ISSUE DATE:	2/12/2021
SERVICE BULLETIN SUBJECT:	800 Volt Winter Software Release
VINs or MODELS AFFECTED:	Service Specified Buses
COMPLETE BY:	Next Service Opportunity
SERVICE BULLETIN #:	SB-21-20
Labor Operation Code:	HC42Z

NOTICE! It is expected that this process may require up to 1 hour per bus. Please schedule appropriately to minimize vehicle downtime.

VEHICLE SOFTWARE UPDATE

Description

The reason for this software update is to update various controllers to the latest state of the art software. This will improve vehicle up-time, reduce driver interactions with the doors, and improve diagnostic fault handling. All the included Proterra Catalyst 800V vehicles require a change to the software/configuration for the following items:

- Body Controller
- Vehicle Controller

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Summary of Software Changes

There are two controllers that will be updated. Below are the high-level updates. More detailed information is available in the individual controller's release notes.

- Body Controller
  - Update the battery low coolant indicators to use the CAN signal instead of the DTC.
  - Update the PE Low Coolant indications to use the CAN signal instead of the DTC.
  - Update Aux heat to have a rapid transition from Eheat to diesel and a slow transition Diesel to EHeat.
  - Prevent the ferry height from being raised up above 15mph.
  - Update the RBS lights as follows: Amber On-> 30% Red On 10%.
  - Updated the high beams to work any time the bus is on. High beams are used as a method of signalling other drivers. They should always be available. Not just during night run mode.
  - Improved LV bar display to use the sensed voltage of the display system.
  - Improved LV faults to reduce false icon displays.
  - Added a flashing ABS active display to the ABS icon.
  - Clean up the drag detection eeproms to reduce configuration manager items.
  - Map the manual hill hold switch to be an AND with vehicle standstill to prevent actuation at speed.
  - Add a configuration to allow the internal buzzer to be disabled after 7 seconds of turning.
  - Improved ABS annunciation to the driver.
  - Adjusted the diagnostic format configuration to improve compatibility with diagnostic tools.

- Vehicle Controller
  - Removing DM01 for Battery Coolant Level Sensor and Power Electronics Coolant Level Sensor from the Vehicle Control.

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Tools/Programs Required

Tools Required:

- Laptop Computer
- Nexiq USB-Link 2

Programs Required:

- Proterra Diagnostics Tool

Software Files Required / Preparation

IMPORTANT! NEVER access the software from the USB memory device, ALWAYS copy the software files to your computer hard drive and access the software from this location. Secure the bus with the Vehicle Master Disconnect in the rear ON.

Component	Part Number	Version
Body Controller	056244	6.5.2
Vehicle Controller	056766	4.4.1

It is recommended that you copy the entire “service bulletin files” folder to your local machine in order to more effectively keep track of the software versions you are deploying: \\bus.local\files\Engineering\Service Bulletins\Service Bulletin Files for SC-21-20\

Service Bulletin Execution

1. Update the Body Controller using the process in Appendix A
2. Update the Vehicle Controller Software using the process in Appendix B
3. Verify software versions using the Proterra Service Tool
4. Update each work order in Service Max when complete

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Appendix A

BODY SOFTWARE UPDATE PROCEDURE

Description

This document contains the necessary information to update the Body Controller on a Proterra Vehicle. This controller provides the control algorithms for body functionality on 800V models. This covers the control logic relating to driver inputs and display, stop requests, doors, interior and exterior lighting, and ramp control.

Tools/Programs Required

Tools Required:

- Laptop Computer
- Nexiq USB-Link 2

Programs Required:

- Proterra Diagnostics Tool

Software Files Required / Preparation

To program the body controller, you will need a *.ZR32A_A data file. This file contains the necessary firmware files and a baseline configuration to provide an operational bus body. The bus may need to be configured to match customer specific functionality after programming.

If the vehicle has already been configured, the Proterra Diagnostics Tool will attempt to automatically carry the configuration information forward into the new software version.

If needed, configuration information is contained in the released customer configuration documentation. Ensure that you also have the configuration definition for the customer's vehicle.

IMPORTANT! NEVER access the software from the USB memory device or network drive, ALWAYS copy the software files to your computer hard drive and access the software from this location.

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Preparing the Vehicle to be Programmed

When programming a vehicle, it is critical that the low voltage batteries remain connected throughout the process. Ensure that the LV batteries are fully charged before starting the process. If they are low you can use the vehicle to recharge them buy turning on high voltage, or you can place the bus on a low voltage charger for the duration of the process.

Connecting to the Vehicle

This process will guide the user to connect to the vehicle with the Proterra Diagnostics Tool.

1. Power up and login to the Proterra-Supplied laptop or a comparable PC that has the Proterra Diagnostics Tool software installed with a valid license.

2. Turn **ON** the 12/24V rear Vehicle Master Disconnect located at the curbside rear charge port access panel.

Vehicle Master Disconnect

3. Connect the Nexiq USB Link2 device to the laptop and to the OBDII Diagnostic Port located in the Street-Side wheel well box.

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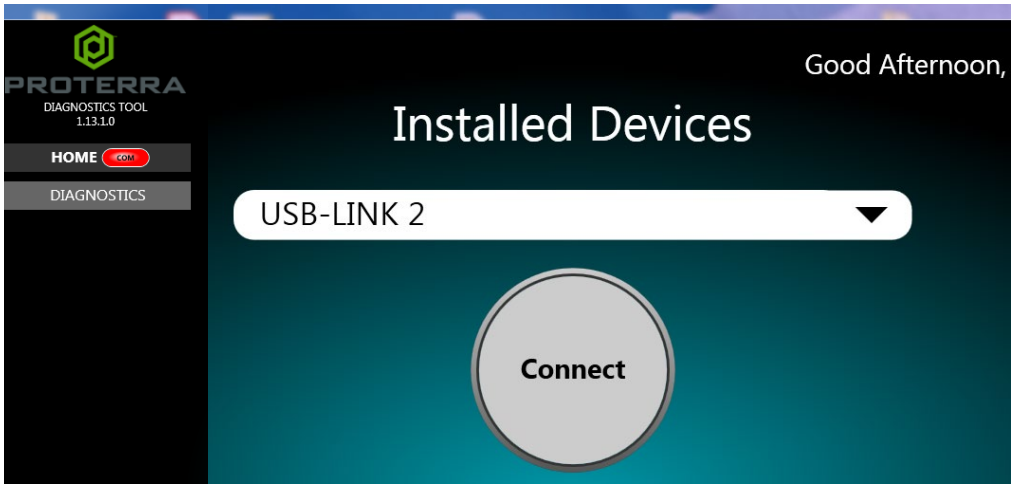
4. Turn the Driver's Master Switch to the **ACC** position.

5. On the laptop, double-click on the Proterra Diagnostics Tool software icon to start the software.

6. When the program opens, read and click OK for the high voltage safety prompt.

7. On the Home tab, select the appropriate device from the drop down and click "Connect".



8. Once the Proterra Diagnostics Tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don't, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.

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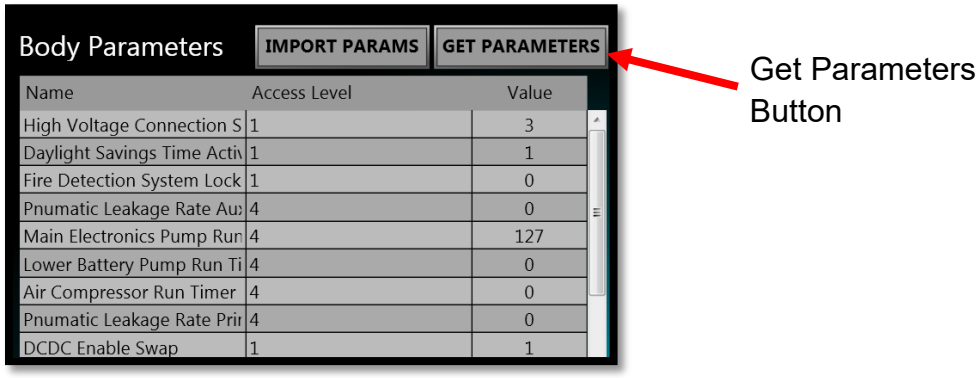
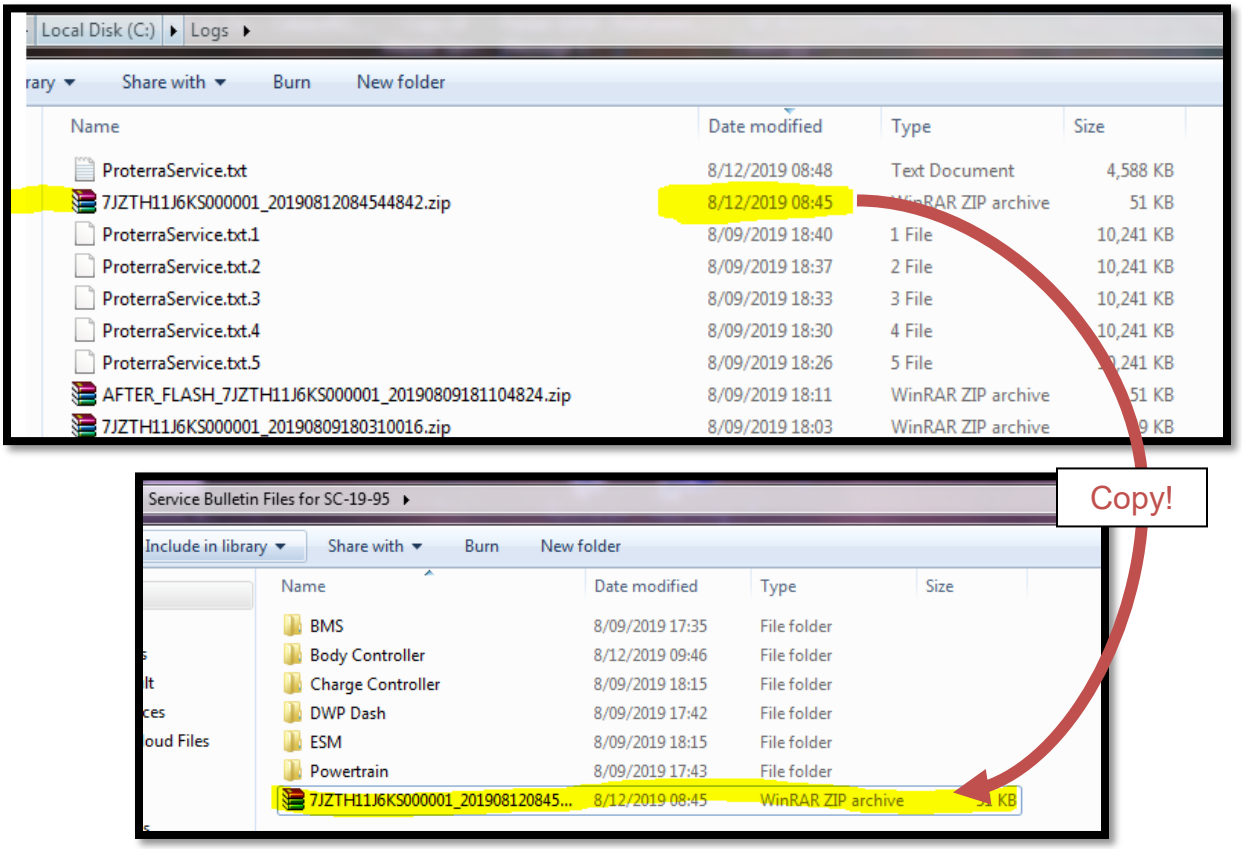
Download and Store Existing Parameters

Sometimes you might want to download and store the customer specific parameters from the vehicle. This can be useful when comparing two vehicles that are behaving differently, or if you are replacing the ZR32A controller on a vehicle.

1. After the first vehicle has been completed and verified, disconnect the Proterra Diagnostics Tool and then re-connect.
2. Navigate to the Configuration tab and click the “Get Parameters” button. This will download the latest parameter set to the “C:\Logs” folder on your machine.



3. In windows file explorer, navigate to the C:\Logs folder. Copy the latest downloaded *.zip file to a folder for the specific customer and vehicle.



4. Do not rename the file as the tool will follow the naming convention when reloading the file.

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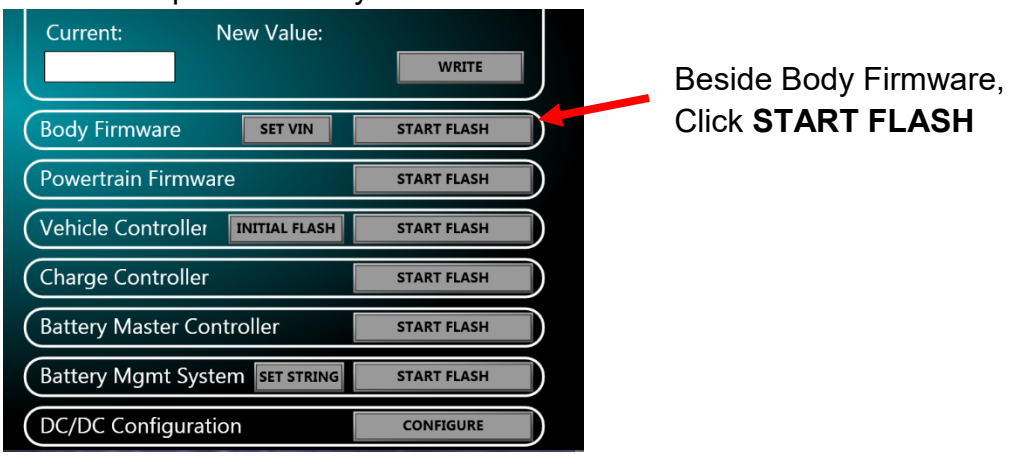
Update Using the Proterra Diagnostic Tool

1. Navigate to the CONFIGURATION tab in the left menu.

2. If this is a replacement controller, select the “SET VIN” and program the controller to match the vehicle VIN, then proceed to step 3. If not proceed to step 3.

3. Select the option for Body Firmware “START FLASH”.



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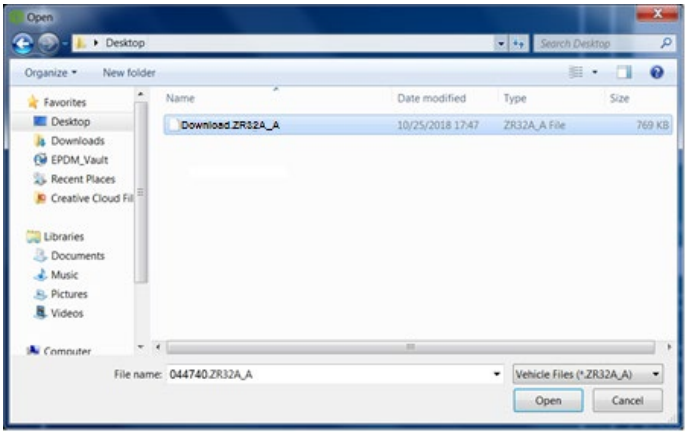
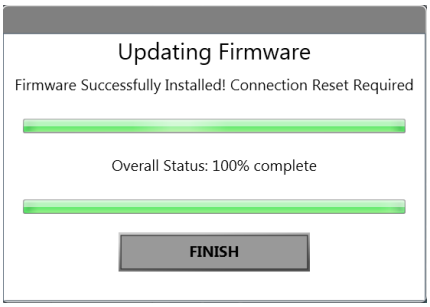
4. In the pop-up window, select the software flash file to load to the controller.



5. The Programming window will come up and will take a few minutes to complete. The process will flash 5 different files to the controller.

6. After the controller is updated the tool will automatically try to copy over the original configuration into the new software. Since there is a possibility that configuration options change it is important to check the configuration after restarting the vehicle.



7. Once the process has finished, cycle power to the bus by moving the driver master switch back to the off position before continuing.

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Appendix B

VEHICLE SOFTWARE UPDATE PROCEDURE

Description

This document contains the necessary information to update the Proterra Vehicle Integration Controller. This controller provides the electrical integration of ancillary systems on 800V models. It owns the vehicle operational state control, startup and shutdown, steering, pneumatics, thermal management, and brake interlock controls.

Tools/Programs Required

Tools Required:

- Laptop Computer
- Nexiq USB-Link 2

Programs Required:

- Proterra Diagnostics Tool

Software Files Required / Preparation

It is recommended that you download any files local to your machine. To program the vehicle controller, you will need a *.hex data file. This file will contain memory address and data information that will be written to the controller in order to update the user code space. This will not update the boot loader or other firmware files.

IMPORTANT! NEVER access the software from the USB memory device, ALWAYS copy the software files to your computer hard drive and access the software from this location.

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Preparing the Vehicle to be Programmed

When programming a vehicle, it is critical that the low voltage batteries remain connected throughout the process. Ensure that the LV batteries are fully charged before starting the process. If they are low, you can use the vehicle to recharge them buy turning on high voltage or you can place the bus on a low voltage charger for the duration of the process.

Connecting to the Vehicle

1. Power up and login to the Proterra-Supplied laptop or a comparable PC that has the Proterra Diagnostics Tool software installed with a valid license.

2. Turn **ON** the 12/24V rear Vehicle Master Disconnect located at the curbside rear charge port access panel.

Vehicle Master Disconnect

3. Connect the Nexiq USB Link2 device to the laptop and to the OBDII Diagnostic Port located in the Street-Side wheel well box.

4. Press and hold the Street-Side Wheel Well WORK LIGHT switch until the work lights turn on.

5. On the laptop, double-click on the Proterra Diagnostics Tool software icon to start the software.

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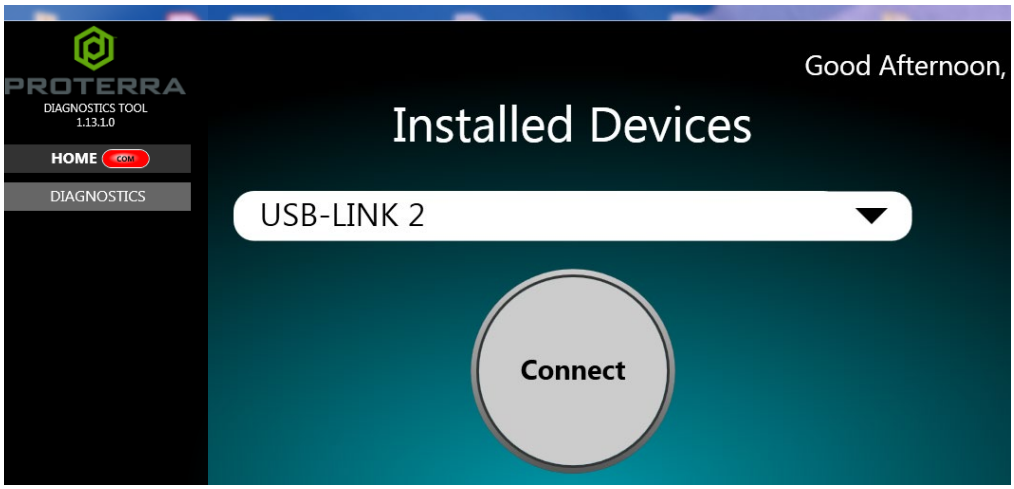
6. When the program opens, read and click OK for the high voltage safety prompt.

7. On the Home tab, select the appropriate device from the drop down and click “Connect”.



8. Once the diagnostic tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don’t see the Home Screen, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.
   Note: 800V Proterra vehicles are equipped with an automatic battery disconnect that will protect the low voltage batteries from a deep discharge.

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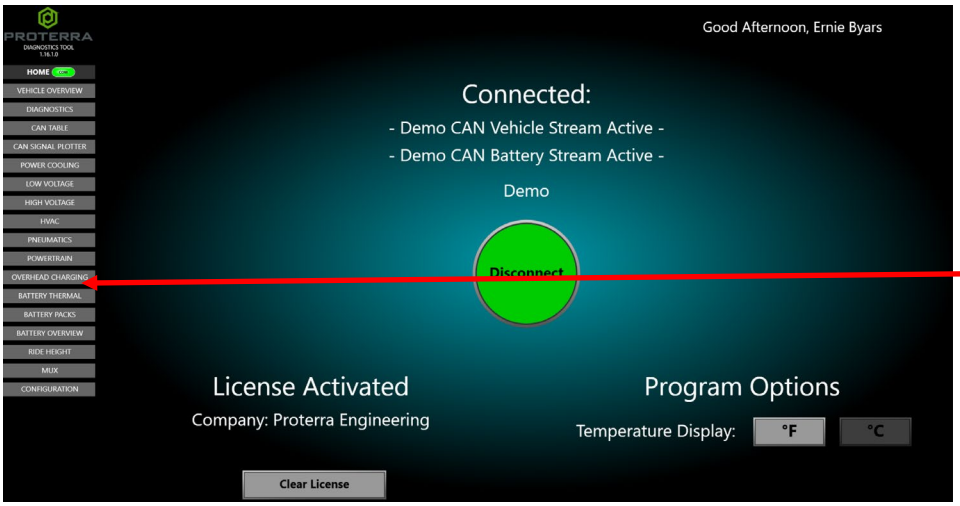
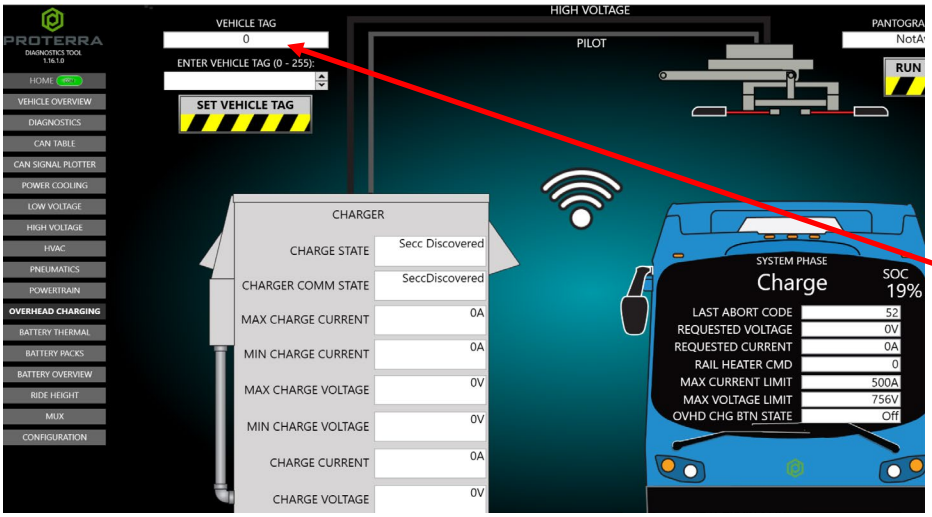
Update Using the Proterra Diagnostic Tool

1. Click on the “Overhead Charging” button on the left side of the screen.
   Note: If the bus that you are working on is not capable of Overhead Charging, skip to step 3 below.



Click “Overhead Charging”

2. Record the value displayed in the “Vehicle Tag” data field. This will be re-entered into the controller after the software update.



Record Vehicle Tag

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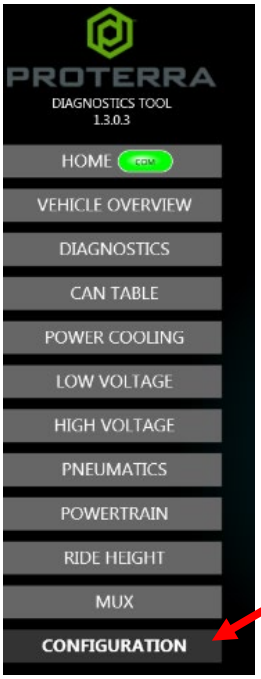
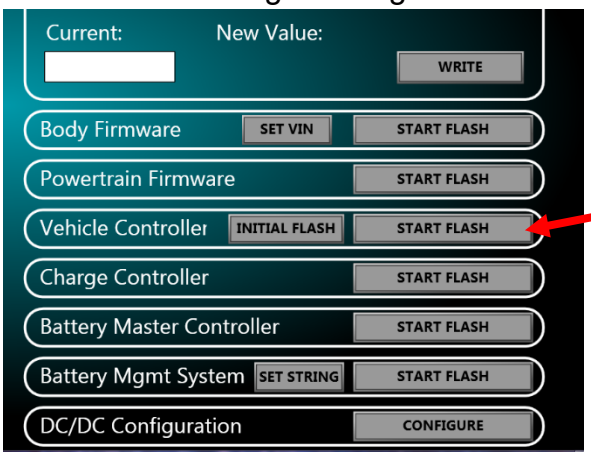
3. Navigate to the CONFIGURATION tab in the left menu.



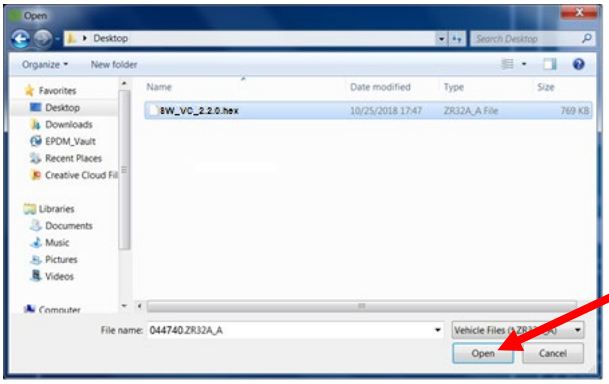
Click
CONFIGURATION

4. Select the option for Vehicle Controller “START FLASH”.
NOTICE: The “INITIAL FLASH” button is only for offline programing of the Vehicle Controller with an Offline Programming Kit.



Beside Vehicle Controller,
Click **START FLASH**

5. In the pop-up window, select the software flash file to load the controller.



Select the file and
Click Open

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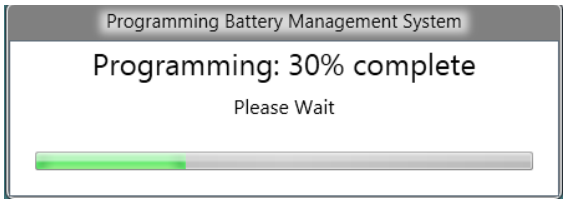
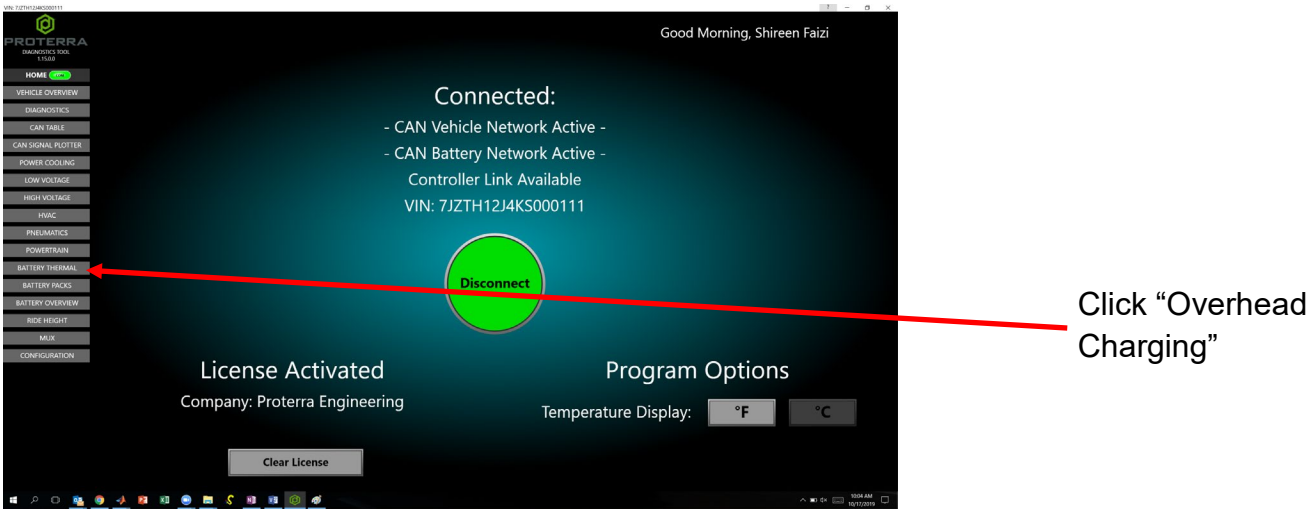
6. The Programming window will come up and may take a few minutes to complete.



7. After completing the software update, Turn **OFF** the Work Light switch inside the street side wheel well box.

8. Click on the “Overhead Charging” button on the left side of the screen.
Note: If the bus that you are working on is not capable of Overhead Charging, skip to step 10 below.



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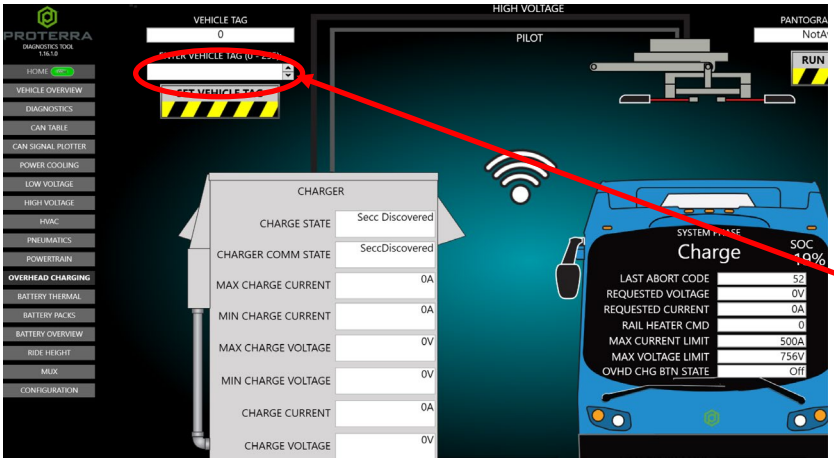
9. The following screen will appear. Enter the “Vehicle Tag” that you recorded previously into the field circled in red below. Click the Button under the field. This will populate the “Vehicle Tag” into the field above and into the controller.



Click “Button”

10. Turn **OFF** the 12/24V rear Vehicle Master Disconnect located behind the vehicle curbside rear charge port access panel, wait 10 seconds, and then turn back to ON.

Vehicle Master Disconnect

11. Verify that the vehicle turns on with no faults and that it is capable of charging.

12. Return the vehicle to service.

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