i-limb® hand user manual

We are pleased that you and your clinical team have decided that the i-limb® hand is the most appropriate prosthetic hand for your needs.

You may have discussed your functional goals with your clinical team. This manual, along with the training and support of your clinical team, should enable you to understand how your i-limb® hand will help you accomplish these goals.

⚠️ This symbol signifies important information and is used throughout the manual.

To ensure your manual is the most up to date refer to www.touchbionics.com/downloads/

Further training information and videos to assist you in getting the most from your i-limb® can be found at http://training.touchbionics.com/quantum-en.html
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1.0 i-limb® hand range overview

1.1 Features comparison

Touch Bionics i-limb® hand range offers multi-articulating technology with many benefits, including:

- Individually motorized digits
- Thumb rotation: powered/manual
- Conformable grip
- vari-grip® feature to apply more force when desired
- Automated grips
- Multiple control options for accessing grips
- Speed boost
- User software/apps
- Ability to personalize the prosthesis to your needs at initial fitting and as you become more experienced
- 4 hand sizes
- Touch screen (TS) feature

The i-limb® product range, combines unsurpassed functionality with style. Individually motorized digits, stall detection and the unique software used to control the i-limb® hands result in the most versatile prosthetic hands currently available to the global market.

The i-limb® hand offers compliant grip, shaping around objects to provide a secure grasp. Rotating thumb (powered or manual) in conjunction with a pulsing, enhanced grip (vari-grip®), an anti-drop safety feature (auto-grasp®) and the wide range of automated grip patterns lead to broad functionality.

Users can choose from a wide selection of automated grips and gestures to help complete their daily tasks. Grips can then be customized further for precise control.

The my i-limb® user software allows the user to interact with their i-limb® hand, to continue their training and adjust the settings to their daily requirements.

There are 4 hands available in the i-limb® range: i-limb® quantum, i-limb® revolution, i-limb® ultra and i-limb® access.
Each digit of the i-limb® hand has its own motor that allows the digits to move until they meet the object being grasped. This results in the i-limb® hand taking the shape of that object (compliant grip). Additionally the i-limb® hand can adopt specific automated grip patterns; these are accessed using various control options. The features and grips available on your i-limb® hand depends on the model of i-limb® hand which you have.

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<th>i-limb® revolution</th>
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<td>- Proximity control</td>
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<td>Grips available</td>
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<td>Speed boost</td>
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<td>Powered thumb rotation</td>
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<td>vari-grip®</td>
<td>✓</td>
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<tr>
<td>Natural hand mode</td>
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</tbody>
</table>

1.2 Control options for automated grips

Automated grips enable further precision in functional tasks. Particular digits are turned off with others remaining active. Additionally the thumb (when applicable) will automatically rotate to the optimum position for the desired grip.

Each i-limb® hand has a selection of pre-set automated grips.

The grips available to you will depend on which model of i-limb® hand you have. All grips available on your i-limb® hand are displayed on the quick grips® pages of your my i-limb® app.

my grips® are fully customizable grips, which you can set specifically to your individual requirements.

A full explanation of each of the automated grips and functional examples for each can be found on the online training module [http://training.touchbionics.com/quantum-en.html](http://training.touchbionics.com/quantum-en.html)

The i-limb® hand can access these automated grips using a range of control options, refer to features comparison table to see which control options are applicable.

Fig. 5: Control options of i-limb® quantum
**Gesture control**

Enables an automated grip to be accessed through a smooth motion of the prosthesis in one of four directions (forward, back, left or right). The grips programmed for each direction are customized to your requirements using the my i-limb® app.

To access gesture control:

- Hold i-limb® hand parallel to the ground (elbow bent to 90°)
- Maintain an open signal until index finger twitches
- Move the i-limb® hand (within 1 second) in direction assigned to the desired grip
- The i-limb® hand will adopt the grip
- To exit the grip hold an open signal until the hand exits the grip

Default setting for gesture control is hold open, however it can alternatively be accessed using cocontraction. This is changed using the my i-limb® app.

**App control**

An automated grip can be accessed at the touch of an icon on the my i-limb® app. These are called quick grips®. The i-limb® hand will exit the grip when the icon is tapped again or by selecting another grip icon to enter.

Speed boost is also available on the app using a simple slider bar. The increase in speed of the digits offers a more responsive action, more natural appearance and increased grip force potential.

**Muscle control**

Triggers are specific muscle signals that can be used to access an automated grip. There are 4 potential muscle triggers: hold open, double impulse, triple impulse and co-contraction.

**Proximity control**

Grip chips® are small Bluetooth® chips which can change the programming of the i-limb® hand when you position the hand near to the chip. The grip chips® can be positioned in practical locations to allow access to the optimum grip for particular tasks at that location. The individual grip chips® are programmed using the my i-limb® app, and can be reprogrammed at any time as required.
To fit the i-limb® hand you have had a socket made for you by your clinical team. They will have made this to ensure it is comfortable and fits directly onto your residual limb. You may experience some redness but this should not last for very long after you remove the socket. If the socket is causing you discomfort or affecting you using your i-limb® hand, then we recommend that you contact your clinician.

Initially, you and your clinical team will develop control of opening and closing your i-limb® hand, which will allow you to be able to carry out a wide range of functional daily activities.

Learning to use a prosthesis takes time and practice to gain control and master the best way to perform tasks with your prosthetic hand. Always start with simple activities and gradually increase the complexity as your skill levels and confidence grow. The pace at which each individual gains this control varies.

Relaxing is as important as opening and closing the prosthesis. If the control is unpredictable, try resting, making slower movements, supporting your prosthesis, or using your prosthesis in a position that is closer to your body. Ensure you take regular breaks, especially at the early stages to allow your muscles to recover and to avoid muscle fatigue.

To use your prosthesis safely and comfortably it is advisable to keep your back straight, try not to raise your shoulders, keep your elbow close to your body and avoid leaning or twisting motions or awkward positions of your trunk.

If you have a flexion wrist it can help you to perform daily life activities with reduced awkward movements. For example; flexing the wrist may help to bring the cup/glass/fork closer to your mouth.

An Occupational Therapist should help you to incorporate your prosthesis into your daily activities in the best way possible. It is recommended that you should undergo 20-30 hours of Occupational Therapy training to maximize your outcomes with your prosthesis.
2.1 Protection of your i-limb® hand

The i-limb® hand will not provide you with sensation and so you will not be able to feel heat and moisture. The i-limb® hand is for low to moderate impact activities. It should not be used for heavy lifting or be exposed to excessive forces or vibration. The i-limb® hand cannot absorb any shock as your own body is able to do. If high degrees of force are applied, you may cause damage to your i-limb® hand. If this does happen, then please contact your clinical team.

To best protect the hand when carrying objects, the weight should be distributed evenly across the digits as close to the knuckles and palm of the hand as possible rather than out on the tips of the digits.

The i-limb® hand is like any other electrical device so do not immerse in water and do not pour water over the device. When cleaning the covering use a damp cloth to remove any dirt.

- Avoid high forces particularly on the fingertips and on the side of the digits
- Avoid moisture, liquids, dust, high temperatures and vibrations
- Do not use to operate heavy machinery.
- Do not use under water
- Do not use for extreme activities that may cause injury to a natural hand

Push thumb to the side

Do not block the index finger from closing around thinner objects

Hold handles or similarly shaped objects securely in palm near the base of the fingers. Move the thumb to the side so that it doesn’t block the index from closing.

The object will be less secure within the i-limb® hand if the digits are not able to conform around its shape.
Hold objects close to palm with all fingers fully closed.

Do not hold objects with fingertips or side of the fingers.

Ensure all digits are fully closed around objects.

Position objects close to the knuckles when pulling/pushing.

Do not pull or push objects with fingertips.

Push up with fully closed fist with force at knuckles.

Do not push up on fingertips.
2.2 Charging your prosthesis

To charge your prosthesis you should remove it from your residual limb and turn it off. The on/off switch is pictured. i-limb® hand is off when switch is in left position.

2.2.1 Switch block or DC charge port

If you have an internal battery within your prosthesis and have a switch block or DC charge port:

To turn the power on/off
If using a switch block the power to the prosthesis can be turned on by pushing the switch away from the charge port. It is turned off by pushing the switch towards the charge port.

Charging the battery
Insert the charger into the power outlet. Insert the charger lead connector into the charge port. A “click” should be heard on connection.

The light display for the charger option 1 is:

- Solid Red: charging
- Solid Green: fully charged or idle
- Continuous flashing red: fault condition
- Rapid flashing amber: Threshold state between charging and fully charged (should only last for 1-2 seconds)
- Continuous flashing red or green: Connection Error. Remove charger lead connector from the charge port. Ensure charger is plugged in and switched on at the mains. Re-insert the charger lead connector into the charge port.

The light display for the charger option 2 is:

- Solid Amber: on standby
- Slow flashing amber: pre-charge mode
- Rapid flashing amber: Error
- Slow flashing green: maintenance charge
- Rapid flashing green: rapid charge
- Solid green: fully charged

Charging time: 90 minutes to 3 hours
A car charger is also available.
To remove the charger lead connector from the i-limb® hand, grasp the connector and pull directly away from the port. Consult Warnings and Precautions for additional information.

If you intend to travel outside of your home country you will need to ensure that you have a Touch Bionics charger that will work in the country to which you are traveling.

2.2.2 External Battery

If you have external batteries, remove the batteries from your prosthesis and insert into charger base unit. i-limb® Power Pack batteries for i-limb® hands should only be charged using the Touch Bionics battery charger supplied. Place the batteries in the charger as illustrated. Insert the charger lead from the battery powerpack into the charge port. Insert the charger into the power outlet.

On the underneath of the base unit the lighting sequence is outlined:

- Middle light on: Charger is plugged in
- 2nd and 5th lights blinking Green: Batteries are charging
- 2nd and 5th lights solid Green: Batteries are charged
- 1st and 4th Red lights on: Battery fault, unplug and try again. If lights continue to illuminate, contact your clinician.

Charging time: approximately 2 hours.

A car charger cable is also available

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⚠️ Do not pull cable to remove the lead.

⚠️ Only use supplied Touch Bionics charger to charge battery.

⚠️ Switch the hand OFF to preserve battery power when not in use.

⚠️ Replace the battery annually for optimal performance.
There are many approaches to daily activities which can be used; the best technique for you will depend on your level of absence and the function within your upper limbs. The following are examples of possible techniques for common daily activities which you may find beneficial.

3.1 Hold a cup/glass/pitcher

**Compliant grip:**

Benefits:

- Good for different sizes and shapes of containers due to the conformable grip
- Very stable due to the amount of surface area in contact with the object

Remarks:

- Ensure the palm of your hand is in contact with the object whenever possible

**Standard tripod closed:**

Benefits:

- Closed fingers under object prevent container from slipping downwards
- Reduced risk of dropping container if the hand is partially opened unintentionally

Remarks:

- Not as stable for tall and/or larger containers

3.2 Use of a handled object

**Cylindrical grip:**

Benefits:

- Strong grip
- Works for any type of tool handle
- Orientation of the handle within the hand can be varied to reduce awkward posture

Remarks:

- Guide the object in the correct position before closing your hand
- Best thumb rotation depends on the thickness of the handle
- This can be achieved by manually rotating the thumb or by selecting cylindrical grip
- Ensure thumb does not restrict index or middle fingers from closing around handle
3.3 Open bottle

The prosthesis is used to hold the bottle while the sound hand removes the lid.

**Compliant grip:**

Benefit:

- Strong grip of the bottle
- Fingers can conform around different shapes of containers

Remarks:

- When opening new container grip lower when breaking seal and open slightly before removing lid to prevent spilling

**Opening a bottle using two prostheses:**

One prosthesis is used to hold the bottle while the other prosthesis removes the lid.

**Tripod grip with thumb in semi-opposition:**

Benefit:

- Natural grasp
- Good strength of grasp

Remarks:

- Limited visibility on the lid
- Potentially awkward positions of the shoulder required to complete

**Grip with the ring and the little finger:**

Benefits:

- Better visibility on the lid
- Good strength of the grasp
- Less awkward position required to perform the task

Remarks:

- Less natural grasp

**Thumb park continuous/full hand:**

Opening the bottle can be achieved by pressing down with the palm on to the non-slip material and rotating.

Remarks:

- Less natural grasp
- Requires the use of non-slip material
3.4 Using a fork/knife

For safety, it is important to remove the fork/knife from the prosthesis as soon as you have completed the task. When using a fork establish the correct position by starting at your mouth to ensure it can be reached, and then go back to the plate.

Compliant grip:
With object between fingers and thumb rotated laterally
Benefits:
- Secure grip
- Allows for variable angles of the fork/knife
- Works well for thick or narrow handles
Remarks:
- Improper positioning may cause damage to the covering
- For a knife; blade must be positioned just above the knuckle

Lateral grip:
Benefits:
- Best grip for bilateral users. Allowing food to be picked up from the plate and brought to your mouth
- Works for all positions of the fork/knife pointing away or towards the plate
Remarks:
- Grip should be secured using vari-grip®
- The fork/knife may slide upwards in the i-limb® hand if too much pressure is applied

Positioning the fork/knife using two prostheses:
Position the knife handle against side of the hand above the knuckles.
Raise the handle away from the table by lifting the prosthesis slightly upwards, allowing the hand to be positioned below.
Close the fingers on the handle to slide the blade between the index and the middle fingers.
The final angle can be established when holding the knife in position by pressing down on a plate or table surface. Vari-grip® can then be used to secure the grasp.
For a fork the same technique can be used, or alternatively use your opposite hand to push on the fork teeth which raises the handle from the table and allows the other hand to move beneath.
3.5 Hold a plate

**Lateral grip:**

**Benefits:**
- Works well with small plates
- Less weight on the fingers

**Remarks:**
- Less stability for big plates as lack of surface of hand in contact

**Thumb park continuous:**

**Benefits:**
- Largest contact area, therefore more stable

**Remarks:**
- More risks of damage to the fingers in case of impact as the force will be directed into the fingertips

3.6 Writing

Depending on your hand dominance you may wish to try writing using your i-limb® hand. Writing can be successfully achieved but requires practice for it to become neat and with a smooth action. Movement of the shoulder/elbow will be necessary and the pen/pencil must be held securely within the i-limb® to avoid unwanted movement when pressing on the paper.

**Lateral pinch:**

**Benefits:**
- Allows the angle and the height of the pen to be adjusted

**Remarks:**
- Less stable

**Compliant grip with thumb rotated laterally:**

**Benefits:**
- Very stable

**Remarks:**
- Fewer orientations of the pen are possible

3.7 Putting on Jacket

To aid putting on a jacket or any clothing with a sleeve, it can be helpful to switch off the hand to avoid any involuntary movements of the hand. A plastic bag or smooth material over the hand can allow the hand to slide more easily through the clothing.

Alternatively, the hand could be removed from the prosthesis when putting on/removing the jacket and then replaced once the task is complete.
Thumb park continuous:
Benefits:
• Narrower width of the hand
Remarks:
• Position can be achieved with automated grip or by manually stalling fingers open
• The tip of the fingers can obstruct the passage of the sleeve if they fold into flexion

Hand fully closed with thumb rotated laterally:
Benefits:
• Fingers do not obstruct the passage of the sleeve
Remarks:
• Increases the width of the hand so can be difficult to pass through narrow sleeves

Example of donning a sleeve:

1. Hold collar with your prosthesis
2. Slide your sound hand through the wrist and up the jacket sleeve
3. With your sound hand now at the top of the sleeve, cover your i-limb® hand with your sound hand
4. Keep your sound hand covering your i-limb® hand, using gravity to allow the jacket sleeve to slide over your prosthesis
5. With your prosthesis now in your jacket you can put on the rest of the jacket
3.8 Carrying objects

Compliant grip with thumb rotated laterally:
Benefits:
• Very strong grip
• Natural grip
• The hand can be quickly removed from the object
Remarks:
• To prevent damage, position the handle close to the knuckles and not at the finger tips

Cylindrical grip:
Benefits:
• Natural grip
Remarks:
• Not possible to remove from the object for the hand without opening it
• Ensure fingers are closed fully around object to prevent it moving within the hand and potentially causing damage
• This can be achieved by manually rotating the thumb or by selecting cylindrical grip

3.9 Examples of activities aided by flexion wrist
4.0 Coverings

4.1 Covering options

Coverings are an important part of the appearance and durability of the i-limb® hand. The i-limb® should not be used without an approved cover.

Covering options for i-limb® hands include:

- **i-limb® skin active**: robotic shaped flexible silicone, matching the shape of the i-limb® hand. Available in clear and black.

- **i-limb® skin contour**: anatomically shaped flexible silicone with contouring around the digit tips. Available in clear and black.

- **i-limb® skin natural**: lifelike silicone with detailing of tones across palm and knuckles. Available in 18 skin tones.

- **i-limb® skin match**: fully customised silicone covering, exactly matching the users' skin tone and features.

**Touch screen (TS)**: feature allows you to interact with touch screen devices. Available on i-limb® skin active and i-limb® skin contour covers.
4.2 Covering don/doff

To don/doff i-limb® hand coverings the position shown in the image should be adopted and the hand switched off. The quick grip don/doff can also be used to achieve this position.

**Donning the i-limb® skin active, i-limb® skin contour and i-limb® skin natural cover:**

1. Align the covering with the fingers of the i-limb® hand and slide downwards
2. When the fingers are mostly donned, pull the thumb opening over the thumb
3. Slide the remainder of the covering over the i-limb® hand.
4. Ensure each digit tip is fitted to the covering
5. Do not pull the covering tightly over the hand

**Donning the i-limb® skin match:**

1. Spray the outer surface with isopropyl alcohol (IPA)
2. Invert the covering to the level of the finger openings
3. Ensure the fingers are straight and not bunched
4. Align the covering finger holes with the digits of the hand
5. Pull down onto digits of the i-limb® hand
6. Position thumb opening over thumb digit
7. Pull the covering over the remainder of the i-limb® hand being careful not to apply too much pressure over the thumb.
8. Inspect the covering for bunching and ensure the covering tips are fully fitted against the digit tips.
9. Check the function of the i-limb® hand and ensure full opening and closing is possible and the digit tips align.

Doffing for all covering types
1. Position the i-limb® hand in the same position as for donning and power off
2. Pull the covering upwards on each digit to release
3. Ease the full covering, being careful not to put too much pressure on the thumb
4. Continue to pull upwards until it is fully removed

4.3 Cleaning
The cover should be regularly cleaned on the outside with a damp cloth and a plain soap. Cleaning with isopropyl alcohol (IPA) once a week can help with disinfection. The cover or i-limb® hand should not be submerged in water for cleaning.

⚠️ Please note that your Touch Bionics prosthesis is not under warranty when it is used without an approved cover.

⚠️ Never put more than one covering on your prosthesis.

⚠️ Always ensure the covering is fitted properly.
5.0 Appendix

5.1 Frequently Asked Questions

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<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>Will I be able to move each digit individually?</td>
<td>No, while there are a number of customized grip patterns that will allow you to just move certain digits for pinching an object or making a certain gesture, you will not have individual control of each digit.</td>
</tr>
<tr>
<td>How long will it take to learn to use my i-limb® hand?</td>
<td>It varies from person to person. You should anticipate a learning curve. You have probably compensated to do activities without a prosthesis or learned to use a different device in the past. You must now train to best utilize the i-limb® hand and fully understand all the functional benefits. This process can take several months before use feels natural. 20-30 hours of Occupational Therapy is recommended. If you are struggling with specific tasks, talk to your clinical team or go to: <a href="http://training.touchbionics.com/quantum-en.html">http://training.touchbionics.com/quantum-en.html</a> to see if there are any videos demonstrating the activity you are struggling to complete.</td>
</tr>
<tr>
<td>How do I exit a grip?</td>
<td>Any grip can be exited by: 1. giving the same signal that was given to enter that grip e.g. if a grip is entered by selecting a quick grip on the app, select the same quick grip to exit. 2. giving the signal to enter an alternative grip 3. power cycling the hand</td>
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<tr>
<td>Can I use the i-limb® hand for sporting tasks?</td>
<td>Depending on the activity you are performing the i-limb® hand may not be the most appropriate. Talk with your prosthetist about your goals and what device may be best to help accomplish your goals.</td>
</tr>
<tr>
<td>My hand is beeping at me, what does that mean?</td>
<td>Three beeps in a row is the low battery warning signal. You should charge your batteries soon after you hear this warning.</td>
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<tr>
<td>My battery does not seem to last all day, what can I do?</td>
<td>The length of time you get between charges will depend on your use of the hand. For internal batteries, inside the prosthesis, it would be expected you would get a full day of use of your prosthesis. If the battery used to last all day and no longer does, you should talk to your prosthetist.</td>
</tr>
<tr>
<td>I had good control when I first got my hand, but now it seems like I drop items more easily, why is that?</td>
<td>Your muscle signals may have become stronger as you have been using them more. If you connect to my i-limb® you can see your signals on the graph. Contact your prosthetist to review your control and settings.</td>
</tr>
<tr>
<td>Why is gesture control not working?</td>
<td>Ensure the i-limb® hand is held parallel to the ground. Ensure movement is smooth and within one second of the index finger twitch. Ensure gesture control is turned on in the my i-limb® app.</td>
</tr>
<tr>
<td>What if the device gets wet in the rain?</td>
<td>You should avoid exposure to water. If it gets wet, dry it off as soon as you can. Always ensure your cover is free from holes, to avoid moisture getting into sensitive areas of the i-limb® hand. Treat your i-limb® hand as you would a cell phone and protect it from water.</td>
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<tr>
<td>How should I clean my i-limb® hand and how often?</td>
<td>You should clean your prosthesis and the cover of your i-limb® hand. Discuss with your prosthetist the best method for your socket based on the materials of it. A damp cloth with a mild soap (avoiding oils or chemicals) or baby wipes can be used to clean the cover. After using the restroom, you can wash your hands using a damp paper towel with soap. Avoid putting your i-limb® hand under running water.</td>
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5.2 General safety, warnings and precautions

i-limb® hand
Do not use without an approved cover.
Do not use under water.
Do not use to operate heavy/industrial machinery.
Do not use with machinery with moving parts that may cause personal injury or damage.
Users must comply with local regulations on the operation of automobiles, aircraft, sailing vessels of any kind and any other motorized vehicle or device.
Do not use for extreme activities that may cause injury to a natural hand.
Do not expose to excessive moisture, liquid, dust, vibration or shock.
Do not expose to high temperatures.
Do not expose to flames.
Do not use or expose to explosive atmospheres.
Do not disassemble componentry or modify in any way.
Maintenance, repairs and upgrades may only be performed by qualified Touch Bionics technicians and technical partners.
Do not use with a damaged cover.
Damaged covers must be replaced or repaired by a qualified Touch Bionics technician or technical partner.
Only approved Touch Bionics accessories and tooling may be used.
Do not use an i-limb® device to operate your mobile device whilst the mobile device is connected to a mains outlet, as this can affect EMG signal.
Failure to comply with the above guidelines will invalidate the warranty.

Batteries
Do not bend or exert excessive pressure on the battery.
Do not pierce the battery.
Do not disassemble.
Do not expose to high temperatures.
Do not incinerate batteries.
Do not alter battery terminal wires.
Do not short circuit the battery.
Do not store batteries inside a vehicle.
Dispose of batteries in accordance with US, European or local regulations.
Only use the appropriate Touch Bionics charger to charge Touch Bionics batteries.
If the battery has visibly ballooned or swelled:
• discontinue the charging process immediately
• disconnect the battery
• remove to a safe area
• leave and observe for 15 minutes
• replace with new battery
• do not re-use
• dispose of any leaking batteries in an appropriate manner

Failure to comply with the above guidelines will invalidate the warranty.
The i-limb® hand has the functional capability to assist a user with driving a motor vehicle however due to factors including the differences in world-wide driving regulations and the variations in the level of ability between users, Touch Bionics is unable to provide definitive advice in respect of a user with an i-limb® hand driving a motor vehicle.

Touch Bionics is aware that individuals have used the i-limb® to drive a motor vehicle and our recommendations prior to a user doing so would include the following:

- contacting the driving authority in your home location to obtain and understand the local regulations;
- working with the appropriate authorities to have your car modified to meet the local regulations for your respective disabilities as required;
- re-taking any mandatory driving test using your i-limb® hand to demonstrate your ability to operate a motor vehicle safely if required by local regulations;
- contacting your insurance provider and advise them that you will be using the i-limb® hand to drive a motor vehicle;
- ensuring that the device has a fully charged battery. Please note that the i-limb® hand will emit a low battery signal which will alert you if the battery requires to be charged;
- switching off the i-limb® hand. This is due to the possibility of involuntary muscle signals being generated; and
- moving the thumb into the lateral position to allow the i-limb® hand to be removed from the steering wheel without opening the hand.

It is entirely the user’s responsibility to seek confirmation that they are physically and legally able to drive using the i-limb® hand and to the fullest extent permitted by law. Touch Bionics shall under no circumstances whatsoever be liable to the user or any other party as a result of or in connection with a user with an i-limb® hand driving a motor vehicle.
5.4 Technical Information

### i-limb® hand

<table>
<thead>
<tr>
<th>Feature</th>
<th>Extra Small</th>
<th>Small</th>
<th>Medium/Large</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage</strong></td>
<td>7.4 V (nominal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. Current</strong></td>
<td>5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Battery Capacity</strong></td>
<td>Rechargeable lithium polymer 7.4 V (nominal); 2,000 mAh capacity; 1,300 mAh capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max hand load limit (static limit)</strong></td>
<td>40 kg/88 lbs (Extra Small)</td>
<td>90 kg/198 lbs (Small/Medium/Large)</td>
<td></td>
</tr>
<tr>
<td><strong>Finger Carry Load (static limit)</strong></td>
<td>20 kg/44 lbs (Extra Small)</td>
<td>32 kg/71 lbs (Small/Medium/Large)</td>
<td></td>
</tr>
<tr>
<td><strong>Time from full open to full close</strong></td>
<td>0.8 seconds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Device Weight (quantum and revolution)

- Note: Titanium digits add an additional 30g/0.07lbs per hand

<table>
<thead>
<tr>
<th>Class</th>
<th>Extra Small</th>
<th>Small</th>
<th>Medium/Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>QWD</td>
<td>472g/1.04lbs</td>
<td>512g/1.13lbs</td>
<td>528g/1.16lbs</td>
</tr>
<tr>
<td>WD</td>
<td>432g/0.95lbs</td>
<td>472g/1.04lbs</td>
<td>488g/1.08lbs</td>
</tr>
<tr>
<td>Flexion</td>
<td>572g/1.26lbs</td>
<td>612g/1.35lbs</td>
<td>628g/1.38lbs</td>
</tr>
<tr>
<td>Friction</td>
<td>467g/1.03lbs</td>
<td>507g/1.12lbs</td>
<td>523g/1.15lbs</td>
</tr>
</tbody>
</table>

### Device Weight (ultra and access)

- Note: Titanium digits add an additional 30g/0.07lbs per hand

<table>
<thead>
<tr>
<th>Class</th>
<th>Extra Small</th>
<th>Small</th>
<th>Medium/Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>QWD</td>
<td>432g/0.95lbs</td>
<td>468g/1.03lbs</td>
<td>478g/1.05lbs</td>
</tr>
<tr>
<td>WD</td>
<td>392g/0.86lbs</td>
<td>428g/0.94lbs</td>
<td>438g/0.97lbs</td>
</tr>
<tr>
<td>Flexion</td>
<td>532g/1.17lbs</td>
<td>568g/1.25lbs</td>
<td>578g/1.27lbs</td>
</tr>
<tr>
<td>Friction</td>
<td>427g/0.94lbs</td>
<td>463g/1.02lbs</td>
<td>473g/1.04lbs</td>
</tr>
</tbody>
</table>

5.5 i-limb® hand Information

**Hazardous Area Classification**

The i-limb® hand device is not intended for use outside the boundaries of the environments listed below. The customer or user of the i-limb® hand device should assure that it is not used in such environments.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum temperature</td>
<td>+70˚c</td>
</tr>
<tr>
<td>Minimum temperature</td>
<td>-40˚c</td>
</tr>
<tr>
<td>Hazardous Area Classification</td>
<td>Non Hazardous</td>
</tr>
</tbody>
</table>

5.6 Component Compatibility


5.7 Warranty

<table>
<thead>
<tr>
<th>Icon</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>📖</td>
<td>Consult instructions for use</td>
</tr>
<tr>
<td>☑️</td>
<td>Class II equipment – provides double isolation to protect against electric shock</td>
</tr>
</tbody>
</table>
| IP40 | Degree of protection – IP40  
Protection against penetration by solid particles with diameters larger than 1 mm. No special protection against penetration by water |
| SN | Serial Number  
The unique serial number for i-limb® quantum devices is a “M” with a 4 digit alpha/numeric number.  
The unique serial number for i-limb® revolution devices is a “R” with a 4 digit alpha/numeric number.  
The unique serial number for i-limb® ultra devices is a “U” with a 4 digit alpha/numeric number.  
The unique serial number for i-limb® access devices is a “A” with a 4 digit alpha/numeric number. |
| ❌ | WEEE Compliance |
| REF | Catalogue number |
| ⼑ | Manufacturer/Date of manufacture |
| 🐃 | European Conformity |