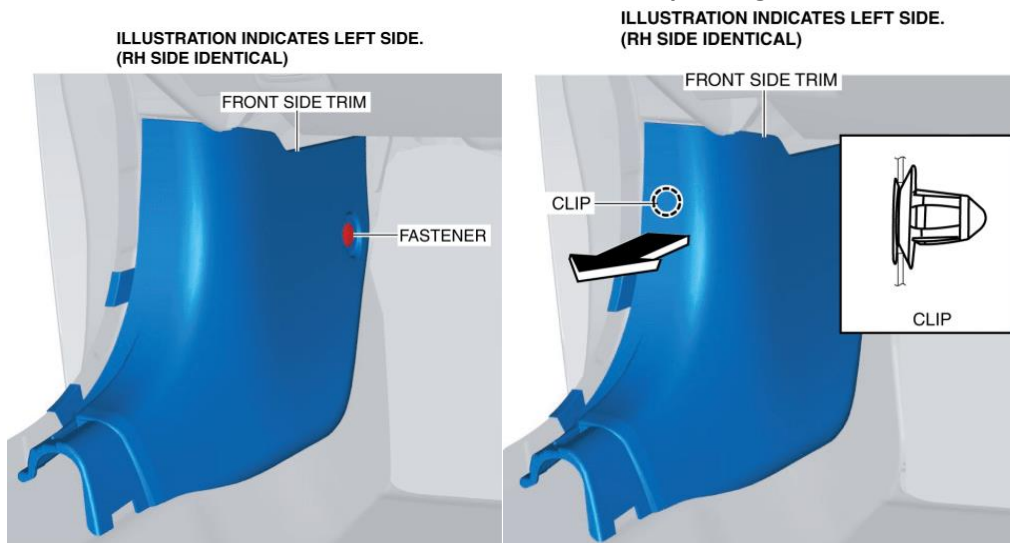
[How To Guide for Installing the OEM Back Up Camera and Cleaner on the Club model ND](#) – check the portion for backup camera installation.

[YouTube video](#) from Ventura Technology

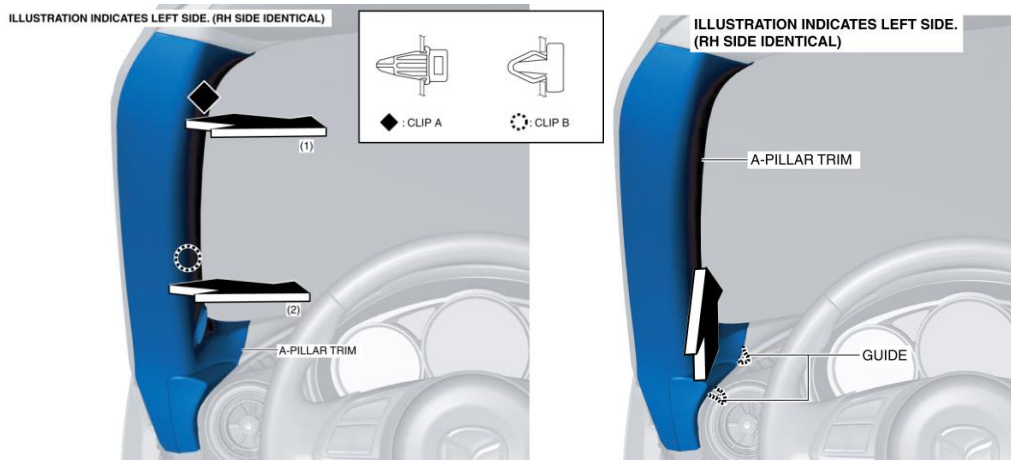
7. For safety reasons, detach the negative clamp from the car battery.
8. Remove the **passenger side** scuff plate.



9. Pull up rubber weather stripping to allow front side trim to be removed
10. Remove one fastener and detach the front side trim on the **passenger side**.

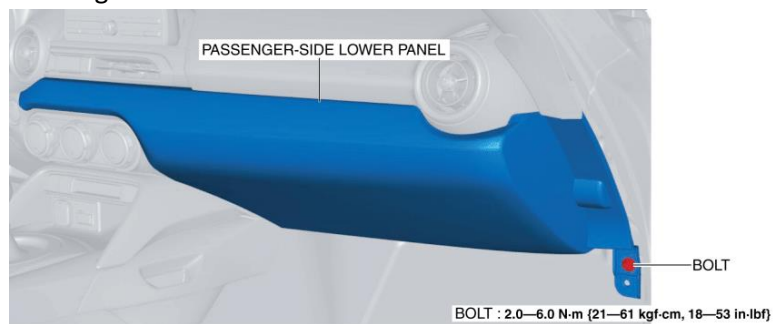


11. Remove **right side** A-pillar. Move the A-pillar trim in the order of arrows (1) and (2) shown below on the left picture and detach clips A and B from the dashboard. Release the tabs in the positions shown below on the right picture.

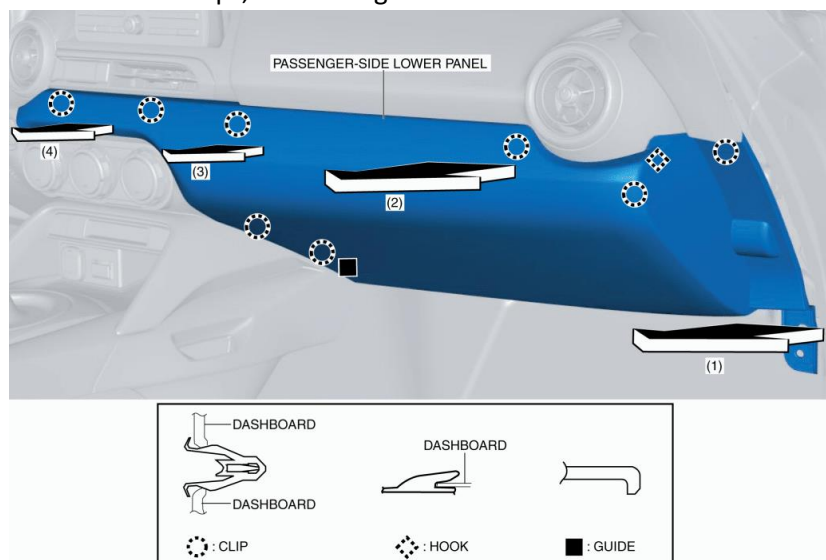


12. Remove passenger side lower panel

a) Remove the bolt using 10mm socket wrench.

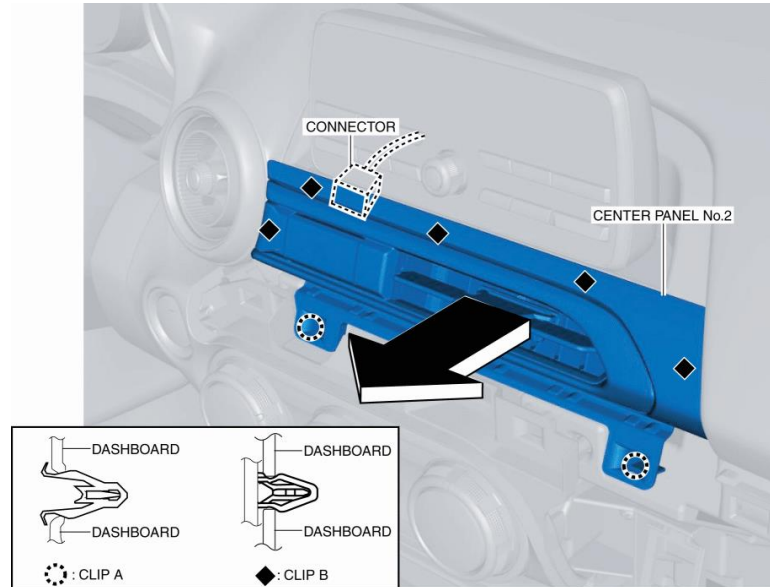


b) Move the passenger-side lower panel in the order of arrows (1), (2), (3), and (4) shown in the figure, and detach the clips, hook and guide from the dashboard.

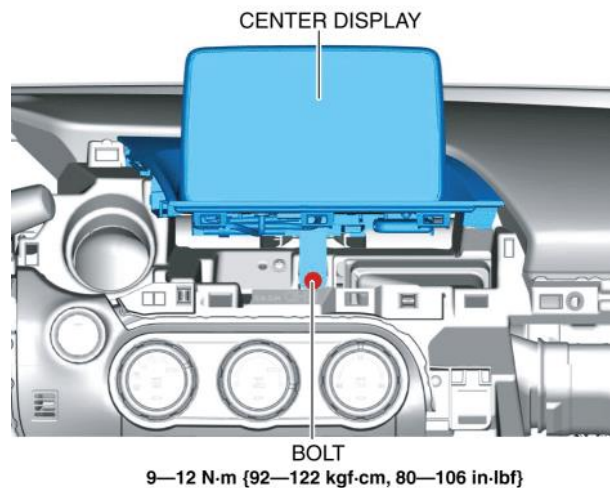


13. **Note:** If the “Smart Mirror Controller is enabled, proceed with “[Smart Mirror Controller](#)” installation before continuing with this step.

Remove Central Panel No.2. Move the center panel No.2 in the direction of the arrow shown in the figure and detach clips A and B from the dashboard.

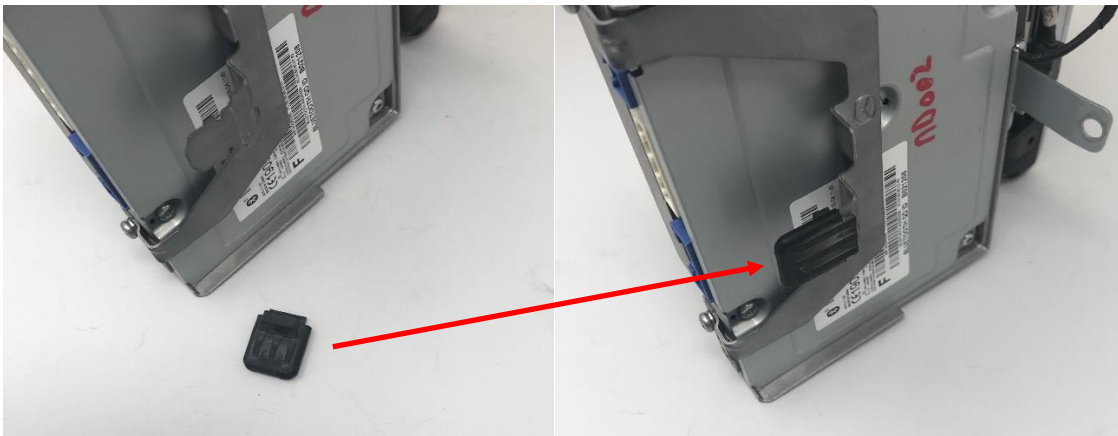


14. Remove 10mm bolt and pull out CMU to get access to the connectors on the back.



15. Attach harness connectors to CMU, CMU harness and switch module. Attach the camera cable to the 4-pin connector. Spread all the cables with connectors to the right and left side behind the CMU and push into place the CMU unit.

Tip: Make sure that the rubber sleeve stays on the metal bracket. It is easy to lose it during manipulation with CMU. See pictures below.



16. Install all the panels in reverse order.
17. Connect the negative clamp to the battery.
18. Check operation with the backup camera, and switch to the front camera by using the mute button or external switch (if installed).
19. Check the lens position. The lens can be rotated 360 degree. Place an object in front of the car, in order to decide how to position your lens.

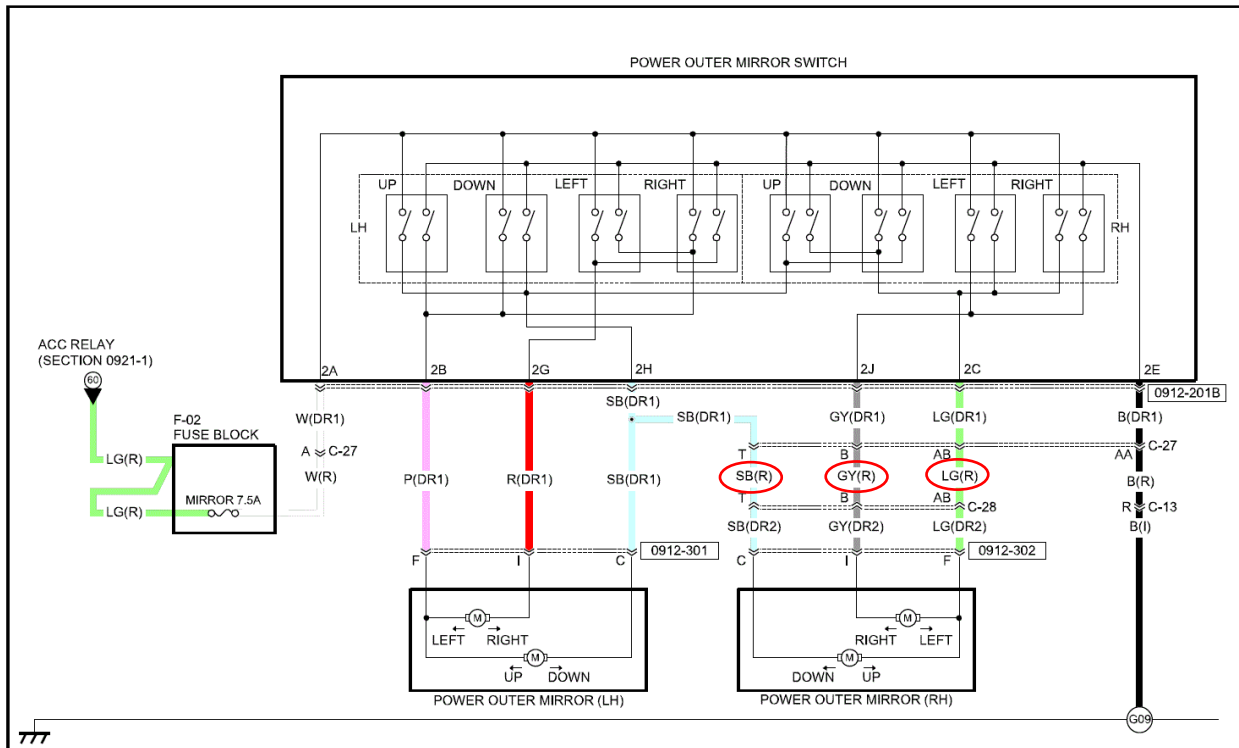




Smart Mirror Controller Installation (optional)

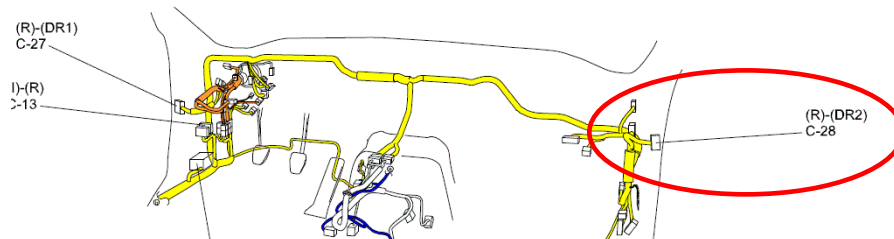
The AIO module optionally can be used as a Smart Mirror Controller. If this option is enabled, an additional cable must be installed.

Review the schematic. The AIO controller will be connected between switches and motors. The 3 wires from the motors (SB(R), GY(R) LG(R)), circled in red on the diagram, must be cut and attached to the provided cable using Posi-Lock terminals.

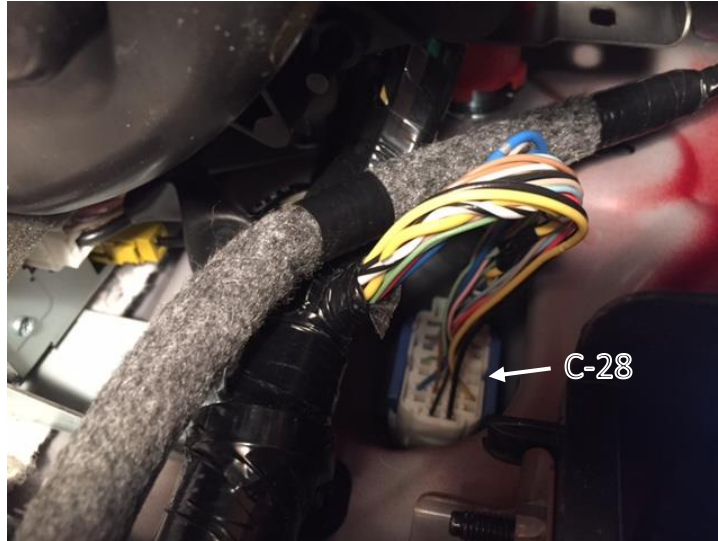


Proceed first with installation steps 7-12.

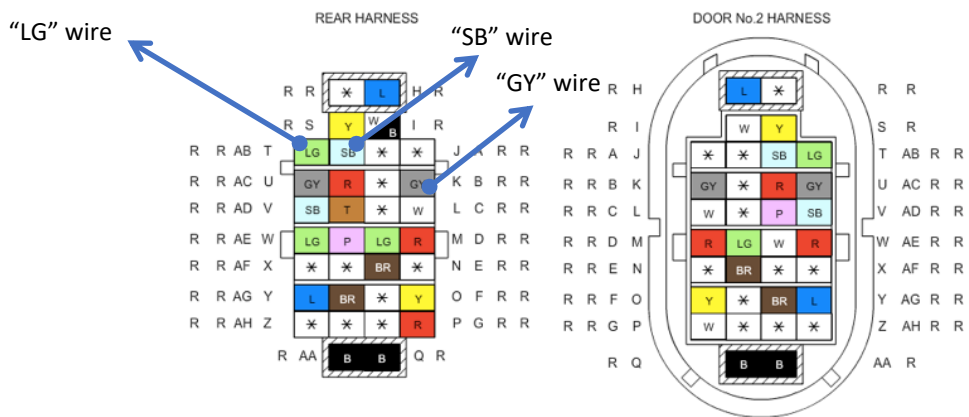
20. Locate the harness from the C-28 connector (C-28 connector is the connector that goes from the car interior to the door interior passenger side).



21. Unwrap the black tape from the cable for 3-4 inches and locate 3 wires from the C-28 connector, according to the schematic diagram, and split them with a cutter.



C-28
REAR HARNESS-DOOR No.2 HARNESS



22. Attach the Posi-lock connector with the solid Blue wire- the "SB" wire (position "T" on C-28). The solid Blue wire must be connected to the wire coming from C-28. The striped blue wire must be connected to the other side of the cut wire.

23. Attach the Posi-lock connector with the solid Green wire to the “LG” wire (position “AB” on C-28). The solid green wire must be connected to the wire coming from C-28. The striped green wire must be connected to the other side of the cut wire.
24. Attach the Posi-lock connector with the solid Orange to the “GY” wire (position “B” on C-28). The solid orange wire must be connected to the wire coming from C-28. The striped Orange wire must be connected to the other side of the cut wire.
25. Proceed with installation step 13
26. Attach 6 pin connectors to the AIO module.
27. Finish installation from step 16.
28. For cars with AT: Start the engine, put it in “Drive” first, then put it in “Reverse”, and while in “Reverse”, adjust the mirror to any position. Last step: put in Park position and make sure the mirror goes back to the original position. After a couple seconds of inactivity, the controller will remember any adjustments for Reverse and other positions independently.
Note: Shifting from “Park” to “Reverse” will not initiate mirror movement. Automatic movement will be initiated after getting to reverse by shifting from driving position only. This is done to avoid unnecessary mirror repositioning during simple back up from a garage or parking lot.
29. For cars with MT: Start the engine, shift gear from 1st to “Reverse” and while in “Reverse”, adjust the mirror in any position. Shift back to 1st gear and make sure the mirror is going back to the original position. After a couple of seconds of inactivity, the controller will remember any adjustments for Reverse and other positions independently. If the hand brake was engaged, it will prevent automatic mirror movement when you put the car in Reverse. This is useful when backing up from a garage or parking lot. During parallel parking (without engaging the hand brake) the mirror will automatically be adjusted in “Reverse”.
30. All done!!

Note: To reset programming to the original state, press and hold Reset button for 3 sec. This will erase settings in EEPROM.

Wiring options:

Connector pin	Definition	CAT3 cable	Flat cable	LHD cars	RHD cars
1	Switch up/down	Blue striped	1 (white stripe)	Blue from the harness	Blue from the harness
2	Switch left/right	Orange striped	2	Gray from the harness	Red from the harness
3	Switch common	Green striped	3	Green from the harness	Pink from the harness
4	Motor up/down	Solid blue	4	Blue from the door connector	Blue from the door connector
5	Motor common	Solid green	5	Green from the door connector	Pink from the door connector
6	Motor left/right	Solid orange	6	Gray from the door connector	Red from the door connector

Warning Timer (optional)

AIO module can be used as a Warning Timer for the Turn Signal. This option can be enabled/configured through USB cable, using PC application. It will produce warning through an Instrument Cluster buzzer if the turn signal is left on for more than configured timeout during driving (if the car speed is more than 20 mph).

No additional installation steps required.

Fuel Level Reminder (optional)

AIO module can be used as an audible fuel level reminder. This option can be enabled/configured through USB cable, using PC application. If you start driving with a fuel level below configured value, it will produce 3 beeps through an Instrument Cluster buzzer. It will not beep during driving.

No additional installation steps required.

Serial Debug Port

Harness includes wires for serial connection to help with tweaking CMU.

Detailed usage available here <https://mazdatweaks.com/serial/>

If not used, tape it to the main bundle.

Recommended RS232 to USB cable: [USB-RS232-WE-1800-BT_3.3](#)



Black wire – Ground – connect to Black wire USB-RS232-WE-1800-BT_3.3

Yellow wire – Pin 2S (CMU side, 18 pin connector) – connect to Rx (Yellow wire)

Orange wire – Pin 2T (CMU side, 18 pin connector) – connect to Tx (Orange wire)

AIO module connectors pinout

Power/CAN/LIN connector (6 pin)

Mates with Molex 0513820600

1. Ground
2. LIN
3. Input Power line
4. Ignition Power
5. CAN-H
6. CAN-L

Video Switch connector (8 pin):

Mates with Molex 0513820800

1. Video input for backup camera
2. Not connected
3. Video output for CMU
4. External switch input
5. Video ground
6. Not connected
7. CAN-H to CMU
8. CAN-L to CMU

Front Camera connector (4 pin)

Mates with Molex 0513820400

1. Video input
2. 12V power output
3. 3.3V power output
4. Ground

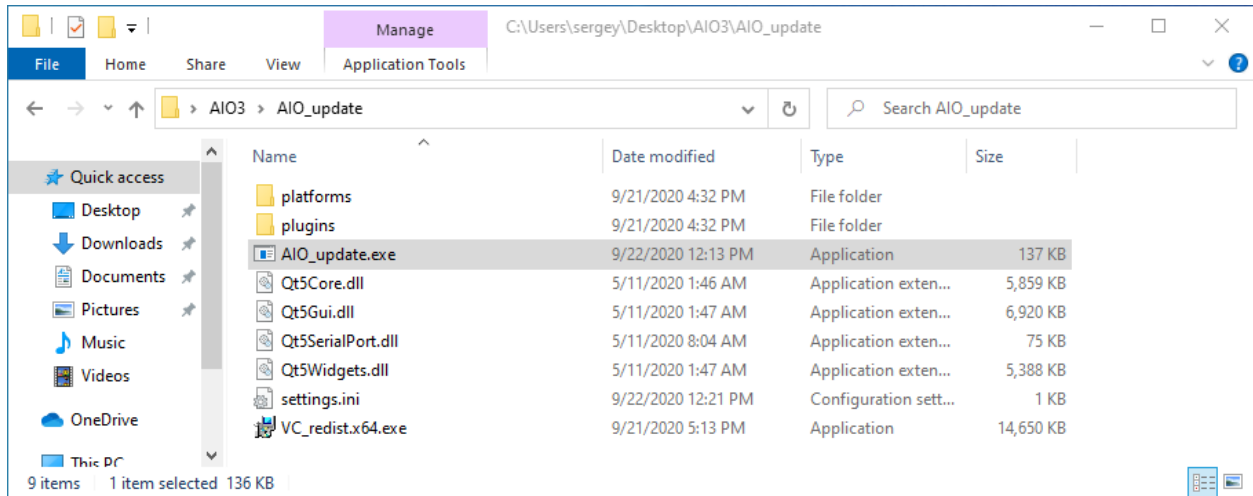
Mirror control connector (6 pin)

Mates with Molex 0513820600

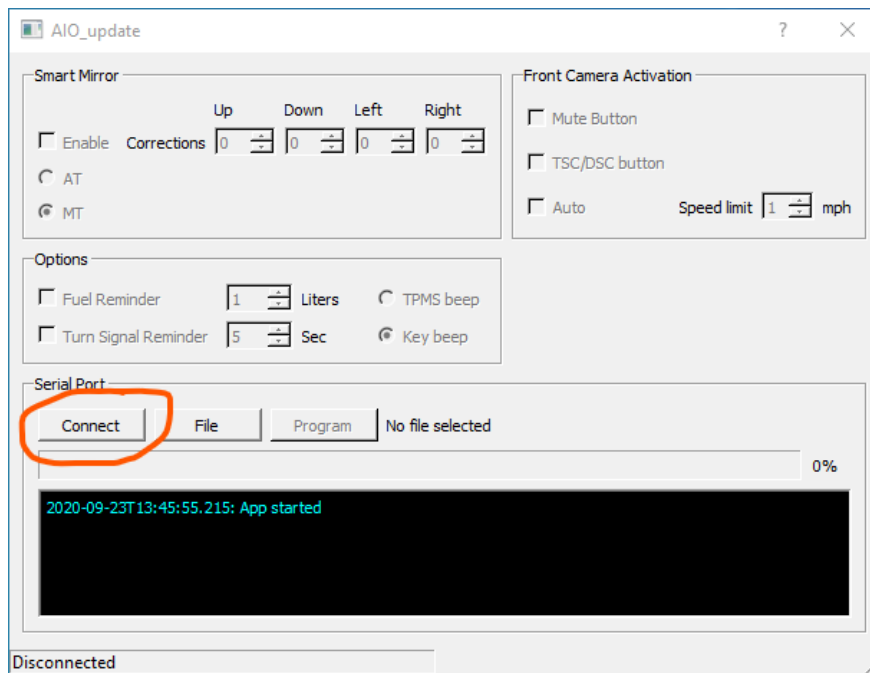
1. Switch up/down
2. Switch left/right
3. Switch common
4. Output motor up/down
5. Output motor common
6. Output motor left/right

Software configuration via USB port.

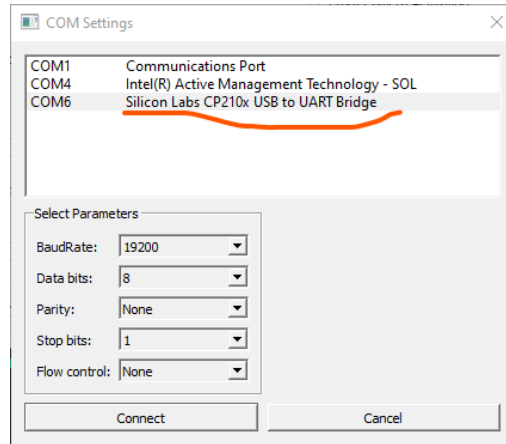
1. Download installation package and unzip it to desired location.



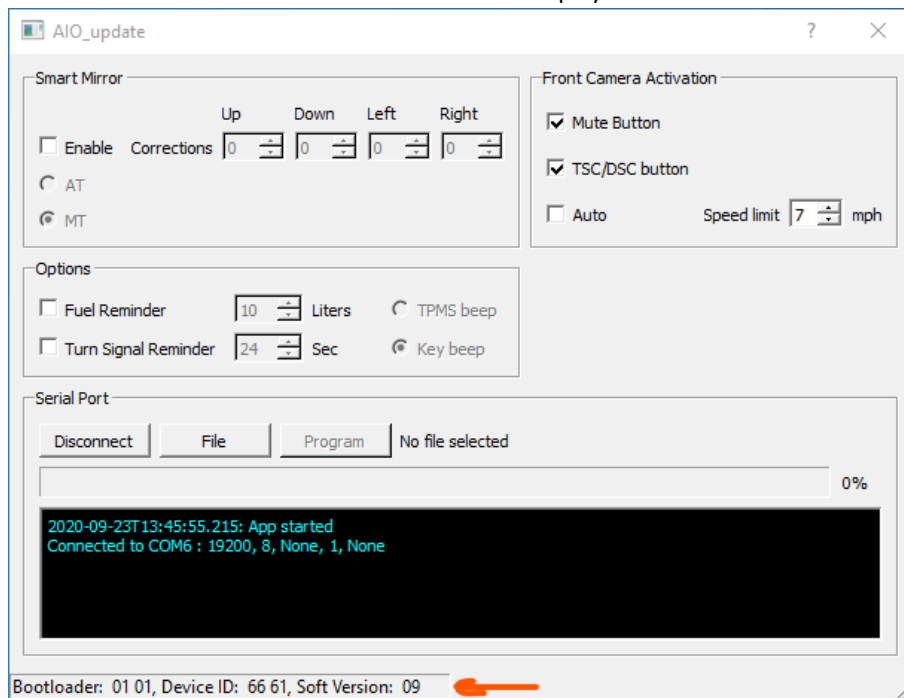
2. Connect AIO module via Micro-USB cable to Windows PC. (all other connectors must be disconnected). Status LED will be solid Red.
3. Start application AIO_update.exe. In case of an error about missing files, install VC_redist.x64.exe from the same folder.
4. Click on “Connect” button.



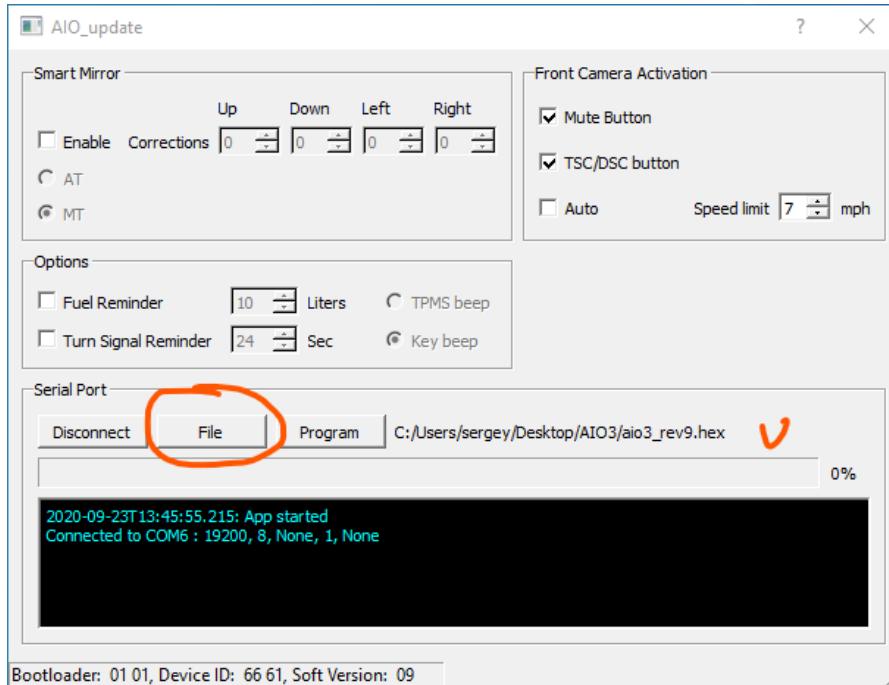
5. Select COM port for Silicon Labs CP210x USB to UART Bridge.



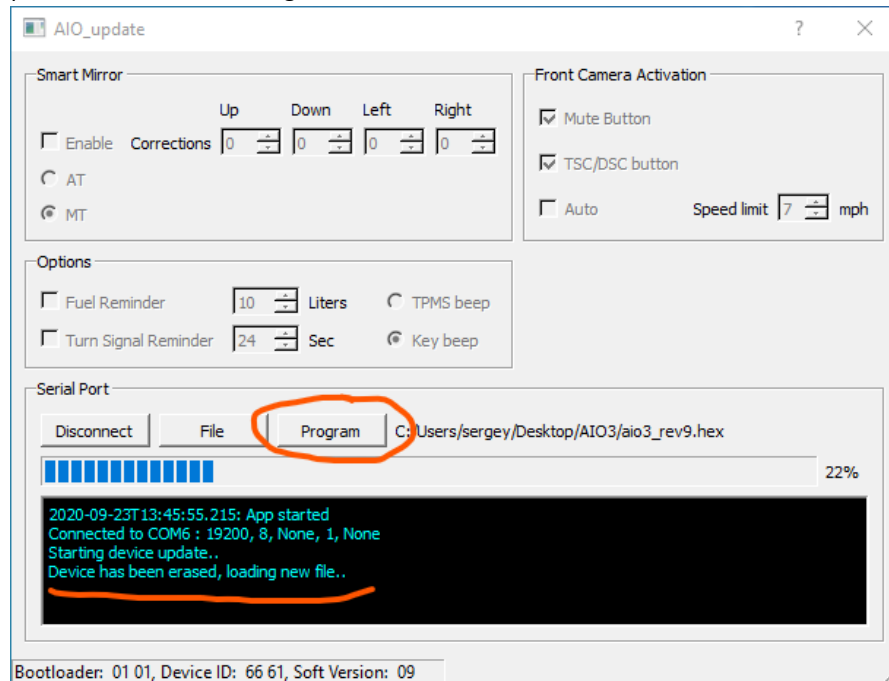
- Successful connection and current software version will be displayed in the status window.



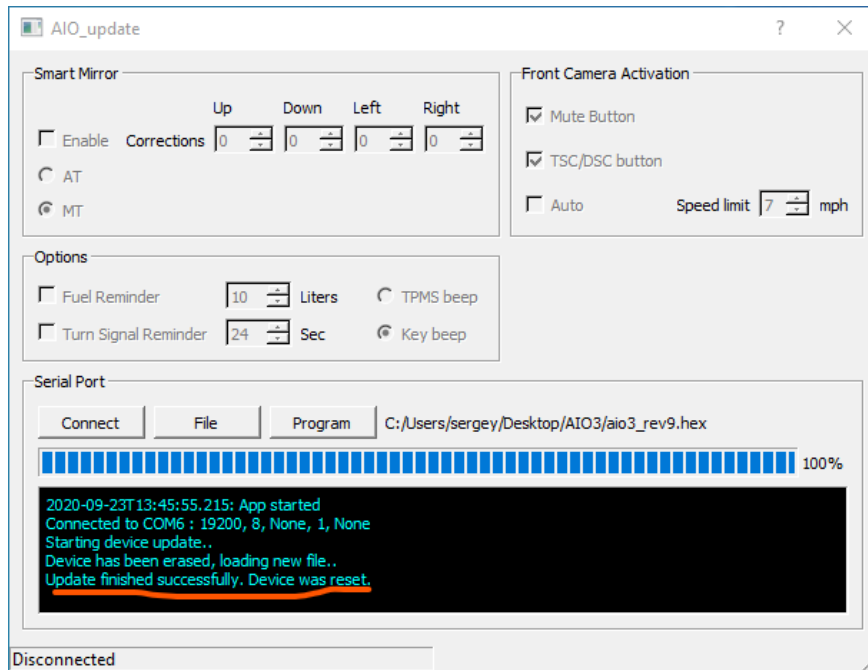
- To update firmware, click on the “File” button and select the firmware file with .hex extension. If the update is not necessary, skip to Step 10.



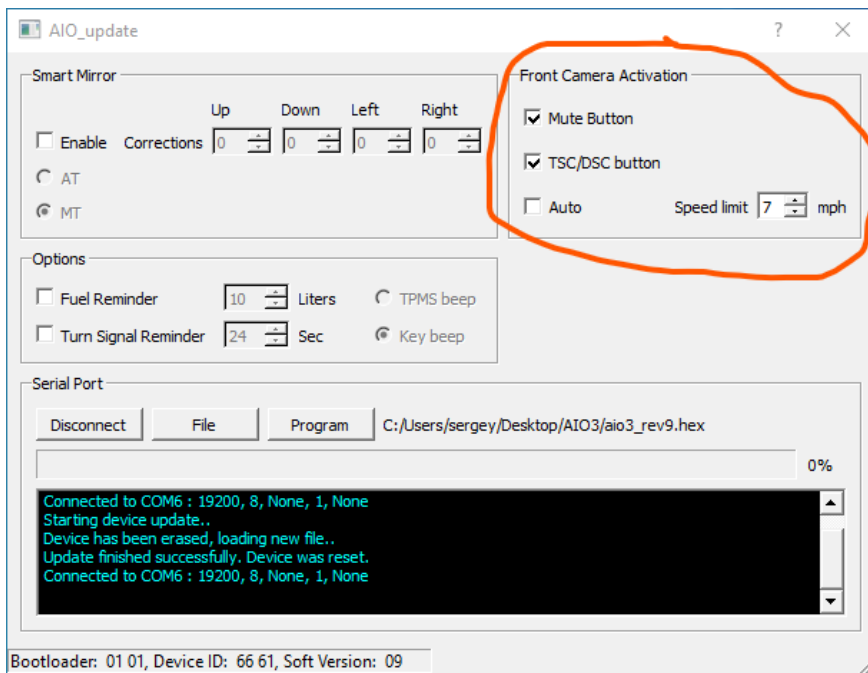
- To start the process, click on the “Program” button.



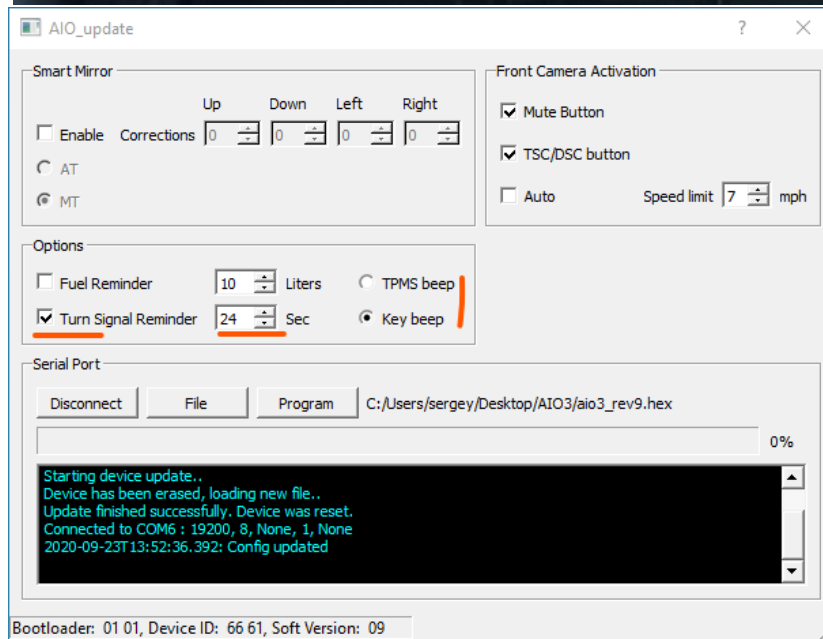
- After uploading is completed, the device will be disconnected.



10. Connect again (using the connect button), to finish configuration. Select desired options for Front Camera Activation.



11. To enable the Turn Signal reminder feature and/or Fuel reminder, select the check box and setup timeout and Beep source. "TPMS beep" is louder, but available only for cars with a TPMS Reset button. If this button is not present, select "Key beep".



12. If the Smart Mirror option is installed (with optional cable), enable it by selecting the “enable” check box and select a transmission type. Directional corrections can be made by utilizing the Up, Down, Left, Right scroll boxes, in the Smart Mirror Section.

