

DATE: draft

TO: Thomas McKegney
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FROM: Jeffrey Bernath

RE: KIRA CV60/1 Field Service Programming Instructions Rev 2

This memo details the process for updating the firmware on the Kira CV60/1. This does not cover process for updating the Deluxe CV60/1 (see [Deluxe CV60/1 Field Service Programming Instructions.pdf](#))

This document is part of a package that includes all of the software, drivers and files needed to update the machine. This package is [CV60 1 Field Service Programming.zip](#).

Software to be Installed

The folder below includes all of the software and drivers that will need to be installed. The install will need to be performed by the Karcher IT Help Desk. Install instructions can be found in [readme_for_install_instructions.txt](#).

[KIRA CV60 1 Field Service Programming\Software to be installed](#)

Updating to Bootloader Firmware

This section covers instructions for updating the firmware to include the bootloader. After the machine has been updated with the bootloader, the firmware can be updated using the [T-Rex Diagnostics](#) tool.

If the machine has already been updated with the bootloader, please skip this section and move on to [Updating Firmware](#).

1. Turn off the main breaker (see Figure 1). The main breaker can be accessed from the right door.



[Figure 1: Main Breaker Off]

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2. Remove the control panel (see figure 2).



[Figure 2: Control Panel Removed]

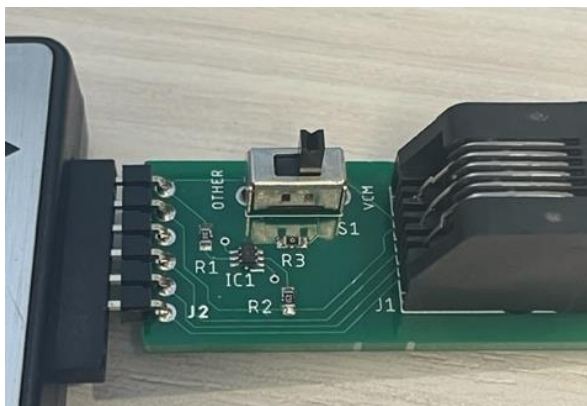
3. From the start menu open Microchip>MPLAB IPE v6.05.
4. The first time the program is opened it will need to be setup. Select Settings>Advanced Mode and using the password "microchip" to login.
5. Select File>Import>Environment and open the following file.
KIRA CV60 1 Field Service Programming\Bootloader Hex\VCM 3 2 2.Bootloader/VCM 3 2 2.Bootloader.pen
6. Select File>Import>Hex and open the following file.
KIRA CV60 1 Field Service Programming\Bootloader Hex\VCM 3 2 2.Bootloader/VCM 3 2 2.Bootloader.hex
7. Assemble the PICkit 4 programmer, included USB cable, PICkit 4 adapter and Tag Connect (see figure 3).

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[Figure 3: Assembled PICkit 4]

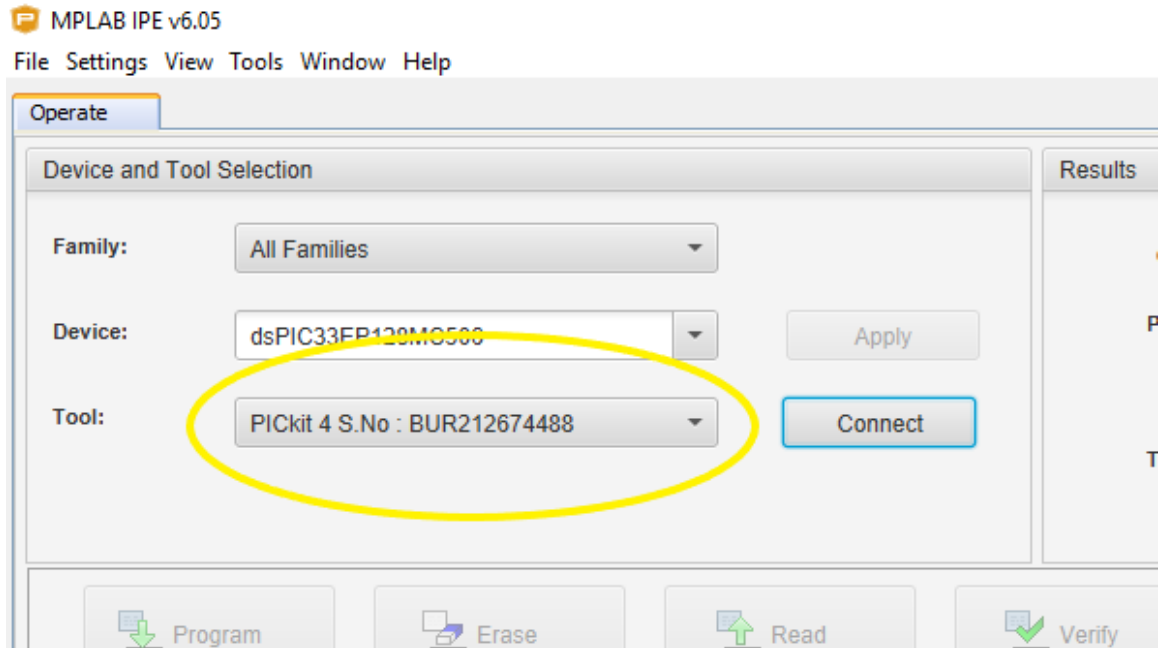
8. On the PICkit4 adapter select "VCM" using the selector switch (see figure 4) .



[Figure 4: PICkit 4 Adapter set to "VCM"]

9. Plug the PICkit 4 into the computer. After a few seconds the PICkit 4 should show up in the Tool: drop down menu in the Device and Tools Selection pane (see figure 5). Do not press the Connect button at this point.

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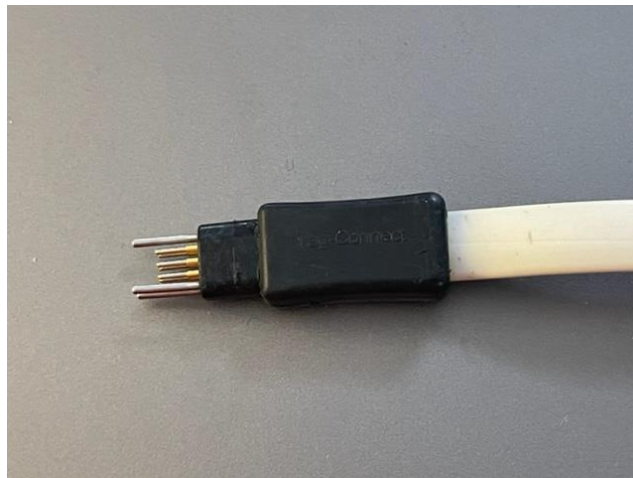


[Figure 5: PICKit4 Connected]

10. Plug the tag connect end of the PICKit4 (see figure 6) into the J7 (see figure 7 and 8) of the VCM (vehicle control module). J7 can be found on the VCM toward the back of the machine next to the lighting control board. This connection will need to be held in place until programming is complete.

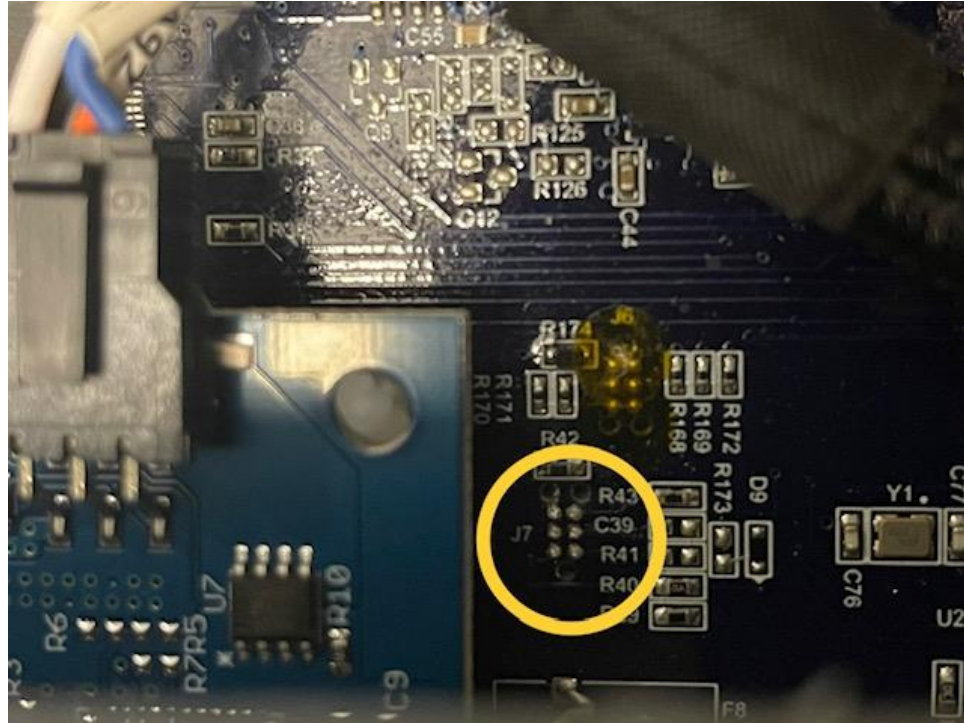
Warning: Accidentally plugging the programmer into J6 will permanently damage the VCM.

Note: The first time the PICKit4 is connected to the IPE it will download and install updates. This may take a couple of minutes.

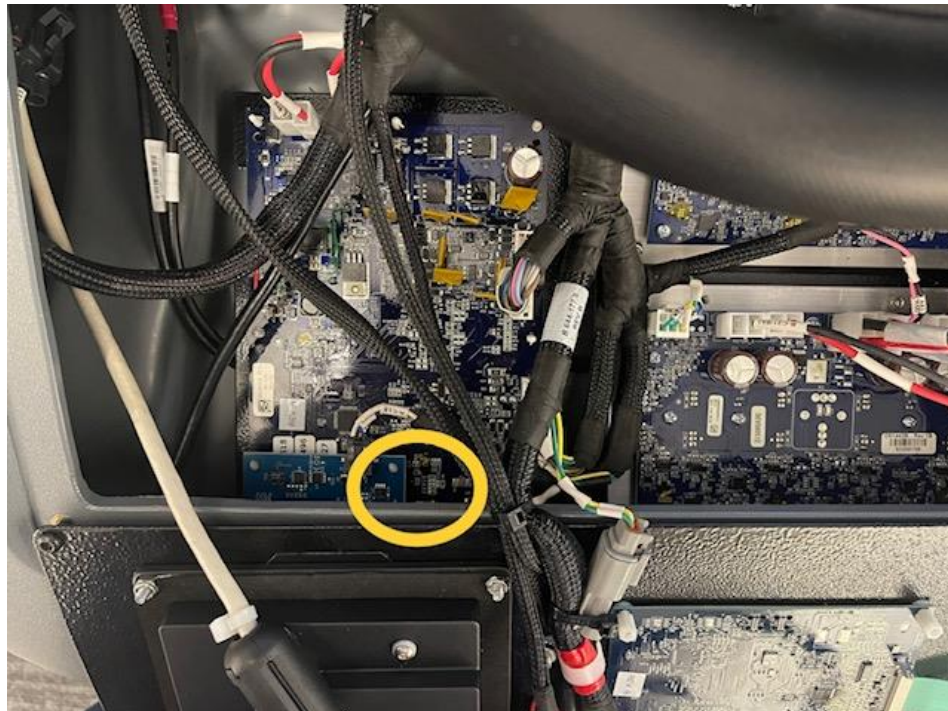


[Figure 6: PICKit4 Tag Connect]

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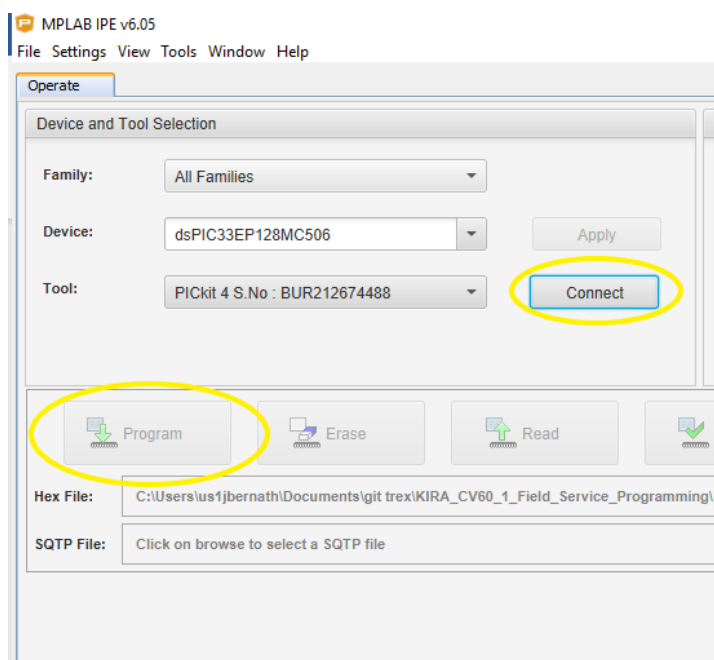
[Figure 7: J7 – VCM Programming Connection]



[Figure 8: J7 – VCM Programming Connection]

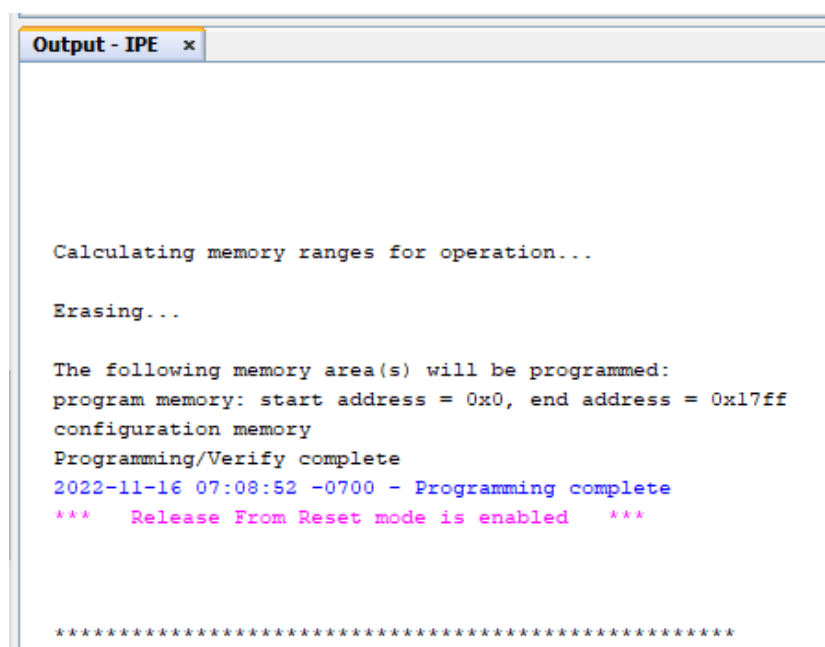
11. Select the Connect button (see figure 9).
12. Select the Program button (see figure 9).

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[Figure 9: Connect and Program Buttons]

13. If programming was completed successfully "Programming/Verify complete" will be displayed in the Output – IPE tab on the lower pane (see figure 10).



[Figure 10: Successful Programming Message]

14. Remove the tag connect from J7 of the VCM.

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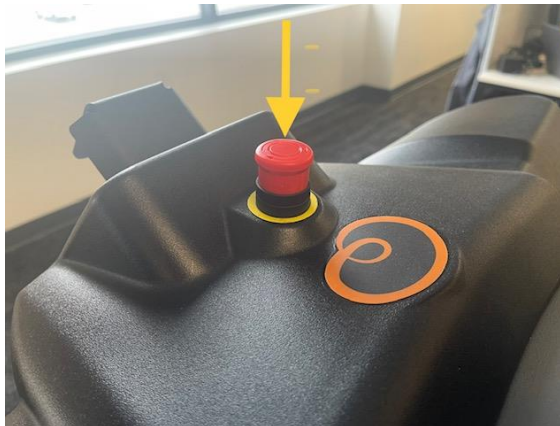
15. Turn on the main breaker (see figure 11).



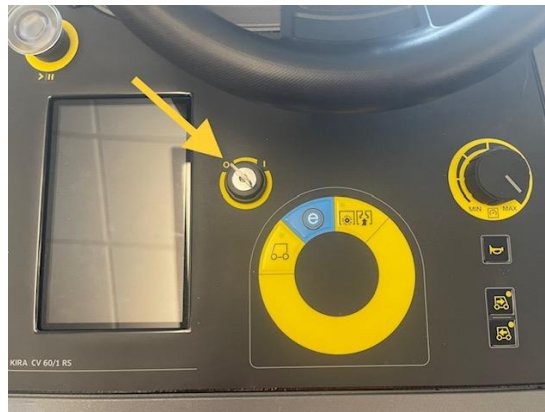
[Figure 11: Main Breaker On]

16. Turn off the key switch (see figure 13) and press the e-stop (see figure 12).

Warning: Leaving the key switch on and not pressing the e-stop will damage the machine.



[Figure 12: Press E-Stop]



[Figure 13: Key Switch Off]

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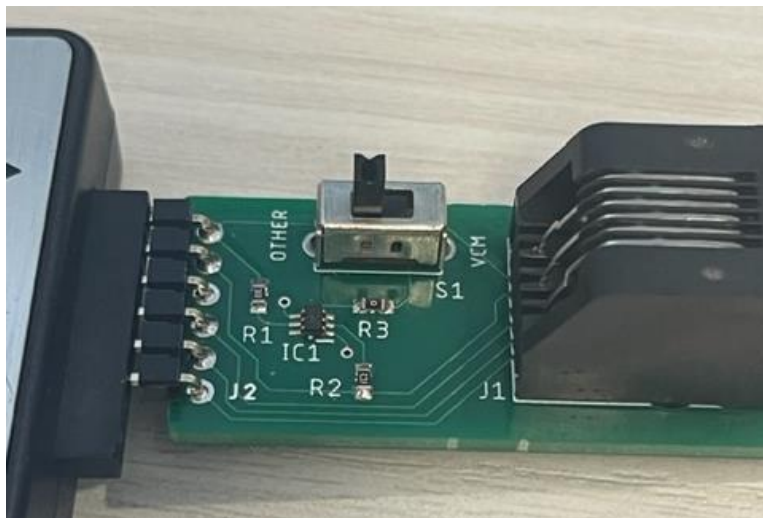
17. Select File>Import>Environment and open the following file.

KIRA CV60 1 Field Service Programming\Bootloader Hex\HMI PIC16 3 2 2.Bootloader\HMI PIC16 3 2 2.Bootloader.pen

18. Select File>Import>Hex and open the following file.

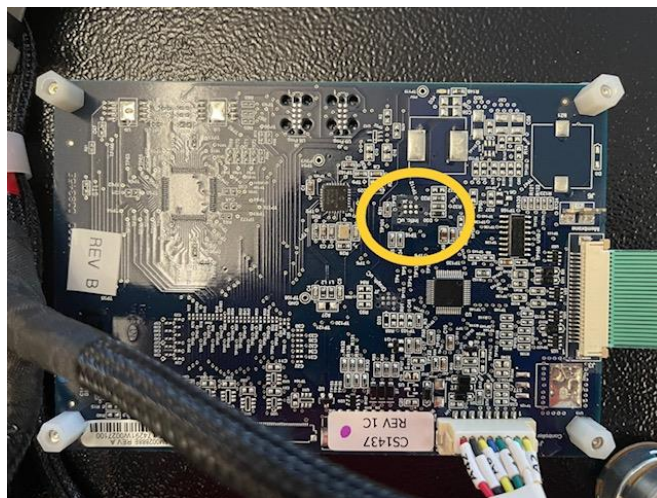
KIRA CV60 1 Field Service Programming\Bootloader Hex\HMI PIC16 3 2 2.Bootloader\HMI PIC16 3 2 2.Bootloader.hex

19. On the PICKit4 adapter select "OTHER" using the selector switch (see figure 14) .



[Figure 14: PICKit 4 Adapter set to "OTHER"]

20. Plug the tag connect end of the PICKit4 (see figure 6) into the J4 (see figure 15) of the HMI (human machine interface). This connection will need to be held in place until programming is complete.



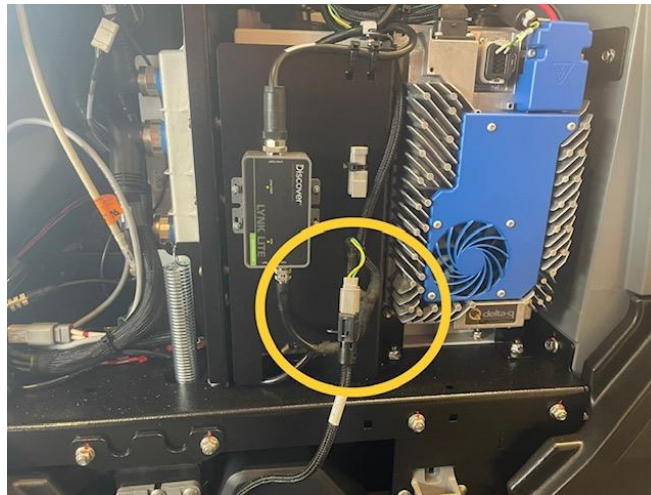
[Figure 15: J4 – HMI PIC16 Programming Connection]

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21. Select the Connect button (see figure 9).
22. Select the Program button (see figure 9).
23. If programming was completed successfully "Programming/Verify complete" will be displayed in the Output – IPE tab on the lower pane (see figure 10).
24. Remove the tag connect from J4 of the HMI.
25. The bootloader has been successfully loaded.

Updating Firmware

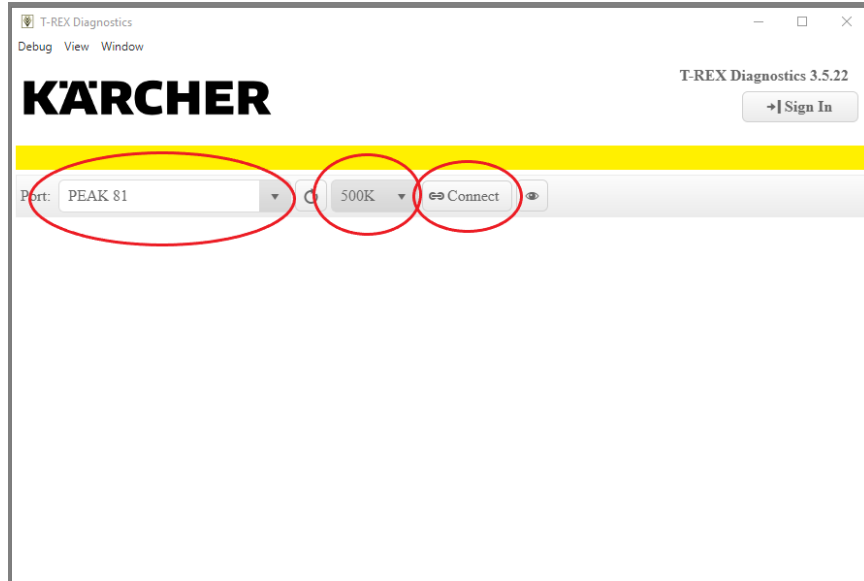
1. Turn on the main breaker and reset the e-stop. Turn the key switch off.
2. Connect the service harness (8.645-398.0) to the service port (B-C32) inside the left door (see figure 16).



[Figure 16: B-C32 - Service Harness Connected to the Service Port]

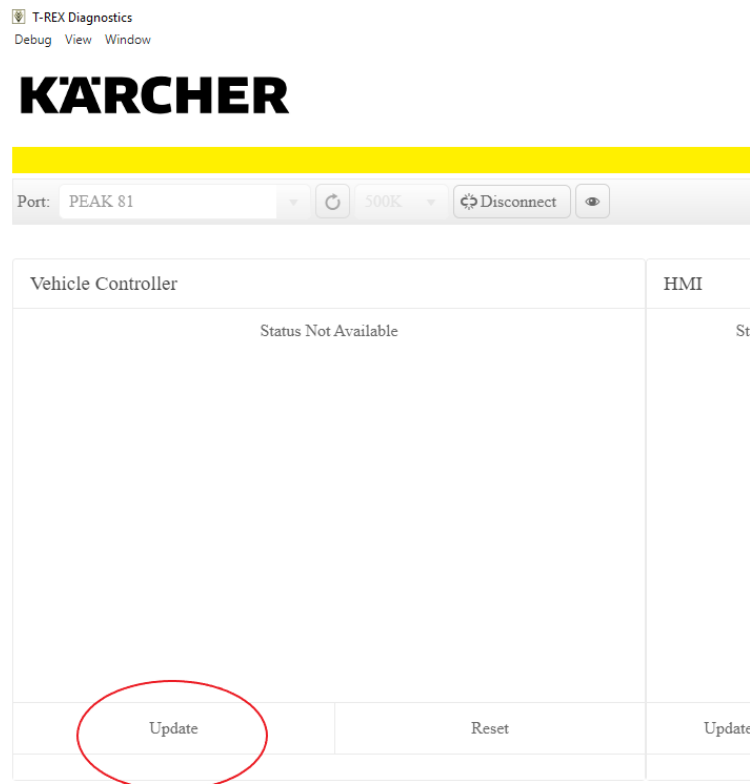
3. Connect the PEAK USB CAN tool (8.645-399.0) to the service harness and computer.
4. From the start menu open T-Rex Diagnostics.
5. Verify that the "PEAK 81" tool is recognized by the program in Port; select 500K in the second drop down menu, then press Connect (see figure 17).

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[Figure 17: Connect the PEAK USB CAN Tool in Software]

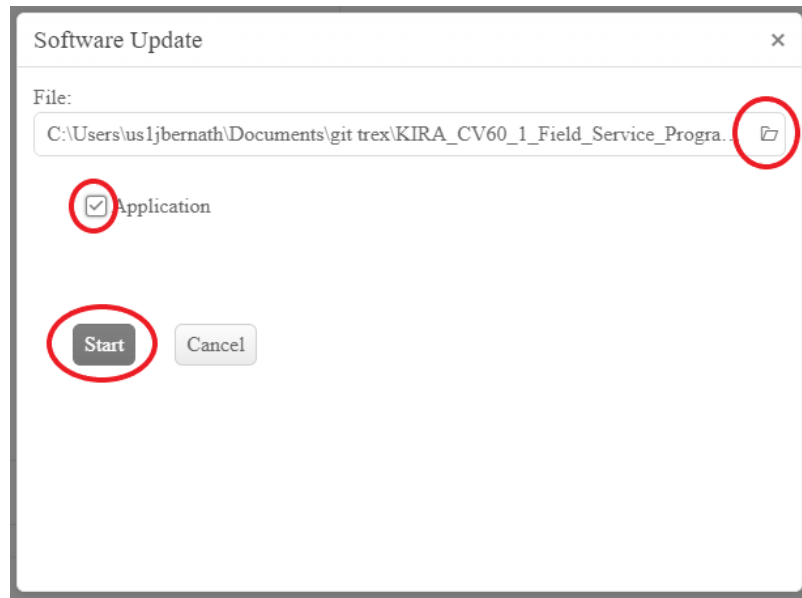
6. In the Vehicle Controller Pane, select Update (see figure 18).



[Figure 18: Vehicle Controller Update]

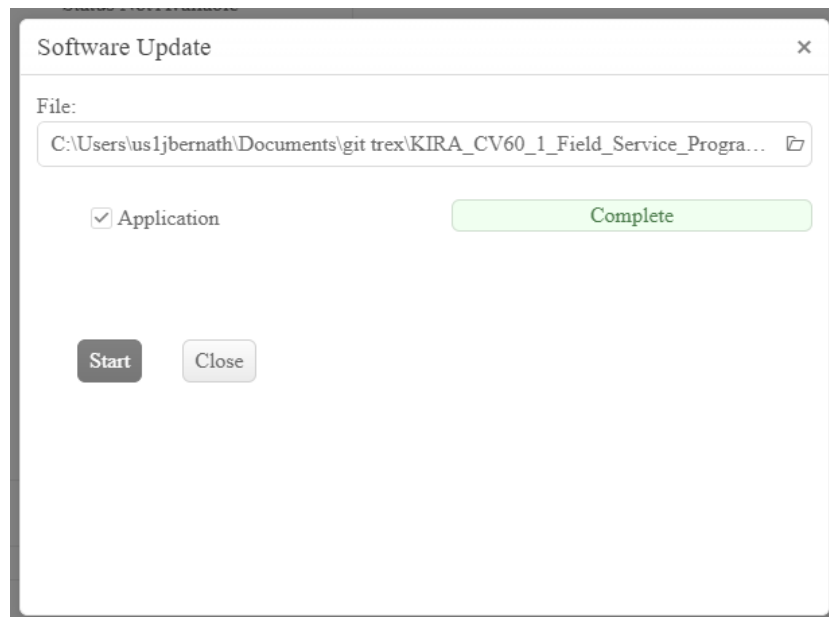
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7. In the File: dialog box file (see figure 19), open the following.
KIRA_CV60_1_Field_Service_Programming\Application_Hex\Trex_VCM_Application_3_2_2/manifest.json
8. Check the Application box (see figure 19).
9. Press Start (see figure 19).



[Figure 19: Program VCM]

10. If programming was completed successfully, "Complete" will be displayed in the progress bar (see figure 20).



[Figure 20: Successful Programming Message]

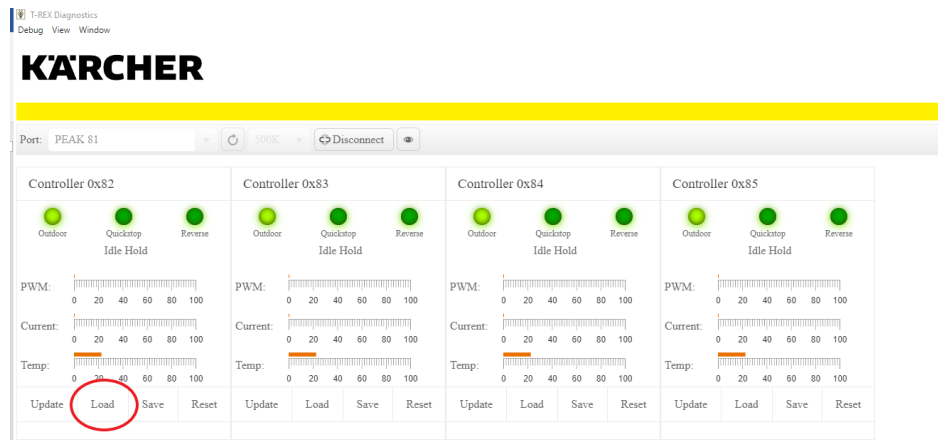
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11. Turn the key switch on.
12. Select Load in the Controller 0x82 Pane (see figure 21) and open the following.

KIRA CV60 1 Field Service Programming\Application Hex\Trex DMC Settings 3 2
2/SWEE000340B EE 59 tract 82.ee

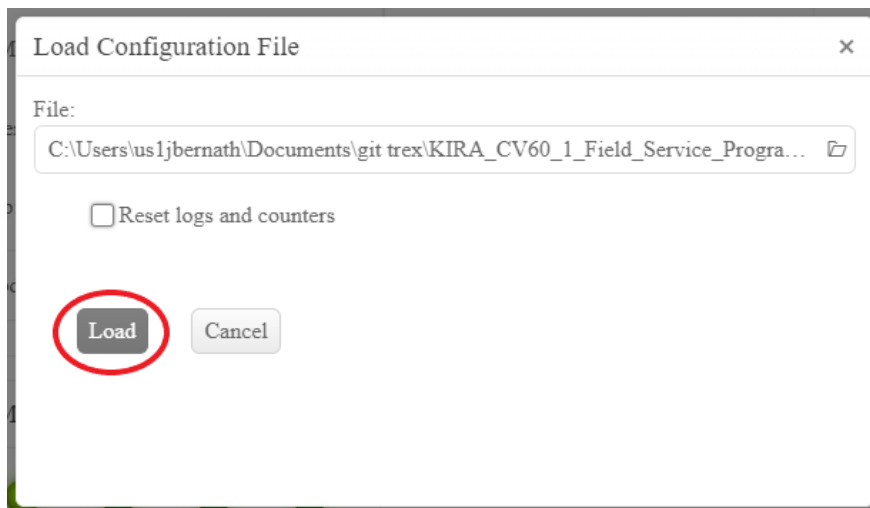
Warning: The controllers are not always displayed in order from lowest to highest.

Each controller must be programmed with the correct setting.



[Figure 21: Motor Controller Load]

13. Press Load (see figure 22).



[Figure 22: Load Motor Controller Settings]

14. If programming was completed successfully "Configuration loaded from file" will be displayed in the lower right corner (see figure 23). Ignore the error message.

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⊗ Error inspecting Controller 0x82: No response was received from the slave in the specified time.

✓ Configuration loaded from file

[Figure 23: Successful Programming Message]

15. Repeat step 11-14 for Controller 0x83, Controller 0x84 and Controller 0x85. Use the following files for each.

Controller 0x83

KIRA CV60 1 Field Service Programming\Application Hex\Trex DMC Settings 3 2 2\SWEE000341B EE 59 brush 83.ee

Controller 0x84

KIRA CV60 1 Field Service Programming\Application Hex\Trex DMC Settings 3 2 2\SWEE000342B EE 59 vac 84.ee

Controller 0x85

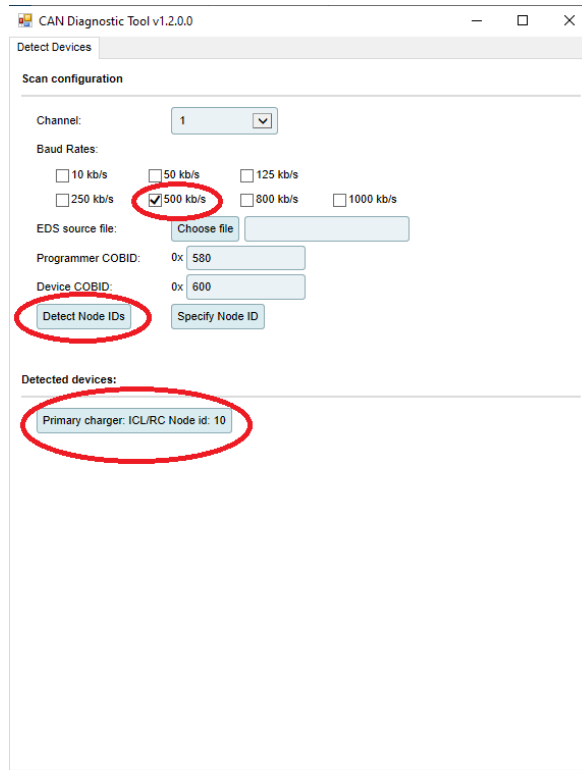
KIRA CV60 1 Field Service Programming\Application Hex\Trex DMC Settings 3 2 2\SWEE000343B EE 59 side br 85.ee

16. The Firmware has been successfully updated.

Updating Charger Configuration

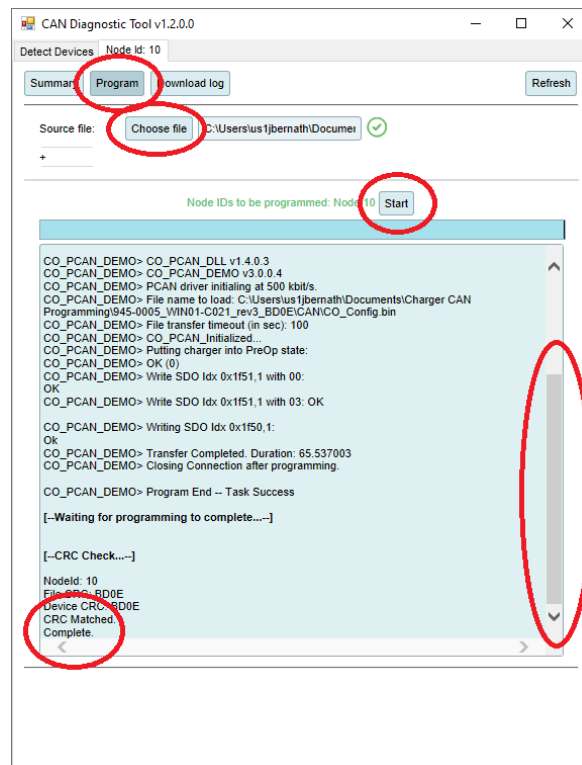
17. Turn off the main breaker and turn the key switch off.
18. Plug the charger into AC power.
19. Connect the service harness (8.645-398.0) to the service port (B-C32) inside the left door (see figure 16).
20. Form the CV60 1 Field Service Programming package open the following.
KIRA CV60 1 Field Service Programming\Software to be installed\Charger CAN Diagnostics tool v1.2.0\RC1\CAN Diagnostic Tool.exe
21. Set the Baud Rate: to 500Kb and press Detect Node IDs (see figure 24).
22. After the charger has been detected, it will show up in the Detected devices: window (see figure 24). Select it.

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[Figure 24: Charger CAN Diagnostic Tool – Connect to Charger]

23. Press Program to use the programming Window (see figure 25).



[Figure 25: Charger CAN Diagnostic Tool – Charger Programming]

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24. Select Chose file, open the following and press start (see figure 25).

KIRA CV60 1 Field Service Programming\Application Hex\Trex Charger Configuratio
n\CAN\CO Config.bin

25. If programming was completed successfully "Complete" will be displayed at the bottom of the status window (see figure 25). Scroll down to view the bottom of the window.