Glossary of terms

A

• auto grasp – The hand senses an accidental 'open' signal given by the user and automatically over-rides it with a 'close' signal. This prevents the unwanted dropping of objects if a spurious open signal is detected.

• auto-revert – This is a function of single-site alternating control, whereby the fingers revert to closing when given a signal regardless of whether the user's previous signal opened or closed the hand. The user can switch this off by changing the setting to 0, or select a delay of up to 15 seconds.

B

• biosim – The software program that allows the clinician to set up the i-limb or i-digits device.

C

• **Compliant grip** – Also known as a "conforming grasp." The ability for the i-limb or i-digits device to conform to the shape of the object that is being held. As the user grasps an object, each finger will stop moving after it senses resistance from that object. This "stall out" of each finger allows for a stronger grip as each finger conforms to the shape of the object.

• **Control Strategy** – This determines how the device responds to signals, and whether it is 'single site' or 'dual site' (either one or two electrodes, respectively). For examples of each control strategy, see 'dual site differential', 'dual site first over', 'single site alternating', 'single site voluntary close', or 'single site voluntary open'.

D

• **Dual site differential** – a control strategy for using the device in which the stronger signal (either 'open' or 'close') 'wins' and is listened to by the hand. The user can change between 'open' and 'close' without relaxing below the threshold each time resulting in quicker responses to muscle signals.

• **Dual site first over** – a control strategy for using the device in which the first signal to cross the thresh-old 'wins' and is listened to by the hand. The fingers will not change direction until both open and close signals go back down below the threshold.

E

• **Electrode** – component placed on the skin to pick up electrical signals given off by muscle activity. Either one or two can be used to control the device.

F

• **Favorite** – a feature/grip mode and associated trigger. This is found in the biosim and my i-limb mo-bile apps. A user can have up to four features/grasp modes and their associated triggers in a favorite. A user can create "Favorites" in the mobile app to assign the same trigger(s) to different features ac-cording to the activity. For example, the Hold Open trigger can be assigned to a

precision pinch feature when the Home Favorite is chosen, but the Hold Open trigger can also be assigned to the handshake feature when the Work Favorite is chosen.

- **Feature** – (or grip pattern) puts the digits into a preset position and determines which digits are 'active' and respond to a user's open and close signals and which are inactive. For example, in 'thumb precision pinch closed', the middle, ring and little fingers close and are not active, the thumb partially closes and is not active, while the index finger starts in the fully opened position and is active.

- **FSR** – a force sensing resistor (or touch pad) that senses pressure and uses this to send an open and/or close signal to the hand.

G

- **grip chip** – A small circular chip that can be used to activate any assigned feature via Bluetooth. The user can place grip chips in areas where specific grasp patterns are used and when the i-limb or i-digits is held within 6 inches of the grip chip, the assigned grip pattern will be activated. A user needs to be disconnected from their app to be able to connect with a grip chip. Note: The digits need to be stalled completely open and the hand cannot be in a grip pattern for a grip chip activation to be successful.

- **Gain** – The measurement of the sensitivity of an electrode. Increasing the gain amplifies the muscle signal and decreasing the gain reduces the muscle signal. It can be adjusted with the dial on the electrode (physical gain) or in the biosim software (internal gain).

- **Grip Pattern** – (or feature) puts the fingers in a preset position and determines which fingers are 'active' and respond to a users' open and close signals. For example, in 'thumb precision pinch closed', the middle, ring and little fingers close and are not active, the thumb partially closes and is not active, while the index finger starts in the fully opened position and is active.

H

- **Handshake** – the Bluetooth transmitter that plugs into the computer's USB port and enables communi-cation of the device with biosim.

I

- **i-limb skin active TS** - A version of covering with a conductive tip for the index finger which allows for use with touch screens.

L

- **Lateral thumb position** – A position in which the thumb is fully rotated away from the palm. This posi-tion allows for a Lateral Pinch, also known as a Key Pinch.

- **livingskin** – life-like passive cosmetic prosthesis.

M

- **my grips** – a custom finger position in which the user determines a preset position for the fingers, as well as whether they are responsive to open and close signals (or which fingers are 'active').

- **Myosite** – a location on the patient's arm on which an electrode is placed that controls the open and/or close signals sent to the fingers.

- **Myotesting** – a process to measure the strength and control of muscles when determining viable sites for electrode placement.

N

- **Natural gloves** - A version of hand coverings with a more life-like appearance to match the individual's skin tone.

- **Natural Hand Position** – a user-determined, preset positioning of the fingers that occurs after a user-determined 2-30 second period of inactivity. The fingers need to be fully stalled open to enable this, and the 'natural hand position' mode needs to be selected in 'global options' under the 'features' tab.

O

- **Opposition** – See "Thumb Opposition"

P

- **Precision pinch** – also known as Tip Pinch, this thumb tip to index tip pinch allows for precision with fine motor tasks. This grip pattern is achieved when the thumb actively opposes the index finger and the middle, ring, and small fingers remain static in either flexion or extension.

- **Proportional Control** – The ability to control the speed of the hand by controlling the strength of the signal; a stronger muscle signal allows the hand to move faster and, conversely, a weaker muscle signal allows the hand to move slower. This is used for more delicate tasks. This skill is necessary for the user to avoid crushing crushable objects by allowing them to gently grasp the items.

Q

- **quick grip** – a means of quickly accessing a grasp pattern when using the mobile app. *This is only available with the i-limb ultra revolution. When the user connects to the mobile app, the quick grips screen is opened and the desired grasp is chosen by tapping the icon. The hand will remain in that grasp pattern until the user taps the same icon, taps another quick grip icon, or activates a trigger.

- **Quick Wrist Disconnect (QWD)** – this port allows for rapid detachment of the i-limb hand from the socket. Other terminal devices can be used in this port as well if applicable to the patient.

R

- **Re-grip timeout** – This determines how long a user using 'single site alternating' control has to wait before they can reverse direction of the fingers.

- **Rotate thumb on exit** – this sets the thumb in the opposition position in the palmar plane of the index finger after exiting a grip.

S

- **Single site alternating** – a control strategy employed when only one adequate muscle site can be found therefore only one electrode is detecting muscle activity. The user controls the 'open' and 'close' by alternating the same muscle contraction. The signal must go above the threshold to have the digits move in one direction and then the signal must return below the threshold before the user can send an-other signal to move the digits in the opposite direction. The user can still

achieve proportional control and only one trigger, 'hold open', can be assigned to a feature/grasp mode.

- **Single site voluntary close** - A control strategy employed when only one adequate muscle site can be found, therefore only one electrode is detecting muscle activity. The hand is fully opened at rest (when the muscle is relaxed) and will only close when a signal goes above the threshold. The user must maintain the muscle signal above the threshold as long as he/she wants to keep the hand in the closed position.

- **Single site voluntary open** – a control strategy employed when only one adequate muscle site can be found, therefore only one electrode is detecting muscle activity. The hand is fully closed at rest (when the muscle is relaxed) and will only open when a signal goes above the threshold. The user must maintain the muscle signal above the threshold as long as he/she wants to keep the hand in the open position.

- **Socket** – joins the users' residual limb to the prosthesis. It is made up of an interface attached to a frame. If the user is missing a full hand, the i-limb hand is connected to this frame or, if the user has a partial hand, i-digits are mounted on the frame.

- **Stalling a digit** – this is accomplished by providing resistance (approximately 6.7 lbs) to a digit while opening or closing the hand. For example, if a user wants to achieve an index point position they can provide resistance to the index finger while closing the hand.

T

- **Threshold** – The minimum level of signal strength needed before the hand will respond to commands. It is seen as the bold line near the bottom of the myotesting graph in the biosim or my i-limb apps. It is an adjustable setting. The hand will react to any signal above the threshold and ignore all signals below the threshold.

- **Thumb opposition** – the position of the thumb when it is directly in line with the index finger as in a pinch.

- **Trigger** – A specific muscle signal given by the user which accesses a feature (or grip pattern). The user pairs the trigger with a feature within biosim or my i-limb ap. For example, the user can pair the 'hold open' trigger with 'lateral grip'. The user then gives a strong, sustained 'open' signal to the hand which then sets the fingers in 'lateral grip' mode.

- **Tripod** – Also known as a 3-Jaw Chuck, this grip pattern is achieved when the thumb actively opposes the index and long fingers and the ring and small fingers remain static in either flexion or extension.

V

- **vari-grip** – this describes the variable grip force the user can give the hand when sending a close signal. A ratcheting sound accompanies this feature to let the user know they are utilizing it. This can be employed in any grip mode.

- **virtu-limb** – used for myotesting and pre-prosthetic training. An i-limb hand on the virtu-limb for assessing the user's control.