

Utah Arm 3

QUICK SETUP GUIDE

Fillauer®

Risk Management

To minimize the risk of device damage or injury to the user while maximizing the functions of the Utah Arm, follow the instructions for installation, and use this device as described in this manual.

Safety Caution

Use caution when using this device in situations where injury to yourself or others may occur. These include but are not limited to activities such as driving, operating heavy machinery, or any activity where injury may occur. Conditions such as a low or dead battery, loss of electrode contact, or mechanical/electrical malfunction (and others) may cause the device to behave differently than expected.

Disposal / Waste Handling

This device, including any associated electronics and batteries should be disposed of in accordance with applicable local laws and regulations. This includes laws and regulations regarding bacterial or infectious agents, if necessary. All metal components may be removed and recycled at the appropriate recycling facility.

Serious Incidents

In the unlikely event a serious incident occurs in relation to the use of the device, users should seek immediate medical help and contact their prosthetist, local competent authority and Fillauer at the earliest possible convenience. Clinicians should at any time contact their local Fillauer representative and local competent authority immediately in the event of any device failure.

Warranty

Seller warrants to Buyer that the equipment delivered hereunder will be free from defects in materials and manufacturing workmanship, that it will be of the kind and quality described and that it will perform as specified in Seller's written quotation. The limited warranties shall apply only to failures to meet said warranties that appear within the effective period of this Agreement. The effective period shall be two years (24 months) from the date of delivery to the fitting center that has purchased the components. Refer to the shipping receipt for the date of shipment.

Hardware Requirements

The Utah Arm 3 uses Windows®-based software and operates on any Windows OS, including Windows XP and Vista. You can download the Utah Arm Legacy Software on the Fillauer website.

In addition to the U3 elbow you will also need inputs, cabling, and depending on your set up wrist control, lock/unlock and remote power on/off connections. Please see the catalog diagram at the back of the book for available options.



Step 1. Load the Software

Insert software CD or go to www.fillauer.com and download the Utah Arm Legacy software to your PC. Complete the software install which will be loaded on the C: drive unless you specify otherwise.

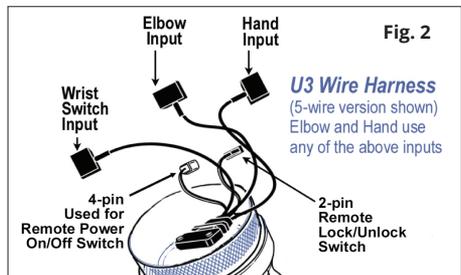
You should now see two new icons on your desktop labeled "Motion Control 5.3.1" and "MC 5.3.1 Simulation". Choose the "Simulation" icon to practice or review and the standard icon to begin using the software to configure your U3 arm. NOTE: Be sure to restart the computer before using for the first time.



Fig. 1. Welcome screen

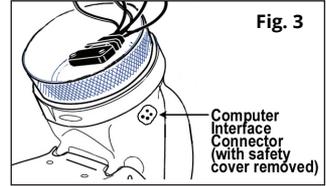
Step 2. Connect the Utah Arm Harness and Inputs

Connections are made through the 1-, 3-, or 5-wire harness (5-wire version). Once you have chosen your harness configuration connect an input, either electrodes or an alternate input switch. For a diagram of options, refer to the Utah Arm parts catalog in this manual.



Step 3. Connect the Computer Interface Cable

For USB: Plug the USB end of the Computer Interface Cable into the back of your computer. Remove the safety cover for the Computer Interface connector on the U3 elbow and plug in the 4-pin connector from the Computer Interface Cable. Always connect to the computer first.



For Bluetooth®: Plug the dongle into the Computer Interface Connector in the arm and the USB adapter chip into your computer. On your computer, open your Bluetooth connection program and choose the Firefly to pair the device. Follow the instructions in the Bluetooth manual for more information.

Note: Computer Interface Cables must be purchased separately from the arm. USB: part# 5010075, or Bluetooth: 5010037 Wireless Bluetooth Connection Kit. The instruction sheet is provided with the kit.

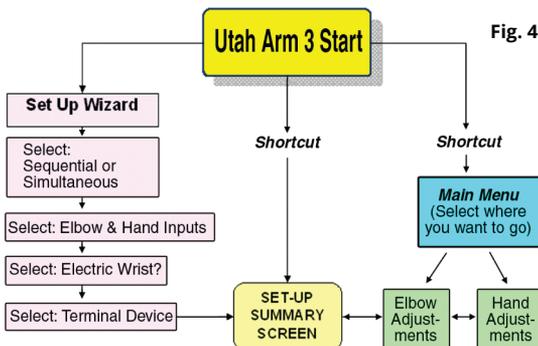
Step 4. Start the Setup Wizard.

With the arm connected, turn on the Utah Arm, using the power switch on the forearm. Open the software app and click on "Utah Arm 3" and "Next" to proceed to the Setup Wizard for the U3. If you get the message "Unable to communicate with the controller" check that the Arm is turned on, the computer connections are tight and run the Auto Scanner by clicking Start Scan on the Desktop.

If all else fails, try rebooting your computer, with the USB cable disconnected. For more help see Troubleshooting the User Interface in the U3 Fitting Manual. Be sure that you are not making adjustments to an arm in "Simulation" mode as they won't affect the arm.

How the Software is Organized:

Use the SetUp Wizard or take a shortcut directly to the adjustment screens.

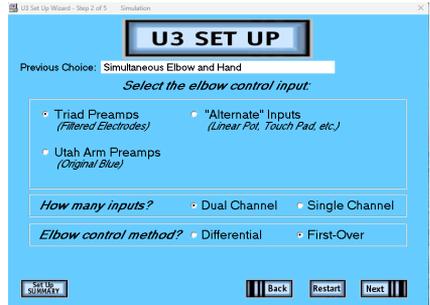


Step 5. Start the Setup Wizard.

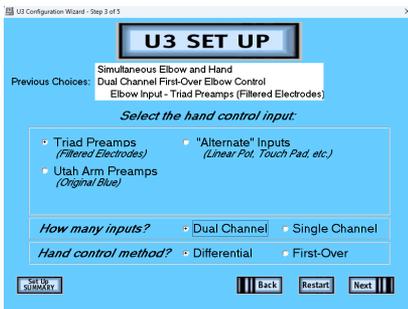
The default setup for the software is Sequential hand and elbow control, Dual-site EMG (same input for Elbow & Hand), and a Motion Control terminal device (Hand, ETD, ETD2). You can change these settings in the Wizard, modifying Simultaneous vs. Sequential, filtering preamps, input controls, and other options. Follow the steps:



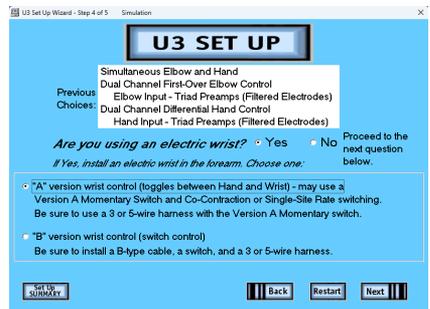
Simultaneous vs. Sequential: If using separate Hand and Elbow inputs, choose “Use separate input signals” and connect both inputs to the Wire Harness. If you choose “Use the same inputs,” the Elbow input will also be used for the Hand, when the elbow is locked.



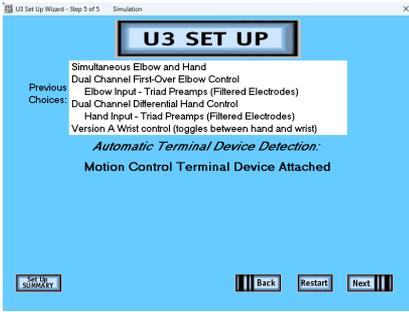
Elbow control input: Choose the type of input you are using for the elbow. For a new device it would be either “Triad Preamp” or “Alternate Input”.



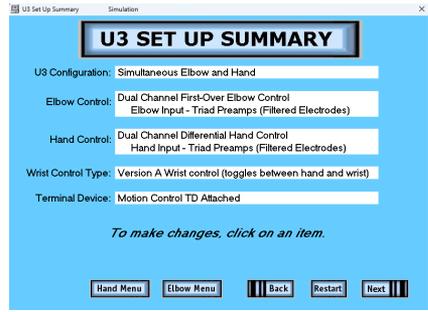
Hand Input: Select the control input and the number of inputs you will be using for the hand. You will only see the “Hand Control Method” if “Dual Channel” is chosen.



Wrist choice: Indicate if you are using an electric wrist rotator, and choose “A” or “B” type control.



Terminal Device: The U3 will “auto-detect” the type of TD connected after power up. Turn the Utah Arm power off to change TDs.



Setup Summary: Review and verify your selections. To make changes simply click on that option.

Elbow Adjustment Screens

Elbow Controller Main Menu

Under User Choices you can toggle between options by clicking on the appropriate button. Before you start, you should check the forearm gains on the elbow itself. This should be set to “5” and comes as a default on newer models. The adjustment is located under the forearm cover. Older models have window A access to the adjuster.

- “Polarity” reverses elbow direction.
- “Manual lock/unlock” will set the lock on the elbow.
- Dual Site EMG— the difference between the A and B muscle signals that control the elbow.
- 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.
- Single Site EMG— Use when only one muscle site is available, or for initial training.
- Single Site Alternate Input— When no muscle EMG is available. Elbow or Hand power is proportional to the amount of input signal. (e.g. Force Sensor, Linear Potentiometer, etc.)

Installation of Each Control Type (connect to Elbow input in wire harness)

- Dual Site EMG/EMG First Over— Use standard dual site Preamps
- Single Site EMG— Use a Single site preamp or dual site preamps, the controller will use the A channel only. If you decide to use dual site control later you can simply select it in the Setup Wizard and both channels will be active.
- Single Site/Alternate Input— Connect the Alternate Input Sensor in place of Preamps. This includes Linear Potentiometer, etc.
- Dual Site/Alternate Input— Dual Site Touch Pads are presently the only option. Connect to Elbow Input.



Elbow Main Menu. See the screens available for the chosen configuration. Click “User Choices” for setting and toggling between options.

User Choices. Choose between “polarity” which reverses the elbow direction and “Manual Lock/Unlock” manages that setting.

How Single Site EMG and Single Site Alternate Input Work

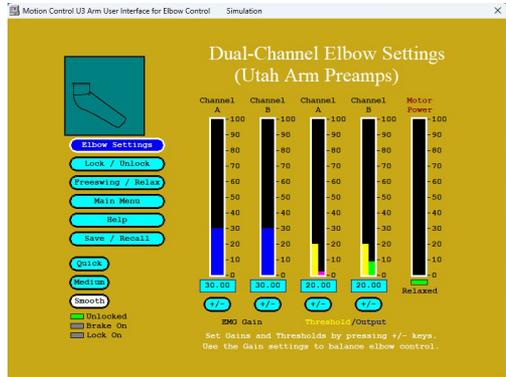
Using the Single Site control options, increasing the signal raises the elbow (flexion) and decreasing the signal lowers the elbow (extension). The power to the elbow is proportional to the level of the input, so slow and fast speed is under the control of the wearer. When the signal is relaxed fully, the elbow will go into freeswing. Note: Single site EMG does not allow powered elbow extension. The elbow is lowered using freeswing.

Elbow Adjustment Screens

Dual Site EMG Inputs

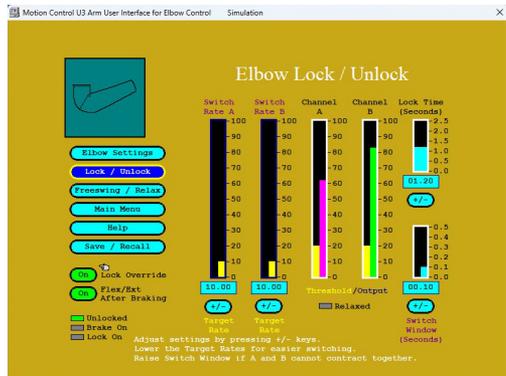
Elbow Settings

For making adjustments and patient training. The screen name is highlighted in the menu button list. To choose other screens highlight by using the up and down arrow keys, then press "Enter". Quick/Smooth Settings - select the best control for the Elbow. To make adjustments, select one, then press "+" or "-" on the keyboard to change the number.



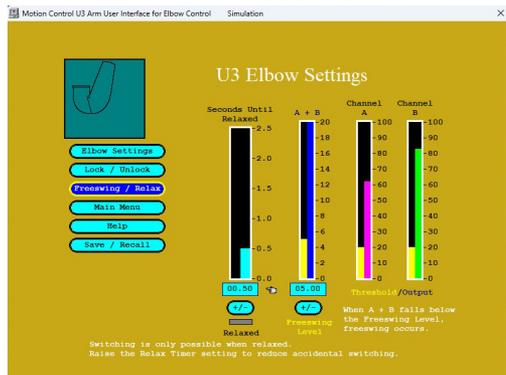
Elbow Lock/Unlock

Use this screen to help train wearer to lock and unlock. Input signals are shown to help with training. To unlock first relax until "Relaxed" light goes on. Then co-contract so both target rates are exceeded. The border of the columns flash GREEN when that occurs. Switch Window is the time allowed between A & B threshold crossings.



Freeswing/Relax

Freeswing occurs when muscle signals A & B fall below freeswing level. The Relax Timer prevents accidental unlock by requiring a pause before switching. Adjust the Freeswing level so wearer can relax below the threshold.

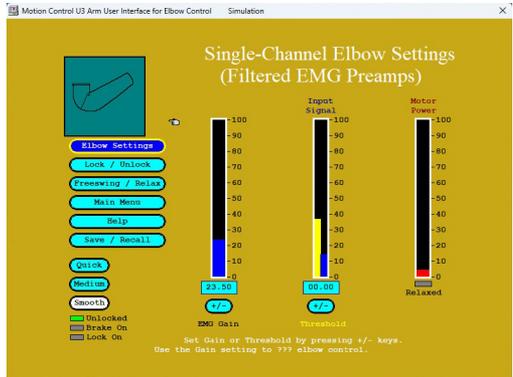


Elbow Adjustment Screens

Single-Site EMG or Alternate Input

To adjust Single-site Input

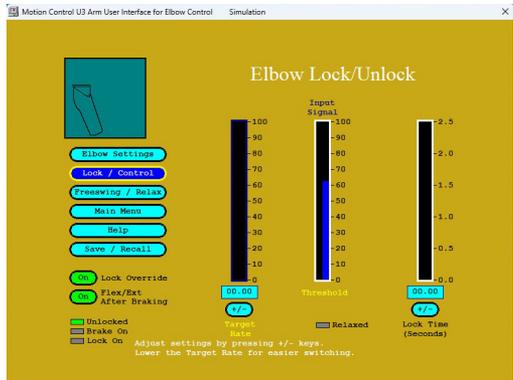
Adjust “EMG Gain” so that “Input Signal” reaches 100% with moderate effort. Use the least necessary setting. Next adjust “Output Gain” so that the elbow control is optimized. Then adjust home threshold by clicking the “Threshold” toggle to prevent accidental motion of the elbow.



Single-site Unlock

Same as dual-site unlock, except with single input. Note: Rate must be higher than “Target Rate” for both rising and falling signal. If difficult for wearer, lower the Target Rate.

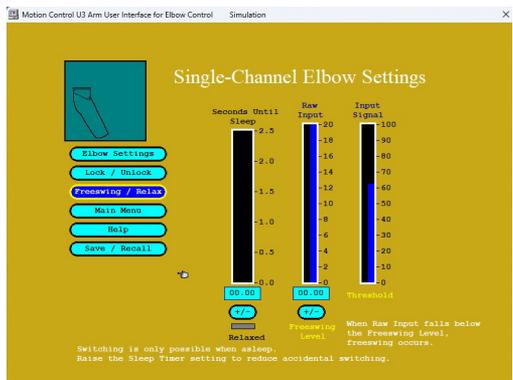
Lock Override: enabled or disabled when lock override button (on the arm) is pushed. This is for U3+ arms only.



Single-site

Freeswing and Relax adjustment is the same as for dual site EMG.

Note: For help on any screen, press “F1”



Hand Adjustment Screens

Hand Main Menu and User Choices

Toggle between options by clicking on the appropriate button. On this screen you can also reverse hand and wrist direction.

Enable AutoCal®

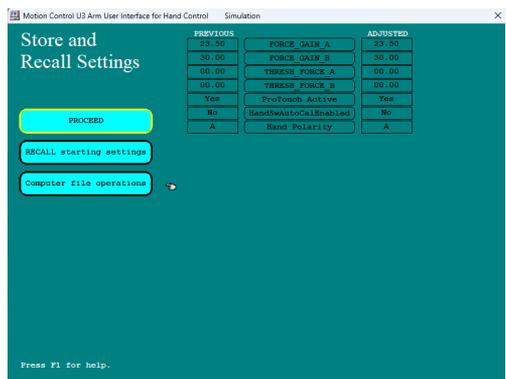
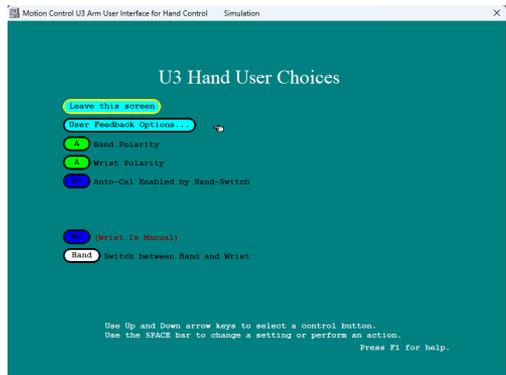
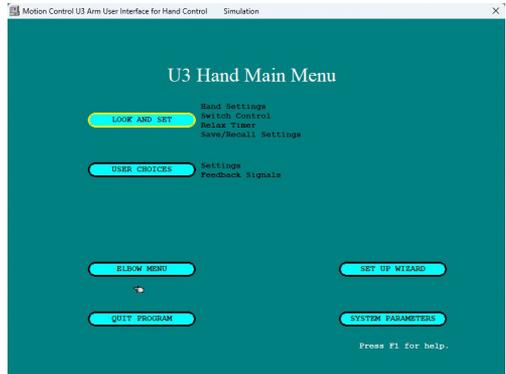
On the User Choices screen choose the AutoCal Enabled by Hand Switch option. The Gains and Thresholds will readjust. Trigger AutoCal by either turning the power off/on twice quickly or opening and closing the hand several times within 7 seconds.

Store and Recall Settings

This screen appears automatically at screen exit whenever settings have been changed. "Previous" settings are the last saved settings. "Adjusted" settings show any changes. To save and exit click on "Proceed". This screen recalls the original settings from the start of the session. To store or recall settings on the hard drive, use Computer File Operation.

Computer File Operations

To save Hand & Elbow settings on your computer. Follow on-screen directions to select a register, rename it, store settings, or retrieve settings. Note: To save all settings, including the Setup Wizard, use Full Feature settings at bottom of screen.

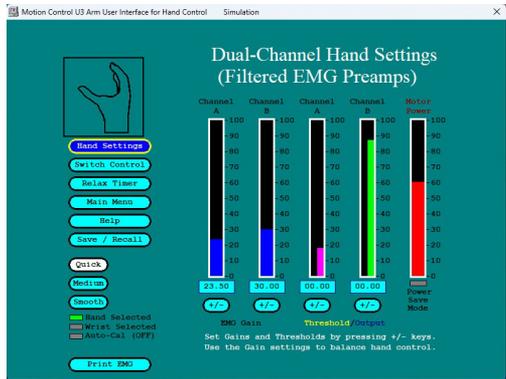


Hand Adjustment Screens

Dual Site EMG Inputs

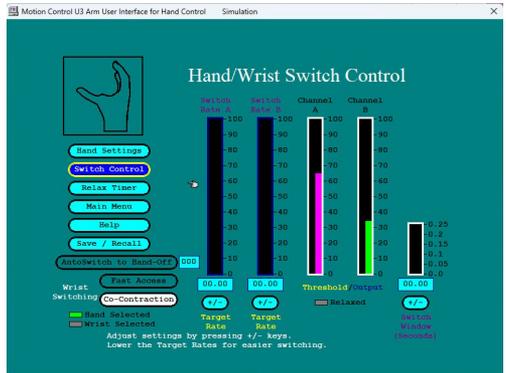
Hand Settings

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 the threshold. To reverse direction, muscle must relax. Note: if the hand moves backwards, hit "Alt +H".



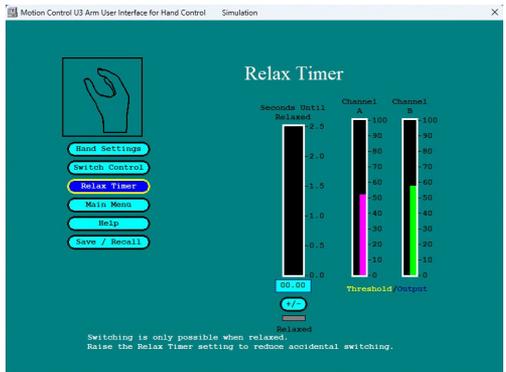
Switch Control

This is if a wrist is installed. 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 the parts catalog. The Switch Window shows how close together in seconds muscle A & B must co-contrast. Note: A feedback buzz can be enabled on the User Setting Screen to alert user when sleep occurs.



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.

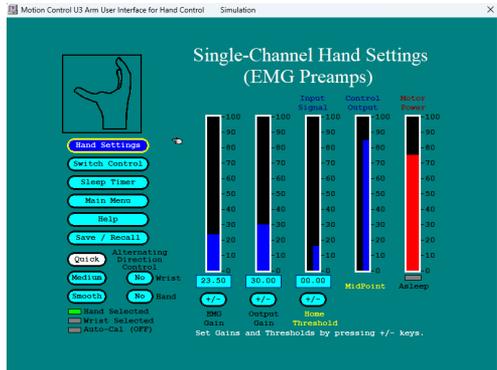


Hand Adjustment Screens

Single-site EMG or Alternate Inputs

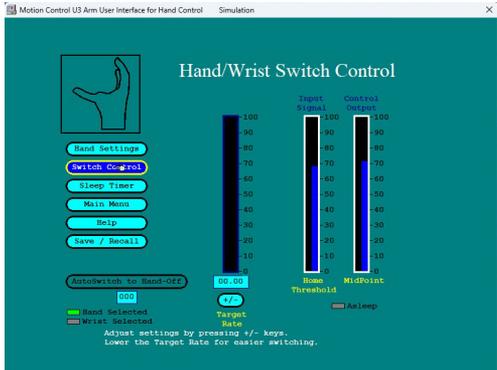
Steps to adjust single-site input

Adjust "Input Gain" so that "Input Signal" reaches 100% with moderate effort. Adjust "Output Gain" so that hand control is a good balance between speed and control. Adjust "Home Threshold" to prevent accidental motion of hand.



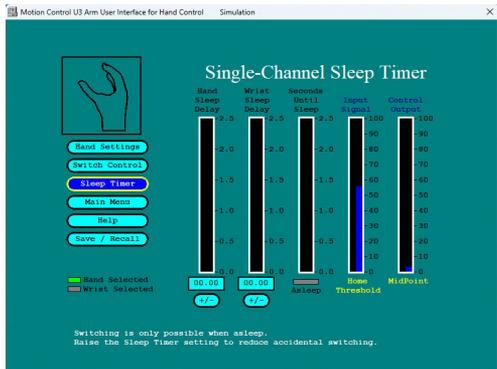
Switching with a Single Input

Same as Dual-site except with a single input. "Asleep" light must be on for switching to occur. Note: A feedback buzz can be enabled on the User Setting screen to alert user when sleep occurs.



Sleep Timer

Hand/Wrist Delay Timer sets the length of time the hand or wrist must stop for "sleep", i.e., for power to turn off. Alternating Control: When Alternating Control is enabled on the Settings screen the direction of the hand or wrist control will reverse each time sleep occurs. Note: A feedback buzz can be enabled on the User Setting screen to alert user when sleep occurs.



Hand Adjustment Screens

Single-site EMG or Alternate Inputs Continued

- **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. Note: This is a legacy feature and may not be included as an option.
- **Alternating Mode:** When this option is enabled the hand or wrist will operate in each direction alternately. The direction of Control will reverse each time the Input Signal is relaxed for as long as the Sleep Time.

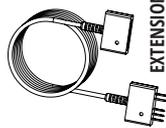
Additional Information

Additional information on the Legacy Software and the Utah Arm setup is available in the prosthetist guide and online. Also review the User Guide for more information on training exercises and other user related knowledge. We recommend that you familiarize yourself with all of the documents as you proceed with setup for a patient.

If you need additional help or have questions, please feel free to contact one of our educators or schedule some time to attend one of the available in-person training courses for the U3.

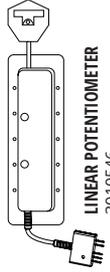
PARTS CATALOG UTAH ARM 3

UTAH ARM 3 BASE PACKAGE Tan: 5010110 Brown: 5010111 Jet Black: 5010112
 UTAH ARM 3 PACKAGE Tan: 5010035 Brown: 5010036 Jet Black: 5010038
 UTAH ARM 3+ PACKAGE Tan: 5010039 Brown: 5010040 Jet Black: 5010041

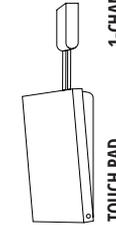


EXTENSION CABLE (EMG)
 Short: 10' (25cm): 3010094
 Long: 6' (1.5m): 3010073

ALTERNATE INPUTS:

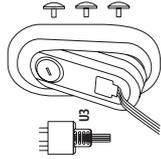


LINEAR POTENTIOMETER
 3010546



TOUCH PAD

1-CHANNEL TOUCH PAD CABLE
 3010548
2-CHANNEL TOUCH PAD CABLE
 3010549

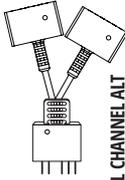


TRIAD PREAMPS:

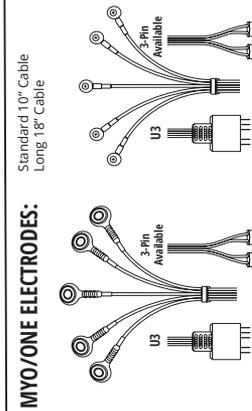
- SINGLE PREAMP**
3010754
- ELECTRODE SET (6)**
Short: 3010636
Med: 3010835
Long: 3010834
- PREAMP DUMMY**
1100278
- PREAMP GROMMET**
1100272
- DUMMY PREAMP GROMMET**
1100279



RIBBON CABLE U3 CONNECTOR
 Single Channel: 300753
 Dual Channel: 3010752
 9-Pin Single: 3010731



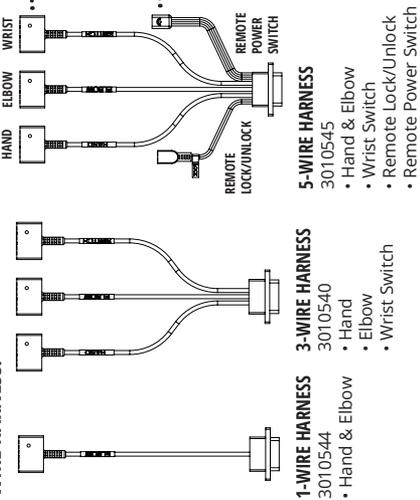
DUAL CHANNEL ALT INPUT CABLE
 3010776



MYO/ONE ELECTRODES:
 Standard 10" Cable
 Long 18" Cable

SNAP U3 STANDARD 5010155 (8mm post), 5010156 (6mm post)
CONTROL SEAL® U3 CABLE STANDARD 5010153
CONTROL SEAL® U3 CABLE LONG 5010154
 Single electrode sets and 3-Pin versions of the Myo/One are also available, see website.

WIRE HARNESS:



1-WIRE HARNESS
 3010544
 • Hand & Elbow

3-WIRE HARNESS
 3010540
 • Hand
 • Elbow
 • Wrist Switch

5-WIRE HARNESS
 3010545
 • Hand & Elbow
 • Wrist Switch
 • Remote Lock/Unlock
 • Remote Power Switch

"A" WRIST CONTROL (12-volt, proportional control)

- MC PULL SWITCH** Jet Black: 3010259
- HIGH PROFILE WRIST PUSH SWITCH**
 T: 3010250, B: 3010251, JB: 3010715
- LOW PROFILE WRIST PUSH SWITCH**
 T: 3010675, B: 3010676, JB: 3010720
- ADAPTER CABLE FOR "A" OTTOBOCK**
- WRIST SWITCH** 3010105
- EXTENSION CABLE 3"(73cm)** 3010556

"B" WRIST CONTROL

- (6-volt on/off control) Use with Wrist Control Adapter Cable for Version B (3010106)
- CABLE PULL SWITCH**
 OttoBock 1701023
 - HARNESS PULL SWITCH**
 OttoBock 1701022
 - ROCKER SWITCH**
 OttoBock 1701021
 - ADAPTER CABLE FOR**

SETS:

- DUAL CHANNEL UTAH ARM CONNECTOR**
3010782
- SINGLE CHANNEL UTAH ARM CONNECTOR**
3010783
- TRIAD SET-NO CABLE**
3010786

Single electrodes available see website.
***COAPT® or IBT PATTERN RECOGNITION**
 If the system is going to use COAPT or IBT, please note that during the order.

"B" OTTOBOCK WRIST SWITCH
3010106

LOCK/UNLOCK SWITCHES

- MC PULL SWITCH** Jet Black: 3010261
- HIGH PROFILE PUSH SWITCH**
T: 3010252, B: 3010253, JB: 3010717
- LOW PROFILE PUSH SWITCH**
T: 3010673, B: 3010674, JB: 3010722
- ADAPTER CABLE FOR OTTOBOCK SWITCH**
3010107

COMPUTER INTERFACE FOR LEGACY SOFTWARE
USB: 5010075
Bluetooth: 5010037

EXTENSION CABLES

HALF-MOON EXTENSION CABLES

- 2-Pin
12" (30.5cm): 3010951 3010989
- 3-Pin
18" (46cm): 3010842 3010990
- 24" (60cm): 3010952 3010991

9-PIN PREAMP EXTENSION
3010336

4-PIN EXTENSION CABLES

- 12" (30.5cm): 3010325
- 24" (61cm): 3010326
- 36" (91.5cm): 3010304

REMOTE POWER SWITCHES

- REMOTE PULL SWITCH** JB: 3010263
- HIGH PROFILE REMOTE PUSH SWITCH**
T: 3010254, B: 3010255, JB: 3010716
- LOW PROFILE REMOTE PUSH SWITCH**
T: 3010671, B: 3010672, JB: 3010723

BATTERY CHARGER
3010732

POWER SUPPLY
1390040

POWER CORDS
US: 1390043, EU: 1390043

SINGLE BATTERY (Li-ION)
Tan: 3010745, Brown: 3010746, Jet Black: 3010747

SUPPLEMENTAL BATTERY PACK/CHARGER
(Charger, Power Supply, Cord, 2 Batteries)
Tan: 3010856, Brown: 3010857, Jet Black: 3010858

WRIST ROTATORS

MOTOR DIRECT
4-Band: 5010045
6-Band: 3010869

PROWRIST
4-Band: 5010056
6-Band Sequential: 3010832
6-Band Simultaneous: 3010833

PROWRIST DISABLE SWITCH
3010846

WRIST SWITCH EXTENSION CABLE
3010556

WRIST LAMINATION DUMMY
1070495

FOREARM COVER SCREW
2000040

FOREARM COVER STANDARD
T: 3010806, B: 3010807, JB: 3010808

FOREARM COVER SHORT
T: 3010812, B: 3010813, JB: 3010814
Ultra Short Option: 3010551

MC WRIST LAMINATION COLLAR
T: 1100295, B: 1100296, JB: 1100288
Hosmer T: 1100295, B: 1100299, JB: 1100291

COAXIAL PLUG
4-Band: 1701009 (Ottobock)
6-Band: 1700064 (Steeper)

ON/OFF EXTENSION BUTTON 3010241

LAMINATION COLLAR
Aluminum: 1070004, Temp. Plastic: 2000139

FRICITION BAND (Single)
1100015

HUMERAL CLAMP BAND ASSEMBLY
(Friction Band and Clamp Band Included)
Tan: 3010145, Brown: 3010146, Jet Black: 3010700

HUMERAL ROTATOR ASSEMBLY
(Lamination Collar, Friction and Clamp Bands included)
Tan: 3010035, Brown: 3010147, Jet Black: 3010701

HUMERAL PLASTIC LAMINATION COLLAR ALIGNMENT FIXTURE
(set) 3010714

BAND SCREW
2000028

HUMERAL CLAMP BAND ASSEMBLY
(Friction Band and Clamp Band Included)
Tan: 3010145, Brown: 3010146, Jet Black: 3010700

HUMERAL ROTATOR ASSEMBLY
(Lamination Collar, Friction and Clamp Bands included)
Tan: 3010035, Brown: 3010147, Jet Black: 3010701

HUMERAL PLASTIC LAMINATION COLLAR ALIGNMENT FIXTURE
(set) 3010714

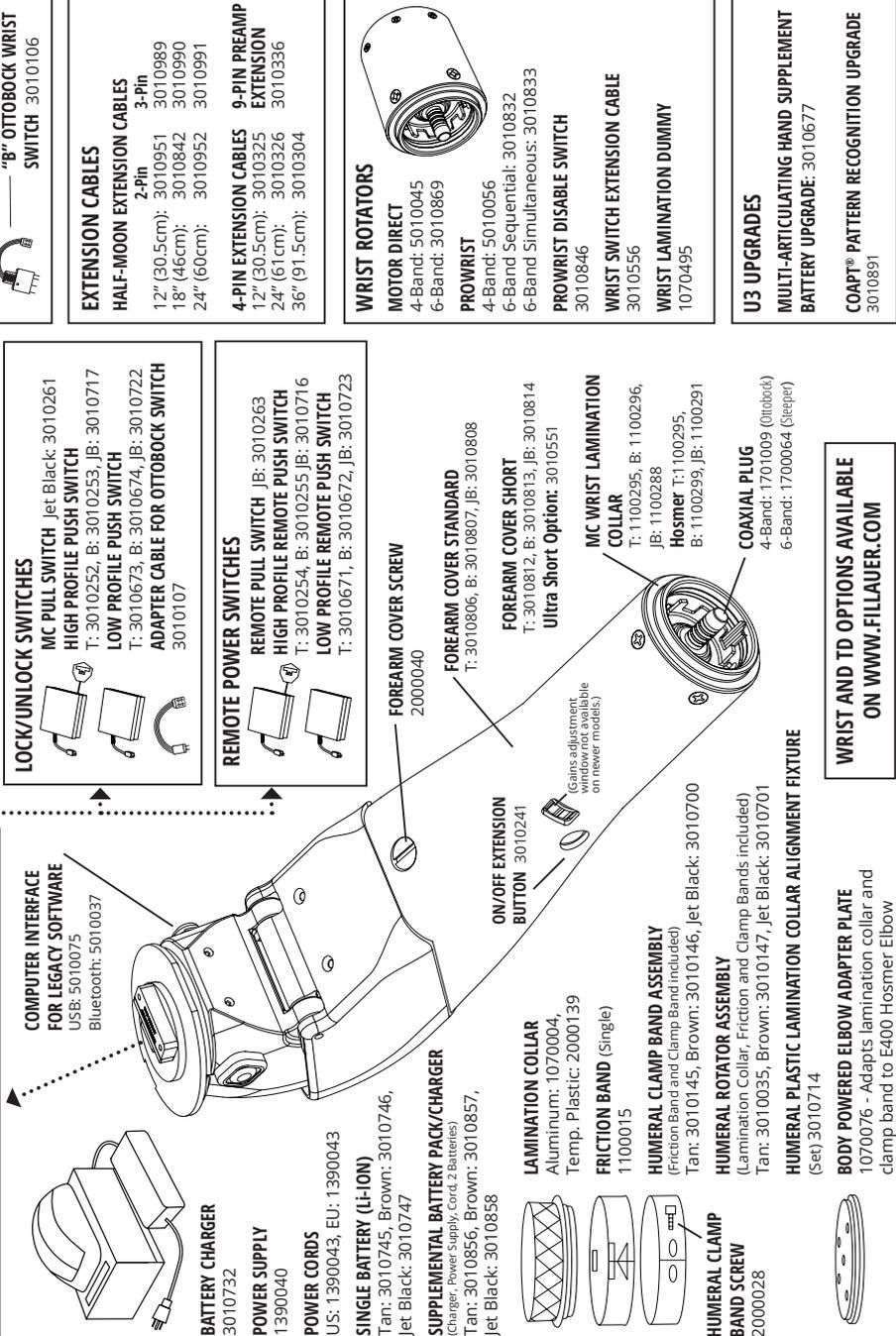
BODY POWERED ELBOW ADAPTER PLATE
1070076 - Adapts lamination collar and clamp band to E400 Hosmer Elbow

U3 UPGRADES

MULTI-ARTICULATING HAND SUPPLEMENT BATTERY UPGRADE: 3010677

COAPT® PATTERN RECOGNITION UPGRADE
3010891

WRIST AND TD OPTIONS AVAILABLE ON WWW.FILLAUER.COM



Customer Support

Americas, Oceania, Japan

Fillauer Motion Control

115 N. Wright Brothers Drive
Salt Lake City, UT 84116
801-326-3434
motioninfo@fillauer.com

Europe, Africa, Asia

Fillauer Europe

Kung Hans väg 2
192 68 Sollentuna, Sweden
+46 (0)8 505 332 00
support@fillauer.com

Fillauer®



Fillauer

2710 Amnicola Highway
Chattanooga, TN 37406
423.624.0946



Fillauer Europe

Kung Hans väg 2
192 68 Sollentuna, Sweden
+46 (0)8 505 332 00