Introduction

This document provides instructions for third parties in Europe to use the Tesla High Voltage Battery Communication Tool application to retrieve Tesla-specific data (vitals) from End-of-Life High Voltage batteries for safety purposes.

This document supersedes CD-21-16-003 R1, dated 23 February 2023. This new revision, R2, adds information on the Tesla High Voltage Battery Communication Tool that has replaced the former Tesla Battery Shipping Tool. Each content change is marked by a vertical line in the left margin. Discard the previous version and replace it with this one.

The procedure described in this document applies to Tesla Model S, Model X, Model 3, and Model Y vehicles from start of production to date.

Definitions and Abbreviations

BMS	Battery Management System for the High Voltage battery
Brick	Group of battery cells, connected in parallel
CAC	Calculated Amp-hour Capacity, displayed as Ah (amp-hour)
CAN	Controller Area Network, an inter-module communications network
HV	High Voltage
Logic Harness	Harness to connect between the Low Voltage Rapid Mate connector on the High Voltage battery and the PCAN-USB to CAN adapter connected to the laptop
Module	Group of bricks, connected in series
Rapid Mate Connector	A quick connect/disconnect HV battery to vehicle interface for power and communications
SOC	Estimated State of Charge, displayed as a percentage (0% - 100%)

Parts Required

Part Name	Tesla Part Number
PCAN-USB to CAN Adapter	1016990-00-A
HV Battery Logic Harness (Legacy Model S and Model X)	1014593-00-A
Harness, HV Battery Communication (2021+ Model S and Model X)	1667803-00-A
M3 Battery Communication Harness (Model 3 and Model Y)	1138540-00-C
Adapter DC Power Supply 60W 12V (or use Power Supply mentioned below)	1076919-01-B (Continental EU (Schuko plug, Type E/F) except for Switzerland) 1076919-02-B (UK/Ireland plug, Type G) 1076919-03-B (Switzerland plug, Type J)
Antigravity Batteries XP-10 Micro-Start Power Supply	Purchase locally at https://antigravitybatteries.com/products/micro-starts/xp-10/

Retrieving the HV Battery Vitals

1. Install the Tesla High Voltage Battery Communication Tool application onto the laptop.
   a. Download the “High Voltage Battery Communication Tool” application from the portal:
      - Tesla Internal location: https://toolbox.teslamotors.com/software
      - External location: https://toolbox.tesla.com/software
   b. Install the application onto the laptop.
   c. Download the PCAN-USB drivers from https://www.peak-system.com (Figure 1).

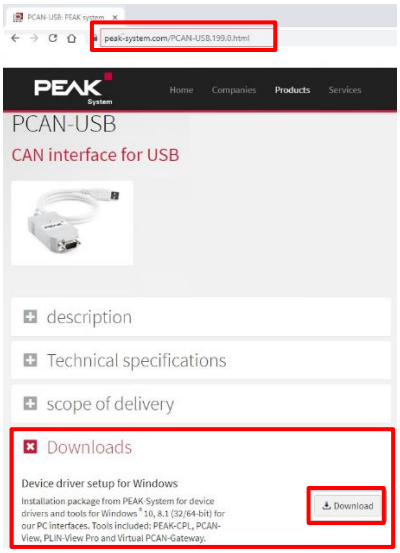

Figure 1

d. After the drivers are downloaded, install them onto the laptop.

2. Connect the PCAN-USB adapter to a USB port on the laptop.

3. Locate the Low Voltage Rapid Mate/Logic connector on the HV battery (Figures 2 through 4).

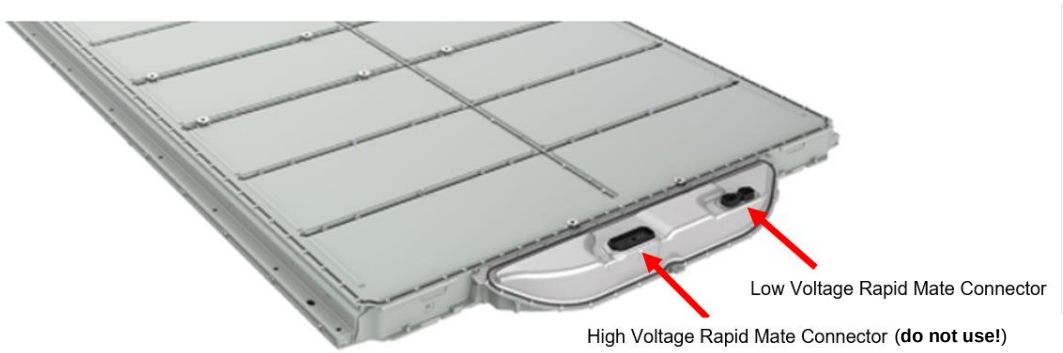

Figure 2 – Rapid Mate connectors (Pre-2021 Model S and Model X)

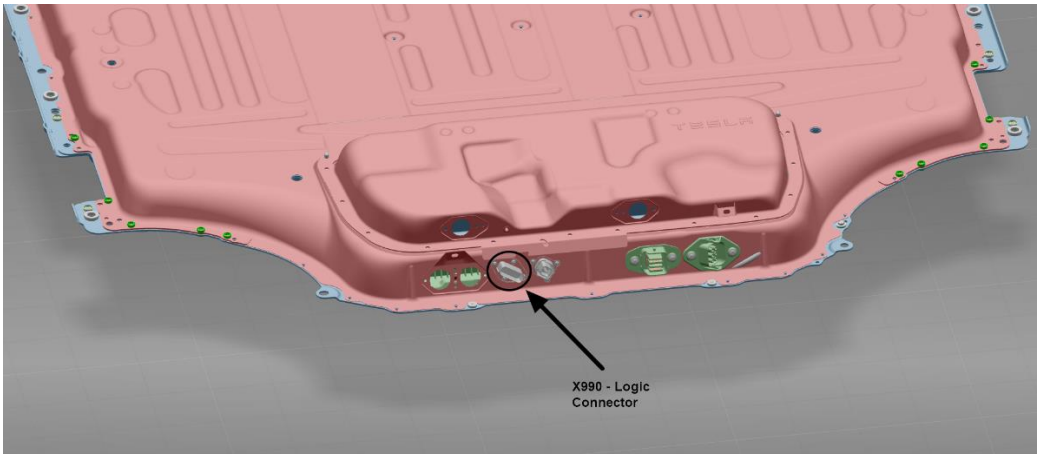

Figure 3 – Logic Connector (2021+ Model S and Model X)

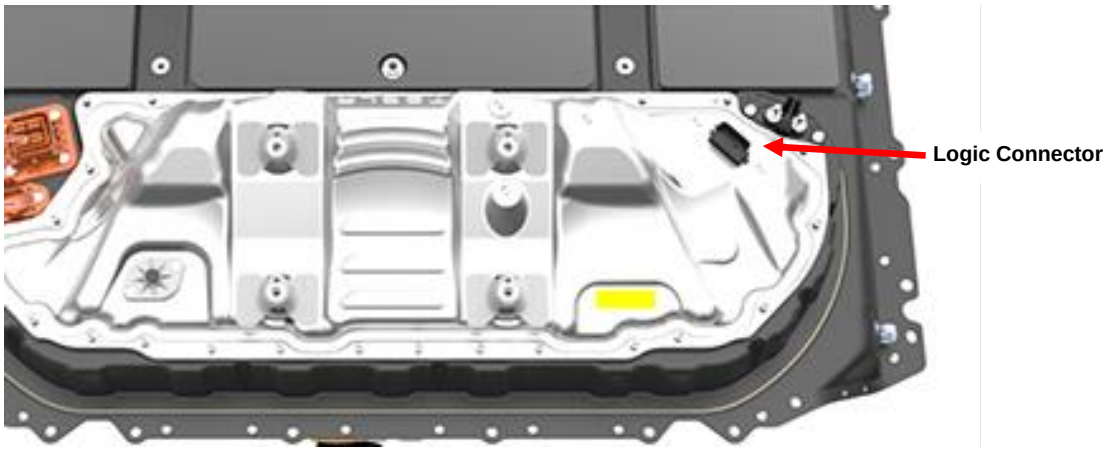

Figure 4 – Logic Connector (Model 3 and Model Y)

4. Connect the logic/communication harness to the Low Voltage Rapid Mate/Logic connector on the HV battery and to the PCAN-USB adapter (Figures 5 through 7).

NOTE: For Model 3, Model Y, Model S (2021+) and Model X (2021+), the PCAN-USB adapter should be connected to VEH CAN.

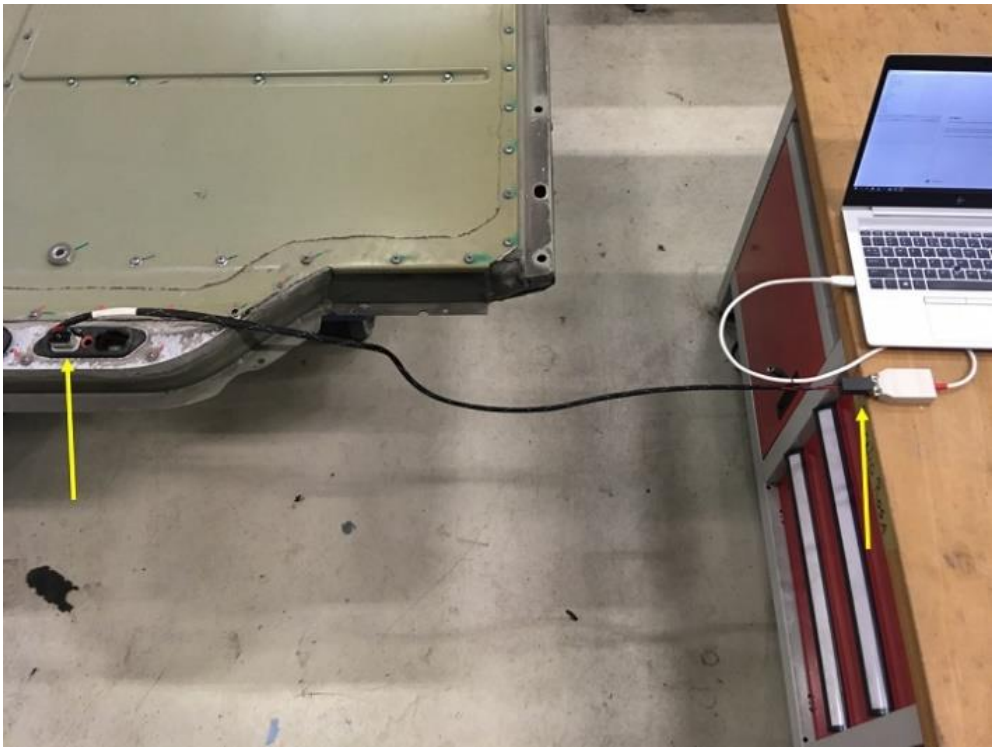

Figure 5 – Connection to PCAN-USB adapter (Pre-2021 Model S and Model X)

Figure 6 – Connection to PCAN-USB adapter (2021+ Model S and Model X)

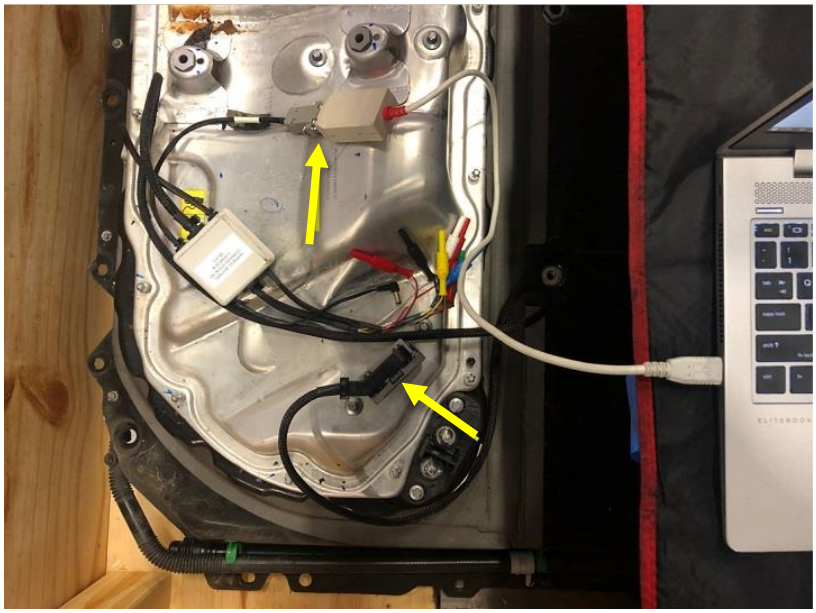

Figure 7 – Connection to PCAN-USB adapter (Model 3 and Model Y)

5. Connect the 12V power supply (adapter or XP-10 Power Supply) to the logic harness (Figure 8).

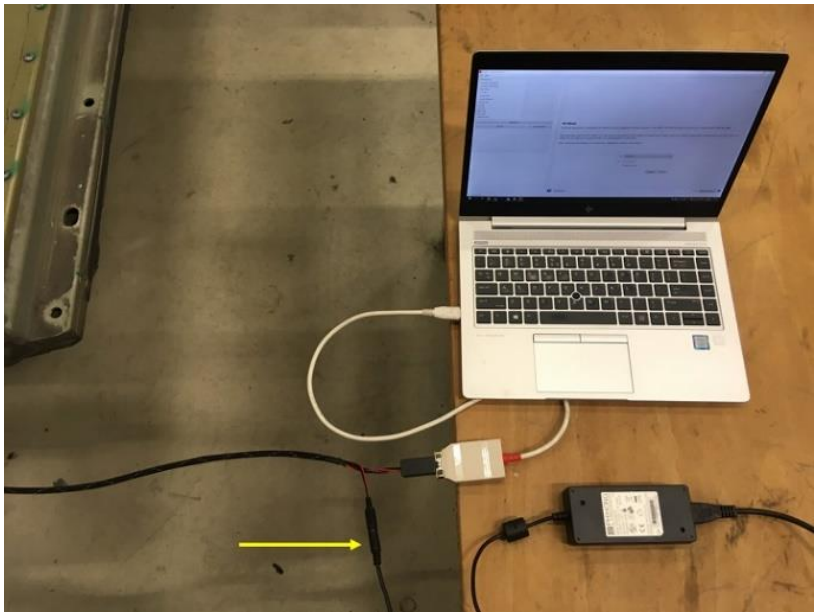

Figure 8 – 12V adapter connected to logic harness

NOTE: If using the XP-10 Power Supply, either turn on the flashlight or connect a phone (or other device) to one of the USB ports. The BMS does not draw a lot of current and the power supply will time out and turn off after a while.

6. Open the High Voltage Battery Communication Tool application and connect to the HV battery pack (Figure 9).
   a. Choose the “Vehicle” model based on the battery that is connected. Click on the bottom left circle icon if the vehicle/CAN pop-up selection does not appear.
   b. Make sure that the “BMB Keep-Alive” check box is checked.
   c. Click **Enable**.

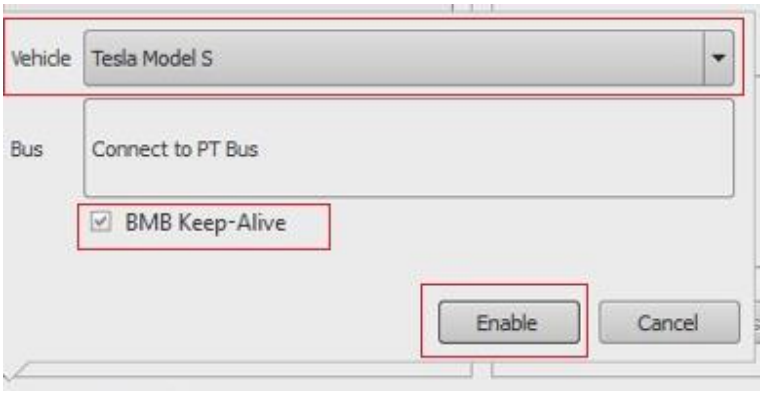

Figure 9

7. Make sure that the green dot in the left hand lower corner of the window is illuminated (Figure 10).

NOTE: If the green dot is not illuminated, check the 12V power supply and all connections to make sure that they are secure.

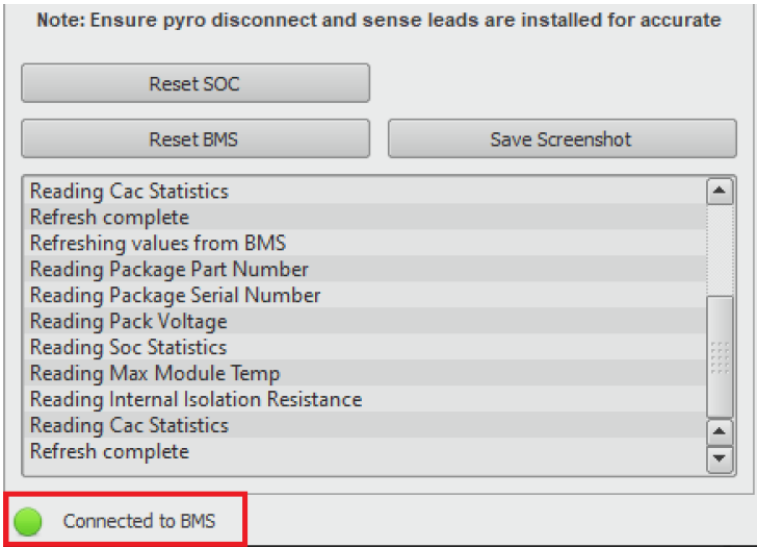

Figure 10

8. Read the battery vitals in the “Battery Info” section (Figure 11).

NOTE: The battery vitals refresh automatically.

NOTE: Pressing the **Reset SOC** button updates the SOC Max/Min values based on the open circuit voltage measured by the BMS. If there is an internal issue within the battery pack (e.g., Battery Monitoring Board, wiring, connection, etc.), this value may be inaccurate.

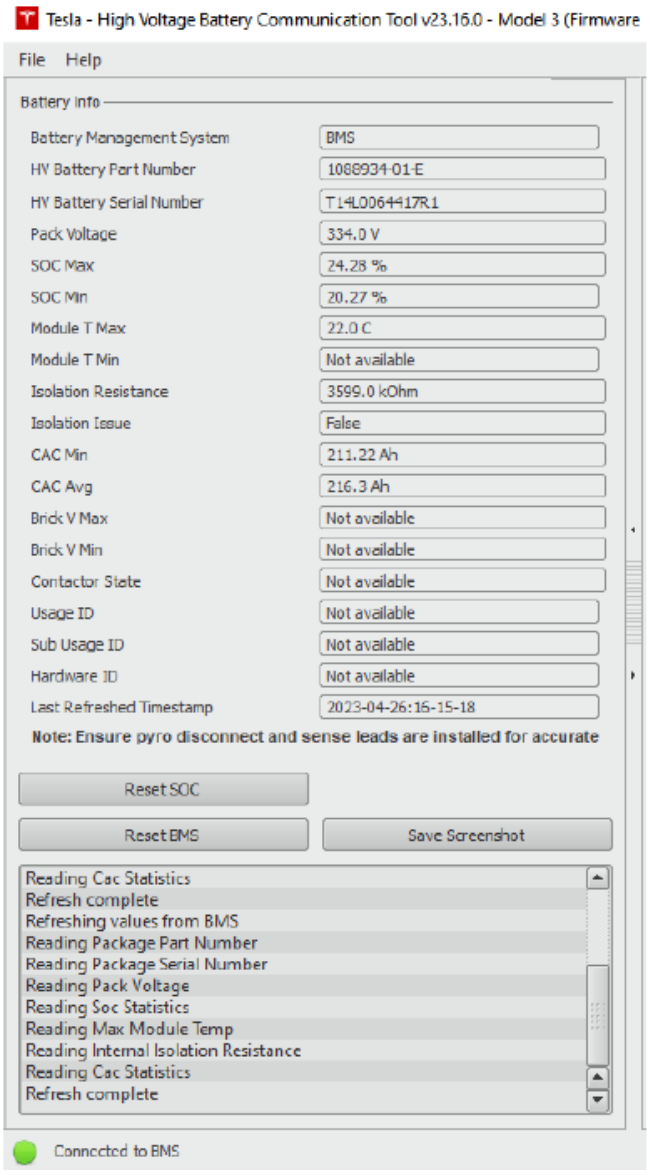

Figure 11

The table below explains the fields that are shown in the “Battery Info” section.

Field name	Description
HV Battery Part Number	--
HV Battery Serial Number	--
Pack Voltage	Voltage of the High Voltage battery pack. If value is close to 0V, this might indicate that the fuse is blown, disconnected, or removed entirely.
SOC Max	Estimated State of Charge for the brick with the highest value.
SOC Min	Estimated State of Charge for the brick with the lowest value.
Module T Max	Current highest measured internal battery temperature.
Module T Min	Current lowest measured internal battery temperature.
Isolation Resistance	Calculated electrical isolation resistance between the high voltage circuits and the enclosure.
Isolation Alert	Indicates if the Battery Management System detects an isolation resistance below 200 kOhm.
CAC Min	Calculated Amp-hour Capacity for the brick that has the lowest capacity.
CAC avg	Calculated Amp-hour Capacity average across all bricks.
Brick V Max	Measured brick voltage of the highest charged brick.
Brick V Min	Measured brick voltage of the lowest charged brick.
Contactor State	Reported state of the battery pack contactors. Contactors are high voltage, high current relays that route power between the HV battery and the vehicle (if battery is fitted to the vehicle).
Usage ID	Genealogy of Model 3, Model Y, Model S (2021+), and Model X (2021+) battery packs.
Sub Usage ID	Genealogy of Model 3, Model Y, Model S (2021+), and Model X (2021+) battery packs.
HWID	Genealogy of Model S (Pre-2021) and Model X (Pre-2021) battery packs.