Myo Plus
Qualification Course
Myo Plus

Qualification Course

1. Introduction
2. Componentry
3. Myo Plus App
4. Fitting Process
5. Test Socket Fitting
6. Troubleshooting & Compliance
Myoelectric Control

Introduction

SITE 1

SITE 2

Modal Control

Previous Limitations
Myoelectric Control

Introduction

Why is advanced control necessary?

- OPEN/CLOSE
- PRONATE/SUPINATE
- OPEN/CLOSE
- PRONATE/SUPINATE
- OPPOSITION/LATERAL
- OPEN/CLOSE
- PRONATE/SUPINATE
- 8 PROGRAMMED GRIPS
Myo Plus

Introduction

- To gain full potential of the multiarticulating bebionic hand
- To operate a hand and wrist rotator more naturally
Myo Plus
Introduction

Watch Introduction Video
Myo Plus

Introduction

2-Site vs Myo Plus

Conventional Control

User adapts

Prosthesis control is constant

Myo Plus Control

User constant

Prosthesis control adapts
Myo Plus

Introduction

Advantages

• Recording of the movement patterns is done through a simple process via the Ottobock MyoPlus app

• Each movement of the prosthesis is assigned a pattern established by a unique movement of the phantom hand and stored in the prosthesis

• The user determines which thoughts will control the prosthesis
User Benefits

- Customization of patterns by the user makes for intuitive control
- Direct selection of movements; no switching between grips or wrist rotation
- More precise proportional control of prosthetic functions
- New prosthetic movements can be added via the easy-to-follow app
- Settings, feedback and training can also be accessed through the app
- Prosthesis control adjusts accordingly to the connected terminal device
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Introduction

Clinical Application

• New or existing prosthetic users who can produce EMG signals
• Transradial & transcarpal amputation levels (*minimum requirement = 4 cm*)
• Traumatic or congenital etiology
• Unilateral or bilateral amputations
• Difficulty with myo-signal separation
• Weak or unbalanced signals
• Standard 2-site control has failed
• Mode switching challenges
• Desired fast & intuitive control
Myo Plus

Introduction

Contraindications

Currently, Myo Plus is not available for users with these amputation levels…

- Transhumeral
- Partial hand
- Shoulder disarticulation

Patients who are not able to generate patterns that are unique enough from each other will not be successful with this system.
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Componentry

Compatibility

Ottobock bebionic hand (old Steeper hands not compatible)

- bebionic Hand EQD: 8E70=*
- bebionic Hand Short Wrist: 8E71=*
- bebionic Hand Flex: 8E72=*

MyoBock terminal devices
(Except: digital MyoBock hands and children hands)

- System-Elektrohand DMC plus: 8E38=6, 8E39=6, 8E41=6
- Sensor Hand Speed: 8E38=8, 8E39=8, 8E41=8
- MyoHand VariPlus Speed: 8E38=9, 8E39=9, 8E41=9
- Transcarpal-Hand DMC plus: 8E44=6
- System-Elektrogreifer DMC VariPlus: 8E33=9, 8E34=9
- System-Elektrogreifer DMC VariPlus: 8E33=9-1, 8E34=9-1

Myo Energy Integral 757B35=3/5

Electric wrist rotator 10S17

Coaxial plug 9E169+10S4

Lamination Ring 10S1=*
Myo Plus
Componentry Overview

- Myo Plus TR 13E520
- Myo Energy Integral 757B35=5
- Myo Plus App 560X18- *
- Myo cuff 757M20=*
- Electrode dome 13Z161, 13Z162, 13Z163
- Dome covers 13Z166
- Remote electrodes 13E401=* 13E400=*/
- Electrode positioning gauge 623F50
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Componentry

Myo Cuff

- A circular flexible electrode cuff for easy and fast application to evaluate movement patterns before fitting
- Training to improve the individual Myo Plus movement patterns
- Provides data for documentation purposes
- Suitable for several limb sizes
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Componentry

Myo Plus TR

• Central processing unit of the Myo Plus system

• Up to 8 remote electrodes can be connected

• Receives/processes EMG signals and assigns them to each prosthetic function

• Up to 72,000 EMG-samples per second are processed to update the movement commands for the prosthesis 40 times per second \((8\ \text{electrodes} \times 9000\ \text{samples per second})\)
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Componentry

Myo Plus TR

- Terminal device control
- Electric wrist rotator control
- Power supply
- Optional output (service)
- 32 bit microprocessor
- Electronics
- Bluetooth Low-Energy
- 8 Remote Electrode Input

Optional output (service)
Myo Plus
Componentry

Remote Electrodes

- Amplifier
- Input contacts (blue/green)
- Ground contact (white)
- Electrode contact cover
Myo Plus
Componentry

Remote Electrodes

• Low installation height of less then 5mm

• Simple & flexible positioning due to flexible design

• The dome electrodes are available:
  ➢ for the use in 60Hz electricity grids
  ➢ in two lengths (90mm or 140mm)
  ➢ with two or three contacts/poles (3-pole has ground)
  ➢ with three different dome sizes

![Diagram of Myo Plus electrodes with specifications](image)
Myo Plus
Componentry

Electrode Contacts

- Dome screw nut
- Shim
- Shim
- Dome - Cover
- Retaining ring
- Cable clip
- Electrode dome
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Myo Plus App

The Myo Plus App is the central adjustment software to:

- check system functionality
- evaluate movement patterns
- record data for prosthetic control
- train and improve movement patterns
- adjust speed and advanced settings
- disable selected movements in specific situations
- available for download from the Google Play Store or the Apple App Store
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Myo Plus App

Compatible operating systems and devices

The functioning of the app is assured on devices that support the following operating systems:

• iOS (for iPhone, iPad, iPod): version 9.3 or higher
  → The mobile device has to support Bluetooth 4.0 (BT LE)

• Android: version 5.0 or higher
Myo Plus

Myo Plus App

Compatible operating systems and devices

- Apple iPhone 5, iPhone 6 Plus, iPhone 6s, iPhone 7, iPhone 8 Plus, iPhone X, iPod
- Touch Generation 5, iPod Touch Generation 6
- Samsung Galaxy S5, Galaxy S7 Edge, Galaxy S8, Galaxy Note 3, Galaxy A3 (2016), Galaxy A3 (2017), Galaxy Tab A, Galaxy Tab S
- Sony Xperia Z, Xperia Z1
- Xiaomi Mi A1, Redmi Note 3
- Acer Iconia One
- Amazon Fire 10
- Blackberry Keyone
- Google Nexus 6, Pixel
- Huawei P9 Lite, P10
- LG Optimus G4, Optimus V30
- Motorola Moto X, Moto G3, Moto G5 Plus
- OnePlus 5T
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Fitting Process

1. Initial session
2. Evaluating the phantom sensation
3. Evaluating the movement patterns with the Myo Cuff
4. Training and testing patterns
5. Creating the basic set
6. Prosthesis training
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Fitting Process

1. Initial Session

Residual limb assessment:
- Etiology of amputation
- Discover if phantom sensation is present
- Length
- Strength
- ROM
- Sensation/Nerve condition
- Skin condition

Other considerations:
• Prosthetic history
• Hand dominance
• Environment
• Goals & daily activities
• Gadget tolerance
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Fitting Process

2. Evaluating Phantom Sensation

• More phantom sensation allows for greater selection of movement patterns

• Ask the individual to imagine completing different tasks with their phantom hand, such as:
  - open/close hand
  - extending wrist
  - radial deviation of the wrist
  - pointing individual fingers
  - abducting thumb
  - flexing wrist

• Movements done with the phantom hand should be mirrored with the sound limb

• Utilize language that resonates with the user

• Individuals with congenital limb difference will require different cues due to phantom absence.
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Fitting Process

2. Evaluating Phantom Sensation

- For **existing myo-users**, it’s recommended to use the **same** phantom hand movement for hand **open** and hand **close**, which is already used in the current fitting.

- For **new myo-users**, it’s recommended to use the **physiological** movement for hand **open** and hand **close**.

- For existing and new myo-users it’s recommended to use the **physiological** movement for **wrist rotation** (pronate and supinate).

- For new users, phantom training will be needed….see next 3 slides for potential cues.
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Fitting Process

Phantom Movement Patterns

- Open hand
- Close hand
- Palm up
- Palm down
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Fitting Process

Phantom Movement Patterns

- Open hand
- Power grip/key grip
- Palm up
- Palm down
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Fitting Process

Phantom Movement Patterns

- Pinch grip/column grip
- Active index grip/finger point
- Precision open grip/mouse grip
- Precision closed grip/relaxed hand position
Watch Video
Myo Plus
Fitting Process

Pairing

1. Turn on the Myo cuff by pressing the charging receptacle for 2 sec. until the LED lights up green.

2. Start the Myo Plus App by clicking the Myo Plus icon.
Myo Plus

Fitting Process

Pairing

Add a new Bluetooth connection by clicking on the + icon

<table>
<thead>
<tr>
<th>Bluetooth mode OFF</th>
<th>Bluetooth mode ON (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluetooth is active for 5 minutes after the battery is switched on - within this time window, a connection to the prosthesis or Myo cuff can be established</td>
<td>Bluetooth is permanently active after the battery is switched on</td>
</tr>
</tbody>
</table>

If Bluetooth is deactivated on your device, confirm the Bluetooth request with “Allow”
Myo Plus

Fitting Process

Pairing

5

• Select Myo Cuff serial number (on PIN card delivered in box)

6

• Enter PIN of Myo cuff
• (also on PIN card)
Myo Plus

Fitting Process

Pairing

7

If a Bluetooth connection request pops up, confirm with “OK”

8

- App is now successfully connected to cuff
- Spiderplot is displayed
Myo Plus

Fitting Process

Login as Specialist

1. To login as a specialist:
   - Choose “Clinician mode”
   - “Login”

2. Enter username & PIN (provided to you after certification)
Myo Plus

Fitting Process

Login as Specialist

3

- Define your new personal password
- Confirm with “OK”
- You are now logged-in as specialist
Myo Plus

Fitting Process

3. Evaluating Movement Patterns (Myo Cuff)

- It’s recommended, to position the Myo cuff that the **ulna is placed between electrode no. 1 and no. 8**

- **Electrode no. 1 should be positioned laterally** so that the electrode number increases in the medial direction

- Regardless of whether the cuff is applied to a left or right forearm, the extensor muscles are then placed between electrode no. 1 and no. 4 and the flexor muscles are placed between electrode no. 5 and no. 8

**ALWAYS position cuff in the same way!**
3. Evaluating Movement Patterns (Myo Cuff)

- Testing the muscle activity in the limb
- Intuitive movements
- Number of patterns depends on the prosthetic hand (and if using rotator)

→ Evaluate all possible phantom hand movements with the cuff
Myo Plus

Fitting Process

3. Evaluating Movement Patterns (Myo Cuff)

Example:
A bebionic hand with active wrist rotation requires four well-separated and unique motion patterns:

Hand open

Power grip / Key grip

Palm up

Palm down

Pattern scaling active
Myo Plus

Fitting Process

3. Evaluating Movement Patterns (Myo Cuff)

- Watch the four movement patterns alternately during execution
- Unique movement patterns show in different directions and have little overlapping:
Poorly separated movement patterns point in the same direction and present with overlapping positions; these two are not unique enough for the system to adequately understand which component should move.
Myo Plus

Fitting Process

4. Training and Recording Test Set

• After the evaluation of the movement patterns is done, the patterns are recorded and stored for testing

• This is done under the menu “Basic Set“

• Creating a test set is recommended to check if the movement patterns are clearly separated and can be used for the Basic Set
Myo Plus

Fitting Process

4. Recording Test Set

Specify the following before recording:

1. If a **MyoBock or bebionic** Hand should be displayed and simulated – this happens via the menu “Myo cuff”

   ➢ By selecting the terminal device, the correct pictures are displayed:
Myo Plus

Fitting Process

4. Recording Test Set

Specify the following before recording:

2. If an electric wrist rotator should be used:

   Basic set

   Rotation

3. If the Myo Plus fitting is on the left or right side:

   Myo Plus fitting on the left side

   Myo Plus fitting on the right side
Myo Plus

Fitting Process

4. Recording Test Set

Specify the following before recording:

4. How many electrode are used:

   Number of electrodes

5. How long the pause time between the movements should be:

   Pause time until next recording
Myo Plus

Fitting Process

4. Recording Test Set

- The test set consists of **two recordings with the elbow held at 90° of flexion**—click on the green arrow for the recording page.

- In each recording, **five movement patterns** must be performed in the following order:

1. Relax
2. Hand open
3. Hand close
4. Palm up
5. Palm down
Myo Plus

Fitting Process

4. Recording Test Set

• Make sure the elbow is flexed to 90 degrees

• Start the recording by clicking on the symbol

• The previously set pause time (blue bar) begins to expire

• During this phase, prepare the user for the movement shown in the picture

• The muscles should be relaxing during the pause time

• When the pause time has expired, the contraction phase (red) begins
Myo Plus

Fitting Process

4. Recording Test Set

• In the contraction phase, the user should generate the previously defined phantom hand movement corresponding to the shown picture

• The contraction strength should be 0% at the beginning of the red phase and should be continuously increased to 80% of maximum contraction strength

• The red bar begins to fill with the increase in contraction strength

• If the picture relaxation (relax) is displayed, the user should relax the muscles also during the red phase
Myo Plus

Fitting Process

4. Recording Test Set

- Continuous increasing of the contraction strength determines the proportional control of grip speed and grip force.

- After the recording time is completed, the pause time restarts in preparation for the next movement pattern.
Myo Plus

Fitting Process

4. Recording Test Set

• After both recordings have been performed, make sure that both recordings are selected (check mark)

![Arm bent 90 degrees](image)

- 2019-01-17 17:22:08
- 2019-01-17 17:22:42

• By clicking on "Create test set" a test set is created from the two recordings and stored temporarily in the Myo cuff

→ The test set is lost after switching off the Myo cuff

• The user can now test the reliability of the control in real time in the menu "Spiderplot / Training"
Myo Plus

Fitting Process

4. Evaluating the Recorded Test Set

Use Spiderplot:

Use movement display:
4. Evaluating the Recorded Test Set

Spiderplot

- Compare generated movement patterns (gray) to the recorded (color-coded) patterns; should be very similar!

- If the current movement pattern is detected as a prosthesis movement, the pattern is highlighted in color and the associated prosthesis movement is displayed in the symbol image.

- Each prosthesis movement is displayed in a different color (scroll down).

- Free text space to enter cues as needed (extend finger, etc.)
Myo Plus

Fitting Process

4. Evaluating the Recorded Test Set

Movement Display:

• If the Spiderplot is displayed, and it is **swiped to the left**, the movement display appears - the movement display simulates the real prosthesis

• The current contraction strength is shown in the contraction bar (**red**)

• The current detected **movement is shown** in the symbol picture

• Evaluate the prosthetic control together with the user by using the spider plot or the movement display

• If the movements are accurate and consistent, continue with the basic set

• Accurate and consistent means the user generates the desired movements with **no overlap** into other movements/prosthetic functions, with little or no problem using chosen movement patterns
Myo Plus

Fitting Process

4. Evaluating the Recorded Test Set

- Encourage the user to perform a specific movement
- Pay attention to the execution quality and speed
- Test all recorded movements
- If necessary, take a longer break before the test to prevent muscle fatigue
- Note that this type of prosthetic control is a brand new feel for the user and requires a lot of concentration
- If there is not sufficient separation of the movement patterns, a new phantom hand movement should be explored
Myo Plus

Fitting Process

5. Creating a Basic Set

- Add another four recordings in two more arm positions to the test set:

- The basic set thus consists of a total of 6 recordings in 3 different arm positions

- Creating and storing the base set is the prerequisite to permanently store the Myo Plus control in the Myo cuff or prosthesis
Myo Plus

Fitting Process

5. Creating a Basic Set

• If all 6 recordings are done, the basic set can be created by clicking on “create basic set”

• A star symbol next to the checkbox indicates that this recording has been recorded but not yet added to the basic set

• After creating the basic set, evaluate the stored patterns during the control

• Proceed in the same way as with the "test set"

• If one or more recordings do not work reliably, you can test them individually
Myo Plus
Fitting Process

5. Evaluating Basic Set

Selecting Individual Patterns to Test:

1. Uncheck the desired recording in the menu “basic set” and create a test set → Now only the selected recordings are used for the control

2. If the control works better, record the desired pattern again → To do this, click on the corresponding arrow symbol

3. Pay attention to the correct arm position and start the recording

4. Then create a new basic set and test the prosthesis control again
Myo Plus

Fitting Process

5. Adding Patterns to Basic Set

- In total 30 recordings can be added to the system - the number of remaining recordings is shown by the counter

- If the basic set is recorded, 24 additional recordings of the same or new prosthesis movements can be added in the menu “Add movements”

- Adding of additional patterns may be necessary:
  - if more than four hand movements of the bebionic hand should be controlled (more as hand open, power grip / key grip, palm down, palm up)
  - when a movement in certain situations or arm positions is detected not to be reliable - e.g. hand above the head
Myo Plus

Fitting Process

5. Adding Patterns to Basic Set

MyoBock Hands – Adding Patterns:

• When using a MyoBock hand, the four available prosthesis movements are already recorded in the basic set

• The selected movements can be added to the basic set by selecting the checkbox and clicking on "Continue to recording"
5. Adding Patterns to Basic Set

Bebionic hand:

- When using the bebionic hand, 4 prosthesis movements are recorded in the basic set.

- Each movement pattern (except hand open and rotation) controls two grip types, depending on whether the thumb is in opposition or lateral.

- These grip pairs are pre-defined and can be seen in the menu "Add pattern" or "Movement selection".

- If more prosthetic movements should be controlled with Myo Plus, the movements must be selected here and added to the basic set by clicking "Continue to record".
Myo Plus

Fitting Process

5. Adding Patterns to Basic Set

• After recording, the functionality of the control can be tested.

Success: Recording completed

The recording was completed with the following patterns:
  - Relax
  - Pinch grip/column grip
  - Active index grip/finger point

Do you want to save or discard this recording?

  Discard

  Accept

• The recording can be saved by clicking on the “Accept” button

• Discard recording if desired
Myo Plus
Fitting Process

5. Basic Set: Additional App Features

• In the menu "Prosthesis Movements", one or more prosthesis movements can be deactivated

• **Example 1:**
Palm down and Palm up is disabled during activities in which the prosthesis should not rotate involuntarily

• **Example 2:** Certain movements deactivated while working on improving others
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Fitting Process

5. Basic Set: Additional App Features

• In the menu “Movement Quality”, the quality of the recorded movement patterns is represented by a simple rating system

• Per recorded movement up to 5 stars can be awarded

• A movement rated with 5 stars can be clearly recognized

• The fewer stars awarded, the harder it is for Myo Plus to distinguish the movements: 3 stars is acceptable

• Movement patterns are exported to the Android / iOS device

• May be useful for documentation and are stored in the image folder of the device
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Fitting Process

5. Basic Set: Additional App Features
Myo Plus

Fitting Process

5. Basic Set: Additional App Features

Settings Adjustments: bebionic hand

When controlling the bebionic hand, the user can choose between two options:

1. Control of the bebionic hand with Myo Plus via movement patterns or

2. Control of the bebionic hand analogous to the classic control, with open/open switching and program switch on the back of the hand
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Fitting Process

5. Basic Set: Additional App Features

Settings Adjustments

- The name of the prosthesis can be defined – when movement patterns are exported, a folder with the name is created on the Android/iOS device

```
Name of the prosthesis (min. 3 characters)
My_MyoPlus
```

- The speed of the terminal device and rotation can be chosen:
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Fitting Process

5. Basic Set: Additional App Features

Settings Adjustments

• Choose to have hand automatically move into glove-donning mode when powered on – this function is very useful for getting dressed

Glove mode active
After the prosthesis is switched on, the hand enters the glove mode.

• Choose if prosthesis should be reset to the basic set – necessary, for example, if the user added additional movement patterns which lead to trouble with prosthetic control

Reset to basic set
All movements recorded under “Add pattern” are deleted.
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Fitting Process

5. Basic Set: Additional App Features

ADVANCED Settings Adjustments: Accuracy of Pattern Recognition

- A high adjustment means, that the prosthesis reacts sensitively and quickly to generated patterns - a high setting is recommended for highly accurate reproducible patterns.
- A low adjustment means, that less accuracy in creating the patterns is required - the control of the prosthesis is thereby more reliable but slower.

A high adjustment means, that the prosthesis reacts sensitively and quickly to generated patterns - a high setting is recommended for highly accurate reproducible patterns.

A low adjustment means, that less accuracy in creating the patterns is required - the control of the prosthesis is thereby more reliable but slower.
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Fitting Process

5. Basic Set: Additional App Features

ADVANCED Settings Adjustments: Interference Suppression

- A high interference suppression means that many external interference signals are filtered out successfully but some intentional EMG signals might also be filtered out. This may lead to a loss of intended movements.

- EXAMPLE: While shopping, a shopping bag is worn over the prosthetic socket - the prosthesis rotates unintentionally
  - Increasing the interference suppression could suppress the unwanted signal generated by the socket rotation
5. Basic Set: Additional App Features

ADVANCED Settings Adjustments: Threshold Value

A low threshold value means that the prosthesis responds even to minor muscle contraction – however, unintentional muscle contractions may cause unintentional prosthesis movements.

- A low threshold value means that the prosthesis responds even to minor muscle contraction – however, unintentional muscle contractions may cause unintentional prosthesis movements
- The button “Use default values” sets all adjustments to default
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Fitting Process

5. Basic Set: Additional App Features

ADVANCED Settings Adjustments:

Reset advanced settings to default values
• All three advanced settings will be returned to their default settings
  (Accuracy of pattern recognition, Interference Suppression, & Threshold Value)

Delete all Patterns CLINICIAN ONLY
• With this button, the basic set and all added patterns will be deleted - other
  settings remain unchanged

Reset to factory setting: CLINICIAN ONLY
• With this button, all saved patterns will be deleted and all settings will be reset to
  factory settings - the Bluetooth connections are also deleted and the app will be
  closed automatically
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Myo Plus App

User Access:

- Spiderplot/training
- Adding patterns (calibration)
- Prosthesis movements
- Movement quality
- Manual control of prosthesis

Settings:

- Speed of open/close and rotation
- Accuracy of pattern recognition
- Interference suppression
- Threshold value
- Reset to basic set

Practitioner Access:

Everything patient can access, plus:

- The ability to create a test set
- Ability to create basic set
- Delete all patterns
- Reset to factory setting
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Fitting Process

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Test Socket Fitting

• Electrode placement
• Components
• Set Up
• System check

Please refer to our YouTube video for setting up a test socket:
Watch Video
Test Socket Fitting

Electrode Placement

Electrodes **should not** be placed along the ulna because:

- weak EMG signals measurement occur
- higher risk of electrode lifting/separating from limb
- increased comfort for user
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Test Socket Fitting

Electrode Placement

For 2 out of 8 electrodes, an additional hole must be drilled for the ground contact (white cable of the 3-poled electrode)

- The hole can be drilled between two electrode domes
- Choose a position where weak muscle activity is expected and the electrode does not pull away with limb movement… BUT NOT DIRECTLY ON ULNA!
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Test Socket Fitting

Electrode Placement

Electrode positioning aid placed so ulna is between electrode 1 and 8

- allows for a comparison of the movement patterns later
- flexors muscles are between electrode 5 and 8
- extensor muscles are between electrode 1 and 4
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Test Socket Components
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Test Socket Set Up

1. Mark the direction of the ulna on the skin

2. Don the inner socket
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Test Socket Set Up

3

Mark the direction of the ulna on the inner socket

4

Draw a line 6-7cm distal to the olecranon
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Test Socket Set Up

5

• Place the electrode positioning gauge distal to the drawn line
• Mark each electrode position
• Do not place an electrode along the ulna!

Mark the electrode numbers (1-8) on the inner socket for easier cabling
Test Socket Set Up

Drill 5mm holes into each marked electrode position

• Insert electrode dome from the inside
• Insert electrode nut from outside into hole
• Screw both together with lug wrench
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Test Socket Set Up

9

Mount the electrode dome covers on the electrodes

10

Cable markers can also be attached to each electrode for easy identification
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Test Socket Set Up

11

Protect the dome electrodes with an elastic textile bandage

12

Remove covers from the required ports

Do Not Use Port "A"
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Test Socket Set Up

13
Connect the remote electrodes - pay attention to correct port assignment

14
Secure cables with the cable protector
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Test Socket Set Up

15

- Insert the Myo Energy Integral battery between inner socket and outer frame
- Mount the charging receptacle

16

- Connect inner socket with outer frame
- BE CAREFUL with electrode cables!
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Test Socket Set Up

Before wiring the electric wrist rotator, check orientation of the pins:

Left no. 3 contact
Left no. 2 contact
Left no. 1 contact

Right no. 3 contact
Right no. 2 contact
Right no. 1 contact
Please note:

- With Myo Plus there is no difference in cabling the wrist rotator for right vs left
- The selection of a left or right hand prosthesis is made in the Myo Plus App
- **DO NOT** use a 13E205 MyoRotronic
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Test Socket Set Up

Myo Plus TR Wiring:

- 3-poled cable **without** the blue dot
- 3-poled cable **with** the **blue dot**
- 2-poled cable
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Test Socket Set Up

Myo Energy Integral Wiring:

2-poled cable

3-poled cable (not to be used)

Charging receptacle

757B35=5
3450 mAh

757B35=3
1150 mAh
Myo Plus

Test Socket Set Up

16. Connect the 2-poled motor cable of the electric wrist rotator to the right no. 3 contact

17. Connect the 2-poled cable of the Myo Plus TR to the left no. 3 contact
Myo Plus
Test Socket Set Up

Connect the 3-poled cable **with blue dot** of the Myo Plus TR to the left no. 2 contact

Connect the 3-poled cable **without blue dot** of the Myo Plus TR to the right no. 2 contact
Myo Plus

Test Socket Set Up

20

Connect the 2-poled cable of the Myo Energy Integral battery to the left no. 1 contact

21

Do not connect a cable to the right no. 1 contact - use fixation ring to hold in place
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Test Socket Set Up

Summary:

- 2-poled cable of Myo Plus TR
- 3-poled cable with the blue dot of Myo Plus TR
- 2-poled cable of Myo Energy Integral battery
- No. 3 contact
- No. 2 contact
- No. 1 contact

- 2-poled motor cable of electric wrist rotator
- 3-poled cable without blue dot of Myo Plus TR
- No. 3 contact
- No. 2 contact
- No. 1 contact

No cable must be connected
Myo Plus

Test Socket Set Up

Wiring the coaxial plug:

2-poled cable of the Myo Energy Integral battery

3-poled cable  without  the blue dot of the Myo Plus TR

3-poled cable  with the blue dot of the Myo Plus TR
Myo Plus
Test Socket Set Up

- Insert the electric wrist rotator into the lamination ring
- Secure with lock ring

- Connect the terminal device
- Establish a connect to the Myo Plus App
Myo Plus

Test Socket Set Up

Log-in as a specialist and test the functionality of the system via App
Myo Plus

Test Socket Set Up: System Check
Myo Plus
Test Socket Fitting

System Check

• A standard recording, called “system test”, is stored when the Myo TR Plus is delivered

• A colored, star-shaped pattern on the spider plot is visible

• In this standard recording, each electrode is assigned to a specific prosthetic function:
  • ELE 1 & 5 = Hand close
  • ELE 2 & 6 = Hand open
  • ELE 3 & 7 = Supination
  • ELE 4 & 8 = Pronation

• By touching the electrode domes, these movements are simulated to ensure correct cabling and function of the system
Myo Plus

Test Socket Fitting

System Check

• The system test can then be deactivated by using the "System test active" slider or by pulling up the “basic set" menu

• The status of the remote electrodes is indicated by the color of the electrode number in the spider plot:

  ➢ **Black**: Function of the electrode is OK

  ➢ **White**: The myo-signal is disturbed and excluded from the movement recognition

  ➢ **Red**: the cable is not connected to the Myo Plus TR or cable is broken
Myo Plus
Test Socket Fitting

System Check

- The functionality of the system can be manually controlled in the menu “Manual Control”
- By moving the slider in the desired direction or tapping the picture, the chosen function can be controlled
- Allows for quick troubleshooting
Myo Plus
Test Socket Fitting

Final Tips...

- If less than 8 remote electrodes are installed, the plug connections with the highest numbers are not used.

- The number of electrodes being used must be specified in the Myo Plus App under the "basic set" menu.

- If the dome nut is over-tightened, the dome tears off at the predetermined breaking point.

- For a Myo Plus fitting, the use of the Myo Energy Integral 757B35=5 with 3450mAh is recommended.
Myo Plus

Qualification Course

1. Introduction
2. Componentry
3. Myo Plus App
4. Fitting Process
5. Test Socket Fitting
6. Troubleshooting & Compliance
## Troubleshooting

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<th>APPLICATION</th>
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<td>1. After every trial with cuff</td>
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<td>2. To clear all patterns from spiderplot</td>
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<td>Force Stop the App &amp; Power Down to restart cuff/TR unit</td>
<td>1. If the app suddenly closes</td>
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<td>Turn Bluetooth settings off then back on in phone/tablet</td>
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<tr>
<td>Forget previous Bluetooth connections in phone/tablet</td>
<td>1. Cuff or TR unit won’t connect to app</td>
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</tbody>
</table>
Myo Plus

End User Troubleshooting

“My prosthesis isn’t moving even though I see patterns on the app?”

- Is “prosthesis active” selected on the spider plot screen?
- Under **prosthesis movements** are the patterns turned on?
- Under **Advanced Settings** make sure threshold value and interference suppression are not maxed out.
- Under **Settings** make sure open/close speed is not minimized

“The Patterns aren’t on my spider plot anymore?”

- Scroll down and make sure **check marks by patterns** are **green** and not grey
- Turn off prosthesis and restart app then reconnect
- Make sure prosthesis is **connected to the app**, patterns will not show up unless you are connected
Myo Plus

End User Troubleshooting

“One of my grip patterns isn’t working even though I calibrated it”
  • Under **Prosthesis Movements** make sure that particular pattern isn’t turned off
  • Recalibrate/record grip pattern

“My rotation is really slow”
  • Under **settings** make sure the wrist rotator is at maximum speed

“My open/closing is really slow”
  • Under **Settings** make sure the open/close bar is at the maximum setting

“I can open and close my hand but can’t go into particular grip patterns”
  • Under **Settings** make sure “control of the bebionic hand” is set at **movement patterns** not open/open
Myo Plus

Myo Plus Disposal

- In some jurisdictions it is not permissible to dispose of these products with unsorted household waste
- Disposal that is not in accordance with the regulations of your country may have a detrimental impact on health and the environment
- Please observe the instructions of your national authority pertaining to return and collection
Myo Plus
Handling & Risks

User Information:

• Must not be used for the operation of motor vehicles
• Must not be used for the operation of heavy equipment
• Do not handle firearms while using the product
• Keep system free of solid particles or liquids
• Switch off the prosthesis when changing the terminal device
• This product was developed for everyday use and must not be used for unusual activities such as extreme sports (free climbing, paragliding, etc.)
Myo Plus

Handling & Risks

Information for O&P professionals:

✓ The product is intended exclusively for use on one patient - Use of the product by another person is not approved by the manufacturer

✓ Fitting a patient with the product may only be carried out by O&P professionals who have been qualified by Ottobock after completion of a corresponding training course

✓ The O&P professional also has to have the technical qualifications required for the alignment of a prosthesis with all required settings and adjustments
Handling & Risks

Information for O&P professionals:

• **Instruct** the user in the proper and safe use of the prosthetic system and **self-calibration** (see certification document "02 Myo Plus Patient evaluation with Myo cuff and App EN" page 53-59)

• Only put the product into use in accordance with the information contained in the accompanying documents supplied

• Especially when connecting the battery, **DO NOT** connect the connectors with **reverse polarity**

• Instruct the user of possible errors
Myo Plus Online Training Quiz

CEUs Optional

Quiz Link
https://ottobock.articulate-online.com/2619373009