



ottobock Myo Plus Pattern Recognition User Guide

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ottobock Myo Plus Pattern Recognition



Use the following steps to connect the Myo Plus system to an iOS or Android app for user evaluation and training. These instructions are intended for Myo Plus qualified O&P Professionals. Please see the full course for detailed information on all features and functions.

Download App



- Download the Myo Plus App to your smart device (Apple App Store, or Google Play)






- Open the App
- Turn on the Myo Plus Cuff by pressing the charging receptacle until two short beeps and a green light appears

Pair Myo Plus Cuff to your smart device

- On the main menu , click on Bluetooth Connections

Add a new connection by clicking on the  icon

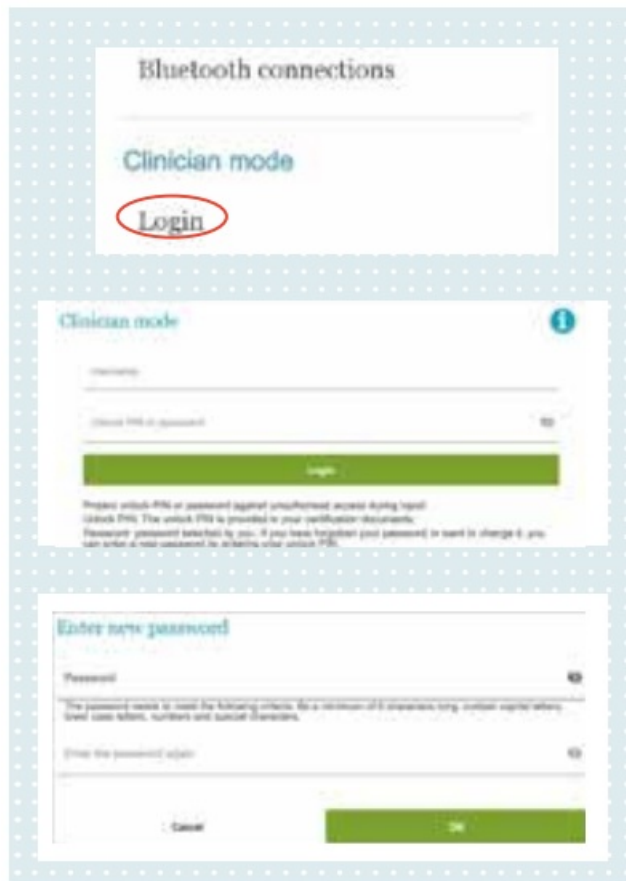


- If Bluetooth is deactivated on your device, confirm the Bluetooth request with ALLOW
- Select the serial number and enter the Bluetooth PIN that can be found on the card that comes with the system
- An active  / inactive  Bluetooth connection will be indicated in the lower right corner.
- If Bluetooth pairing request pops up, confirm with OK.  The app is now successfully connected to the Myo Plus system
- The multicolored star pattern indicates the System Test is active. Deactivate the system test using the toggle switch below the Spiderplot to clear the plot and proceed with fitting.

Use a previous paired Myo Plus Cuff

- If you have previously paired this Myo Plus Cuff with the same, programming device and have not completed a factory reset, the Bluetooth connection should happen automatically (when the Bluetooth setting is active on the device, and it's paired to the cuff).
- In this case, the pairing request mentioned in the step above will not be displayed.

Log-in as Clinician



- On the main menu , under Clinician Mode click on Login

Enter Username and Unlock PIN

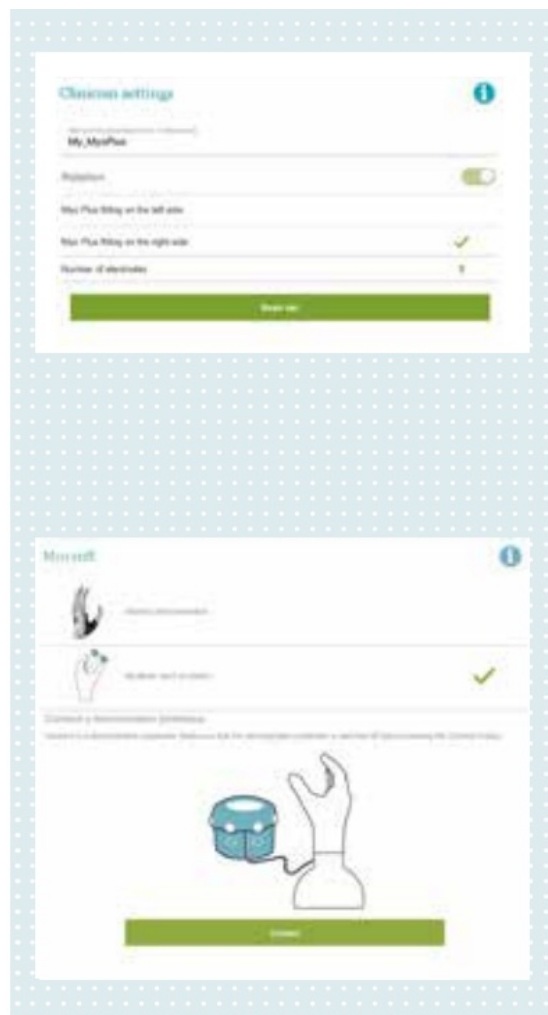
- These are provided to you at the time of professional certification for Myo Plus

Now create your own unique password

- This will be used in the future to access clinician mode
- Password criteria: minimum 8 characters including capital letters, lower case letters, numbers and special characters.
- After 5 wrong login attempts, the account is locked for 30 seconds.

Myo Plus Cuff Set Up

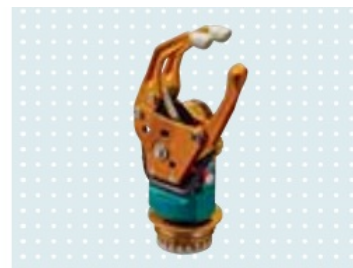
After login as clinician, the app automatically navigates to the clinician settings menu 



- Choose a name of the prosthesis
- Select if an electric wrist rotator should be simulated
- Select if the fitting is on the left or right side
- System test must be deactivated

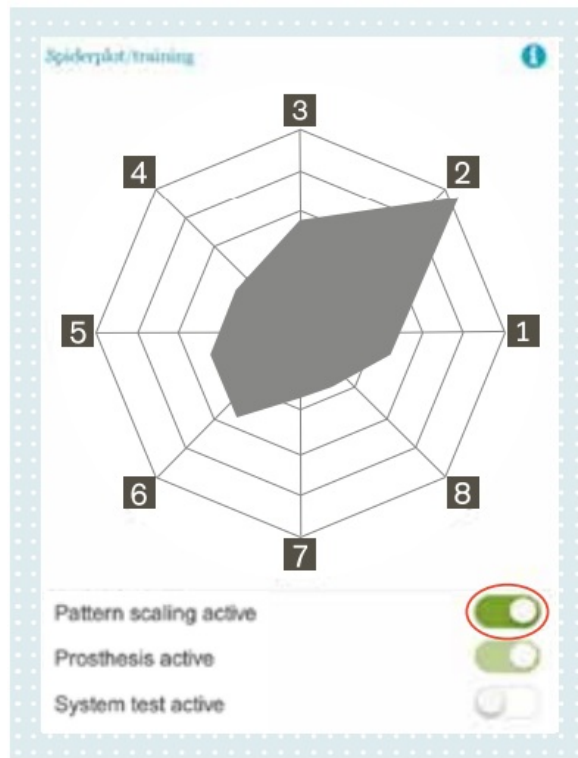
In case of an interim or definitive prosthesis the number of electrodes will be set automatically to the amount built into the socket.

Set the designated hand type



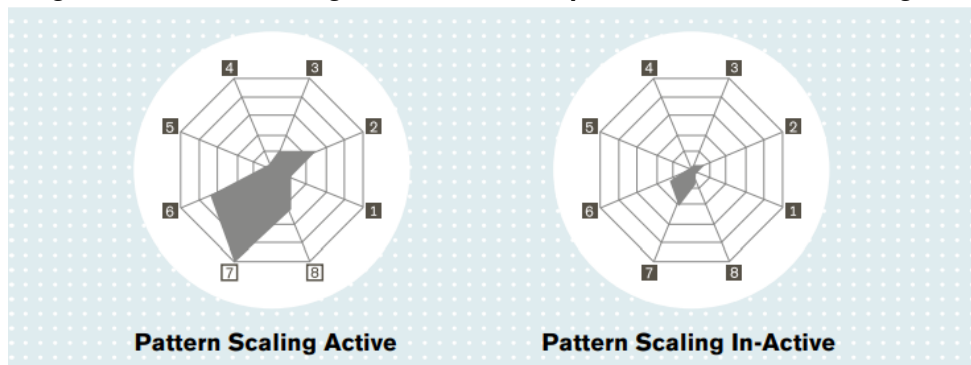
- In the main menu , click on MyoCuff
- Choose either bebionic or MyoBock hand for the simulation

Check connectivity of Myo Plus Cuff



- After adjusting the Clinician settings navigate to the menu Spiderplot/Training.
- To test connectivity to electrodes and confirm all 8 are functioning, tap each electrode set on the Myo Plus Cuff to confirm that patterns are created on the Spiderplot.

The Pattern Scaling Active feature enlarges the size of the patterns for easier viewing

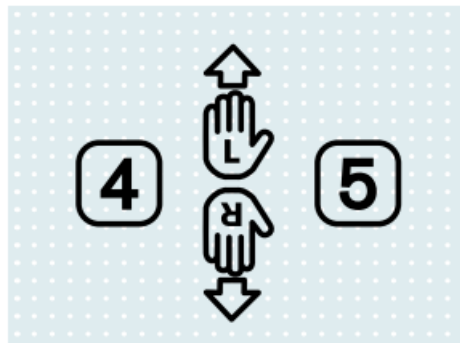


- Black electrode numbers indicate full functionality
- White electrode numbers indicate a signal disturbances e.g. missing skin contact or external influence. They will be turned off temporarily.
- Red electrode numbers indicate a malfunction or broken electrode.

Orientation of Myo Plus Cuff on limb



- Put on the Myo Plus Cuff so that the hand symbol is legible from the user's point of view.



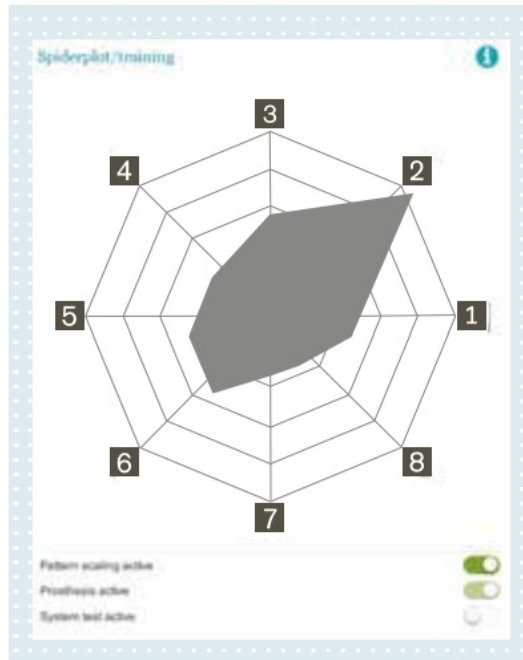
- Then rotate the Myo Plus Cuff so that the ulna is positioned on the indicated line between electrodes no. 1 and no. 8.
- In this orientation, electrode numbers increase in the medial direction.
- Electrodes 1-4 will be positioned over the extensors.
- Electrodes 5-8 will be positioned over the flexors.

First signal evaluation

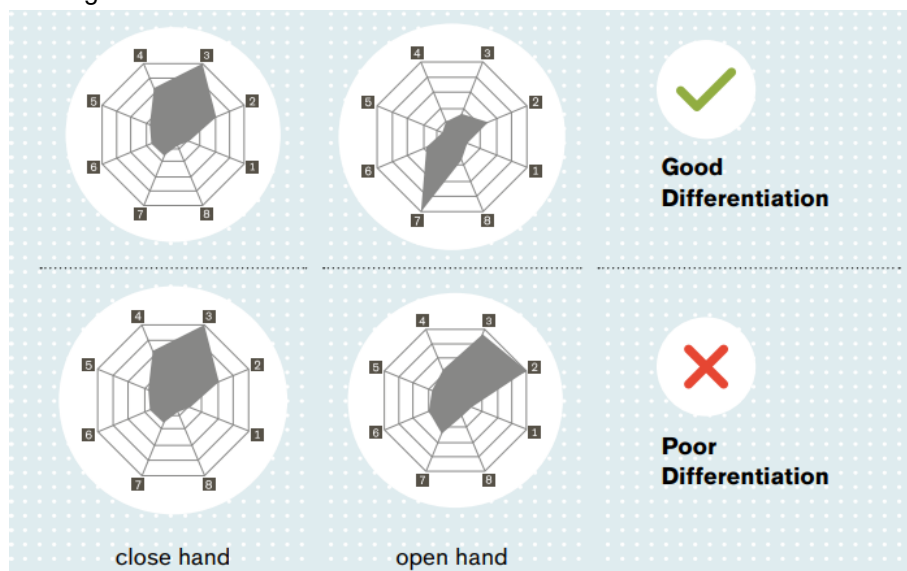
Before recording data, have a conversation with the user to determine what phantom limb motions they feel they can try to create. Have them do the same motion on the contralateral limb if they are a unilateral amputee.

To test and evaluate the muscle patterns in real time click the menu  Spiderplot / Training

By performing a movement with the phantom hand the corresponding muscle activities are shown in real time through the gray filled shape.



It is important that each pattern is clearly different from other patterns. If they are not, coach the user to try and recruit slightly different muscle activity. For example, consider having them lead pronation or supination with the thumb or small finger to recruit more muscle activity. The Pattern Scaling active feature enlarges the size of the patterns for easier viewing.




The number of necessary movement patterns depends on the planned prosthesis fitting

- e.g. a MyoBock hand with active rotation needs 4 patterns, open/close/pronate/supinate.

Prepare Test Set recording

Click on Basic Set in the main menu 



- Select pause time between recording sets; 4 seconds is default and a good choice for most users.
- For a test evaluation start with two recordings in the 90-degree bent arm position – by clicking on the green arrow  the recording page is displayed.


Depending on which components are chosen, a number of, movement patterns must be performed during the recording process

- Independently of the terminal device, three different movement patterns must be performed in order: relax, hand open, hand close
- With an active wrist rotation, two additional movement patterns must be performed in order: palm up, palm down.

Record Test Set



Press  button to begin recording

Tip: the recording can be paused with  and continued at any time.

Relax Phase

- Relax the limb during the Blue and Red phase.
- Complete relaxation is important so the system can recognize a baseline “quiet” setting for the user.

TIP: Activate the Spiderplot in the recording circle, as shown below in step 5, to verify that no muscle activity is occurring during relaxation.

Preparation Phase

- Relax the Limb and prepare for the next indicated movement.

Recording Phase



- Perform the indicated movement starting with a contraction from 0% at the beginning and constantly increasing up to 80% contraction strength.
- As the movement is performed, the red bars will start to fill in.

1. Repeat this procedure until all movements have been recorded

Tips: Scroll down and select Show Spiderplot instead of MotionClass will change the view for a better evaluation of an actual contraction pattern. By observing these patterns, you can guide the user in performing the contraction towards the indicated electrode position (1 to 8).

- After both recordings have been performed, make sure that both recording sets are selected.
- By scrolling down and clicking on Create test set , a test set is created from the recordings and stored temporarily in the Myo Plus Cuff.

WARNING

- When the Myo Plus Cuff is switched off the data will be erased from the cuff.
- The recorded sets are still stored in the Myo Plus App. If you intend to continue with the same patient you can create a set by selecting the previously recorded patterns and clicking Create test set.

Test reliability of the patterns

Now test the reliability of the control in real time in the menu  Spiderplot / Training



Each function in the prosthesis is assigned a colored outline, which can be seen by scrolling down below the Spiderplot.

- By performing a movement with the phantom hand, the corresponding muscle activities are shown in real-time through the gray filled shape
- By checking or unchecking individual motions, patterns can be removed or added to the Spiderplot to ease evaluation when necessary

If the user encounters problems during testing the recorded movements try the following

- The user may have produced an incorrect pattern during or after the recording
- Train the phantom movements with the user again, and try varying the individual patterns
- Simultaneously perform the movement with the contralateral hand
- Take a break to regain the user's concentration and relax possible muscle fatigue
- Record the patterns in the test set again.

By swiping to the left, the movement display will appear

- The red bar indicates current relative contraction strength
- The hand symbol indicates the movement pattern currently being detected.

TIP: A strong pattern is indicated by a solid appearance . A weak pattern would flicker between multiple

movement pictures.

Show Spiderplot



- Scroll down and select Show Spiderplot instead of MotionClass will change the view for a better evaluation of actual contraction pattern.
- If the user can perform the movement patterns without major difficulty, you can continue with the basic set recording.

Create Basic Set

The quality of the Basic Set is of great importance

The 'Basic set' interface shows a 'Pause time until next recording' slider set to 10 seconds. Below this, there are four arm positions: 'Arm bent 90 degrees', 'Arm hanging', 'Arm extended', and 'Arm extended'. Each position has two recording slots (Set 1 and Set 2) with green checkmarks and arrows indicating successful recordings. At the bottom, there are two green buttons: 'Creating a test set' and 'Creating the basic set'.

It creates the foundation for how the system operates and recognizes muscle activity patterns.

- Click on the arrows for the additional 2 arm positions.
- Arm Hanging and Arm Extended
- For each arm position, record 2 sets of data. When all 6 sets are checked, click on Creating the Basic Set
- A basic set can only be created when all 6 recordings have been made
- When using a interim prosthesis all 6 sets must be recorded.

Optional /Connect a Demo Prosthesis

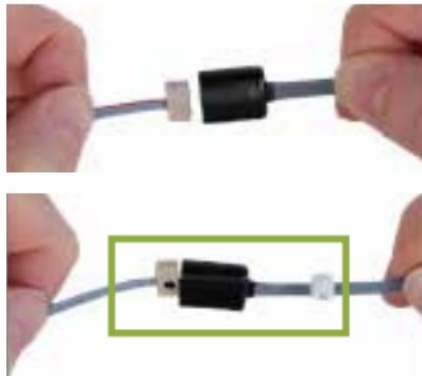
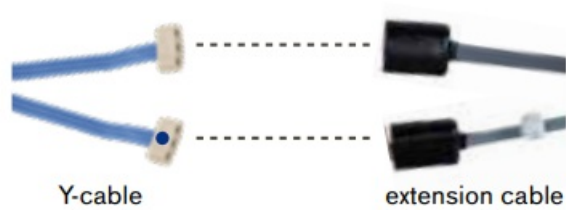
Connect the Myo Plus Cuff to the demonstration prosthesis



- Turn off the cuff and demonstration prosthesis. You will hear a beep.
- Place a MyoBock or bebionic terminal device in the wrist connection/lamination ring on top of the demonstration stand.
- On the cuff, open the button near electrode No. 3, gently pull out the 2-poled cable attached to the Myo Plus TR processor and close the button again.
-



Connect the 2-pole cable of the Myo Plus Cuff to the 2-pole socket of the extension cable.



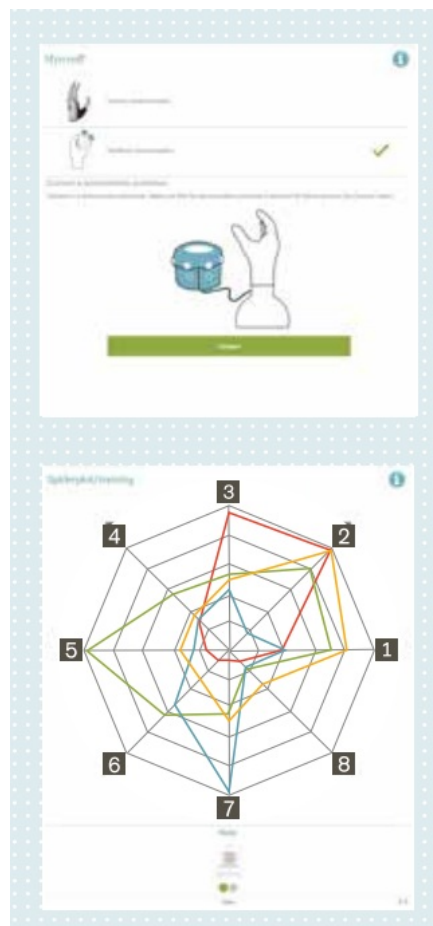
- Connect both plugs of the Y-cable of the Myo cuff to the free 3-pin sockets of the extension cable.


NOTE: Use silicone grease (633F11) before connecting!s Cuff to the free 3-pin socket of the extension cable.

TIP: The cable with the blue dot belongs to the port with a cable tie attached

Attention: Do not remove the cable tie!

Establish the connection

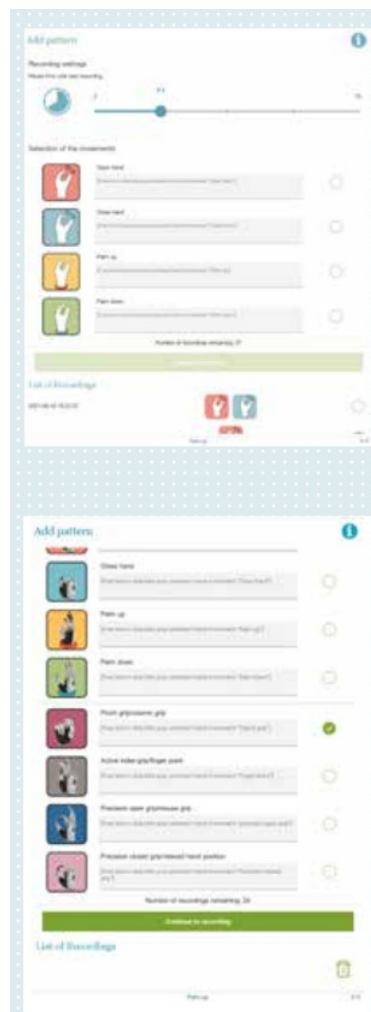



- It is important to switch the cuff on before starting the Myo Plus app.
- Do NOT turn on the demo dome yet.
- Switch on the Myo Plus Cuff, you will hear 2 short beeps and see a green light
- Start the Myo Plus App and establish a Bluetooth connection
- Login as a clinician
- Go to menu  and select Myo cuff , choose between bebionic and MyoBock device and click on Connect
- NOW switch on the demonstration prosthesis within 15 seconds.
- You will again hear 2 short beeps and see a green light.
- If the Myo Plus Cuff is connected to the demonstration prosthesis, the app switches to the main menu and select Spiderplot / Training
- Now the terminal device will perform the user's movement



Optional/ Additional Grip Patterns

Refine basic set pattern



- In the Add pattern menu  , additional recordings of hand open/close and palm up / palm down may be created
- This may be useful if the user finds that control for a certain function is not adequate in certain arm positions.

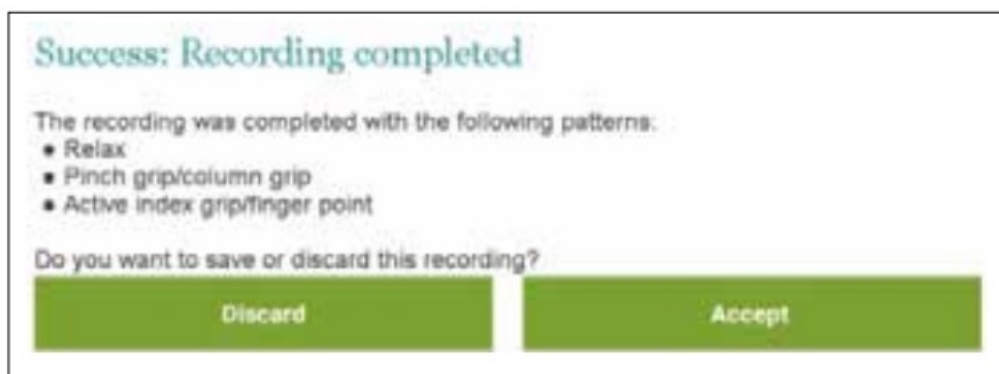
TIP: Click on the movement, then click Continue to recording to add additional movement of data with the arm in any chosen position.

To add additional grip patterns to the bebionic, click on Add pattern on the main menu 

- 8 grip functions may be added by creating 4 additional muscle patterns
- Depending on the position of the thumb – lateral or opposed – each additional pattern conducts 2 movements, e.g. active index grip / finger point
- These movement pairings are predetermined and cannot be modified.

TIP: Click on the grasp(s) to be added, then click on Continue to recording at the bottom of the screen.

After recording, the following message will appear



1. Click "Accept" to keep, "Discard" to re-record.



- In the “Add pattern” menu, additional recordings of hand open/close and pronate/supinate may be created
- This may be useful if the user finds that control for a certain function is not adequate in certain arm positions
- Click on the movement, then click “Continue to recording” to add additional layer(s) of data with arm in any chosen position

Only when logged-in as a clinician, the recordings can be locked so the user can not delete the recording

1. Select the checkbox until marks the desired recording
2. After logging out as a clinician, the recording is not erasable for the user.



List of recordings

The list of recordings can be found below the selection of movements.

- The list displays the basic set and the additional recordings and includes a time and date stamp. The icon indicates which grip patterns have been recorded
- These additional recordings can be deleted or locked.


TIP: To select one or more recordings for deletion select the checkbox.



- marks the selected recording for deleting
- To delete the selection, click on 
- Lock a recording from deletion by the user 

Adjusting settings



Go to the menu menu  and select Settings. Here you can adjust basic settings which are useful in daily use including:

- Speed of the hand and/or wrist rotator
- bebionic control method
- Glove donning mode active

Advanced Settings can also be accessed on the settings page.

Advanced settings allow for more precise adjustments, including



- Accuracy required when performing patterns
- Interference suppression to reduce any environmental interference or other causes of unintentional signal.

- Threshold value for sensitivity of how responsive the system is to EMG signals.
- Clicking “Reset advanced settings to default values” will change all values back to default settings.

A clinician can also

- Delete all patterns (which includes the basic set and any added patterns)
- Reset to factory setting, which will delete all patterns, and all settings will be reset to factory settings. The Bluetooth connections are also deleted and the app will be closed automatically.

Set to Default

- If you're using your system to evaluate more than one potential user, be sure to reset the system back to manufacturer's settings before testing a new user. Recordings cannot be stored and reloaded!

You can inquire a Myo Plus Cuff loaner set, through your local Ottobock contact. Additional information, including video tutorials, can be found on the Ottobock web site, YouTube, or by getting in contact with our technical support team.




Comprehensive information on the Myo Plus app is available here:

<https://www.ottobock.com/en/apps/myoplusapp/>



Discover the Ottobock Professionals YouTube channel: <http://videoguides.ottobock.com/myoplus>

Documents / Resources

	<p>ottobock Myo Plus Pattern Recognition [pdf] User Guide Myo Plus Pattern Recognition, Pattern Recognition, Myo Plus, User evaluation</p>
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References

-  [YouTube](#)

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