

## Adaptive Limb and Communication Device FCC Test Instructions

### Adaptive Limb Modes of Operation for Test Purposes

1. Simulation of normal walking, activated by initiating the Test Mode on the limb as described below.
2. Communicating with the Communication Device, activated by setting up a communication link as described on the next page.
3. Independent continuous transmission, activated by initiating Continuous Transmission Mode on the limb as described below (**this mode has been specifically added for test purposes to assist with set up and is not a valid mode for a limb in normal configuration**).

### Adaptive Limb Test Mode Features

The test mode drives the stepper motor and the dc motor in a predetermined repetitive sequence. Whilst this sequence is being followed the red LED flashes on and off at one second intervals.

Note: the LED has been included for test purposes only and is not part of the normal limb configuration.

If the sequence is disrupted, e.g. a microcontroller reset, then the LED will stop flashing. Test mode can only be re-initiated by reselecting the Test Mode using the buttons on the circuit board located in the knee as described below. The force and swing sensors are also monitored for adverse changes. If such a change is detected the LED is flashed rapidly for 2 seconds then returns to the normal flash rate indicating continuation of the test sequence.

**Note: on completion of a given test, particularly overnight, to save battery power press and release the lower button on the circuit board located in the knee and confirm that two beeps only are heard.**

### Initiating Test Mode on the Limb

1. Press and release the lower button on the circuit board located in the knee.
2. Wait for **two beeps** to sound.
3. Press and release the upper button on the circuit board located in the knee.
4. **Three beeps** should be sounded to confirm that the test mode has been activated.
5. The red LED will flash rapidly for 2 seconds then flash on and off continuously, where the on and off period is one second.

### Initiating Continuous Transmission Mode on the Limb

1. Press and hold the upper button on the circuit board located in the knee.
2. Press and release the lower button on the circuit board located in the knee.
3. Wait for **two beeps** to sound.
4. Release the upper button
5. **Four beeps** should be sounded to confirm that the continuous transmission mode has been activated.

Transmission can be confirmed by selecting Transceiver Test as described below.

1. Power on the Communication Device and press the right arrow key to select **ADVANCED SETUP**.
2. Step down the **ADVANCED SETUP** menu using the down arrow key until **DIAGNOSTICS** is highlighted. Then hit the select key (marked with a black circle).
3. Step down the **DIAGNOSTICS** menu using the down arrow key until **TRANSCIVER TEST** is highlighted. Then hit the select key.
4. Press the right arrow key to display the **NEAREST** channel.
5. If the limb has been set to continuous transmission mode correctly then channel 1 will be selected and **RX COUNT** will continually increment.

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### Communication Device Modes of Operation for Test Purposes

1. Communicating with the Adaptive Limb, activated by setting up a communication link as described below.
2. Independent continuous transmission, activated by selecting Transceiver Test on the Communication Device for a chosen channel as described below.

### Setting Up a Communication Link between the Communication Device and the Limb

The limb can be monitored with the Communication Device during test mode. If program mode is selected via the Communication Device then test mode is terminated and can only be re-initiated using the buttons on the circuit board located in the knee as described above.

1. Initiate test mode on the limb as described above.
2. Power on the Communication Device and press the right arrow key to select **ADVANCED SETUP**.
3. Step down the **ADVANCED SETUP** menu using the down arrow key until **DIAGNOSTICS** is highlighted. Then hit the select key (marked with a black circle).
4. Step down the **DIAGNOSTICS** menu using the down arrow key until **VALVE CHECK** is highlighted. Then hit the select key.
5. The **VALVE CHECK** screen should now be displayed with 2 empty scales, one for the hydraulic valve and one for the pneumatic valve.
6. Press and hold the upper button on the circuit board located in the knee until moving bars are displayed on the hydraulic and pneumatic valve scales. Now release the upper button on the knee.

The moving bars represent the positions of the dc motor (hydraulic valve) and stepper motor (pneumatic valve). When in test mode these bars show how the motors move according to the predetermined repetitive sequence.

### Initiating Continuous Transmission Mode on the Communication Device

1. Power on the Communication Device and press the right arrow key to select **ADVANCED SETUP**.
2. Step down the **ADVANCED SETUP** menu using the down arrow key until **DIAGNOSTICS** is highlighted. Then hit the select key (marked with a black circle).
3. Step down the **DIAGNOSTICS** menu using the down arrow key until **TRANSCIVER TEST** is highlighted. Then hit the select key.
4. Ensure **CHOSEN** is highlighted (press the left arrow key to select **CHOSEN** if it isn't selected already).
5. If selected correctly **TX DATA** will increment, **RX DATA** will remain blank and **ERRORS** will increment with **TX DATA** (but will remain at 255 when this count is reached whilst **TX DATA** increments from 0 again).

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### Additional Notes

#### Audio Indications

##### **A) Audio Indications that Occur Automatically in any Mode**

- **2 beeps** – indicates that an involuntary reset has occurred which disables the pneumatic and hydraulic controls.
- **1 short beep every 15 seconds** – indicates that the battery supply is low and that the batteries should be replaced/recharged as soon as possible.

##### **B) Audio Indications that Occur Automatically in Program Mode Only**

- **Very fast repeating beeps for 2 seconds** – indicates that the limb has been in program mode for 3 minutes without receiving a valid command from the Communication Device. If a valid command is not sent within the next minute the beep sequence will sound again and then the limb will automatically exit program mode, confirmed by 2 long beeps, erasing any program settings made during the current session.

##### **C) Audio Indications Initiated by Pressing and Holding the Upper Button on the Knee**

- **1 short beep every second** – confirms that the pneumatic and hydraulic controls have been disabled as a result of a basic reset.
- **Very fast repeating beeps** – indicates that the battery level is ok.
- **2 medium beeps a second** – indicates that the battery level is starting to reduce but still usable.
- **1 long beep a second** – indicates that the battery level is low but still usable. The battery should be replaced/recharged as soon as possible.
- **1 continuous beep** – confirms that the battery has failed or that safety mode has been set.