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## **1. Purpose**

- 1.1. This document describes the procedure for installing the HUMAC64 Biodex System4 upgrade.

## **2. Tools Required**

- 2.1. Small Phillips head screwdriver.
- 2.2. Medium Phillips head screwdriver.
- 2.3. Small flathead screwdriver.
- 2.4. Zip-tie cutter.

## **3. Confirm the Biodex Revision**

- 3.1. Confirm the Biodex does not have a manual control panel.

## **4. Testing the Biodex**

- 4.1. You must confirm the Biodex is operating correctly before installing the HUMAC interface.
  - 4.1.1. Ask the therapist if they have had any problems with the Biodex, e.g. an error code appears each time they turn the system on, or they cannot use isokinetic mode.
  - 4.1.2. Ask the therapist to place the system in Con/Con Isokinetic mode. Push the input adapter through one repetition to confirm it moves as expected.
- 4.2. If they reported any error codes, or the system does not move as expected, stop and contact CSMi before upgrading the system with a HUMAC.

## **5. Installing the Interface**

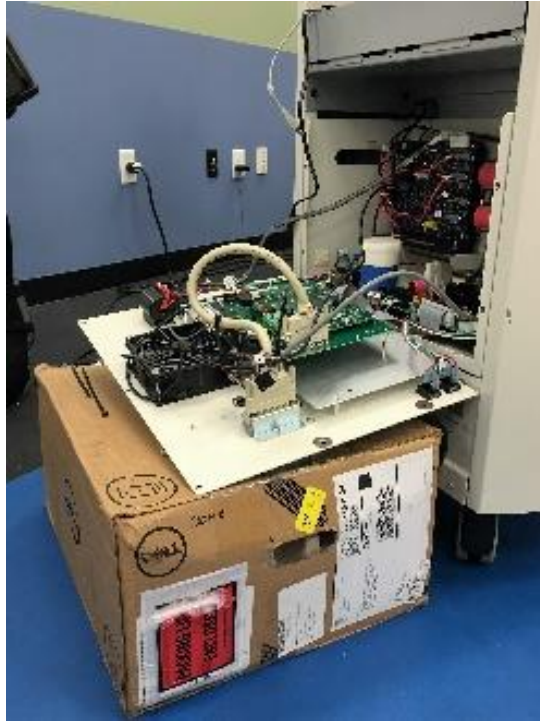
- 5.1. Unplug the Biodex from the wall.
- 5.2. Lock the two computer cart back wheels so the cart does not move during installation.
- 5.3. Place a box or stool with the height reaching the base of the back panel behind the computer cart (as shown in the photo below). This will provide the back panel a place to rest when it is opened.



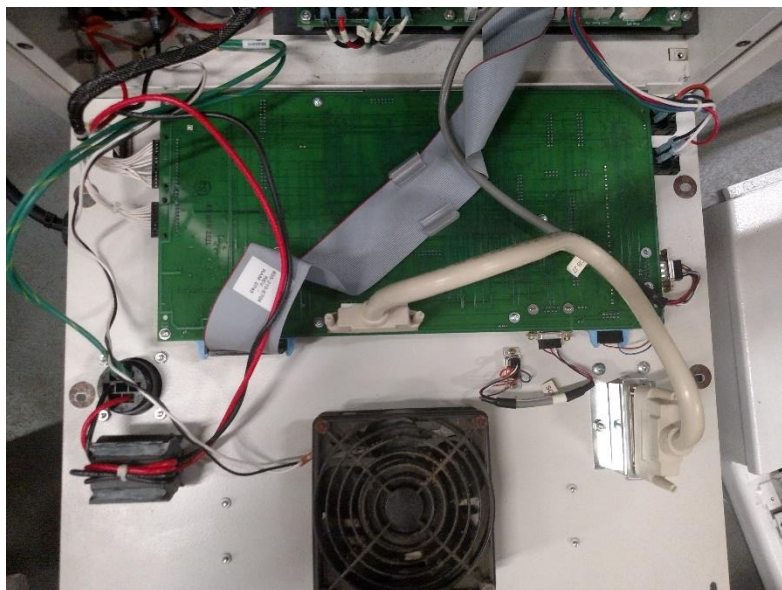
- 5.4. Remove the 7 screws at the rear of the controller. Remove the top center screw last. As the back panel is hinged at the bottom, be prepared for it to tilt open towards you when the screw is removed.



- 5.5. Gently allow the controller panel to tilt open and let it rest on the box placed in front of it – see the picture below.

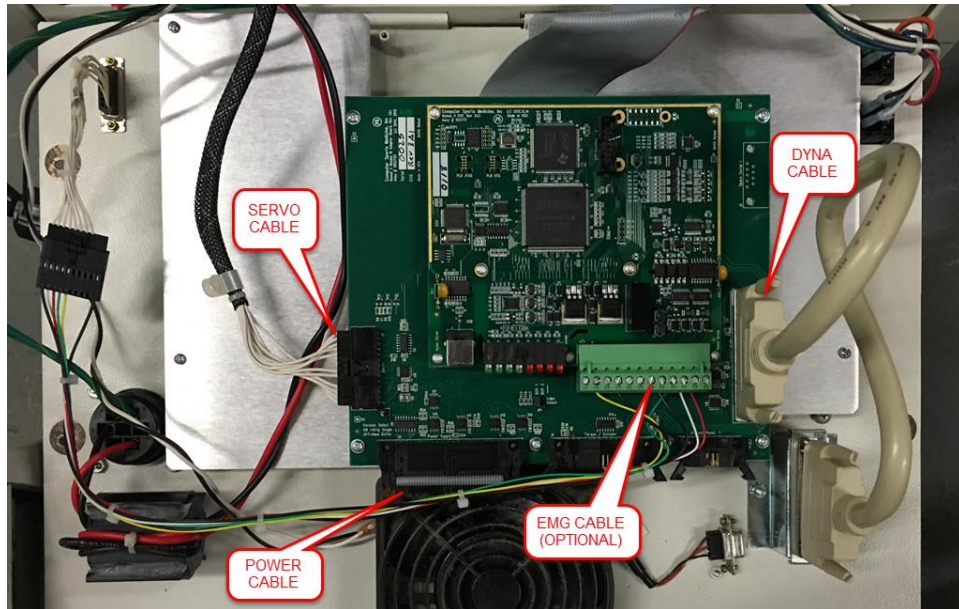


- 5.6. You now have access to the green control board and its associated connecting cables. What you see should look like the picture below.



- 5.7. Unplug the connectors running to the green controller circuit board. The DB9 connectors require a small flat head screwdriver. Make sure the DB9 mounting screws will stay in place on the connector; if they will not, remove and set them aside.

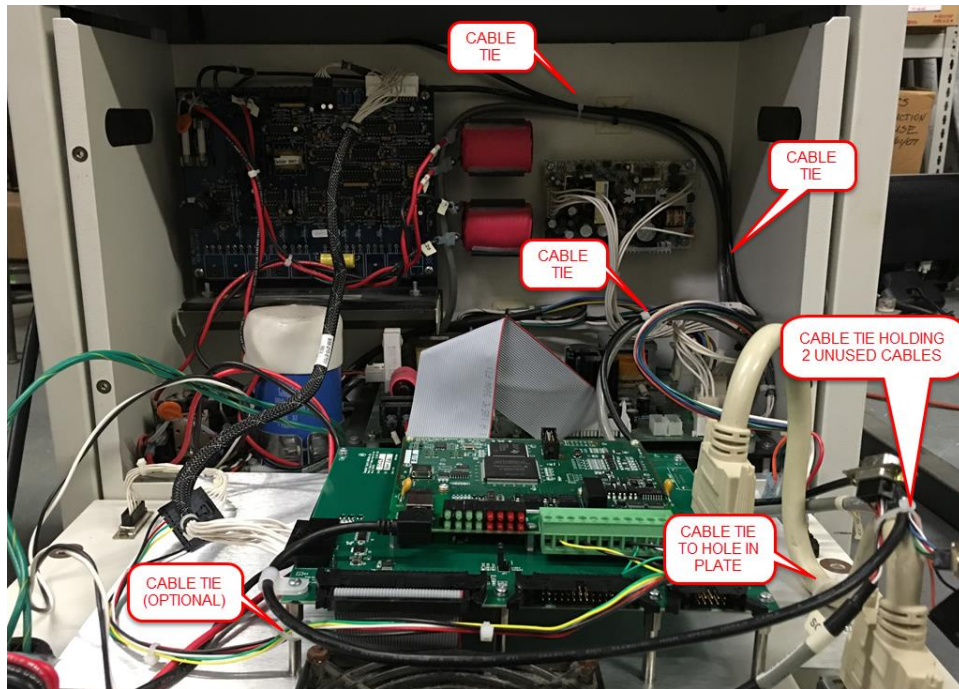
- 5.8. Remove the ten (10) Phillips head circuit board mounting screws and remove the board from the panel. Keep four (4) of the screws to install the HUMAC Interface.
- 5.9. Install the HUMAC adapter plate and interface assembly on the back panel as shown in the picture below using the four (4) screws you previously set aside.
- 5.10. Connect the Power, Dynamometer and servo connectors to the HUMAC board.
  - 5.10.1. **IMPORTANT:** The orientation of the cables on the HUMAC board is different than on the Biodex board. Each cable/connector pair has an alignment keyway. Make sure you check the keyways before installing the cables.



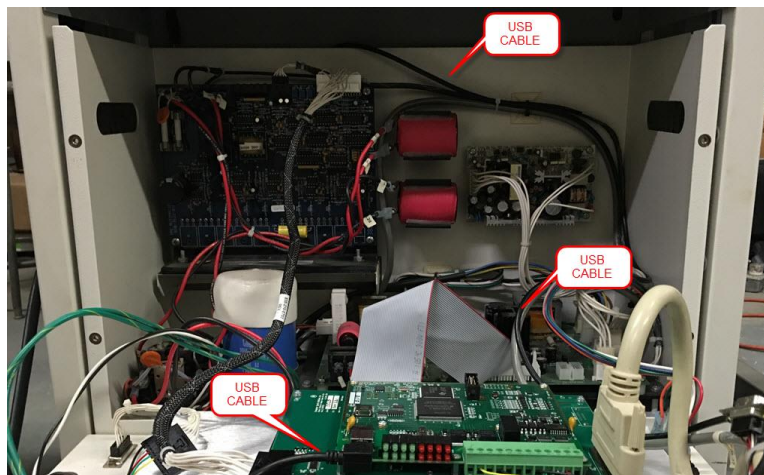
- 5.11. The Auxiliary Output cable (shown as “Optional” in the picture above, but included in the upgrade kit) is connected as follows:
  - 5.11.1. The green connector block attaches to the green bar connector on the HUMAC board (you may need to remove the existing connector on the board).
  - 5.11.2. The thin black connector (at the other end of the cable) plugs into the thin black connector that attaches via white wires to the Auxiliary Output jack on the back panel (this can be seen on the left side of the picture above).



- 5.12. Install all the cable ties in the following locations (including those shown as optional) to retain the cabling and unused Biodex connectors.



- 5.13. Feed the USB Cable through the top of the cabinet.



- 5.14. Remove the side cover from the Biodex cart. This cover is held in place by a retaining lip – to remove it, slide it straight up until it is clear of the lip, then tilt the bottom slightly out (clearing the lip) and lower the cover. Connect the USB cable to an open USB connector on the PC as shown in the picture below, and re-install the side cover.



5.15. Close the back of the Biodex and re-install the 7 screws.

5.16. The HUMAC interface is now fully installed.

## 6. Installing or Upgrading the Computer System

6.1. The electrical outlets for computer, printer, and monitor on the computer cart are accessed from a gray panel located on the back of the cart, just above the main back panel you just opened to install the HUMAC. See the picture below.



6.2. You need to remove this panel and the white side panel to route the cables.

