



TECHNICAL SERVICE BULLETIN

ISSUE DATE:	7/30/2021
SERVICE BULLETIN SUBJECT:	Body and Vehicle Software Update
VINs or MODELS AFFECTED:	Service Specified Buses
COMPLETE BY:	Next Service Opportunity
SERVICE BULLETIN #:	SB-21-106
Labor Operation Code:	HZ53Z

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

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**
 - Removed the diagnostics for the center radiator fan so that 35' Heron's (two radiator fan buses) won't produce a fault for a fan that isn't installed.
 - Update to unforce the HVAC fresh air flaps closed, giving control to the driver for the re-circulation feature.
 - Created Eeprom "EP_bo_RHSC_DoorOpenRqrdforKneel" that will only allow bus to kneel when both doors are open.
 - Eeprom "EP_bo_EXLI_HazardlightsActiveWhenDoorsOpen" was created so that when any door is opened the hazard lights will be activated until both doors are closed.
 - A High Side output has been created for an ITS supplier that sends a "Front + Rear Door Opening simultaneously" signal.
 - An exterior light or (cornering light) is enabled when the vehicle is in night mode and right turn signal is active.
 - When Eeprom "EP_bo_EXLI_CrowdAlarmDuringTurnSignal" Eeprom is active, new inputs have been added to disable each turn signal's exterior audible alert individually.
 - When State of Charge is below 7% and 13%, this will enable two separate outputs for a Presto buzzer to satisfy customer requirements.
 - Created "EP_bo_RHSC_AutoKneelWhenDoorsOpen" that allows the bus to automatically kneel when either door is fully open and recover when doors are closed.
 - Changed the status of coolant temp sensor faults for HVAC / Aux heat so that display on dash correctly.
- **Vehicle Controller**
 - Updated the software to correctly read N/A (Not available) from the body if the radiator fan was not installed, previously a fault would be shown. This update is currently only available for center radiator fan. This is intended for the 35' Heron's (two radiator fan buses) so the fault will not be produced for the center radiator fan.
 - Updating the Hill Hold telltale indication time to be reduced to approximately 0.5 seconds from approximately 3.5 seconds. Customer issue originated from SCVTA and SAMTRANS. This code change has been tested with SCVTA and validated.
 - Updating the max operation speed of coolant pump 2 to 75% for all Heron variants. This change comes from a test that is required for 35' Heron buses.
 - Update the calculations for determining when HVAC should De-rate.

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	058605	6.8.0
Vehicle Controller	058796	4.5.0

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-21-106\\>

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

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, you will use the Proterra Diagnostics Tool to manually 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.

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 by 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.



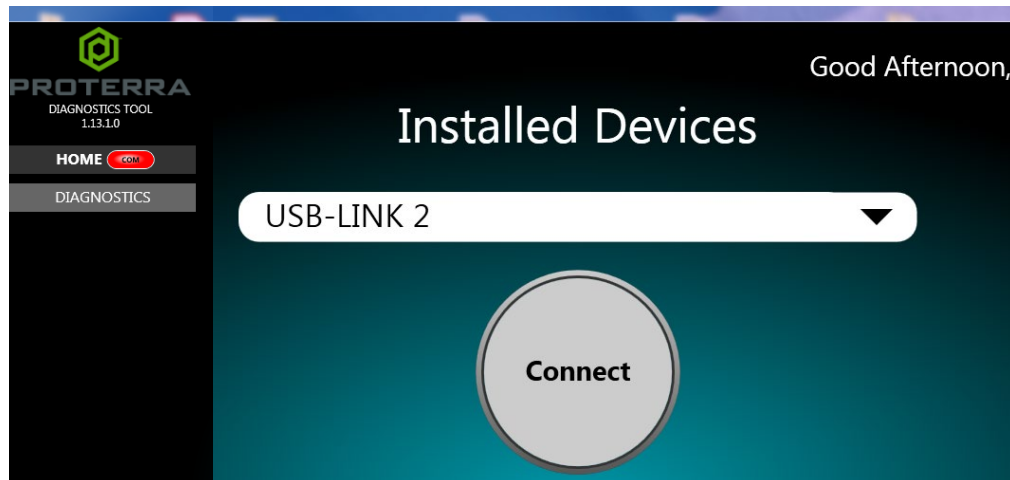
4. Turn the Driver's Master Switch to the **ACC** position.



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".

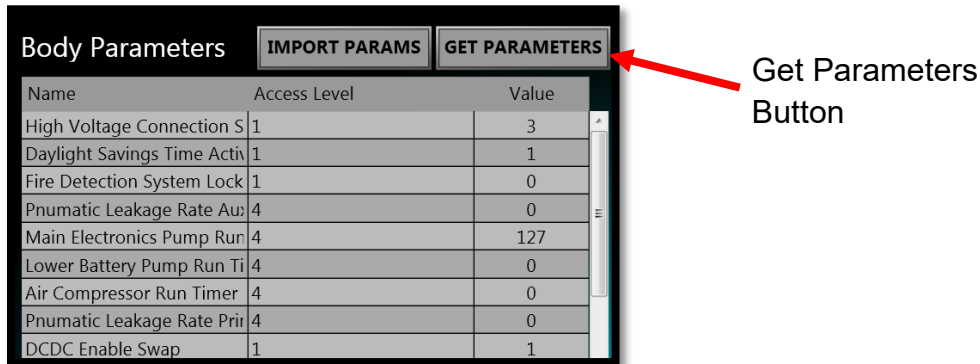


8. Once the Proterra Diagnostics Tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don't, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.

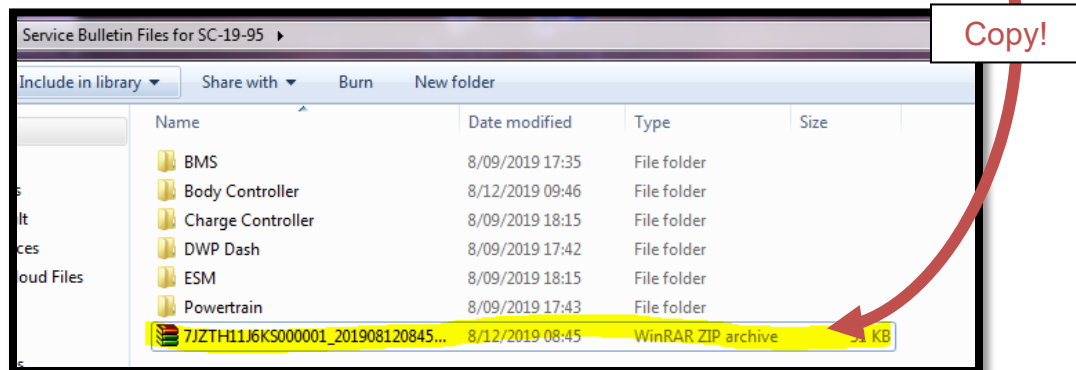
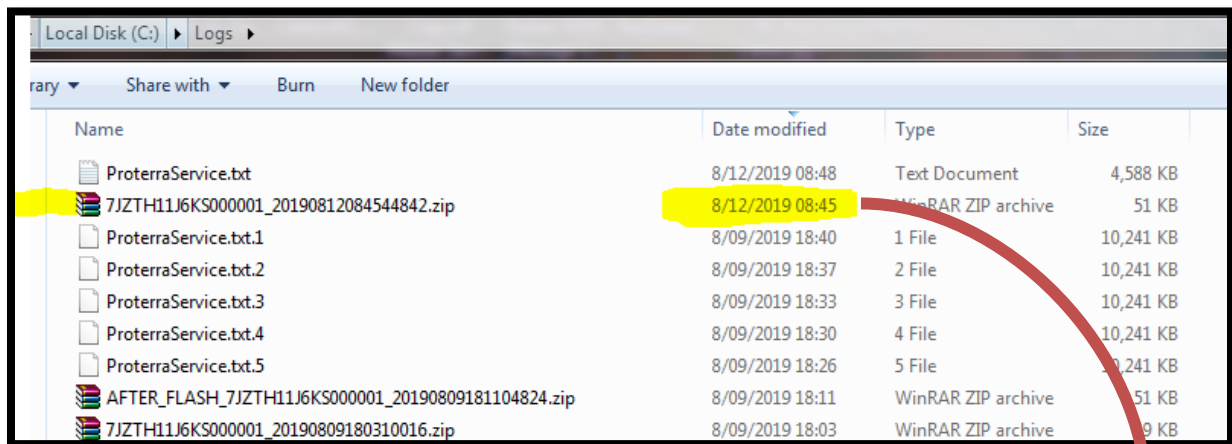
Download and Store Existing Parameters

This step will manually download and store the customer specific parameters from the 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.



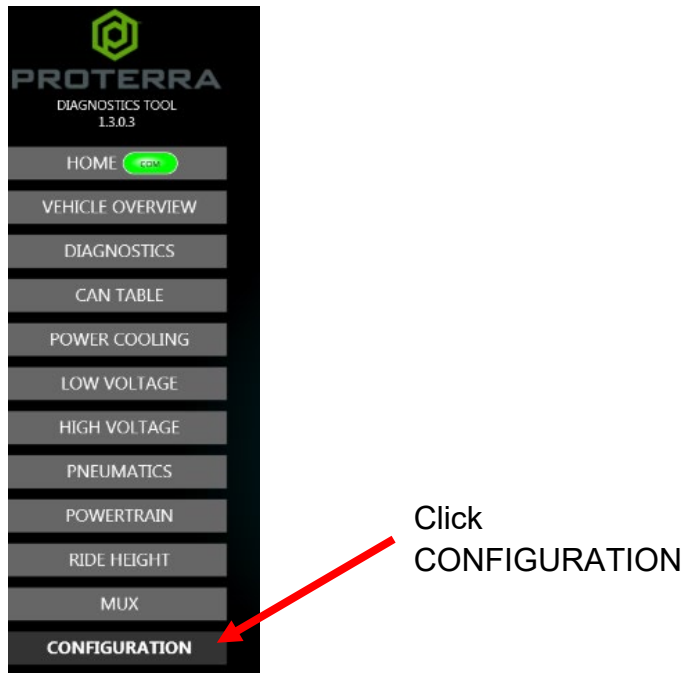
3. In windows file explorer, navigate to the C:\Logs folder. Copy the latest downloaded *.zip file to a folder for the specific customer and vehicle.



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

Update Using the Proterra Diagnostic Tool

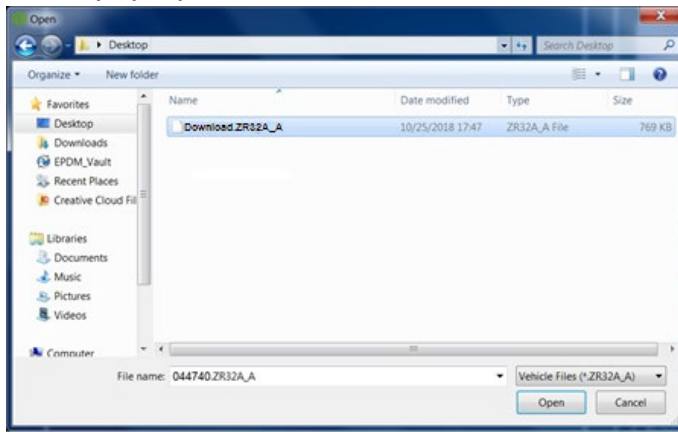
1. Navigate to the CONFIGURATION tab in the left menu.



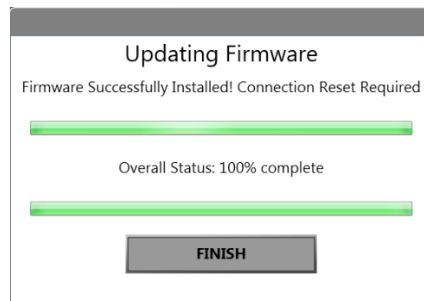
2. If this is a replacement controller, select the “SET VIN” and program the controller to match the vehicle VIN, then proceed to step 3. If not proceed to step 3.
3. Select the option for Body Firmware “START FLASH”.



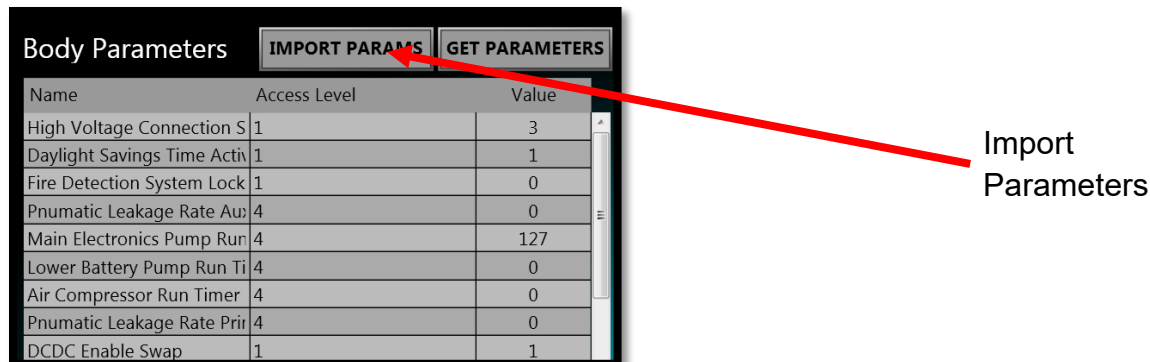
4. In the pop-up window, select the software flash file to load to the controller.



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. Navigate to the Configuration tab and click the “Import Parameters” button. This will download the latest parameter set from the “C:\Logs” folder on your machine.



7. Once the process has finished, cycle power to the bus by moving the driver master switch back to the off position before continuing.
8. Proceed to Appendix B to program the Vehicle controller.

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.

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 by 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

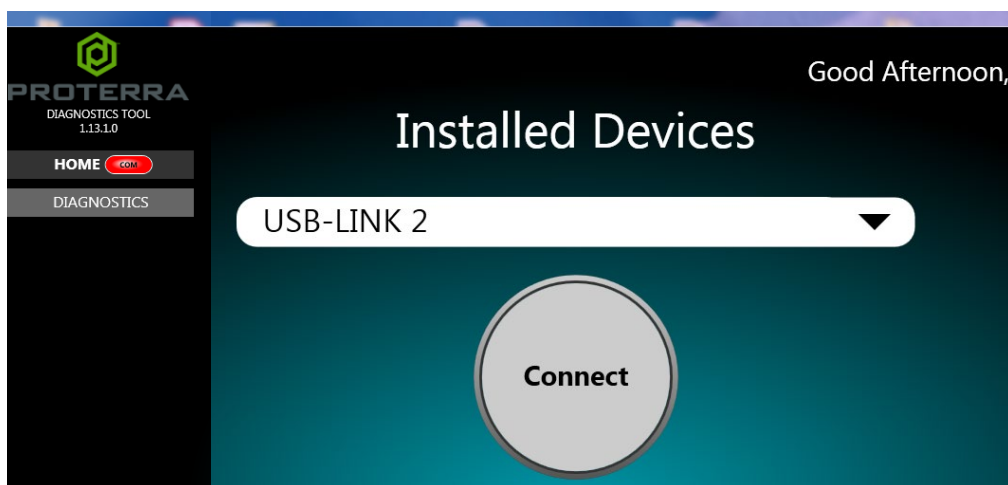
3. Connect the Nexiq USB Link2 device to the laptop and to the OBDII Diagnostic Port located in the Street-Side wheel well box.



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.



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”.



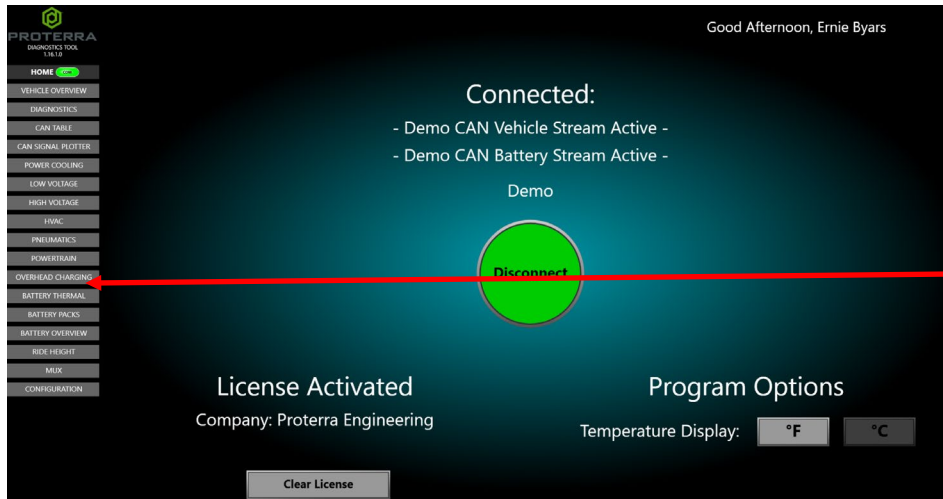
8. Once the diagnostic tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don't see the Home Screen, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.

Note: 800V Proterra vehicles are equipped with an automatic battery disconnect that will protect the low voltage batteries from a deep discharge.

Update Using the Proterra Diagnostic Tool

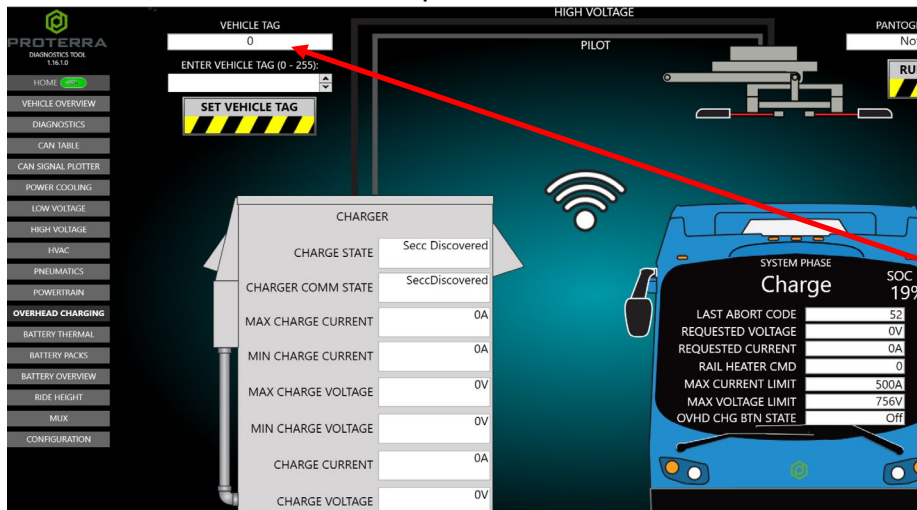
1. Click on the “Overhead Charging” button on the left side of the screen.

Note: If the bus that you are working on is not capable of Overhead Charging, skip to step 3 below.



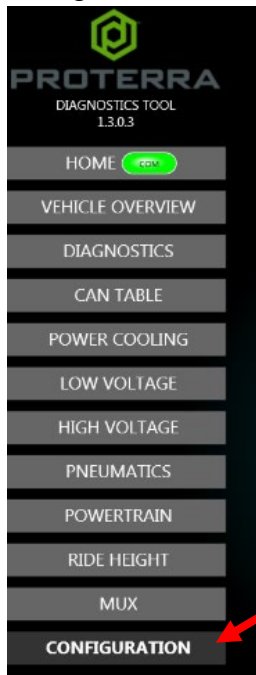
Click “Overhead Charging”

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

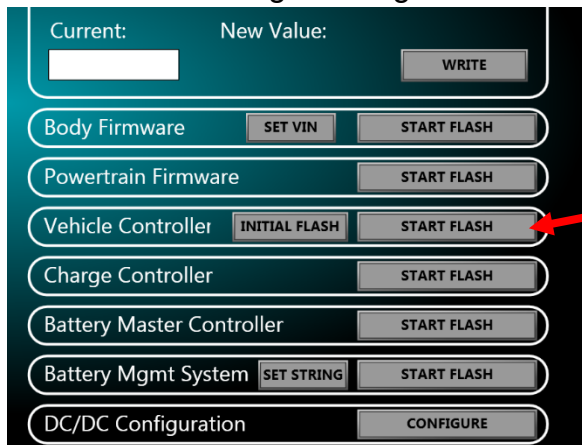
3. Navigate to the CONFIGURATION tab in the left menu.



Click
CONFIGURATION

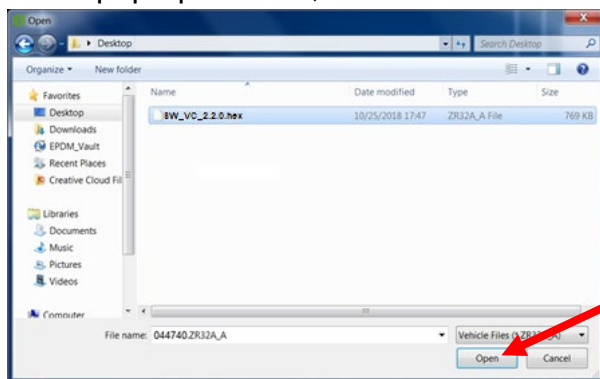
4. Select the option for Vehicle Controller “START FLASH”.

NOTICE: The “INITIAL FLASH” button is only for offline programming of the Vehicle Controller with an Offline Programming Kit.



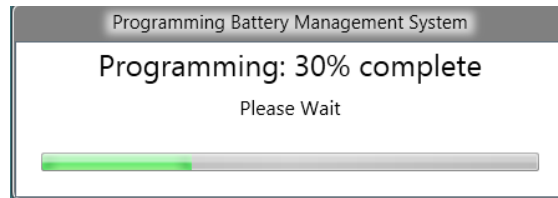
Beside Vehicle Controller,
Click **START FLASH**

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



Select the file and
Click Open

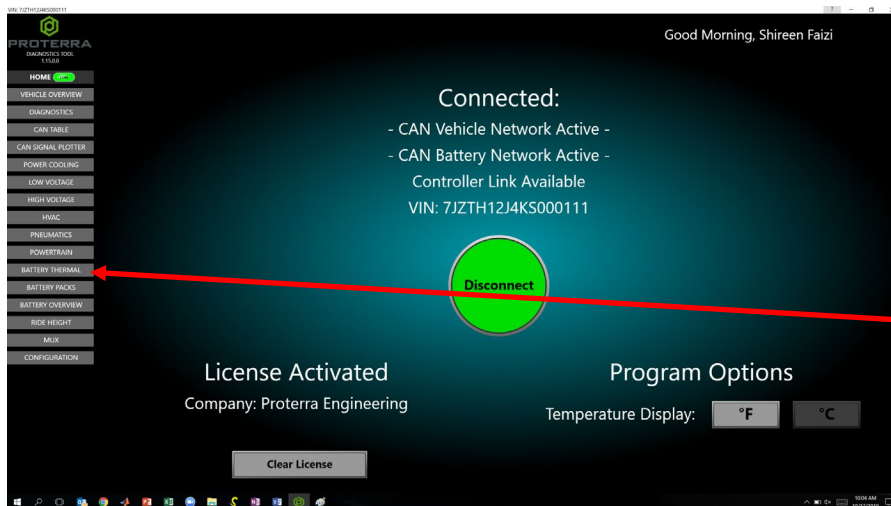
6. The Programming window will come up and may take a few minutes to complete.



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

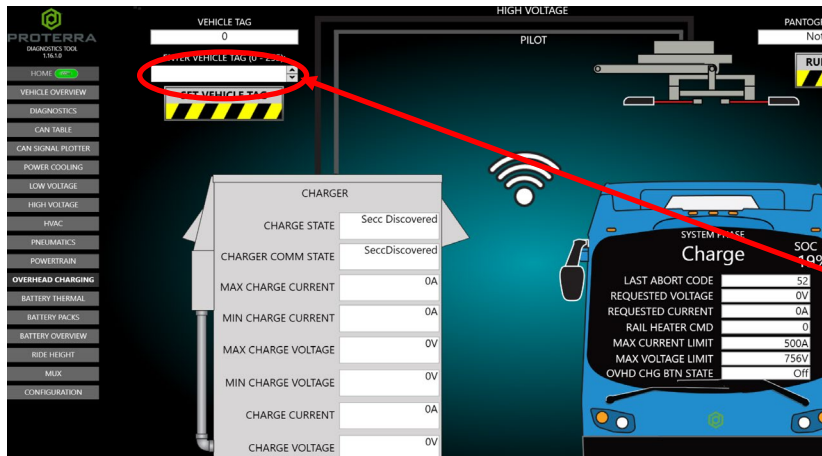


8. Click on the “Overhead Charging” button on the left side of the screen.
Note: If the bus that you are working on is not capable of Overhead Charging, skip to step 10 below.



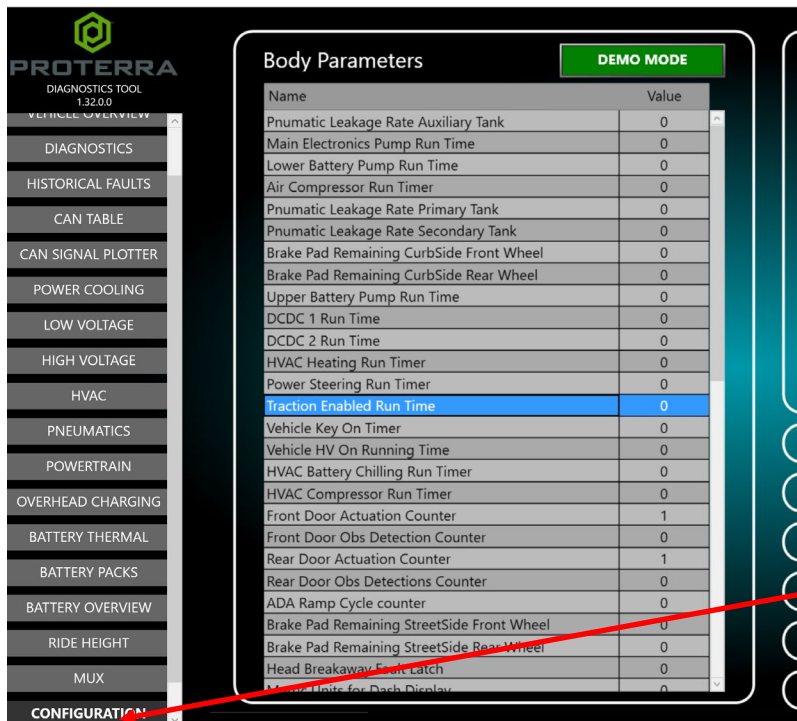
Click “Overhead Charging”

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. Click on the “Configuration” Button at the bottom left of the screen.



Click “Configuration”

11. Scroll through the list of “Body Parameters” on this screen.

12. Note the values listed for the following three parameters:

"EP_bo_RHSC_DoorOpenRqrdforKneel"

"EP_bo_EXLI_HazardlightsActiveWhenDoorsOpen"

"EP_bo_RHSC_AutoKneelWhenDoorsOpen"

13. These parameters should all have a value of 0. If these parameters have any other value, use the Diagnostic Too to set them to 0.
14. Scroll through the entire list of Body Parameters. No Body Parameter should have a value of 238. If any Body Parameters have a value of 238, use the Diagnostic Tool to set the value to 0.
15. 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

16. Verify that the vehicle turns on with no faults and that it is capable of charging.
17. Return the vehicle to service.