

Quick Set Up Guide

ProPlus, ProWrist, and ProControl 2

Motion Control, Inc.

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Hardware Requirements:

A Windows-based computer running Windows XP, Vista, 7, 8, 10 or Mac with Windows OS running in Boot Camp or Parallels.

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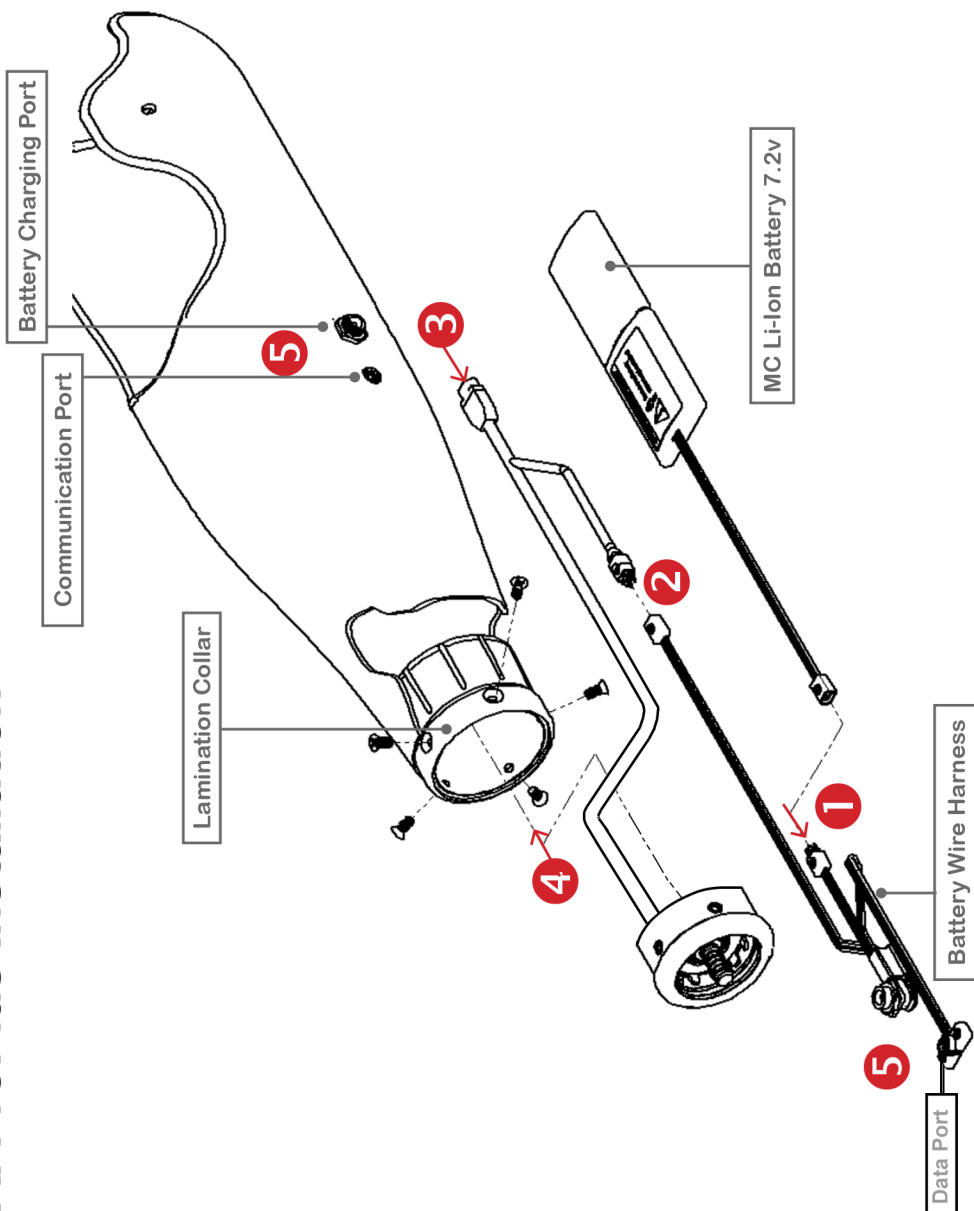
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Step 1. Connect the System Parts

Choose the diagram on the next pages for your parts:

- A. ProPlus Installation
- B. ProWrist Installation
- C. ProControl 2 Installation

A. ProPlus Installation



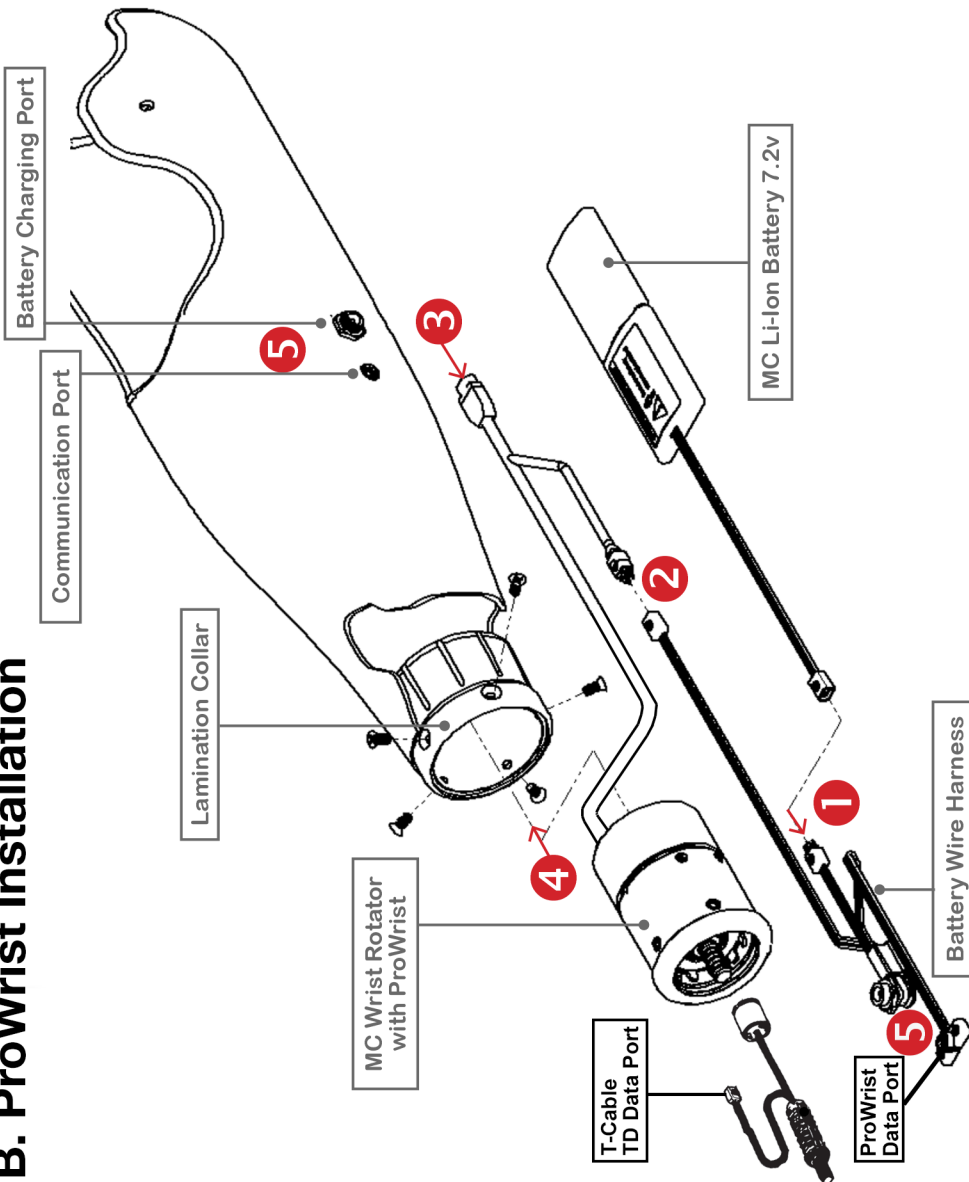
STEPS

- 1 - Connect battery to the Battery Wire Harness.
- 2 - Connect the Battery Wire Harness to the Coaxial Input (4 pin)
- 3 - Connect the Preamps to the Coaxial Plug (9 pin)
- 4 - Locate the position of the charging and communications port and drill holes accordingly. Secure the battery and preamps to the wall of the prosthesis with self adhesive Velcro.
- 5 - Attach the preamps to the socket.

CLOSE UP VIEWS

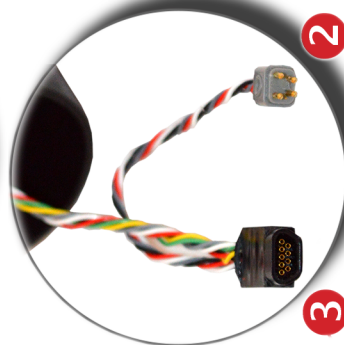
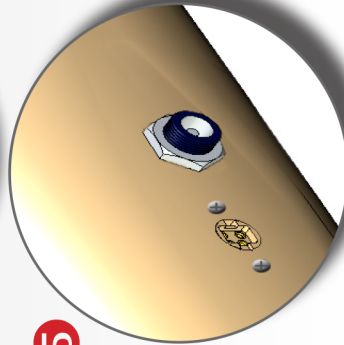


B. ProWrist Installation



Triad Preamps with ProControl 2 ribbon cable

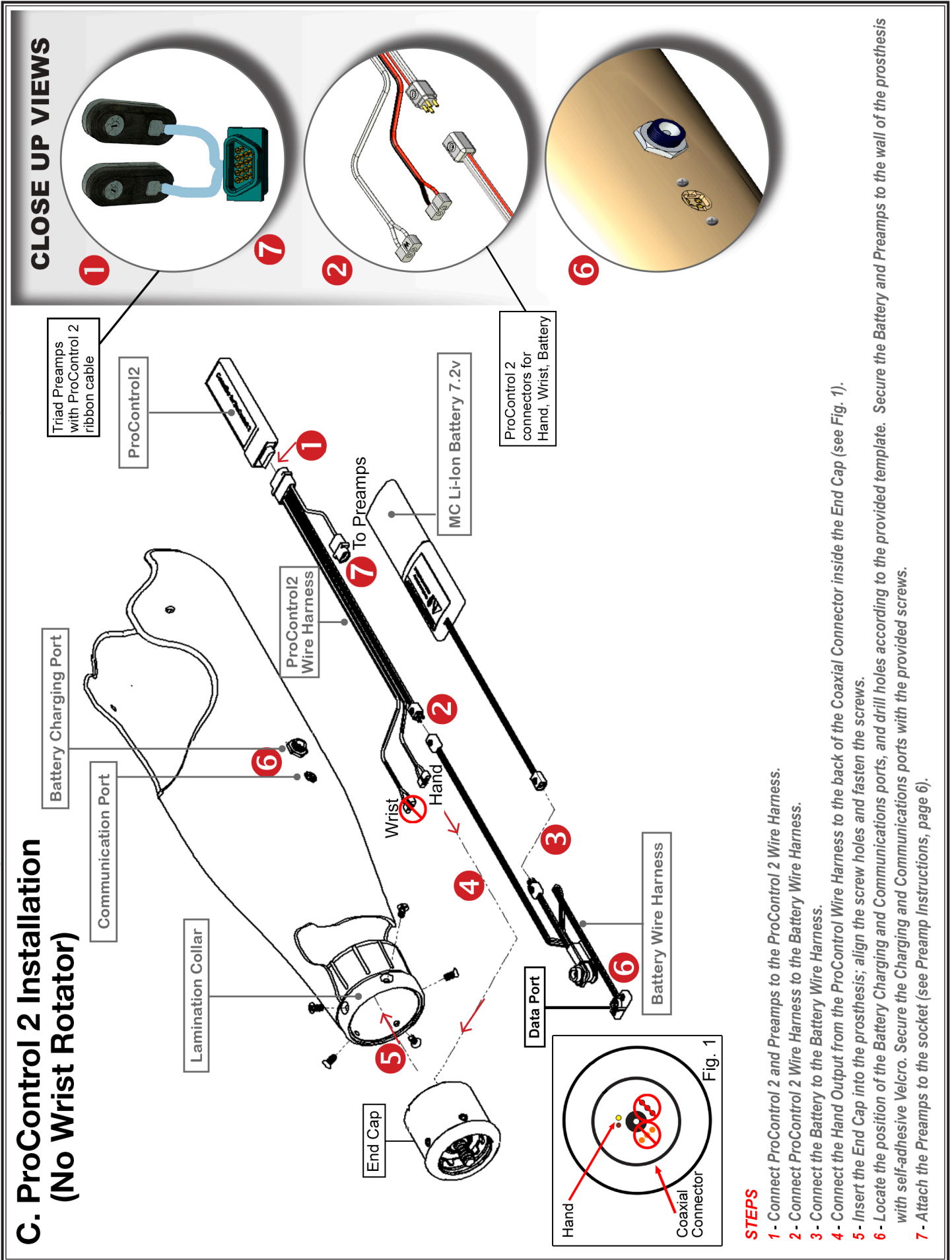
CLOSE UP VIEWS



STEPS

- 1 – Connect battery to the Battery Wire Harness.
- 2 – Connect the Battery Wire Harness to the ProWrist input (4-pin)
- 3 – Connect the Preamps to the ProWrist input (9-pin)
- 4 – Insert the entire assembly into the Lamination Collar, including the ProWrist Rotator. Align the screw holes and fasten the screws.
- 5 – Locate the position of the charging and communications port and drill holes accordingly. Secure the battery and preamps to the wall of the prosthesis with self adhesive Velcro. Secure the charging and communications ports with the provided screws.
- 6 – Attach the preamps to the socket.

C. ProControl 2 Installation (No Wrist Rotator)



STEPS

- 1 - Connect ProControl 2 and Preamps to the ProControl 2 Wire Harness.
- 2 - Connect ProControl 2 Wire Harness to the Battery Wire Harness.
- 3 - Connect the Battery to the Battery Wire Harness.
- 4 - Connect the Hand Output from the ProControl 2 Wire Harness to the back of the Coaxial Connector inside the End Cap (see Fig. 1).
- 5 - Insert the End Cap into the prosthesis; align the screw holes and fasten the screws.
- 6 - Locate the position of the Battery Charging and Communications ports, and drill holes according to the provided template. Secure the Battery and Preamps to the wall of the prosthesis with self-adhesive Velcro. Secure the Charging and Communications ports with the provided screws.
- 7 - Attach the Preamps to the socket (see Preamp Instructions, page 6).

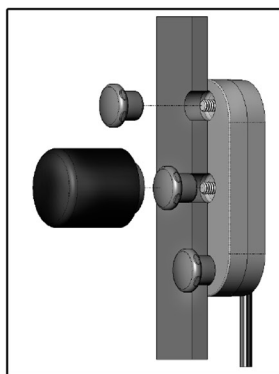
➔ Electrode Site Selection (Triad Preamp Style)

- Begin EMG testing with the most distal of the remnant muscles.
- For each potential control site, palpate the muscle as the patient contracts it, placing the electrode over the belly of the muscle.
- Ask the patient to contract, hold, and relax, in about a three-second sequence. A smooth and even contraction is the goal, without strenuous effort, and with relaxation following each contraction.
- Systematically move the electrode by about 1cm increments, testing the entire musculature of the remnant limb.

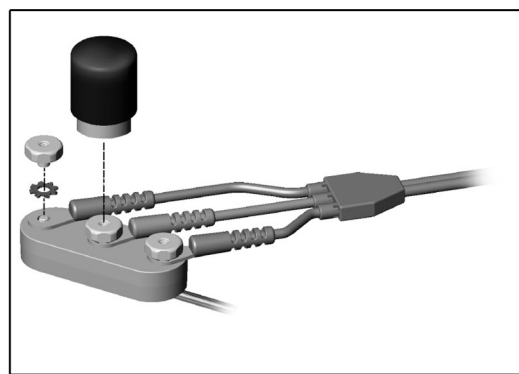
Electrode Mounting Methods



Grommet Method



Temporary Socket Method



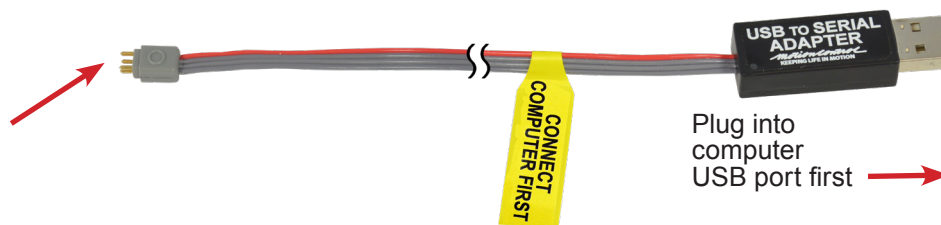
Remote Electrode Method

For detailed mounting instructions, please see Motion Control Document No. 1910048 - Triad Instructions.

Step 2. Connect the Computer Interface

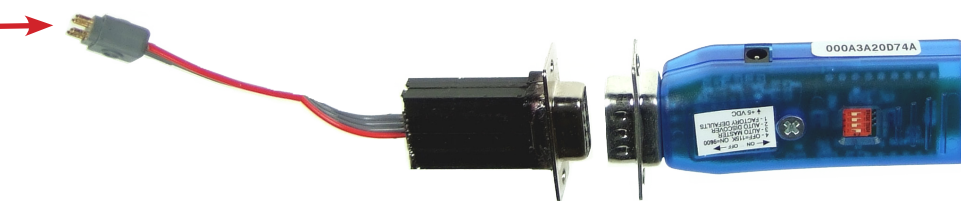
Hardwire Connection

1. Plug the Computer Interface cable into a USB port on your computer.
2. Plug the 4-pin connector into the device port.



Bluetooth Connection

1. Plug the 4-pin connector into the device port.
2. Follow the Bluetooth device setup instructions for your computer.

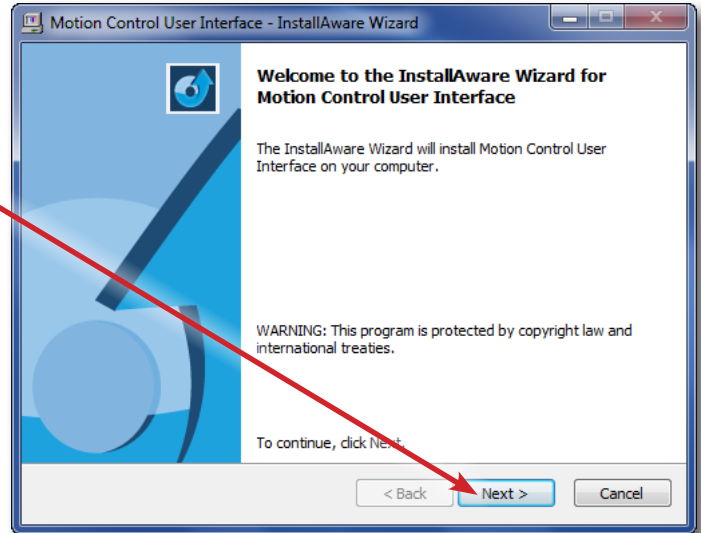


REMEMBER! The Hand must be turned ON for the User Interface to operate.

Step 3. Install the Computer Interface Software

Motion Control 5.3.1 is the Windows-based version of the User Interface which is available for download at: <http://www.utaharm.com/files/wl/?id=c&filename=UserInterfaceInstallation.exe>. Open the file and Click **Next**.

The program will be automatically installed on your "C" drive unless you specify otherwise (see figure at right). When the operation is complete, you will see a message indicating the software has been successfully installed.



InstallAware Wizard will install the software to your hard drive. Click "Next".

You should now see two new icons on your desktop labeled "Motion Control 5.3.1" and "MC 5.3.1 Simulation". Choose the Simulation if you want to see a demonstration version of the software, otherwise, choose "Motion Control 5.3.1" to start using the software.



Click on a desktop icon to use the software.

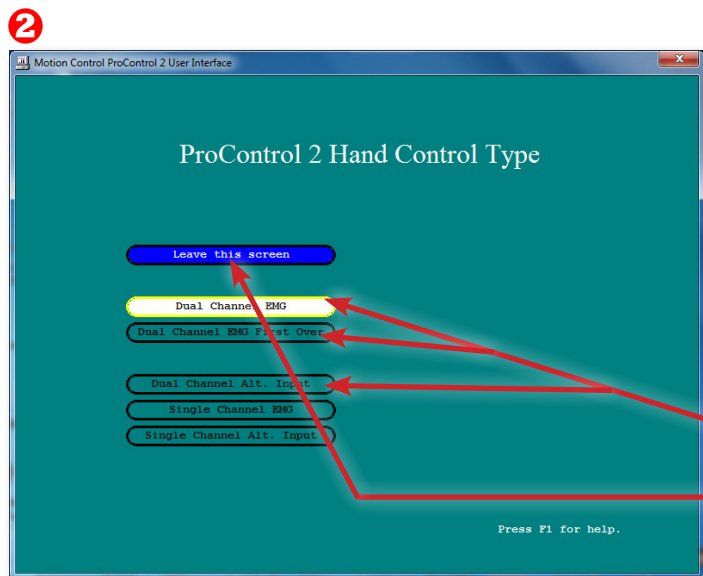
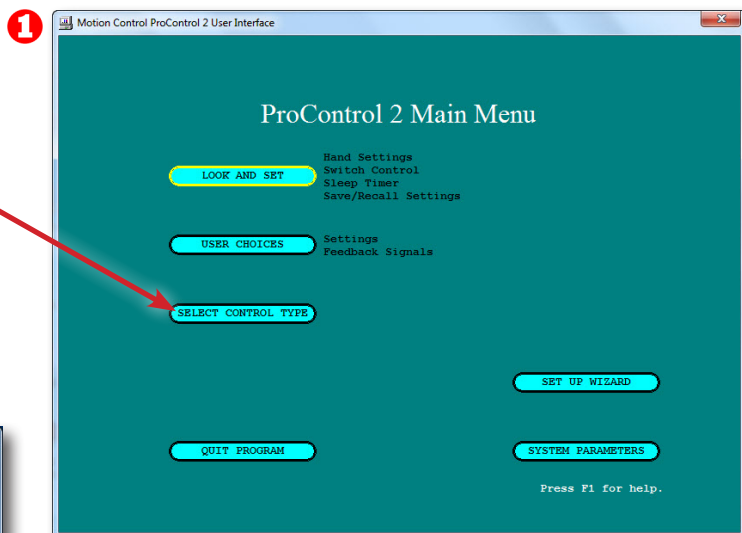
Step 4. Using the Software



Welcome to the User Interface.
Select **ProControl 2**, then click **Next**.

ProControl 2 Main Menu

Click **SELECT CONTROL TYPE**.

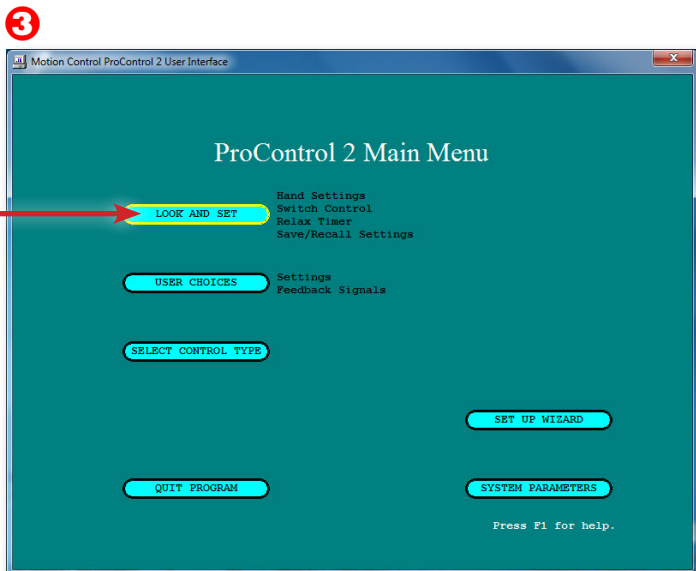


Setting up Dual Channel Control

ProControl 2 Hand Control Type

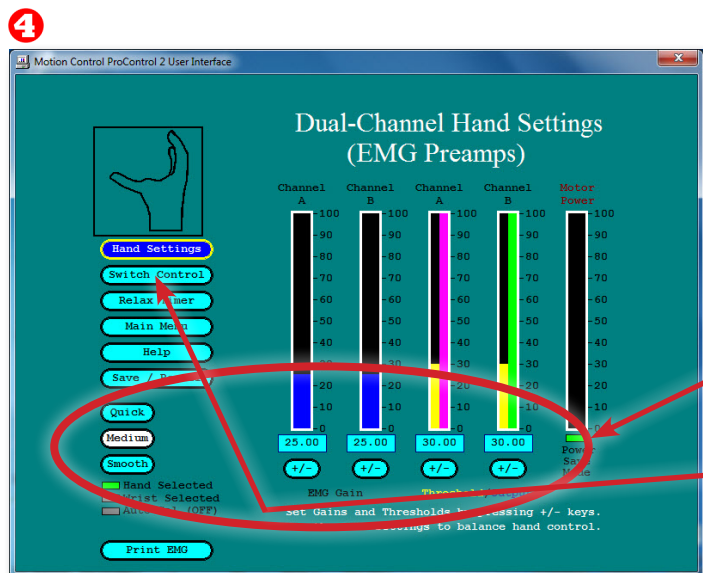
There are three options for Dual Channel Control: **Dual Channel EMG (Differential)**, **Dual Channel EMG First Over**, and **Dual Channel Alt. Input**.

1. Select the appropriate **Dual Channel** type, then click **Leave this screen** to return to the **Main Menu**.



ProControl 2 Main Menu

2. Click **LOOK AND SET**.



Dual-Channel Hand Settings

3. On this screen you will set the **Gains**, **Thresholds**, and **Filtering**.

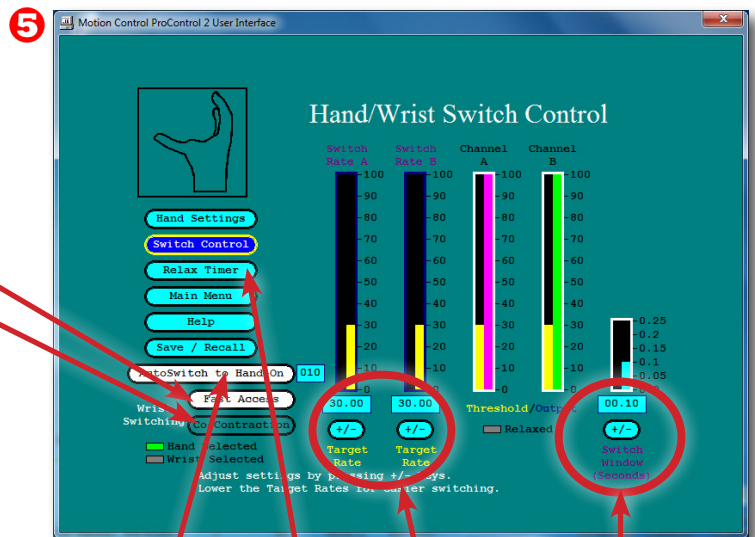
4. Select **Switch Control**.

Note: Switch Control only available if Wrist is present, or in ProWrist.

Hand/Wrist Switch Control

5. Select Hand-to-Wrist switching by: **Fast Access**, or **Co-Contraction**.

NOTE: When you switch one on, you must switch the other off, otherwise both will be enabled and performance will be erratic.



6. AutoSwitch to Hand may be turned On or Off.

7. Set Target Rate for ease of switching.

8. Set Switch Window adjustment if using Co-Contraction.

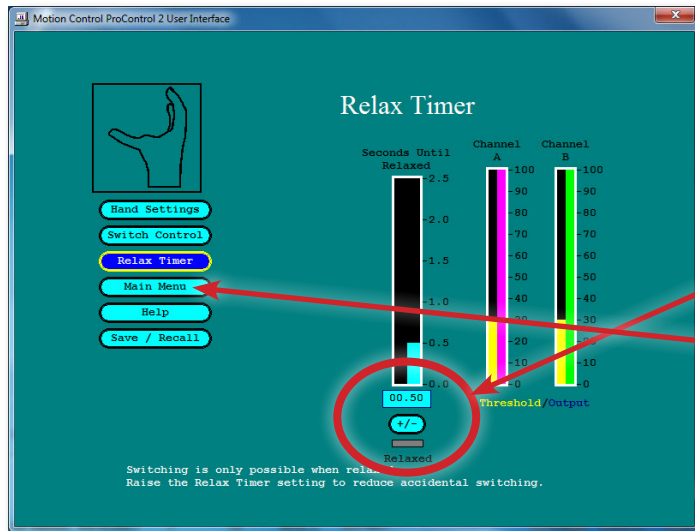
9. Click Relax Timer.

Note: Only available if Wrist is present

10. Set Relax Timer, which is the time a patient needs to relax before Hand/Wrist switching.

11. Click Main Menu.

6 Relax Timer



Before you can return to the **Main Menu**, the system automatically opens the **Store and Recall Settings** window, prompting you to save (to the ProControl 2) any changes you have made during the session.

12. Choose one of the options listed. When the action is complete, you will automatically return to the **Main Menu**. The options are explained below:

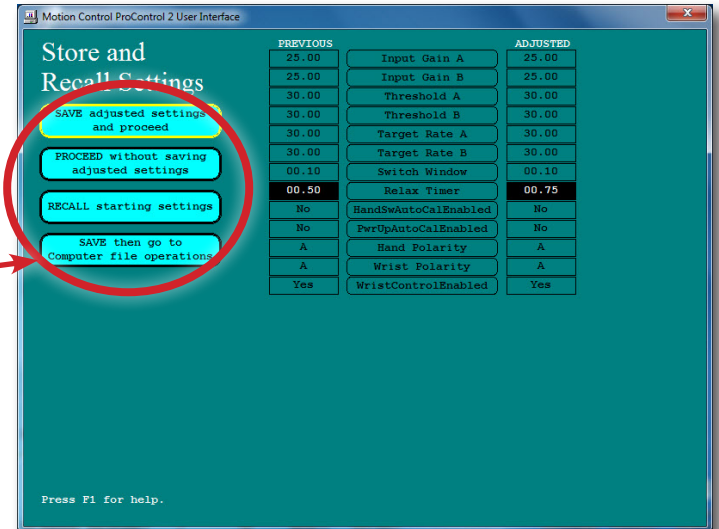
SAVE adjusted settings and proceed saves the changed settings to the ProControl 2, then opens the Main Menu window.

PROCEED without saving adjusted settings opens the Main Menu window without saving any adjustments you made during the session. All adjustments you made will be lost.

RECALL starting settings restores the settings from the last SAVE.

SAVE then go to Computer file operations saves the changes to the ProControl 2, then opens a **File Operations** window allowing you to save a file of the adjusted settings on your computer. This should be done at the conclusion of the fitting session. You can also **RECALL** settings from a prior **SAVE** from the **File Operations** window. (See the **File Operations** section on page 10 for more information).

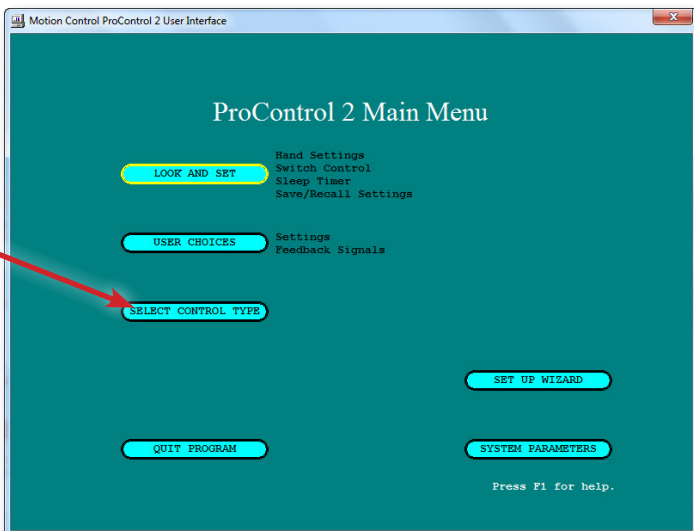
7 Store and Recall Settings



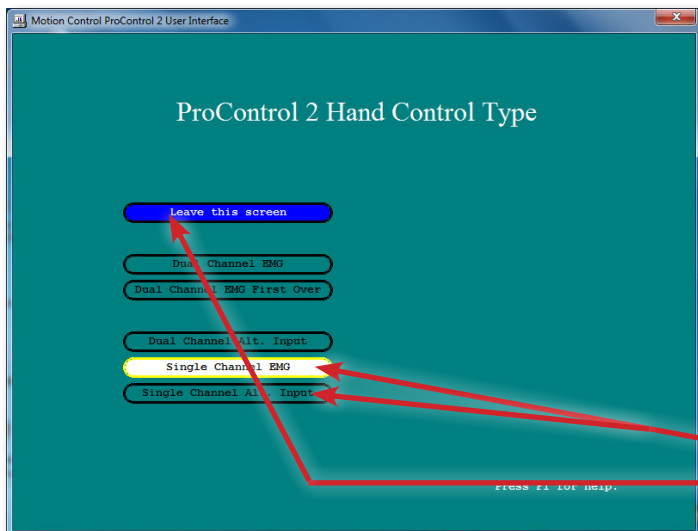
Setting up Single Channel Control

1. From the ProControl 2 Main Menu, click **SELECT CONTROL TYPE**.

1 ProControl 2 Main Menu



2 ProControl 2 Hand Control Type



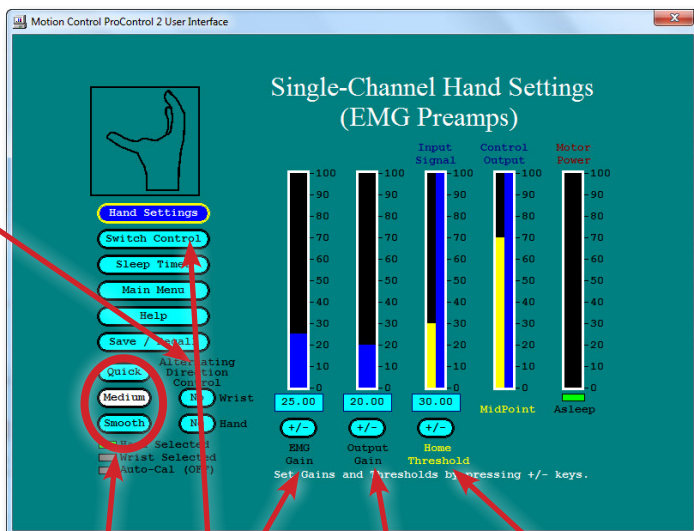
There are two options for Single Channel Control: *Single Channel EMG*, and *Single Channel Alt. Input*.

- 2. Select the appropriate **Single Channel** Control type.
- 3. Click **Leave this screen**.

Single-Channel Hand Settings

4. Choose between **Midpoint** or **Alternating Direction Control**, for Hand and Wrist.

3



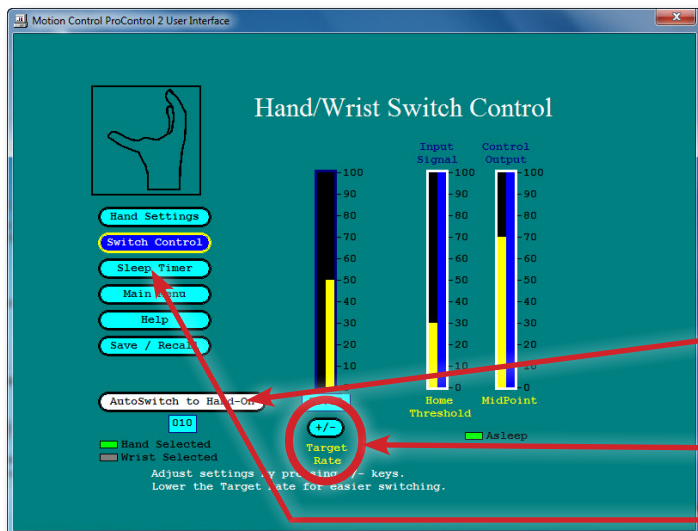
5. Set: **Filtering, EMG Gain, Output Gain, Home Threshold**

6. Click **Switch Control**

Hand/Wrist Switch Control

7. AutoSwitch to Hand may be turned On or Off.

4

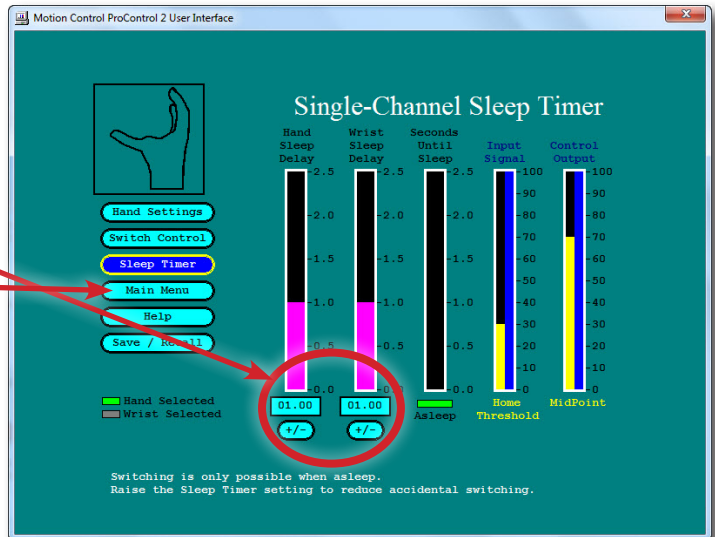


8. **Target Rate** is adjusted for easier switching.

9. Click **Sleep Timer**.

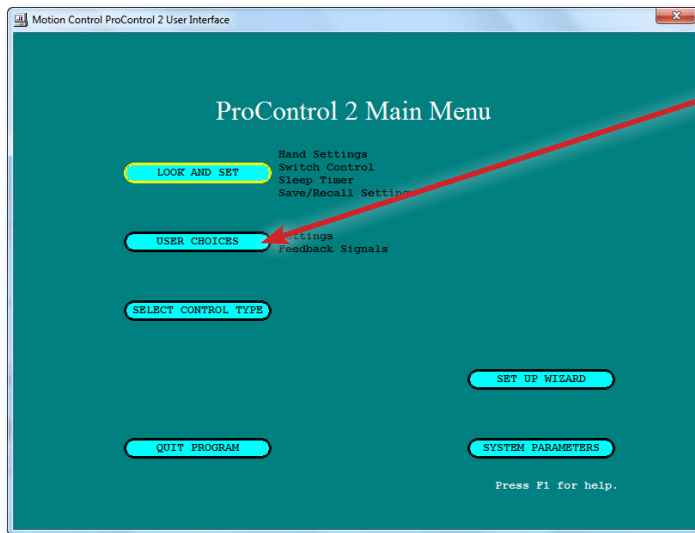
10. Adjust the length of relaxation time required for Hand/Wrist Switching and direction change in Alternating Control.

6



11. Click Main Menu to follow the same steps as Dual Channel, to SAVE and EXIT the program.

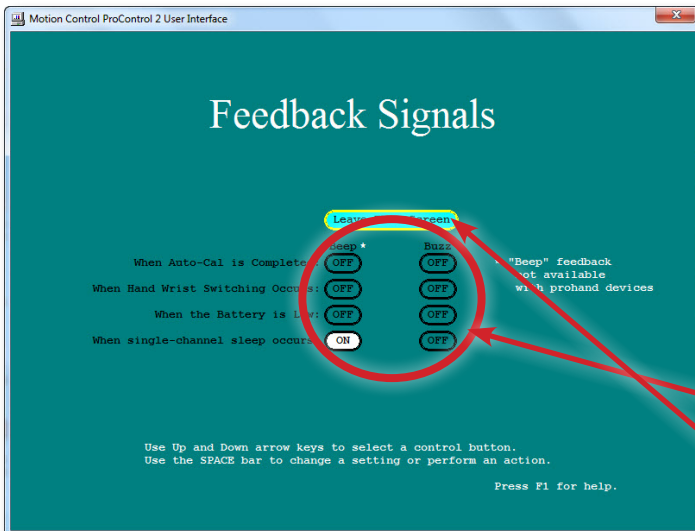
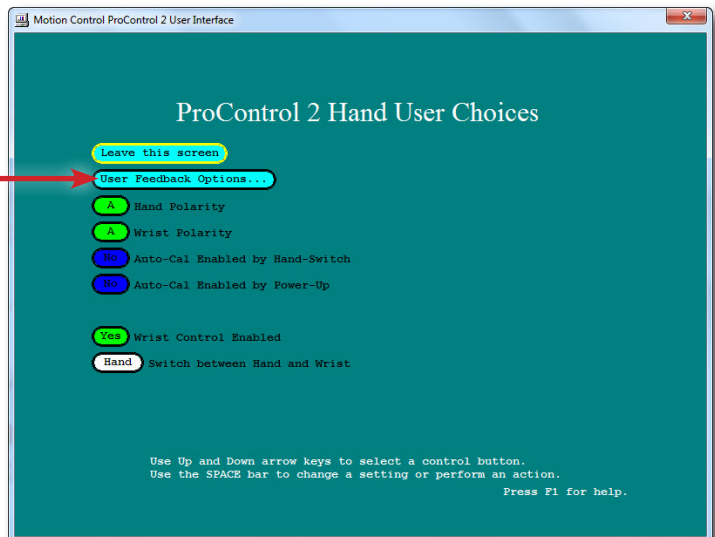
User Choices



1. From the ProControl 2 Main Menu, select USER CHOICES.

ProControl 2 Hand User Choices

2. Select User Feedback Options (beeps and buzzes).



Feedback Signals

3. Set your preferences.

4. Click Leave this screen.

ProControl 2 Hand User Choices

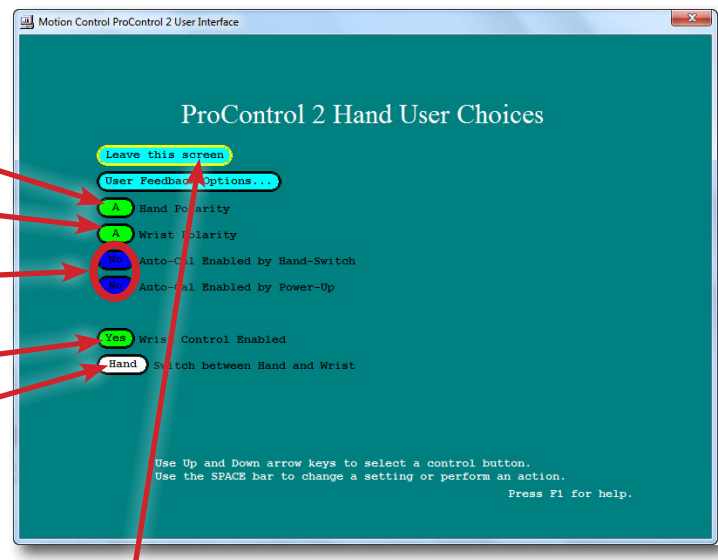
5. Allows you to Switch **Hand Polarity**,
(A/B - reversing Open and Close).

6. Switch **Wrist Polarity**,
(A/B - reversing pronation and supination).

7. Set how and when to enable **Auto-Cal**
(see next section regarding Auto-Cal).

8. Turn On or Off **Wrist Control**.

9. Switch between Hand and Wrist.



10. To return to the **ProControl 2 Main Menu**, Click **Leave this screen**.

Using AutoCal - automatic adjustment feature

- AutoCal automatically sets Gains based on the wearer's signals
- After AutoCal is triggered, the wearer's EMG is measured for seven (7) seconds
- Gains are adjusted automatically so that the Range is 0-100% of measured EMG signal
- Thresholds are set automatically to 15% above relaxed EMG; Minimum Threshold = 31%
- Settings may be changed manually by the prosthetist, if necessary, by disabling AutoCal

Three ways to start AutoCal:

1. **By Hand Switch** – Turn the Hand off – then on again, twice within 7 seconds.
2. **By Power Up** – when the system is first turned on by Hand switch or removing the interrupter plug.
3. By pressing **Alt + A** on your keyboard (while connected to the computer).

(These options are enabled / disabled by the "AutoCal" buttons on the Settings screen. See explanation below.)

AutoCal Instructions to the wearer:

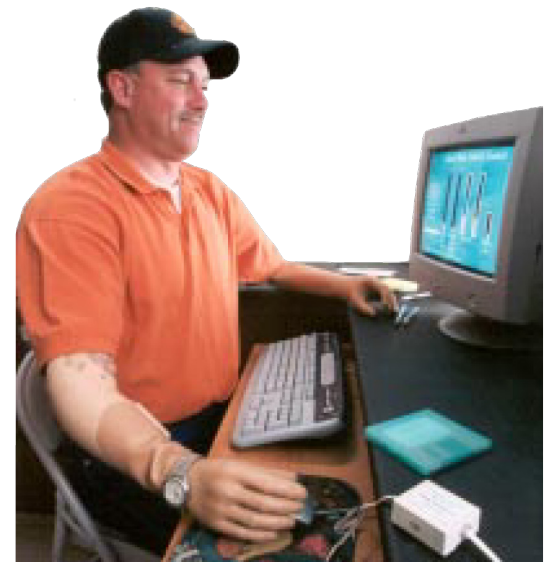
1. Put on the prosthesis, and let the electrodes warm up to the temperature of your skin. Depending upon the pressure of the electrode on the skin, this could take up to 10 minutes.
2. If ProControl 2 is set for **AutoCal Enabled on Power Up**, turn on the Hand Power Switch, then contract the opening muscle, without straining. Then follow steps **3 - 6**. If AutoCal is set for **AutoCal Enabled by Power Switch**, when the hand switch is in the ON position, turn the hand off, then on twice within seven (7) seconds. Then follow steps **3 - 6**.

3. Relax briefly, then contract the closing muscle, without straining, so that the Hand closes.

4. Open again, and close again, without straining.

5. Relax – try to feel the light vibration generated in the Hand at the end of the AutoCal seven-second period. A short “beep” will sound. (See **Feedback Signals** on the **User Settings** screen)

6. After AutoCal, test your hand control – open and close the Hand slowly, then quickly. You should be able to vary the speed of the hand by the strength of your contraction. Your maximum speed should be controllable and not jittery. If you have an Electric Wrist, try to co-contract quickly, or fast access, then relax, and operate the wrist with the same muscles.



Computer File Operations

Full Feature-Set Store and Recall

This allows you to **Save** to your computer, a file containing the adjusted ProControl 2 settings. ***This should be done at the conclusion of every fitting session.***

You can also **Recall** settings from a prior Save (or session).

Following your selection, the **Main Menu** window will open. Click **QUIT PROGRAM** to Exit.



User Interface Troubleshooting - with USB Serial Port Adapter.

1. Basic Checks — DO THIS FIRST

a. Charge the Battery

b. Check all Cables/Connectors

c. Install the USB driver software

(use the Belkin model supplied by Motion Control - Install XP , Vista or Windows 7, 8 version per your computer)

d. Power Cycle the prosthesis – keep the Arm and/or Hand “ON”.

e. Power Cycle the Computer

(UN-plug the Computer Interface Module for the restart).

1. Start the User Interface Program (version 5.3.1)

[Double-click the Motion Control 5.3.1 icon on your desktop, NOT the Simulation icon]

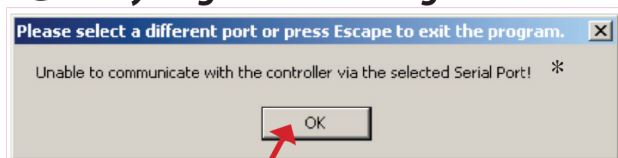
2. Choose ProControl2

Tech Note:

For Windows 32 bit system, install “Windows” driver

For Windows 64 bit system, install “Vista” driver

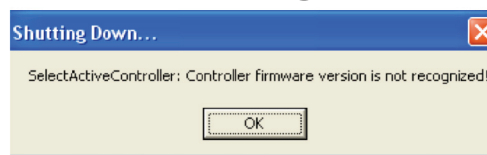
2. Do you get this message?



Click “OK”

* [or: “serial Com Port is not available”]

3. Or this message:



Then: - Your User Interface program is not the right version.

- Install the U.I. program supplied with the device, or download the latest version from www.UtahArm.com.
- If you are not sure, call Motion Control Technical Support at 888-696-2767.

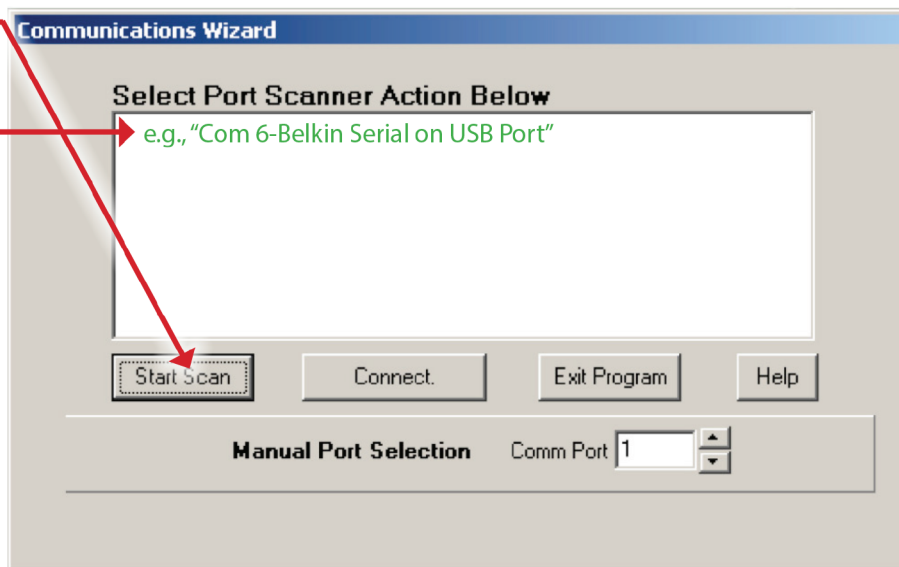
Then the Auto Scanner will appear:

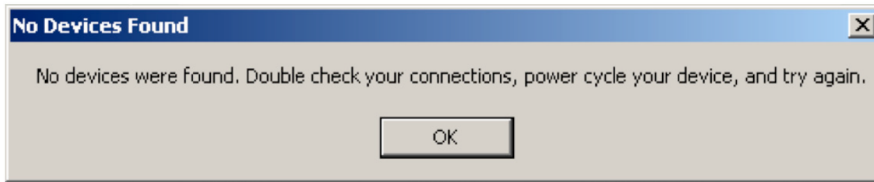
Click “Start Scan”

- If the ComPort is located, it will show up in the box here, e.g., “Com 6-Belkin Serial on USB Port”

- Then a simple dialog box will display, “Valid device found..”, click “OK”, and you’ll connect. (wait 5 seconds).

YOU’RE IN!



If the Auto Scanner returns a message:

Do what the message says:

- Double-check your connections
- Power cycle your device
- Try again to open

Then, your USB Adapter may not be installed properly. Follow these steps:

IDENTIFY USB/SERIAL PORT ADAPTER COM PORT:

- In MS Windows XP, right click on “My Computer”
- Select “Properties”
- select the “Hardware” tab and then, “Device Manager”.
- Under “Device Manager” scroll down to “Ports (COM & LPT)”
- Expand “Ports (COM & LPT)”, by clicking “+”
- If the USB Adapter installed properly, you will see “Belkin Serial or USB Port (Com X)” usually 5 or 6. If you continue to get this error message it’s possible that another program in your computer is keeping you from connecting. *Uninstall that program.*
- If no USB Serial port is found, reinstall the USB Adapter driver, then reconnect the USB Adapter software. [You will also need to restart your PC].

NOTE: For Windows Vista, 7, or 8 (32 or 64-bit) contact Motion Control Technical Support

Then, go back to the top, and do “Basic Checks” again - you might have fixed it!

***If this does not correct your problem, please
call Motion Control for technical support.***

1 (888) 696-2767

Troubleshooting Notes for Bluetooth Connections:

- **Symptom 1: “Com Port not found” message:** When installing the Belkin USB adapter, note which *physical* USB port you use and try to use the same port each time you plug in the adapter. If you use a different USB port than the original installation, the Windows System may need to install the Belkin Software again. If this happens, it will state, “Found New Hardware.” Simply follow the directions given in the New Hardware Wizard (have the system automatically search for the files) which will pop up when you insert the USB Bluetooth Adapter. This should not require the CD again, but will merely find the proper driver files on your hard drive.
- **Also try:** If your computer already has Bluetooth capability, you may be able to use the current installation. However, some existing Bluetooth systems do not have sufficient performance to be used with the Motion Control System due to latency issues. If your internal Bluetooth does not communicate with the FireFly, please use the Belkin USB Bluetooth adapter provided, (see steps below) or follow the “Found New Hardware Wizard”. If there are conflicts with your existing Bluetooth, it may be necessary to uninstall or disable your current Bluetooth.
- **Symptom 2: “ ANYCOM serial adapter software previously installed”** (or similar) and your computer currently has ANYCOM installed, for the Otto Bock C-Leg, it may need to be uninstalled prior to the Belkin Bluetooth installation. C-Soft and Otto Bock Bluetooth should work with the Belkin adapter. Computers with built in Bluetooth capability should also work if the most current Bluetooth driver is installed.

To Remove Programs interfering with the Com Port:

Go to the Control Panel from the Start Menu, Select “Add/Remove Programs”, Find the (O.B. software or other Program) Select “Remove. Install Belkin Adapter (see steps below).

INSTALLING THE BELKIN BLUETOOTH ADAPTER

1. Insert the Belkin Driver CD into the CD drive.
 2. The Belkin driver program should start automatically.
 3. Select “Install Bluetooth Software”
 4. Follow the instruction given by the Install Shield Wizard instructions:
 - Select “Next” at the welcome Screen,
 - Accept the terms and conditions, then click “Next” again, and again,
 - Click “Install”
 - Click “OK”, when it warns you about certification.
 5. **When prompted, connect the USB Adapter into the USB port.**
[Remember the physical USB port you use the first time – always use the same one]
 6. Installation should continue automatically. This may take a few minutes. Click “Finish”.
-

Definition of Control Types

Dual Channel Control

Input signals A – B = proportional motor power (if A > B, TD opens; if B > A, TD closes).

Note: “Differential Control”.

Dual Channel First Over

Controller output signal is whichever channel crosses the threshold first, ignoring the other channel. This is useful for wearers with unintentional co-contraction.

Single Channel EMG

Useful when only one muscle channel is available. Provides Proportional Hand and/or Wrist control.

Single Channel Alternate Input

Useful when no muscle EMG is available. Provides Proportional Hand and/or Wrist control.

Single Channel EMG / Alternate Input

Midpoint Control (default)

Increasing the signal opens the hand with proportional control. A decreasing signal closes the hand at full speed. The hand will hold the same position when held steady for a period of time adjusted by the sleep timer. This could also be called “voluntary opening”. The action can be reversed by switching A/B polarity (voluntary closing).

Alternating Direction

With Control Type set for Single Channel (EMG or ALT Input), the direction changes after each relaxation (sleep cycle)

Hand/Wrist Switching in Single Channel Control

Like it is in Dual Channel Control, switching is accomplished by a fast input signal. Switching is easier with low target rate settings. accomplished by adjusting the Target Rate in the Switch Control screen of the User Interface. The higher the target rate, the more difficult to switch.

Motion Control, Inc.

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