



<b>ISSUE DATE:</b>	1/16/2020
<b>SERVICE BULLETIN SUBJECT:</b>	Catalyst 800V Software Update
<b>VINs or MODELS AFFECTED:</b>	Catalyst 800V Vehicles
<b>COMPLETE BY:</b>	Next Available Service Opportunity
<b>SERVICE CAMPAIGN #:</b>	SC-20-11

**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:

- DWP/Dash Software
- Body Controller
- Vehicle Controller

## Summary of Software Changes

There are three controllers that will be updated. Below are the high level updates. More detailed information is available in the individual controllers release notes.

- Dash Software
  - New icons per customer requirements.
  - Additional text displays for Overhead Charging.
  - Improve backwards compatibility with earlier vehicles.
  
- Body Controller
  - New calibrations to facilitate easier configuration of multiple systems and deprecated older calibrations that were no longer needed based on the new configuration architecture.
  - Addition of a new feature for secure bus access via a key switch or CAN anti-theft message.
  - Addition of SWAT functionality to disable the bus and open the doors when the bus needs to be forcefully boarded.
  - Improvements to the door integration and switch controls to simplify door operation and improve driver and passenger experience.
  - Added EBC4 messaging to transmit brake wear data via CAN.
  - Bug fixes to improve door response timing, improve switch robustness, and improve diagnostics surrounding inputs.
  
- Vehicle Controller
  - Bug fixes to improve vehicle performance.
  - Improved Air compressor startup stability.
  - Updated Multiple fault lamp statuses.
  - Updated Temperature sensor fault thresholds.
  - Added functionality around overhead charge including an additional welded contactor check post charging system.

## Tools/Programs Required

### Tools Required:

- Laptop Computer
- Nexiq USB-Link 2
- USB-Serial Adapter
- K-Line Communications Adapter
- Proterra Diagnostic Port DB9 Breakout Cable (Octopus)

### Programs Required:

- Proterra Diagnostics Tool
- Parametereditor3

## 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
Driver Display Dash	047051	Rev. 10
Body Controller	051531	5.5.4
Vehicle Controller	051211	2.2.0

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-20-11>

## Service Bulletin Execution

1. Update the Dash Software using the process in [Appendix A](#)
2. Update the Body Controller Software using the process in [Appendix B](#)
3. Update the Vehicle Controller Software using the process in [Appendix C](#)
4. Verify software versions using the Proterra Service Tool
5. Update each work order in Service Max when complete

## Appendix A

# MOKI DASH SOFTWARE UPDATE PROCEDURE

## Description

This document contains the necessary information to update the Moki Dash on a Proterra Vehicle. The software provides the low level drivers for the telltales, icons, gauges, and digital display screens to provide driver feedback on vehicle functionality.

## Tools/Programs Required

### Tools Required:

- Laptop Computer
- USB-Serial Converter
- K-Line Communications Adapter
- Proterra OBDII breakout cable

### Programs Required:

- ParameterEditor v3.03

## Software Files Required / Preparation

The .zip file should have already been downloaded locally to your machine. To program the Moki dashboard, you will need a \*.zip data file. This file contains the necessary files and configuration data to provide an operational drivers dash and screen.



**IMPORTANT!** Do not unzip the file. The software that flashes the controller is expecting a zipped package to flash.

## Preparing the Vehicle to be Programmed

When programming a vehicle, it is critical that the low voltage batteries remain charged and 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.

**NOTE:** If using a low voltage charger, connected to wall power, please DO NOT connect your laptop computer to wall power at the same time. This can cause adverse effects or interruptions to programming over the K-line protocol.

## Connecting to the Vehicle

1. Power up and login to the Proterra-Supplied laptop or a comparable PC that has the ParameterEditor software installed.
2. Turn **ON** the 12/24V rear Vehicle Master Disconnect located at the curbside rear charge port access panel.

3. Connect the cabling and adaptors to the laptop and to the OBDII Diagnostic Port located in the Street-Side wheel well box.



**NOTE:** Make sure you have the K-Line adapter connected to the K-Line connection to the OBD Breakout cable and not the PCAN DB9.

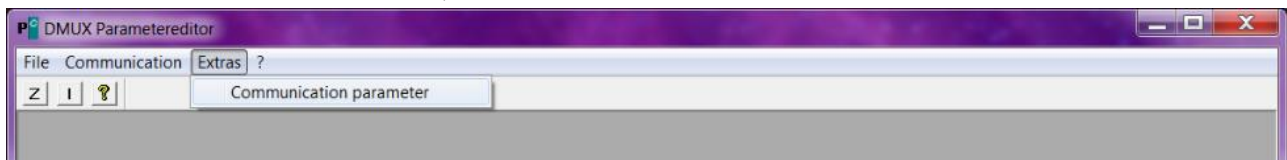
4. Press the Hazard Light Switch to wake the bus up.

## Update Using the ParameterEditor Software

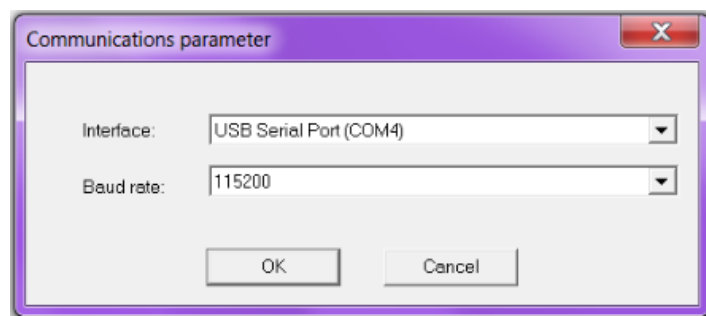
1. Open the “ParameterEditor” version 3 software. If you do not have this version, please contact Proterra Service for customer laptops or Proterra IT for Proterra owned laptops.



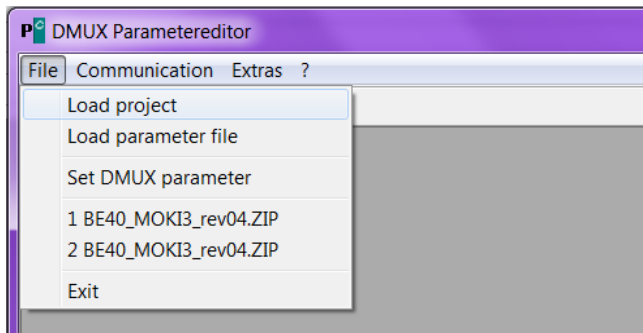
2. On the Parametereditor toolbar, select “Extras” and then “Communications Parameter”.



3. Ensure the communication parameters are correctly set. Your COM port may be a different number.

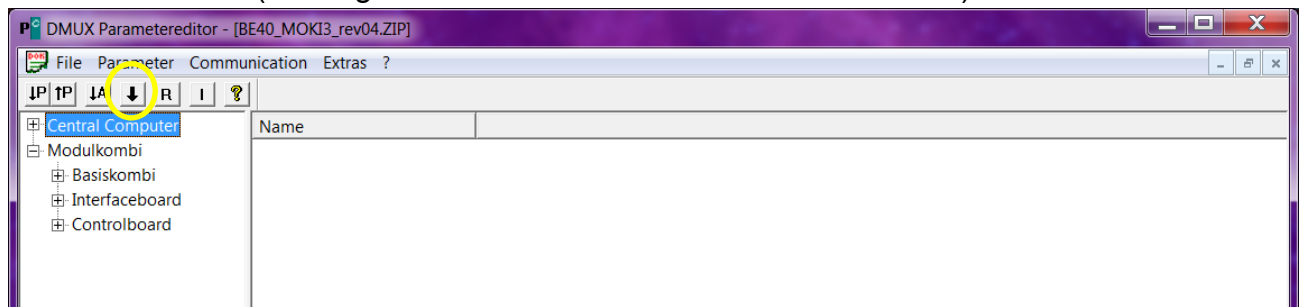


4. On the Parametereditor toolbar, select “File” and then “Load Project”.



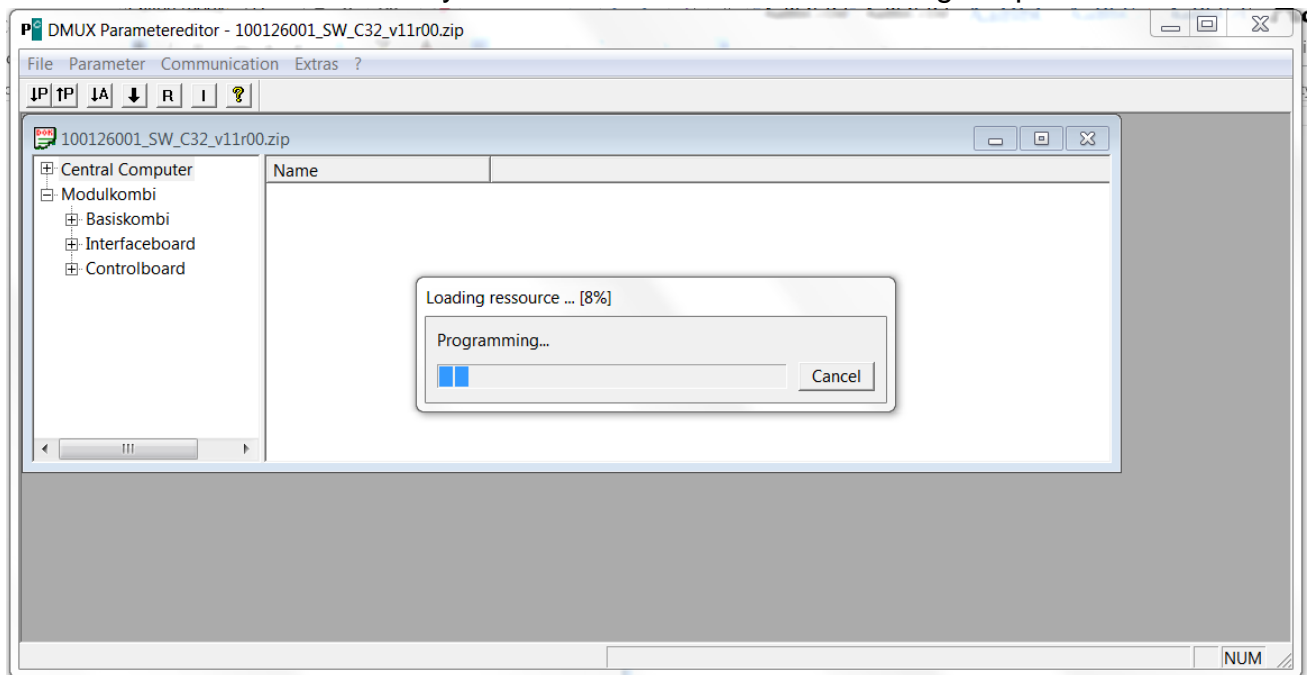
5. Open the folder where the Driver Work Place configuration is stored, and select the appropriate \*.ZIP file from above.

6. Select “Load All” (the large down arrow with no letter label next to it):

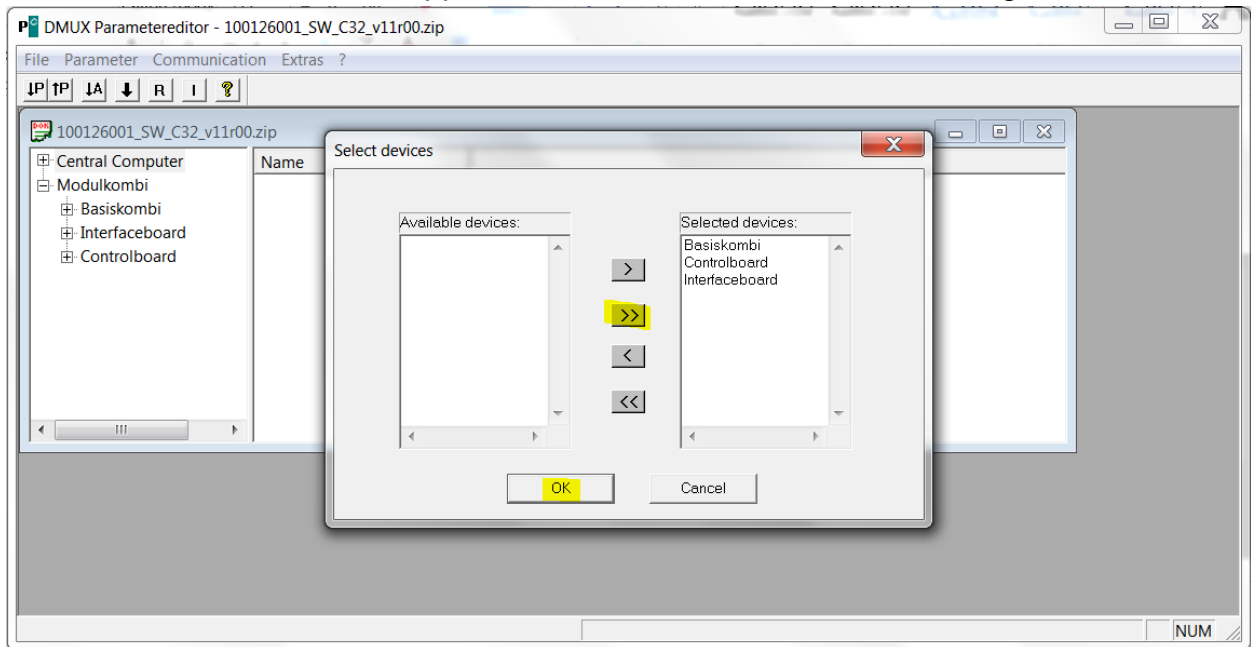


7. The download should begin and takes approximately 10 minutes.

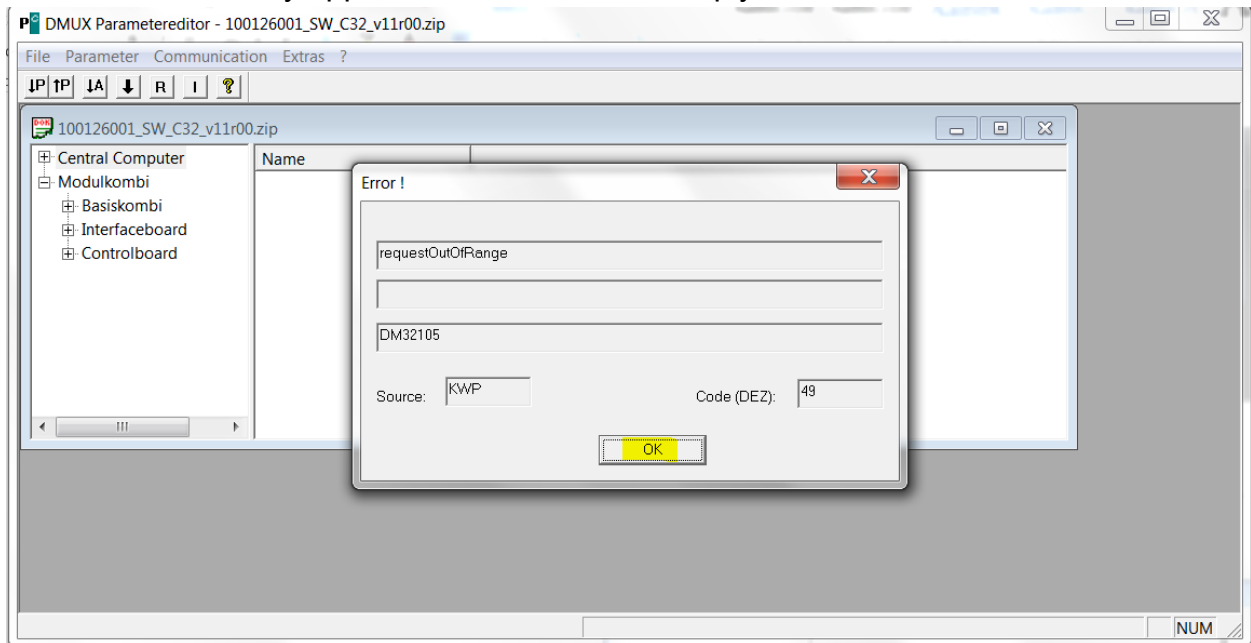
**NOTICE:** The vehicle dash may flash on and off a few times during the process.



8. If a “Select Devices” screen appears, select the double arrows to the right and click “OK”.



9. An Error screen may appear, which is normal, simply click “OK”.



10. When the download is complete, the lights on the dash should stop flashing and the home screen should again appear.

11. Turn off the Hazards and allow the vehicle to go to sleep.

## Appendix B

# 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.

## 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".

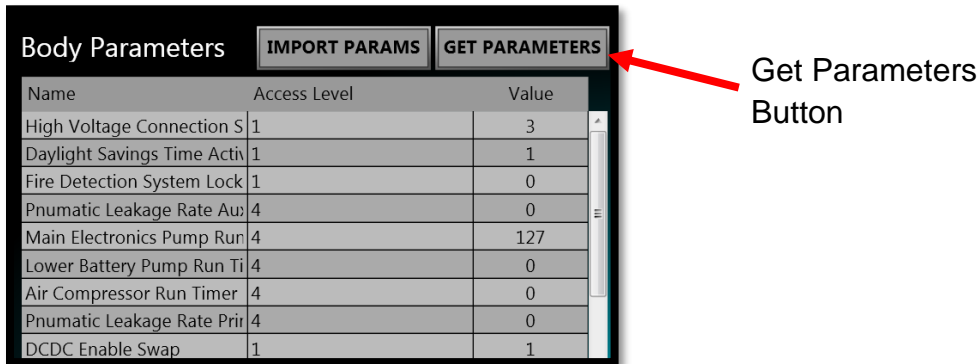


8. Once the Proterra Diagnostics Tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don't, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.

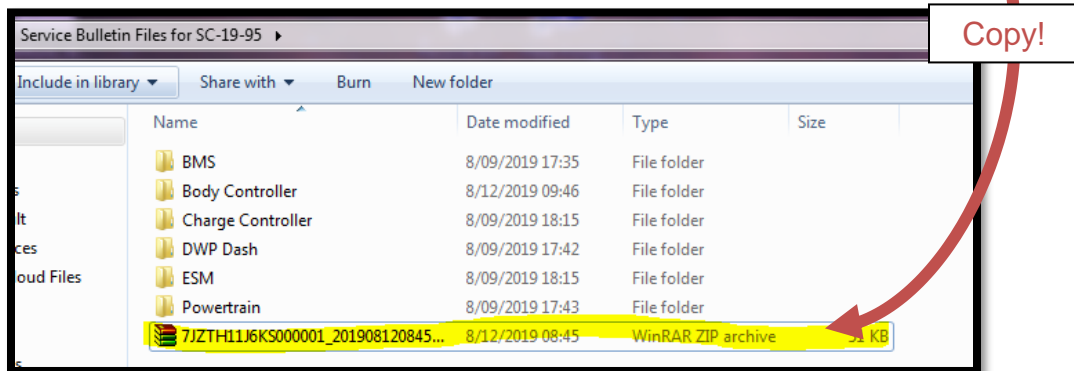
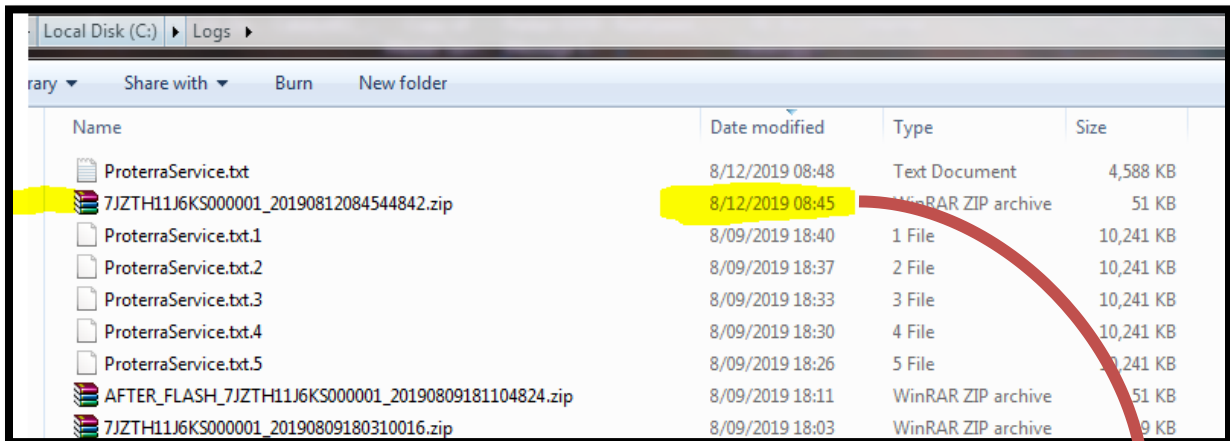
## Download and Store Existing Parameters

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.



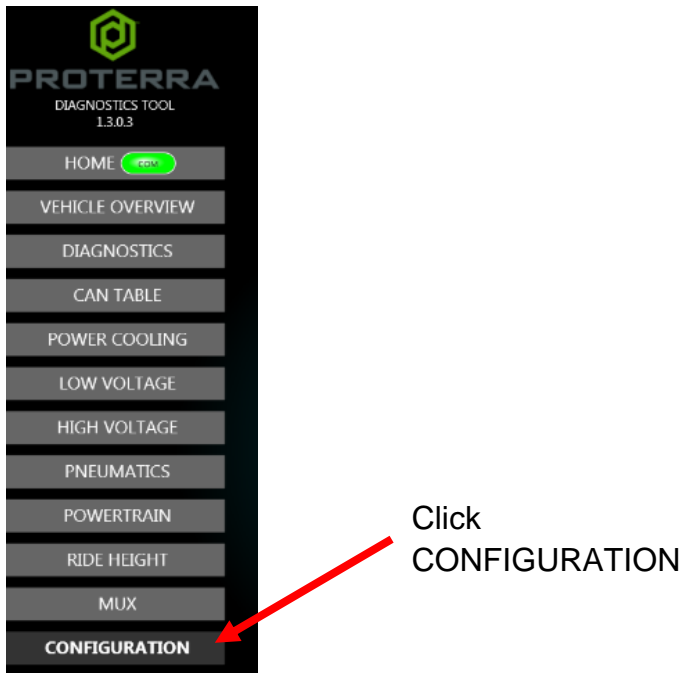
3. In windows file explorer, navigate to the C:\Logs folder. Copy the latest downloaded \*.zip file to a folder for the specific customer and vehicle.



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

## Update Using the Proterra Diagnostic Tool

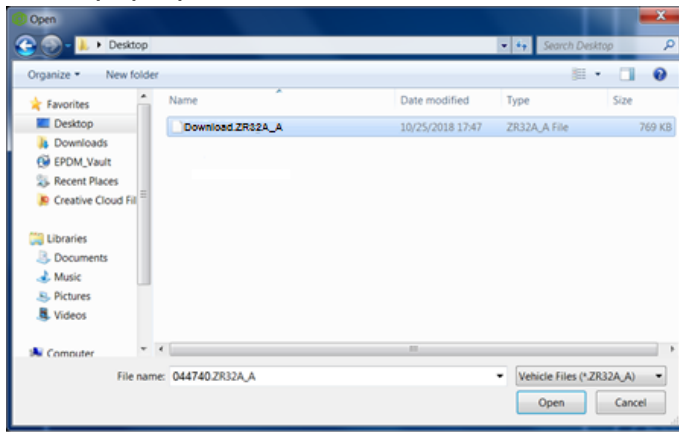
1. Navigate to the CONFIGURATION tab in the left menu.



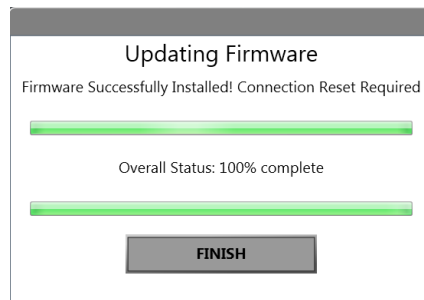
2. If this is a replacement controller, select the “SET VIN” and program the controller to match the vehicle VIN, then proceed to step 3. If not proceed to step 3.
3. Select the option for Body Firmware “START FLASH”.



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. 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.

## Appendix C

# 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

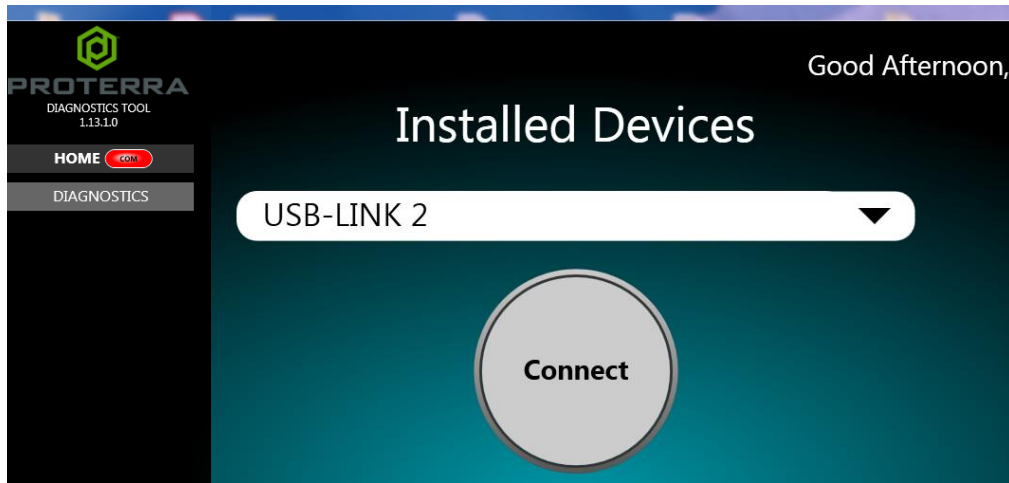
3. Connect the Nexiq USB Link2 device to the laptop and to the OBDII Diagnostic Port located in the Street-Side wheel well box.



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.



- When the program opens, read and click OK for the high voltage safety prompt.
- On the Home tab, select the appropriate device from the drop down and click “Connect”.

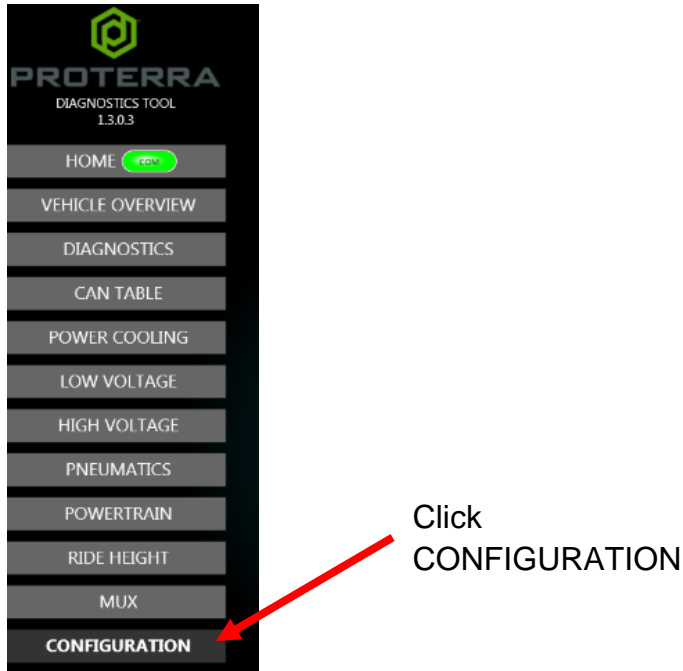


- Once the diagnostic tool has connected to the vehicle, you will have a VIN number and connection status displayed on the home screen, and tabs available to navigate. If you don't see the Home Screen, double check that the low voltage batteries are connected and that the Nexiq tool is plugged in.

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

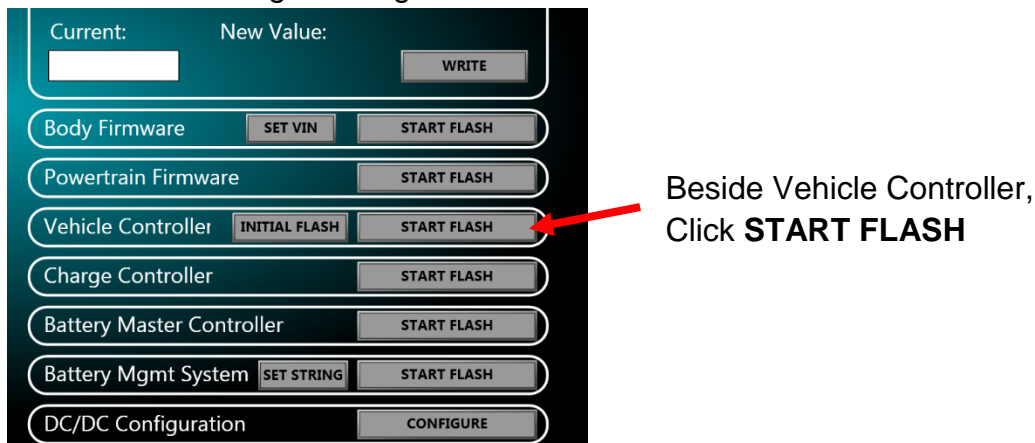
## Update Using the Proterra Diagnostic Tool

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

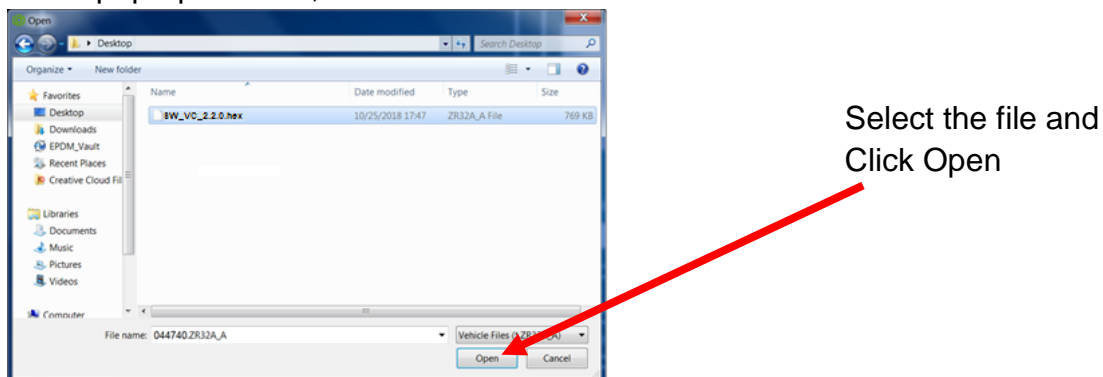


2. Select the option for Vehicle Controller “START FLASH”.

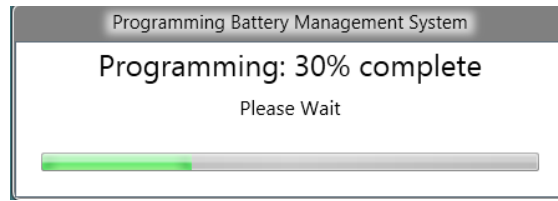
**NOTICE:** The “INITIAL FLASH” button is only for offline programming of the Vehicle Controller with an Offline Programming Kit.



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



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



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



- 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

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