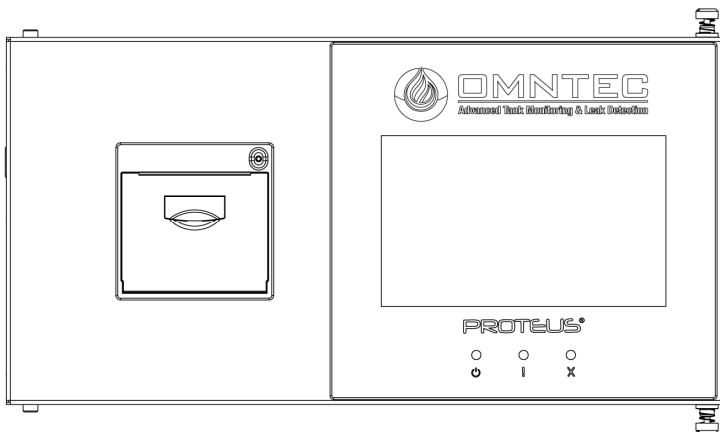# OEL8000III-K/X

GEN 3.0 TO GEN IV UPGRADE KIT: KIT-G3-UPGRADE-2 (Without Printer)

PROTEUS® Series
TANK GAUGING SYSTEM
Gen IV

Revision 2524

Document No. 500203

OMNTEC Mfg., Inc. has been certified by DQS Inc. to ISO 9001:2015

This document details the removal of a Gen 3.0 MCU board and the installation of a replacement Gen IV MCU board and door replacement (including new tempered-glass display) into a PROTEUS® K4, K8, and X model ATG controller.
It is imperative to read and understand this document prior to starting these procedures.

Required Tools:

- 3/16 SAE (Standard) nut driver.
- 4-40 SAE nut driver.
- M3XO.5 Metric nut driver.
- #1 Phillips screwdriver.
- #1 Phillips 90°, low-profile screwdriver (only for PROTEUS® X MCU installations).
- Allen Key (2.5 mm)
- Torx Driver (T15)
- PC with SD card capabilities, running Windows OS with admin permissions.
- Serial RS-232 cable.
- RS-232 to USB adapter (if necessary).
- SD card to USB adapter (if necessary).

KIT-G3-UPGRADE-2

- Replacement Front Panel Kit (Includes Front Panel w/Display, and Display Cable)
- Gen IV MCU Board ATG
- MB-232/485 Board
- Assembly Gen IV PM2222C Power Cable
- Two (2) SAE and Two (2) Metric Standoffs
- Two (2) SAE and Two (2) Metric Nuts
- Two (2) SAE 4-40 Screws and Two (2) Metric Screws
- 10 POS Relay Connector
- 4 POS Relay Connector

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PROTEUS® K4 and K8 Replacement Procedures:

NOTE: IF POSSIBLE, BEFORE PERFORMING ANY WORK, RECORD PROGRAMMED PARAMETERS IN THE EVENT OF DATA LOSS OR PROGRAMMING CHANGES FROM THE ORIGINAL.

WHEN UNINSTALLING THE GEN 3.0 MCU, SAVE ALL THE HARDWARE. YOU WILL NEED THIS PRE-EXISTING HARDWARE FOR THE REINSTALL OF THE NEW GEN IV MCU.

1) Power off the controller.
2) Disconnect the serial (DB9) and Ethernet cables from the external MCU ports (if applicable) on the left-hand side of the PROTEUS® K panel.
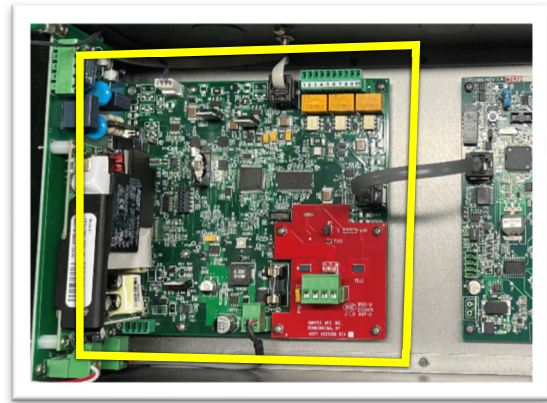3) Open the controller door and locate the MCU board.
   (See Figure 1.1; yellow)

Figure 1.1

4) Disconnect the DC power cable.
   (See Figure 1.2; red)
5) Remove all communication cables.
   (See Figure 1.2; yellow)
   This includes the gray display cable, the gray 416 board cable, the relay cable connection to J9 (if applicable), and the DB-485 red board (if applicable). If the PROTEUS® has a printer (K4-P and K8-P), remove the communication cable (white connector) at the MCU.
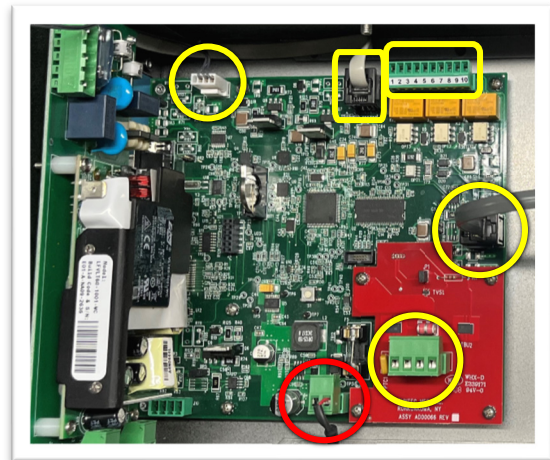6) Disconnect the green ground wire from the door ground lug.

Figure 1.2

7) Remove the door hinge screws (x2) on the left-side (top and bottom) of the panel, using an Allen key (2.5 mm) or Torx driver (T15). (See Figure 1.3; yellow)

   Note: Save these two hinge screws to reuse with the new replacement door. Replacement hinge screws are not provided.

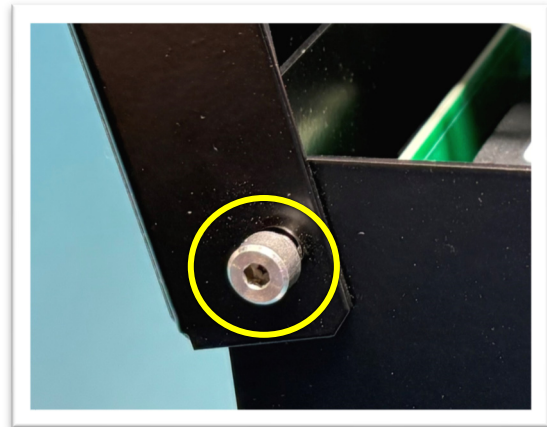8) Carefully remove the door unit and put it to the side.

Figure 1.3

9) Using the #1 Phillips screwdriver, remove the three (3) screws that secure the EMI shield to the left-hand side of the PROTEUS® K panel. (See Figure 1.4; yellow)

   Note: Do not misplace these screws. They are reused later in this document. Replacement screws for the EMI shield are not provided.
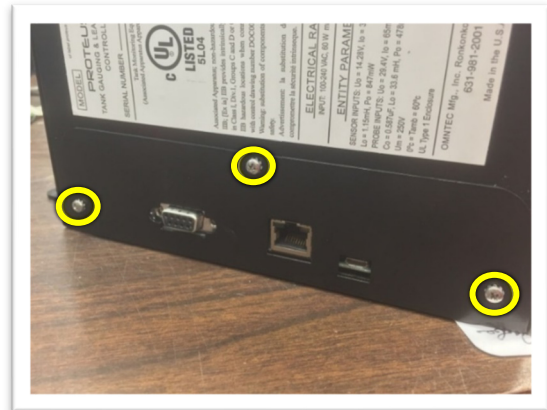

Figure 1.4

10) Remove the EMI shield and place it on the side. You will reinstall it later. The removal of the EMI shield makes it easier to access the MCU board at the three snap-stands. (See Figure 1.5; yellow)

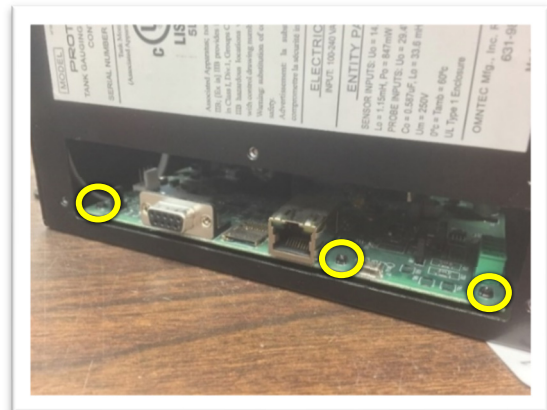   Access to the three snap-stands is relevant in Steps 13 and 14.

Figure 1.5

11) If applicable (see **note** below), using the #1 Phillips screwdriver, take out the four screws that secure the optional DB-485 red board to the Gen 3.0 MCU. Remove the DB-485 red board.
(See Figure 1.6; yellow)

   Note: The DB-485 board is an option that is added to a PROTEUS® K controller; it is not a standard feature. This older DB-485 red board will neither fit nor function with the Gen IV MCU board. See Steps 17 and 18 regarding our new MB-232/485 option board for our Gen IV MCU.
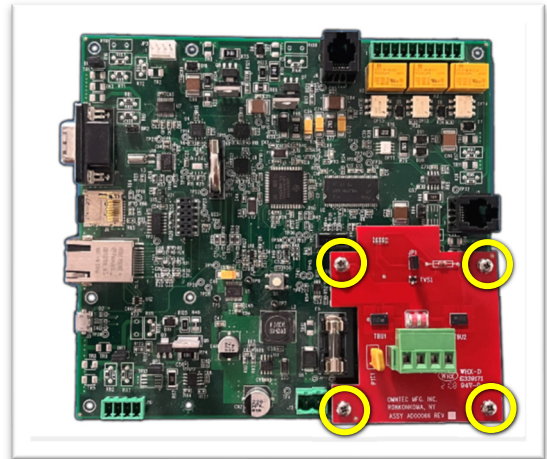

Figure 1.6

12) Use the #1 Phillips screwdriver to remove the screws that secure the MCU board at four points.
(See Figure 1.7; yellow)

   Note: If a DB-485 red board was removed in Step 11, use a 3/16" (SAE) nut driver on the four fastener standoffs.
   (See Figure 1.7; red)

   Also note: If a DB-485 red board is not on the Gen 3.0 MCU board, simply remove the four (4) screws from the vacant space with the #1 Phillips (SAE) screwdriver.
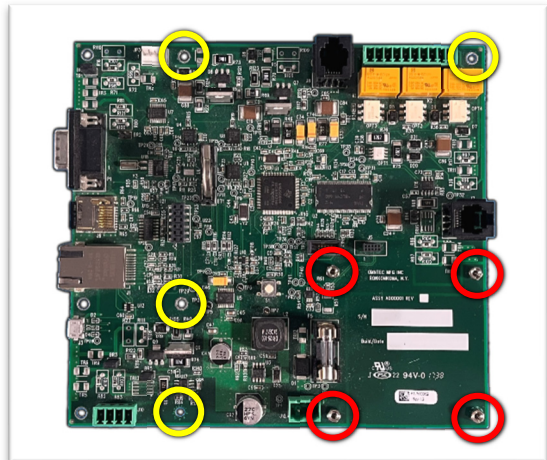

Figure 1.7

13) Once all the screws and fastener standoffs are removed, *carefully* pull the MCU board up and off the three snap-stands (see Figures 1.5 and 1.8; yellow) and extract it out from the controller.
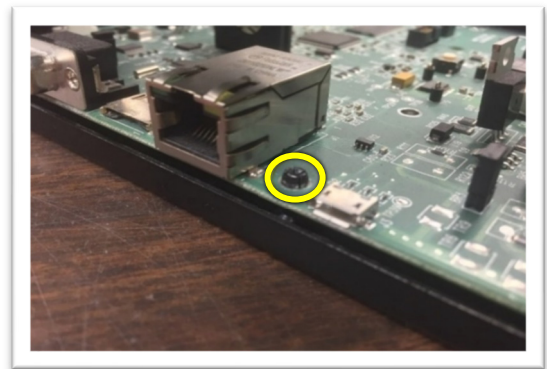

Figure 1.8

Installing a new Gen IV MCU board into a PROTEUS® K controller panel.
Note: For these steps, use the pre-existing hardware, removed during the previous steps.

14) Align the new Gen IV MCU board to the three snap-stands (see Figure 1.9; yellow), gently apply pressure to install. ***Do not bend the board***. The board should snap into place.

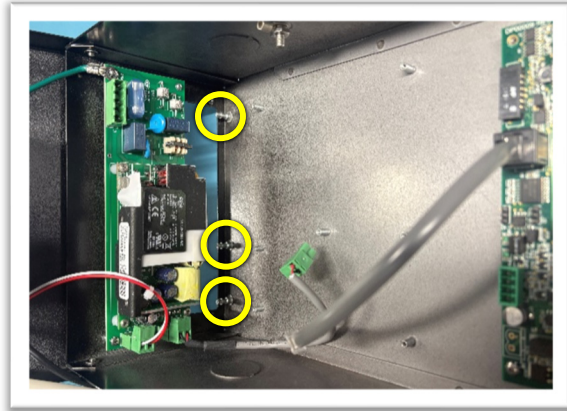Figure 1.9

15) Using the pre-existing screws, secure the Gen IV MCU board at the six points illustrated.
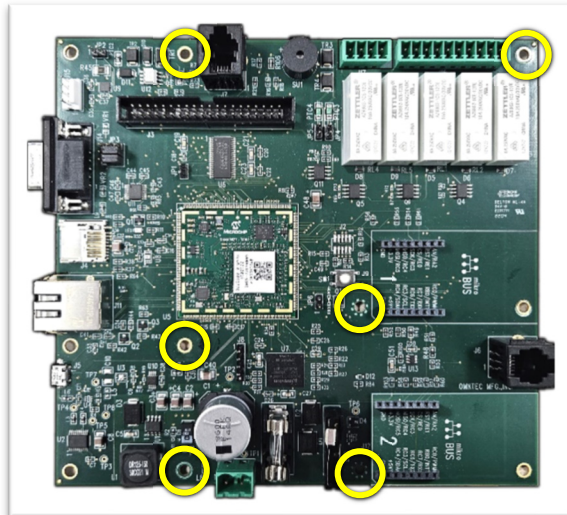(See Figure 1.10; yellow)

Figure 1.10

16) Screw in the two (2) standoffs and two (2) 4-40 nuts on Option Bus 1 and 2.
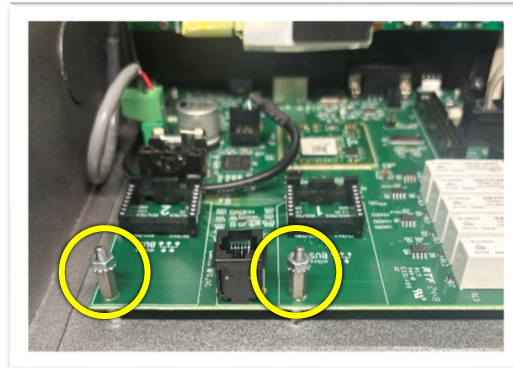(See Figure 1.11; yellow)

Figure 1.11

17) The Gen IV MCU offers two expansion board slots marked **OPTION BUS 1** and **OPTION BUS 2**. The MB-232/485 option board **MUST** be installed into the Option Bus 2 slot. ***The system is always powered down when removing or installing an MB-232/485 option board***.
(See Figure 1.12; yellow)
Pin alignment to the option bus slot is critical.

Note: If you have the old DB-485 option board (Figure 1.6), it will neither fit nor function with the Gen IV MCU board.
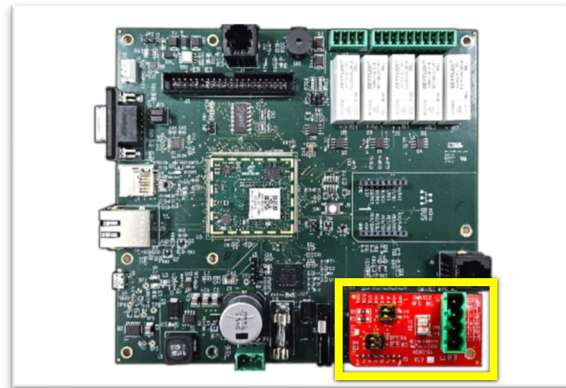

Figure 1.12

AD000159
Figure 1.13

18) Figure 1.13 is our selectable MB-232/485 option board (AD00159) and will only work on our Gen IV MCU board.
See our **OPTION BOARD INSTALLATION INSTRUCTIONS for configuration options and settings**, available at www.omntec.com**:**
   ➢ Document **DI00012**, for our selectable MB-232/485 option board

PROTEUS® K DOOR REPLACEMENT

You will require a 2.5 mm Allen key or a T15 Torx driver.

19) Carefully straddle and slide the hinges of the new replacement door over the hinge holes on the left-side of the panel box. Once in place, tighten the door lock clockwise (located on the top, upper-right of the door). This will lock the door. (See Figure 1.14; yellow).

Locking the door will temporarily hold the door in place, assisting you to easily install the two hinge screws removed earlier (Step 7). Tighten with the 2.5 mm Allen key or T15 Torx driver.

Figure 1.14

20) Connect the gray power cable from the power supply to the MCU. (See Figure 1.15; red)

21) Connect the wide gray display ribbon cable. (See Figure 1.15; yellow)

22) Connect the gray 416 board cable. (See Figure 1.15; white)

23) Connect the MCU relay cable connections to J16 and J17 (if applicable). (See Figure 1.15; blue)

24) Reconnect the green ground cable to the door ground lug.

Figure 1.15

25) Secure the EMI shield with the three (3) pre-existing 4-40 screws (removed in Step 9) to the left-hand side of the PROTEUS® K panel. (See Figure 1.16; yellow)
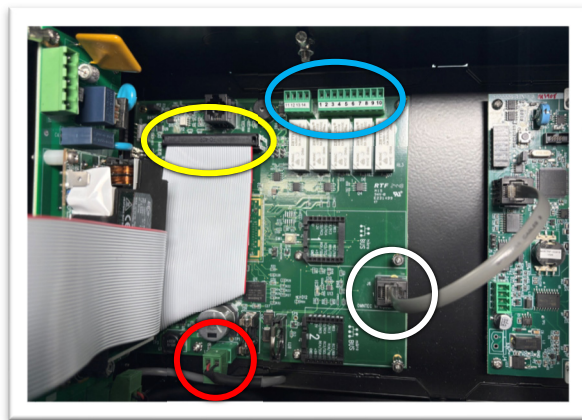

Figure 1.16

26) Apply power to the controller. Allow the system to boot up. The system will produce a hardware alarm. Go into UTILITIES > DIAGNOSTICS > DIAGNOSTIC PASSWORD KEYPAD and type SET CHECKSUM. Press ENTER. Allow the system to reboot.
(See Figure 1.17; yellow)

Note: Failure to do so may save an invalid system configuration.

Figure 1.17

For procedures on replacing the printer, refer to document **DI00014 DI00015 DI00020** (available at www.omntec.com/support/documents).

It is highly recommended to update the firmware on the other associated system boards. See our **PROTEUS® FIRMWARE UPGRADE GEN 3.5** document **(500183)**, available at www.omntec.com/support/documents, regarding updating this firmware upgrade.

PROTEUS® X MCU Replacement Procedures:

NOTE: IF POSSIBLE, BEFORE PERFORMING ANY WORK, RECORD PROGRAMMED PARAMETERS IN THE EVENT OF DATA LOSS OR PROGRAMMING CHANGES FROM THE ORIGINAL.

WHEN DOING THIS UNINSTALL, SAVE ALL HARDWARE. YOU WILL NEED THIS PRE-EXISTING HARDWARE FOR THE REINSTALL OF THE NEW MCU AND POWER SUPPLY BRACKET.

1) Power off the controller.
2) Open the controller door and locate the MCU board.
   (See Figure 2.1; yellow)
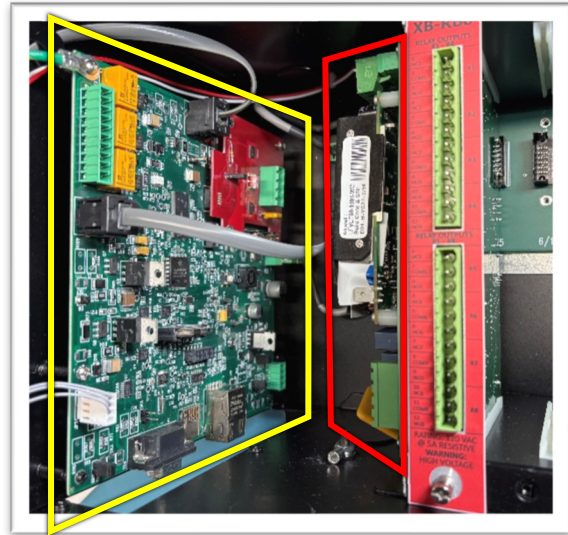3) Locate the power supply.
   (See Figure 2.1; red)

Figure 2.1

4) Remove the three DC power connectors from the power supply.
   (See Figure 2.2; yellow)

   Note: If your PROTEUS® X does not have a printer, there are only two DC power connections to the power supply. There will not be a red/white printer power cable.
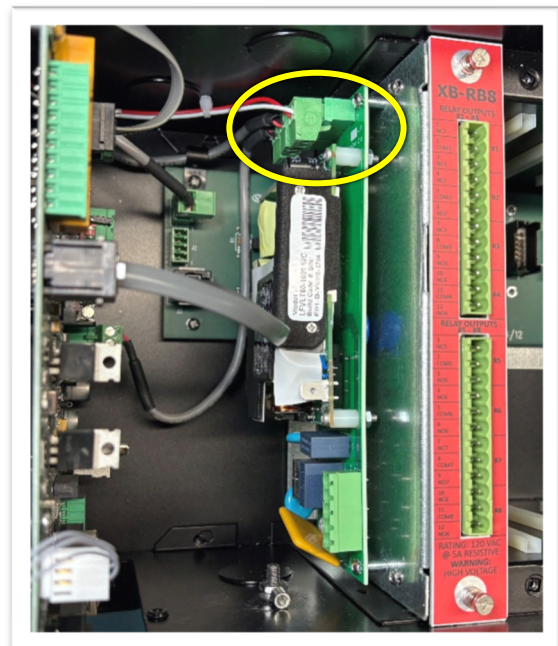

Figure 2.2

5) Remove the AC power connector.
(See Figure 2.3; red)

Note: If there is a board in Slot 7, you must remove this by loosening the two mounting screws using the #1 Phillips (SAE) screwdriver.
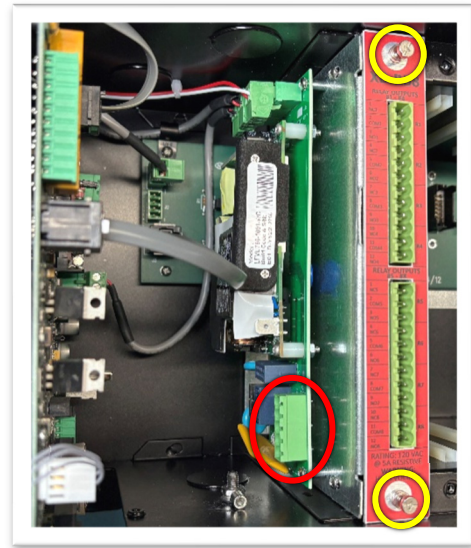(See Figure 2.3; yellow)

Figure 2.3

6) Slide out the board and place to the side.
(See Figure 2.4)

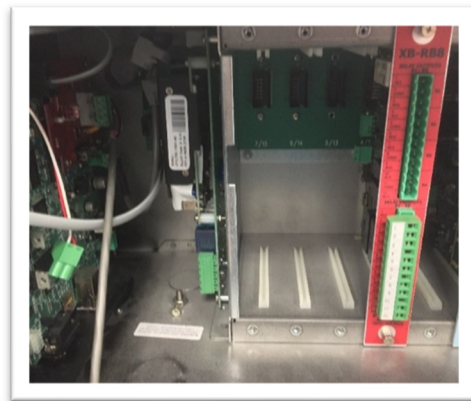You will reinstall this board after the installation of the new Gen IV MCU.

Figure 2.4

7) Using the #1 Phillips 90°, low-profile (SAE) screwdriver, take out the top screw of the power supply bracket.
(See Figure 2.5; yellow)

Figure 2.5

8) Use the #1 Phillips 90°, low-profile, (SAE) screwdriver to remove the bottom screw from the power supply bracket. (See Figure 2.6; yellow)

9) Extract the power supply assembly and place it to the side. You will reinstall this after the installation of the new MCU.
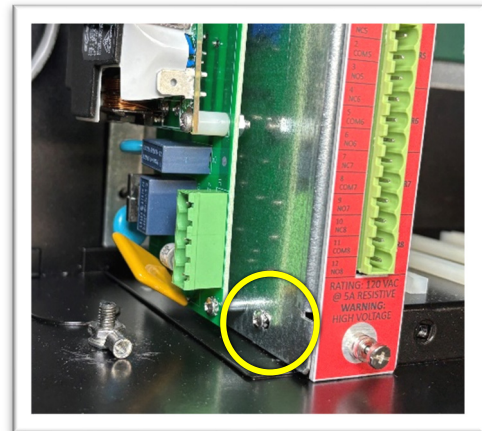

Figure 2.6

10) Remove the DC power cable. (See Figure 2.7; red) Disconnect all communication cables from the MCU board. (See Figure 2.7; yellow) This includes the gray display cable, the gray 416 board cable, the relay cable connections to J9 (if applicable), and the DB-485 red board (if applicable). If the PROTEUS® has a printer, remove the communication cable (small 4-pin white connector) at the MCU.

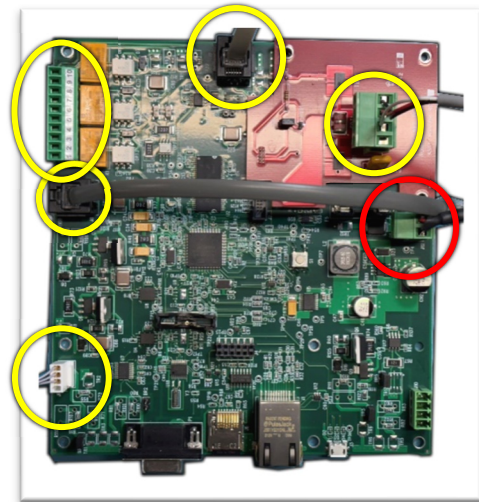11) Disconnect the green ground wire from the door ground lug.

Figure 2.7

12) Remove the door hinge screws (x2) on the left-side (top and bottom) of the panel, using the Allen key (2.5 mm) or Torx driver (T15). (See Figure 2.8; yellow)

Note: Save these two hinge screws to reuse with the new replacement door. Replacement hinge screws are not provided.
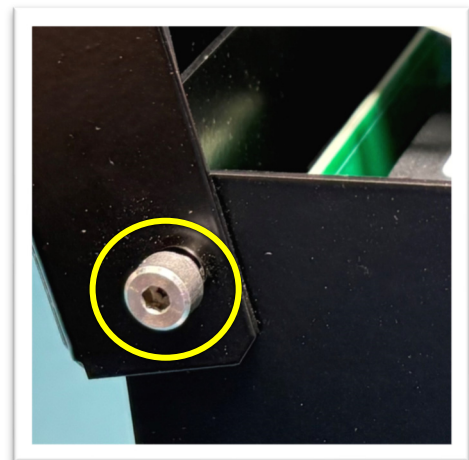
13) Carefully remove the door unit and put it to the side.

Figure 2.8

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14) From the bottom of the PROTEUS® X controller, disconnect any communication cables from the DB9 and RJ-45 connectors (if applicable).
(See Figure 2.9; red)

15) Using the #1 Phillips screwdriver, remove the three (3) screws from the EMI shield.
(See Figure 2.9; yellow)

Note: Do not misplace these EMI shield screws. They are reused later in this document. Replacement screws for the EMI shield are not provided.

16) Remove the EMI shield and place it on the side. You will reinstall it later along with the three EMI shield screws. The removal of the EMI shield makes it easier to access the MCU board at the three snap-stands.
(See Figure 2.10; yellow)

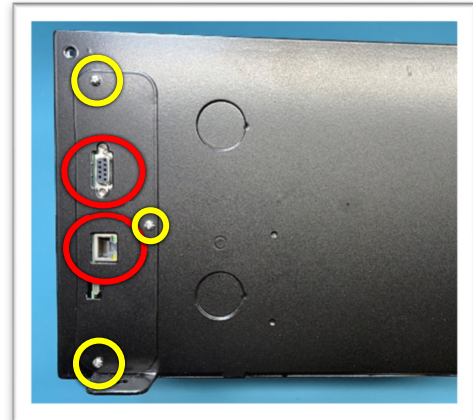Access to the three snap-stands is relevant in Steps 22 and 23.

Figure 2.9

Figure 2.10

17) Use the #1 Phillips screwdriver to remove the four (4) screws from the existing DB-485 red board.
(See Figure 2.11; yellow)
18) Take out the DB-485 red board.
19) Remove the standoffs under the DB-485 red board. Both the DB-485 and its hardware are now obsolete. Hardware comes with the new MB-232/485 board.
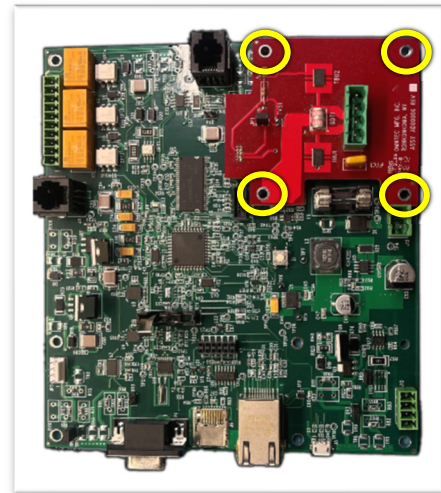

Figure 2.11

20) Remove the remaining four (4) screws with the #1 Phillips screwdriver.
(See Figure 2.12; yellow)

Note: This includes disconnecting the green earth ground cable and setting it aside. This is reconnected during the reinstall procedures. A replacement earth ground cable is not provided.

21) Remove the four (4) mounting stud screws using the 3/16" (SAE) nut driver.
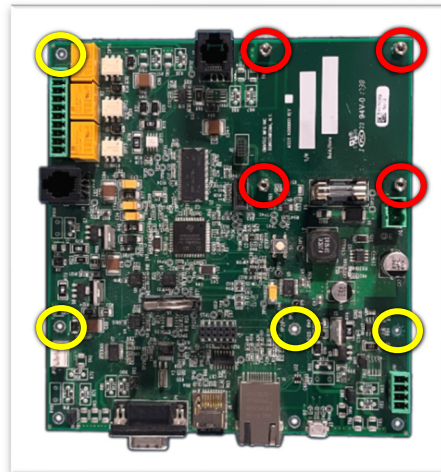(See Figure 2.12; red)

Figure 2.12

22) Now, with the MCU unsecured from the enclosure casing, carefully pull the MCU board off the three snap-stands.
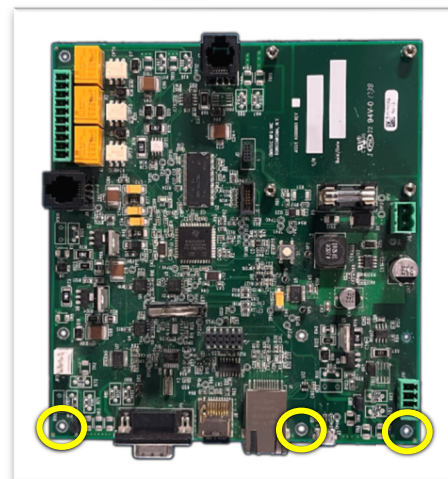(See Figure 2.13; yellow)

Figure 2.13

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Installing a new Gen IV MCU board into a PROTEUS® X controller panel.
Note: For these steps, use the pre-existing hardware, removed during the previous steps.

23) Install the new Gen IV MCU into the PROTEUS® X enclosure with the DB9 and Ethernet connectors in the downward position (towards the EMI opening) as depicted. Gently apply pressure and push the MCU onto the three (3) snap-stands. ***Do not bend the board***. The board should snap into place.
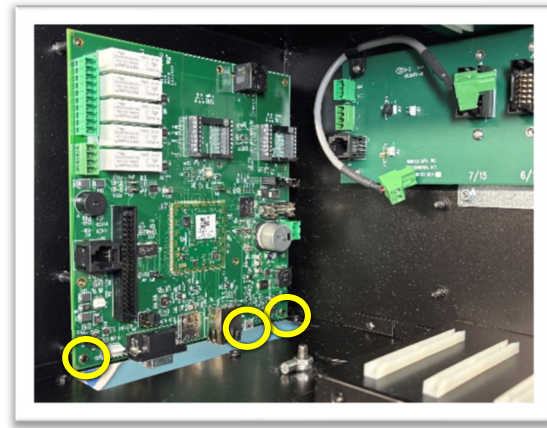(See Figure 2.14; yellow)

Figure 2.14

24) Screw the two (SAE) standoffs into the upper-right corners of Option Bus 1 and Option Bus 2.
(See Figure 2.15; yellow)

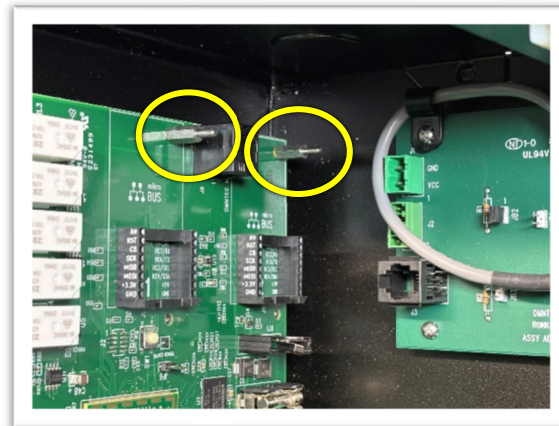***Note: Use the option board standoffs and nuts supplied with the MB-232/485.***

Figure 2.15

25) The Gen IV MCU offers two expansion board slots marked **OPTION BUS 1** and **OPTION BUS 2**. Install the MB-232/485 option board onto the Option Bus 2 slot. ***The system is always powered down when removing or installing an MB-232/485 option board***.
(See Figure 2.16; yellow)
Pin alignment to the option bus slot is critical.

Note: If you have the old DB-485 option board (Figure 1.6), it will neither fit nor function with the Gen IV MCU board.
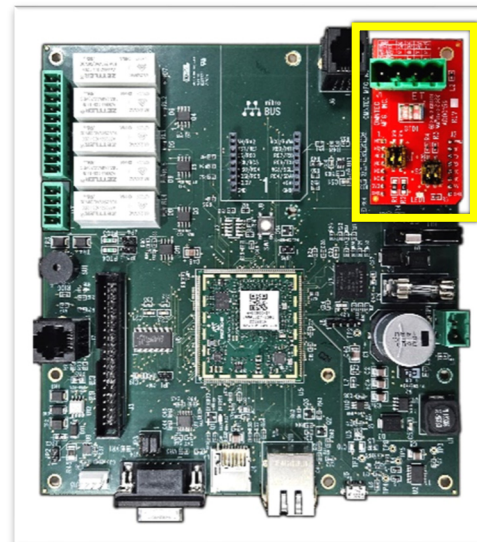

Figure 2.16

26) Figure 2.17 is our selectable MB-232/485 option board (AD00159) and will only work on our Gen IV MCU board.

AD000159
Figure 2.17

See our **OPTION BOARD INSTALLATION INSTRUCTIONS for configuration options and settings**, available at www.omntec.com**:**
  ➢ Document **DI00012**, for our selectable MB-232/485 option board

27) Secure with the two (2) SAE nuts onto the two option bus standoffs.
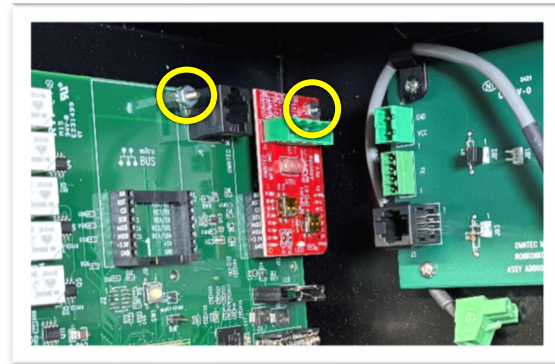(See Figure 2.18; yellow)

Figure 2.18

28) Attach all the remaining screws at five points, as illustrated.
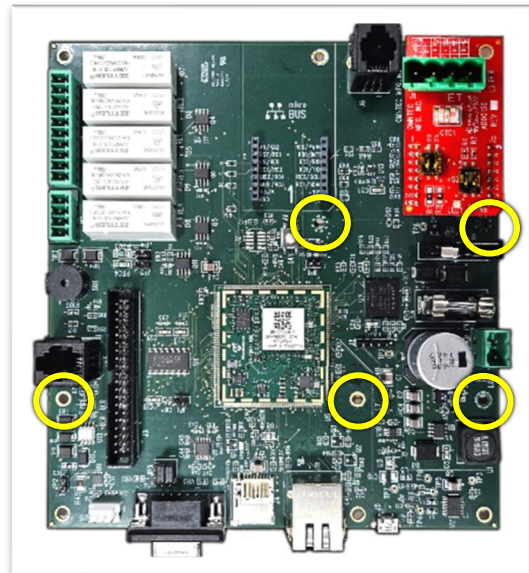(See Figure 2.19; yellow)

Figure 2.19

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PROTEUS® X DOOR REPLACEMENT

You will require a 2.5 mm Allen key or a T15 Torx driver.

29) Carefully straddle and slide the hinges of the new replacement door over the hinge holes on the left-side of the panel box. Once in place, tighten the door lock clockwise (located on the top, upper-right of the door). This will lock the door. (See Figure 2.20; yellow).

Figure 2.20

30) Locking the door will temporarily hold the door in place, assisting you to easily install the two hinge screws removed earlier (Step 12). Tighten with the 2.5 mm Allen key or T15 Torx driver.

31) Connect the gray 2-pin power cable connector to the MCU.
(See Figure 2.21; red)

32) Connect the gray 2-pin power cable connector to the backplane.
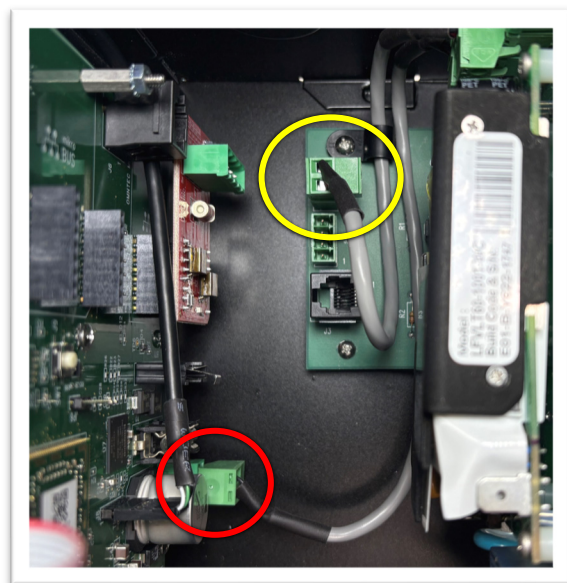(See Figure 2.21; yellow)

Figure 2.21

33) Connect the wide gray display ribbon cable to the J6 connector on the MCU. (See Figure 2.22; red),

34) Connect the gray 416 board cable from the backplane to the MCU. (See Figure 2.22; yellow)

35) Connect the MCU relay cable connections to J16 and J17 (if applicable). (See Figure 2.22; blue)

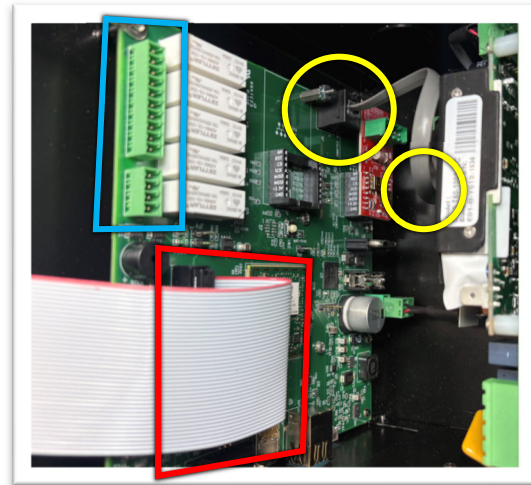36) Reconnect the green ground cable to the door ground lug.

Figure 2.22

37) Slide the power supply bracket into its slot so that the bracket holes fit into their respective back-side enclosure posts. (See Figure 2.23; yellow)

38) Use the #1 Phillips 90°, low-profile (SAE) screwdriver to secure the two (2) 4-40 (SAE) screws. (See Figure 2.23; red)
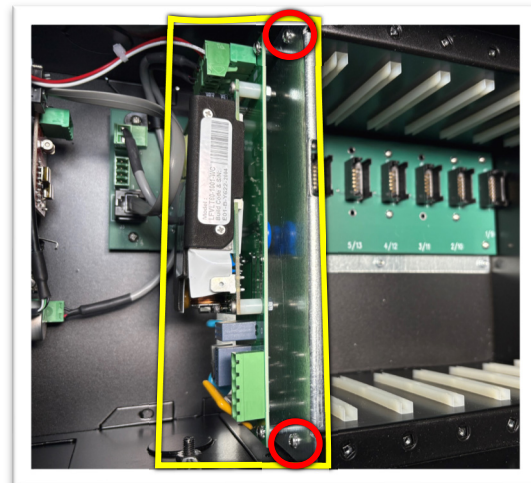

Figure 2.23

39) Plug the gray power cable connector, coming from the bottom of the MCU (see Figure 2.20; green), into the ***back-most connector*** of the power supply. (See Figure 2.24; yellow)

40) Plug the gray power cable connector from the backplane (see Figure 2.26; blue), into the ***middle connector*** of the power supply (See Figure 2.24; yellow)

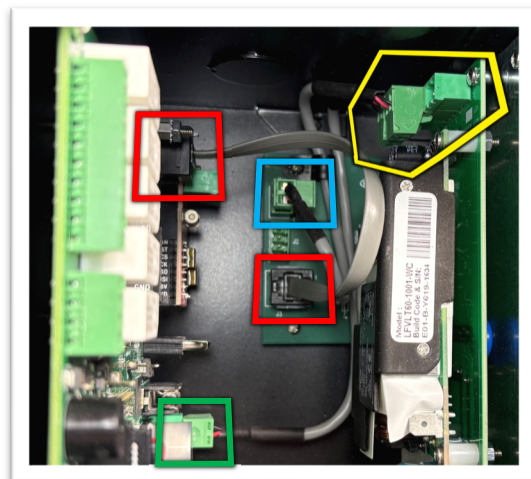41) Plug the gray cable into the backplane and its other end into the MCU. (See Figure 2.24; red)

Figure 2.24

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42) Secure the EMI shield with three (3) pre-existing 4-40 (SAE) screws.
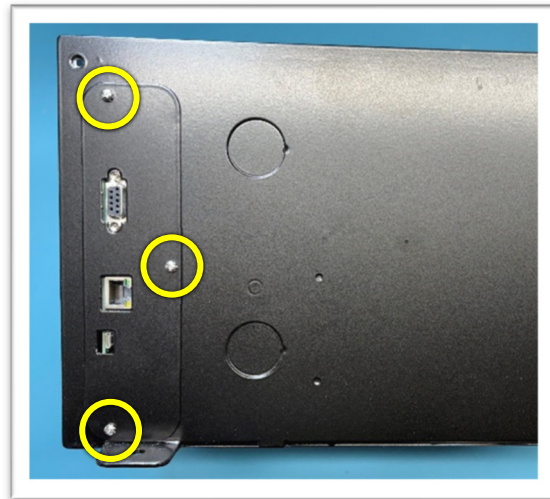(See Figure 2.25; yellow)

Figure 2.25

43) Apply power to the controller. Allow the system to boot up. The system will produce a hardware alarm. Go into UTILITIES > DIAGNOSTICS > DIAGNOSTIC PASSWORD KEYPAD and type **SET CHECKSUM**. Press ENTER. Allow the system to reboot.
(See Figure 2.26; yellow)

Note: Failure to do so may save an invalid system configuration.

Figure 2.26

For procedures on replacing the printer, refer to document **DI00014 DI00015 DI00020** (available at www.omntec.com/support/documents).

It is highly recommended to update the firmware on the other associated system boards. See our **PROTEUS® FIRMWARE UPGRADE GEN 3.5**, document **500183**, available at www.omntec.com/support/documents, regarding updating the firmware.

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