



## HUMAC2015 NORM Interface Installation Instructions

### 1. Introduction

- 1.1. This document contains instructions for installing the HUMAC Interface in the NORM.
- 1.2. Before beginning the installation, the HUMAC program should be installed on the computer.

### 2. System Requirements

- 2.1. PC with USB 1.1 or 2.0 interface.
- 2.2. CD-ROM Drive.
- 2.3. Windows98, 98 SE, Me, 2000, or XP.
- 2.4. CSMI HUMAC Rev 1A1, 1A2, or 1A3 board.

### 3. Tools Required

- 3.1. Small flat head screw driver.
- 3.2. Medium phillips head screwdriver.
- 3.3. Large phillips head screwdriver.
- 3.4. Wire cutters.
- 3.5. Long reach grabbers.
- 3.6. Long nose pliers.
- 3.7. 3/8" box wrench.
- 3.8. 7/64" allen wrench.
- 3.9. 5/32" allen wrench.

### 4. Test the NORM

- 4.1. Turn on the CYBEX.
- 4.2. Start the CYBEX NORM application.
- 4.3. Confirm the system can be run in Isokinetic mode.
- 4.4. Ask customer if they are experiencing any problems with the CYBEX. Note any problems on document 300871 (HUMAC2015 NORM Upgrade Installation Checklist).

### 5. Remove the Original CYBEX Components

- 5.1. Unplug the NORM from the wall.
- 5.2. Remove the input adapter from the dynamometer. Remove the range stops from the dynamometer.
- 5.3. Remove the NORM plastic covers.
- 5.4. Unplug all cables from the computer and remove the computer.
- 5.5. Remove the monitor, keyboard, and light pen.

- 5.6. Unplug all cables from the NDCB. Remove the screw at the front of the NDCB and slide the NDCB forward to remove it.

## 6. Install the New Computer

- 6.1. Attach the Velcro to the underside of the monitor base and install the monitor on the monitor tray. Plug the power cord into the monitor.
- 6.2. Attach the Velcro to the underside of the keyboard and install the keyboard on the monitor tray.
- 6.3. Place the mouse next to the keyboard.
- 6.4. Run the monitor signal, monitor power, keyboard, mouse, and ground wires through the flexible tubing. Be sure to leave enough slack at the top so the monitor tray can rotate freely.
- 6.5. Place the CPU in the base of the NORM.
- 6.6. Connect the monitor signal, keyboard, and mouse cables to the CPU.
- 6.7. Connect the printer cable to the CPU.
- 6.8. Connect the speaker cable to the CPU.
- 6.9. Plug the CPU, Monitor, Printer, and Speaker power cords to the free plugs on the back of the NORM servo box.

## 7. Installing the HUMAC Interface

**Note:** The original CYBEX NORM had two metal connectors at the back of the dynamometer. The new CYBEX NORM has three metal connectors at the back of the dynamometer.

### 7.1. Original Two Conductor NORM

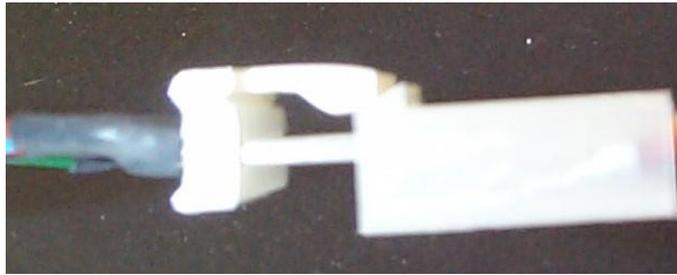
- 7.1.1. The original NORM used two white plastic connectors to connect to the NDCB. The HUMAC includes an adapter cable set to convert from the original NORM connectors to the three conductor design.



**Figure 1 - Adapter Cable Set**

**IMPORTANT:** The original NORM cables and the adapter cables use a lip and tab to indicate the correct connector orientation and to lock the connectors in place. When connecting the adapter cables make sure the lip on the adapter cable locks over top of the tab on the NORM cable. The following picture

*shows the cables partially connected. When installing the HUMAC, make sure the cables are fully plugged together.*



**Figure 2 - Cable Partially Connected to Show Lip/Tab Orientation**

- 7.1.2. Plug the 6-pin CYBEX cable into the 6-pin adapter cable connector.
- 7.1.3. Plug the 9-pin CYBEX cable into the 9-pin adapter cable connector.
- 7.1.4. Plug the round Amphenol connector on the adapter cable to the matching HUMAC interface connector.
- 7.1.5. Plug the DB-9 connector on the adapter cable into the matching HUMAC interface connector located just below the round Amphenol connector.
- 7.1.6. Plug the DB-25 cable from the NORM Servo Box into the matching HUMAC interface connector.
- 7.1.7. Plug the DB-15 connector on the adapter cable into the matching HUMAC interface connector.
- 7.1.8. Plug the Patient Comfort Switch into the matching connector at the front of the HUMAC interface.
- 7.1.9. Plug the USB cable from the CPU into the matching connector at the front of the HUMAC interface.
- 7.2. New Three Conductor NORM
  - 7.2.1. Plug the round Amphenol connector from the NORM Servo Box to the matching HUMAC interface connector.
  - 7.2.2. Plug the DB-9 connector from the NORM Servo Box into the matching HUMAC interface connector located just below the round Amphenol connector.
  - 7.2.3. Plug the DB-25 cable from the NORM Servo Box into the matching HUMAC interface connector.
  - 7.2.4. Plug the DB-15 connector from the NORM Dynamometer into the matching HUMAC interface connector.
  - 7.2.5. Plug the Patient Comfort Switch into the matching connector at the front of the HUMAC interface.
  - 7.2.6. Plug the USB cable from the CPU into the matching connector at the front of the HUMAC interface.

## 8. Programming the Servo Amp Settings

- 8.1. Remove the four bolts from the base of the NORM Servo Box. Note: On some NORM systems they are 3/8" bolts, on other NORM systems, they are large Phillips head screws.
- 8.2. Remove the seven screws holding the cover on the NORM Servo Box and remove the cover.
- 8.3. There are two methods for programming the servo amplifier, **Automatic** and **Manual**. The method you use is based on your HUMAC Interface Revision and the Servo Amplifier Revision.

HUMAC Rev	Servo Rev	Programming Method
1A1	0096	Manual
1A1	1095	Manual
1A2, 1A3	0096	Manual
1A2, 1A3	1095	Automatic

- 8.4. **HUMAC Rev:** Next to the round power connector on the HUMAC interface is a white label which lists the HUMAC revision:

HUMAC/NORM Interface  
Rev: **1A3**  
S/N: \_\_\_\_\_

- 8.5. **Servo Rev:** The Servo EPROM (located next to the servo personality module) has a white label with the revision number. The revision number will be 9101-**1095**-xxx or 9101-**0096**-xxx.

- 8.6. Automatic Programming Method

- 8.6.1. The servo amplifier contains a number of jumpers. Move jumper P10 to pins 2-3.

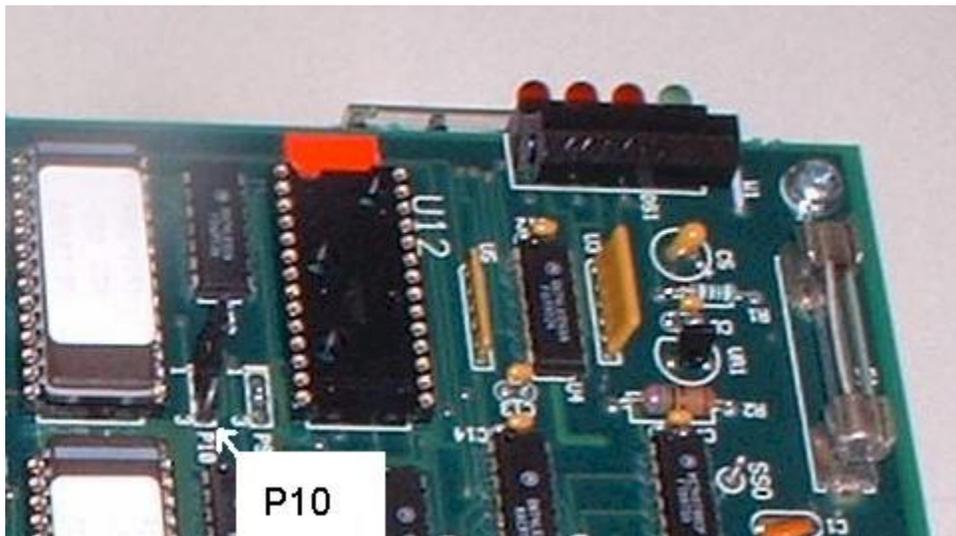


Figure 3 - Jumper P10 Location

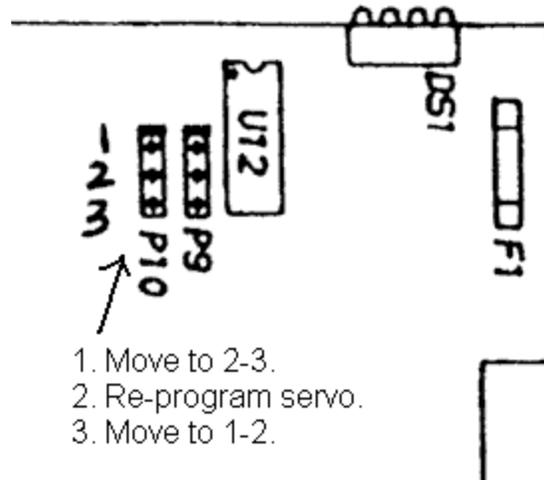
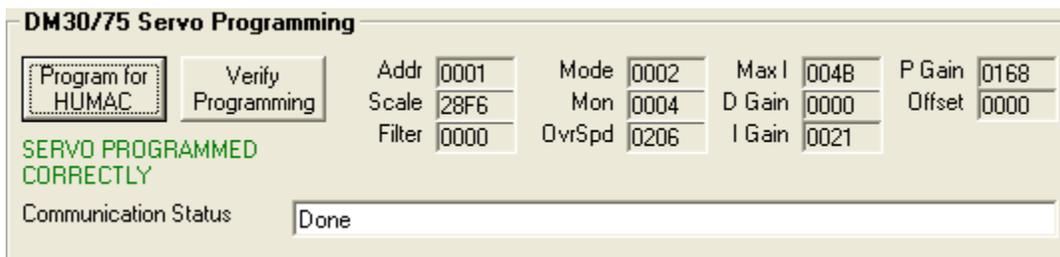


Figure 4 - Setting P10

- 8.6.2. Plug the NORM in and turn the NORM on.
- 8.6.3. Start the computer.
- 8.6.4. 64-bit HUMAC Interface.
  - 8.6.4.1. From the Windows Task Bar, select Start, All Programs, HUMAC2015, Utilities, Diagnostics64.
  - 8.6.4.2. From the **Startup Screen**, enter **CSMIDIAG** as the password and click the **Proceed with Caution** button.
  - 8.6.4.3. The HUMAC will display the **HUMAC64 Diagnostics** form. The message *"Initializing HUMAC Interface Board. Please wait..."* will be displayed at the bottom of the page. During this time the HUMAC is loading the **PLD** and **DSP**, and reading the **MACHINE**, **SERVO**, and **MOTOR** settings.
  - 8.6.4.4. When the procedure is complete, the **MACHINE SETTINGS** area will display the **MACHINE**, **SERVO**, **MOTOR** and **REV** values.
  - 8.6.4.5. Click the **PROGRAM FOR HUMAC** button.



- 8.6.4.6. Click the **EXIT** button to save the settings.
- 8.6.5. 32-bit HUMAC Interface
  - 8.6.5.1. After the software and drivers are installed, select **Start, Programs, HUMAC2015, Diagnostics**.
  - 8.6.5.2. Enter the Password **"CSMIDIAG"** and click the **Proceed with caution** button.

- 8.6.5.3. From the HUMAC diagnostics program, click the **Load PLD** button. The HUMAC will load the PLD.
- 8.6.5.4. Click the **Get Servo** button. The HUMAC will begin communicating with the Servo Amplifier. When it is completed the word Done will appear in the Communication Status box. The HUMAC will detect if you have a DM-30 (Low Power) or DM-75 (High Power) Servo Amplifier and the Machine Type (6000 or NORM). Verify the settings are correct.
- 8.6.5.5. Click the **Program HUMAC** button. The programming takes about one minute. When it is completed the word Done will appear in the Communication Status box.
- 8.6.5.6. When the programming completes verify the “**SERVO PROGRAMMED CORRECTLY**” message is in green.
- 8.6.5.7. Click the **Exit** button to close the Diagnostics program.
- 8.6.6. Turn the NORM off.
- 8.6.7. Unplug the NORM from the wall.
- 8.6.8. Move servo jumper P10 to pins 1-2.
- 8.7. Manual Programming Method
  - 8.7.1. Remove the cable from P6 on the servo and install the HUMAC Serial cable from P6 on the servo to COM1 on the PC.
  - 8.7.2. If you have a 1A1 HUMAC interface, unplug the DB-25 pin cable from the HUMAC interface. If you have a 1A2 or 1A3 HUMAC interface this cable can be left connected.
  - 8.7.3. Setting the Servo to R/W Mode
    - 8.7.3.1. The servo amplifier contains a number of jumpers. Move jumper P12 to pins 2-3. Move jumper P10 to pins 2-3.

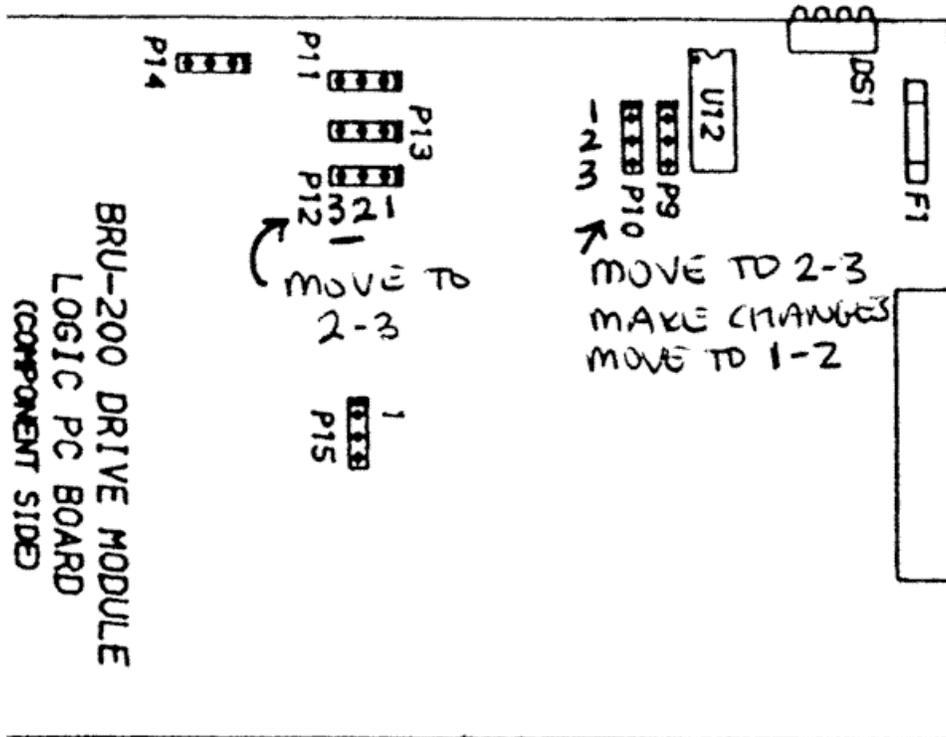


Figure 5 - Servo Jumper Connections

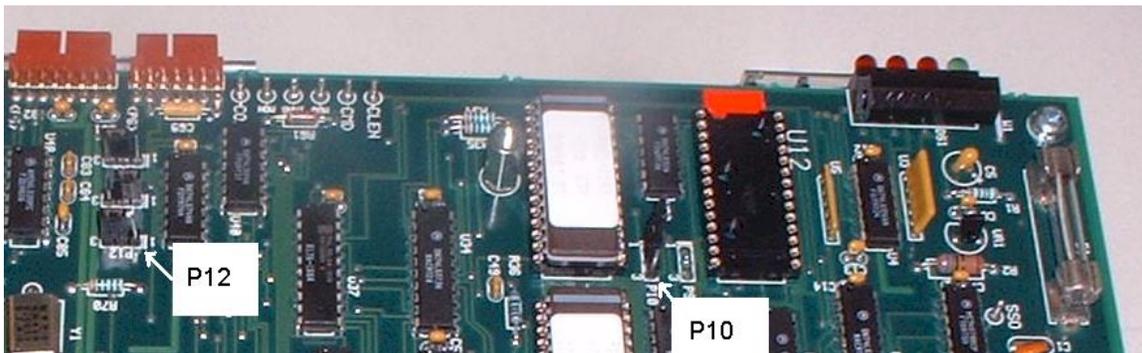


Figure 6 - Jumper Locations on Board

- 8.7.4. Connect the servo serial cable from COM1 on the computer to the serial input (P6) on the servo amplifier.



**Figure 7 - HUMAC Serial Cable in P6**

- 8.7.5. Plug the NORM in and turn the NORM on.
- 8.7.6. Verify that the servo amplifier green LED is on and the three red LED's are off. If this is not what you see, make sure the DB-25 cable is not plugged into the HUMAC interface. Turn the servo off and back on.
- 8.7.7. Changing the EPROM Contents
  - 8.7.7.1. Place the HUMAC CD in the computer. If the SETUP program starts, press Cancel to exit SETUP.
  - 8.7.7.2. Start a DOS box on the PC.
    - 8.7.7.2.1. Windows98, Me: Start, Programs, MS-DOS prompt.
    - 8.7.7.2.2. Windows2000, XP: Start, Programs, Accessories, Command Prompt.
  - 8.7.7.3. Type **d:<enter>** where d: is your CD-ROM drive.
  - 8.7.7.4. Type **cd \ecomm<enter>**.
  - 8.7.7.5. Type **ECCOMM<enter>** to start the program.
  - 8.7.7.6. Press <space>.
  - 8.7.7.7. Press **P**.
  - 8.7.7.8. Press <enter> to move the cursor to the Mode parameter.
  - 8.7.7.9. Press **2 <enter>** to switch the servo amplifier to Torque mode.
  - 8.7.7.10. Move the cursor to the scale parameter.
  - 8.7.7.11. Set the **Scale to 7.50 amps per volt**.
  - 8.7.7.12. Set the **Filter Bandwidth to Off**.
  - 8.7.7.13. Press **S** to save your changes. The screen should look like the following:
  - 8.7.7.14. The Peak I will be 29.7. AMP for low-power servo amplifiers and 49.8 AMP for high-power servo amplifiers.

```

Command Prompt - eccomm
Scale 7.50 AMP/V:
Offset 0.0000 V:
Peak I 49.8 AMP:
Overspeed 3595 RPM: Mode(2): Torque
Filter BW OFF Hz: Monitor-Tach
:
***** Saved data *****

```

**CYBEX NORM With DM-30 (Low Power Amp)**

Parameter	Value
Scale	7.50 AMP/V
Offset	0.0000 V
Peak I	29.7 AMP
Overspeed	3595 RPM
Filter BW	OFF Hz
Mode	2 Torque
Monitor	Command

**CYBEX NORM With DM-75 (High Power Amp)**

Parameter	Value
Scale	7.50 AMP/V
Offset	0.0000 V
Peak I	49.8 AMP
Overspeed	3595 RPM
Filter BW	OFF Hz
Mode	2 Torque
Monitor	Command

8.7.7.15. Press **Alt-X** to exit the program.

8.7.7.16. Type **exit <enter>** to close the DOS box.

**8.7.8. Setting the Servo to Read Only Mode**

8.7.8.1. Turn the NORM off.

8.7.8.2. Unplug the NORM from the wall.

8.7.8.3. Move jumper P10 to pins 1-2. Leave jumper P12 at pins 2-3.

8.7.8.4. Replace the original NORM cable on servo P6.

8.7.8.5. If you have a 1A1 HUMAC interface reconnect the DB-25 pin cable to the HUMAC interface.

**9. Completing the Installation**

9.1. Place the cover back on the NORM Servo Box. Connect the ground wire from the HUMAC interface to one of the plugs on the NORM Servo Box. Be sure to place one lock washer below the lug and one lock washer above the lug.

9.2. Install the four bolts from the base of the NORM Servo Box.

9.3. Re-install the plastic covers on the NORM.