

The Utah Hybrid Arm

Quick Set-Up Guide

Doc. No. 1910044 — Rev. A
February 2009

* Refer also to the U3 Instruction Manual for detailed explanations of many common features.

Hardware Requirements: The Hybrid Arm User Interface uses Windows-based OS including XP & VISTA

Utah Hybrid Arm Features:

Myoelectric Control of TD and Wrist

- Variety of electrodes – snap, hi profile, low profile
- Easy adjustment via Computer Interface
- Alternate inputs also available
- Linear Pot
- Force Sensor
- Touch Pad
- Other manufacturer's inputs compatible
- Bluetooth (wireless) communication available

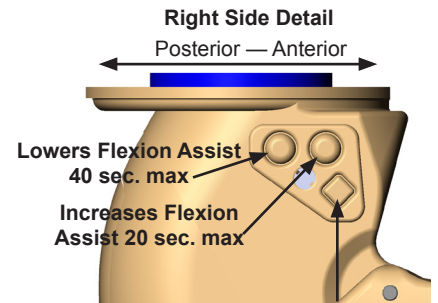
Many TDs compatible – AutoDetect allows connection to all

- MC Hand
- MC Electric TD (ETD)
- iLimb Hand
- Otto Bock varieties

Elbow Lock/Unlock Options:

- Auto-Lock (Hold-Steady, Lock Time adjustable)
- Remote switch (Push or Pull type)

Forward Hinge-Pin location



Power On/OFF (Hold 3 sec.)
Lock/Unlock (Push Quickly)

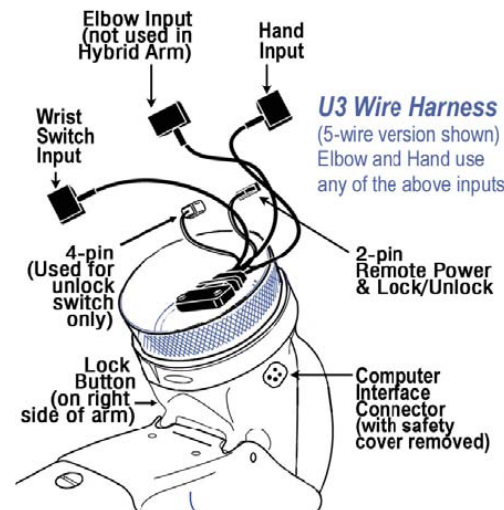
- No gaps in forearm – Cosmetic & Stays Clean
- Very high TD position – close to mouth
- Battery easily replaced & recharged
- Utah Arm-type 12volt Battery & Charger
- Very fast TD operation
- Charger usable in car

Step 1. Connect the Hybrid Arm Inputs

The U3 wire harness is used for the Hybrid Arm. Note the differences in the function below.

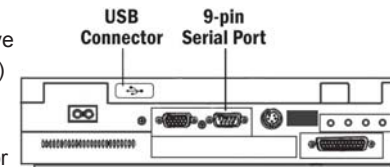
To make adjustments using your computer, connect the Computer Interface on the left side of the elbow, as shown, and the 9-pin connector to the back of your computer.

For Switch Options, refer to the Utah Arm parts catalog.



Step 2. Connect the Computer Interface

1. Remove the safety cover for the Computer Interface connector on the U3 elbow.
2. Plug in the 4-pin connector from the Computer Interface. (p/n 5010021)
3. Plug the Computer Interface into the 9-pin serial port at the back of your computer. If your computer does not have a serial port, use a USB-serial port adaptor. (p/n 1800075) from Motion Control.
4. Bluetooth Connection Kit (4050170) also available and interchangeable with hard-wire computer interface 5.1.8 or higher.



Step 3. Load the Software - Use Version 5.1.8 or higher

1. Insert CD or 3.5" floppy disk into PC and double-click on the file "U3PC2inst.exe."
- A window will open asking if you want to install the program; click **YES**. The program will automatically load on your "C" drive when you click on "Unzip" unless you specify otherwise (fig.1).

When the self-extractor is complete, you will see a message indicating the software has loaded successfully.

2. you should now see two new icons on your desktop labeled "U3PC2" and "U3PC2 Demo" (fig.2) Choose Demo to practice. Be sure to choose "U3&PC2" to actually adjust the prosthetic.

Note: If other Windows programs are running while using the User Interface software, your computer monitor may switch to a different viewing resolution. Your normal setting will return when you exit the program.

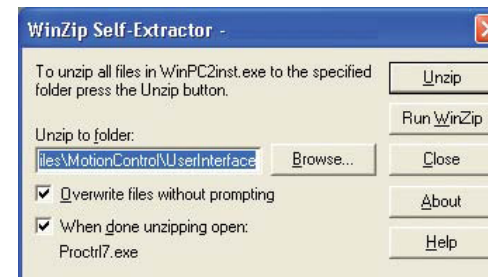


Fig.1 WinZip self-extractor will automatically install to your hard drive. Just click "Unzip"



Fig.2 Click on desktop icons to begin using software.

Click on "Hybrid Arm" and "Next" to proceed to the Set Up Wizard for U3.



How the Software is organized:

Note: If using the Otto Bock Sensor Hand, install the WHITE shorting plug, or none at all, to work with the Hybrid Arm.

Utah Hybrid Arm

Main Menu



Quick Troubleshooting Guide:

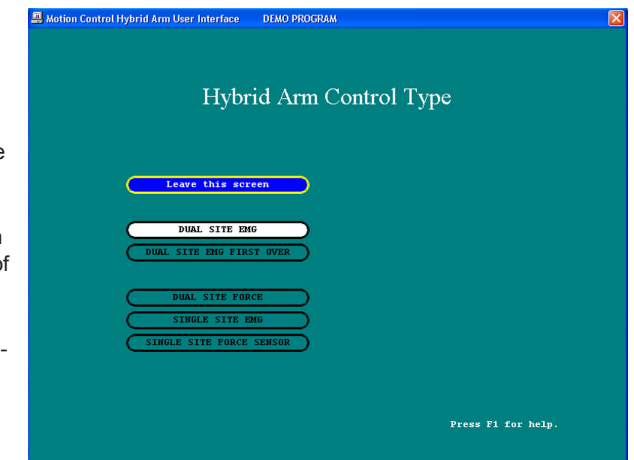
If you get the message "Unable to communicate..." check that the Arm is turned on, the computer connections are tight, and try Com. Port. Try rebooting your computer with the Computer cable disconnected.

Definition of each Control Type:

1. **Dual Site EMG** - the DIFFERENCE between the A and B muscle signals controls the Elbow.
2. **Dual Site EMG First Over** - the elbow is controlled by the FIRST muscle to contract over the Threshold, NOT the difference between A and B. This is especially useful for the patient who cannot control each muscle independently. Reversing the direction of the Elbow requires the first muscle to relax below threshold.
3. **Single Site EMG** - Use when only one muscle site is available, or for initial training.
4. **Single Site Alternate Input** - (e.g., Force Sensor, Linear Potentiometer, etc.) - Used when no muscle EMG is available. Elbow (or Hand) power is proportional to the amount of input signal.

Installation of each Control Type: (Connect to Hand Input in wire harness)

1. **Dual Site EMG/EMG First Over** - Use standard dual site Utah Arm Type preamps.
2. **Single Site EMG** - Use a Single site preamp or dual site preamps-- the controller will use the "A" channel only.
3. **"Single Site/Force Sensor"** - Connect the Linear Pot, Touch Pad, or Force Sensor in place of preamps.
4. **"Dual Site/Force Sensor"** - Dual site Touch Pads are presently the only option.



Store & Recall - with changes:

This screen appears automatically at screen exit whenever settings have been changed.

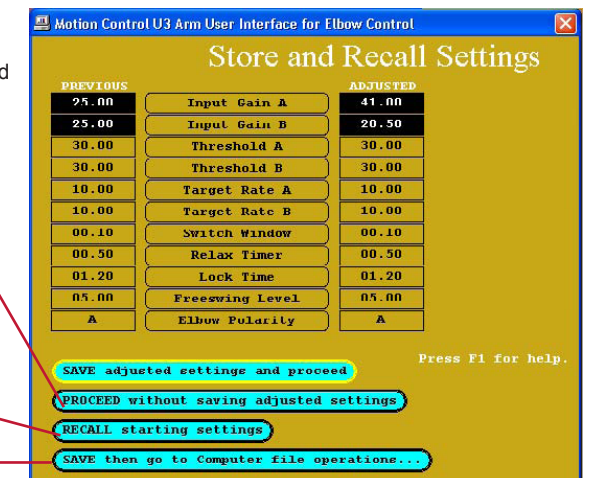
"Previous" settings are last saved settings.

"Adjusted" settings show any changes.

To save and exit, click on PROCEED.

Recall "original" settings from start of session

To store or recall settings on the hard drive, use "Computer File Operations"



Computer File Operations:

To save adjusted settings into permanent memory on your computer, follow on-screen directions to select a register, rename it, store settings, or retrieve settings.

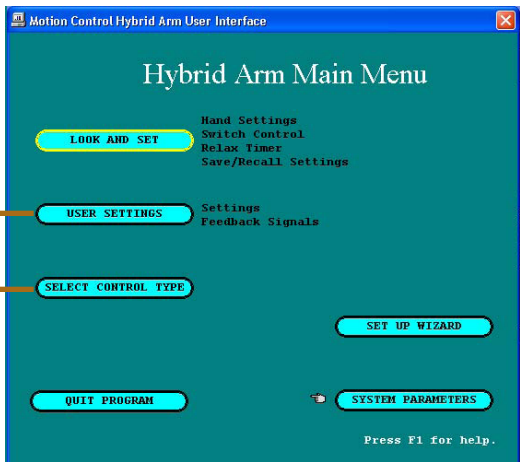
Hand Adjustment screens

Hybrid Arm Main Menu

User Settings

See below

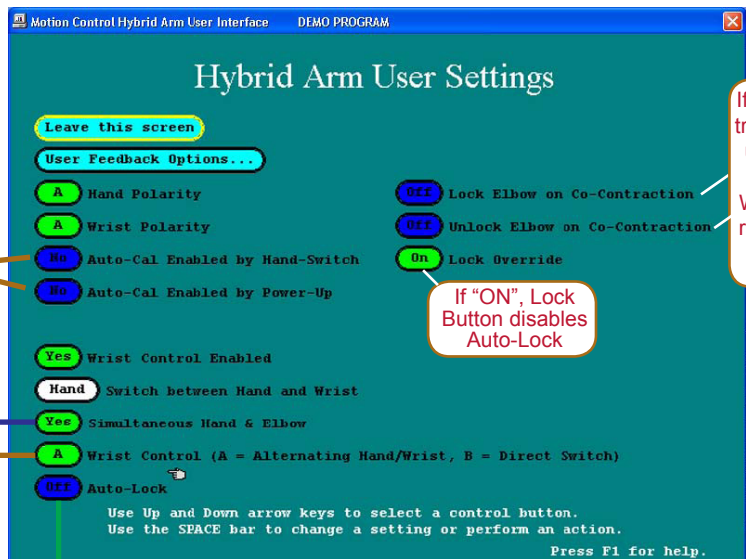
Select Control Type
(see reverse side)



Enable Auto-Cal by clicking to "Yes" (recommended - "Auto-Cal by Hand switch")
Gains and Thresholds will readjust.

Trigger Auto-Cal by:

1. Turn Hand switch off/on twice quickly.
2. Open and close the hand several times within 7 seconds.
3. Auto-Cal by power up - use only when TD has no on/off switch.



If "ON", co-contraction controls unlock or lock only. Hand / Wrist switching requires an external switch.

If "ON", Lock Button disables Auto-Lock

Auto Lock - If "ON", elbow will lock automatically when held steady just like U3

"Wrist Control"
"A" - Hand Control switches to wrist w/switch, contraction also may be used.
"B" - Version requires a 3-position switch and adapter (see parts catalog)

If "NO", elbow must be locked for hand to operate

Dual-site EMG inputs

Hand Settings

Default Dual Site EMG:

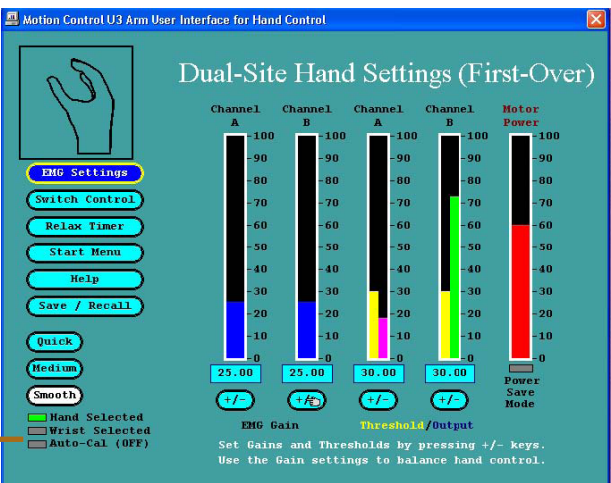
Hand power is the difference of Channel A and B outputs.

First-Over Dual Site EMG:

Hand power is output of the first muscle above threshold. To reverse direction, muscle must relax. Enable first-over on "Control Type" screen from Main Menu.

Enable Auto-Cal on "User Settings" screen

To reverse Hand icon, press "Alt" + "H"



Lock Time: If Auto Lock is selected this setting adjusts the amount of time the Arm must hold still before Auto Lock occurs

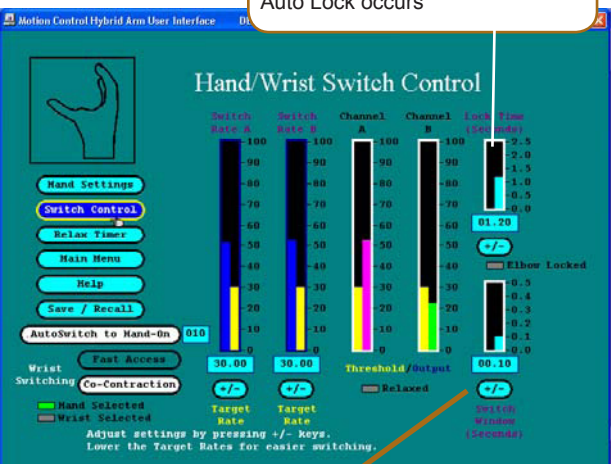
Switch Settings - for "A" type switching, Enable on "User Settings" screen.

Fast Access: Wrist operates when one muscle contracts, with Rate above Target Rate.

Co-Contraction: A & B Switch Rates are above Target Rates PLUS A & B cross threshold together.

External Switch: (optional) See parts Catalog)

Note: A feedback "BUZZ" can be enabled on the User Settings to alert user when sleep occurs.



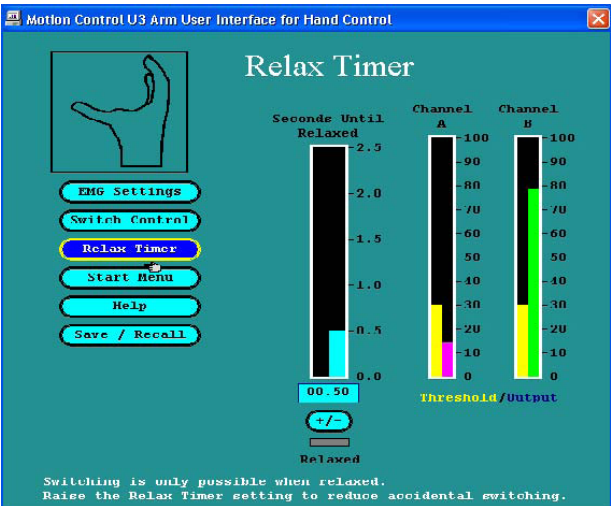
Switch Window: (If co-contraction button is enabled.) How close together (in seconds) muscle A & B must co-contrast.

Relax Timer:

Relax Time prevents accidental switching by requiring a pause before switching.

To switch between Hand and Wrist, muscles must first relax (input signals fall below thresholds) for the length of this setting, the Relax Time.

For wearers with difficulty relaxing, LOWER the time setting.



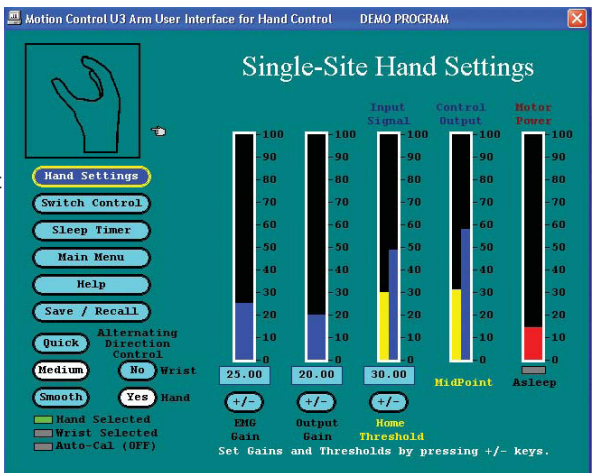
Single-site EMG or Alternate input

Steps to adjust Single-Site inputs:

1. Adjust "Input Gain" so that "Input Signal" reaches 100% with moderate effect.
2. Adjust "Output Gain" so that Hand control is optimized.
3. Adjust "Home Threshold" to prevent accidental motion of the Hand.

Note: Change Polarity on User Settings screen.

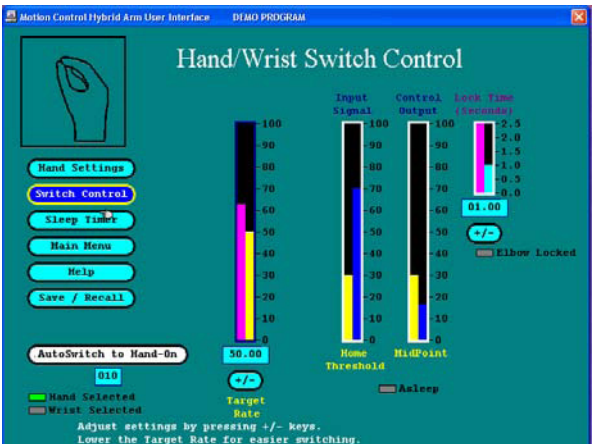
Recommended: Higher input closes. Alternating Direction Control (see below) provides proportional control in both opening and closing.



- **In Single Site control:** an increasing signal operates in one direction (usually closing), and a lowering input reverses the direction
- **Home Threshold:** determines when the Hand will start running, as the Input Signal is raised. Its purpose is to prevent unwanted motion of the Hand from small fluctuations of the input.
- **Midpoint:** This value is not adjustable. It functions as the reversal point for the Hand direction. Whenever the Input is lowered, and the signal falls below the Midpoint, the Hand direction reverses; then the Hand moves at one speed in the reverse direction.
- **Alternating Hand or Wrist Mode:** When this option is enabled, the Hand or Wrist will operate in each direction alternately, each direction is also proportional. The direction of Wrist Control will reverse each time the Input Signal is relaxed for as long as the Sleep Time (go to the Sleep Timer screen to adjust).

Switching with a Single inputs:

Same as dual site, except with a single input, i.e., quick input must exceed Target Rate setting. "Asleep" light must be on for switching to occur.

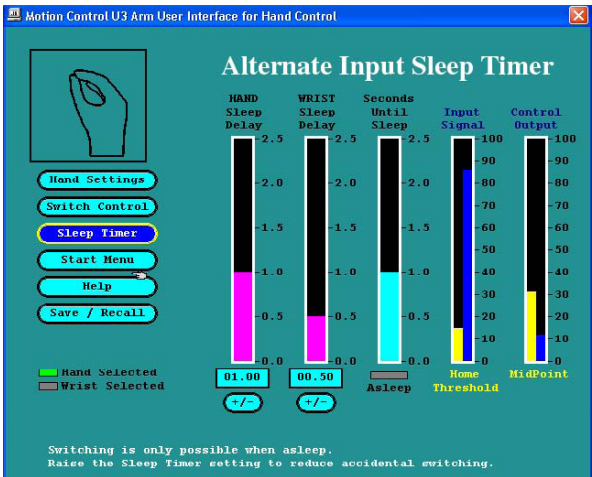


Sleep Timer:

- **Hand Sleep Delay** - Sets the length of time the Hand must stop for the Hand to "Sleep," i.e., for the Power to turn off.
- **Wrist Sleep Delay** - The Wrist will also "Sleep" after it is stopped for this Delay Time.

* When Alternating Wrist Control is enabled (on the Hand Settings screen), the direction of the Wrist Control will reverse each time the Wrist goes to sleep.

Note: A feedback "buzz" can be enabled on the User Settings screen to alert the user when sleep occurs.



Hand Adjustment screens