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# Operation Manual

## PLLM\_Touch

March 2017

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**Portable Limb Load Monitor with Touch Screen  
for Audio / Visual Feedback on Weight-Bearing**

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## Indications and Intended Use

Ultra thin weight sensing forefoot and heel pads give reliable and accurate feedback on weight -bearing during gait, standing, sit to stand and reaching activities.

Conditions assisted by the PLLM\_Touch may include the following: Acquired Brain Injury, Cerebral Vascular Accident (stroke), Parkinson's disease as well as most conditions which affect the Central Nervous System. The treatment groups could include amputees and those required to partially weight bear while recovering from orthopaedic surgery.

## PLLM\_Touch Standard Unit

**If you have ordered the PLLM\_Touch Standard Unit you should have the following:**

Operation Manual  
Control Unit with screen and stylus  
Pouch with strap (for holding Control Unit)  
Node (for wireless transfer data from sensor pads to Control Unit)  
Ankle strap for holding Node in place  
Forefoot sensor pad and heel sensor pad  
Insoles – 3 sizes - for holding sensors in correct position  
Mono headphone  
2x 9v Lithium UltraLife batteries (included)

## PLLM\_Touch Deluxe Unit

This unit includes everything that is in the standard unit plus a Data Logger that will log weight-bearing data from the two sensor pads.

## Before you start

- When storing or using this device, do not allow it to come into contact with liquids or intense heat. This may damage the unit and its accessories. Smoke and overheating could result from contact with liquids.
- This device is not single use and is for commercial use only. Each device comes with its own serial number (#).

## Specifications Control Unit

### General

Rated power source	9v DC
Format	Battery PP3
Max current consumption	92mA
Dimensions (L x W x H)	141 x 81 x 40 mm
Weight	266g

## Specifications Node (wireless unit)

### General

Rated power source	9v DC
Format	Battery PP3
Max current consumption	70mA
Dimensions (L x W x H)	115 x 69 x 28 mm
Weight	115g

## Use and care of the two units

### Installing the battery

- Slide back panel at rear of each enclosure and attach the 9V battery clip to the battery.

## Caution

- Use one Lithium UltraLife battery in each unit (batteries are available through nCounters)
- Remove the battery if the units will not be used for a month or longer.
- If the battery is incorrectly replaced, the units will not function.
- In the event of battery leakage, wipe the units completely clean and install a new battery.

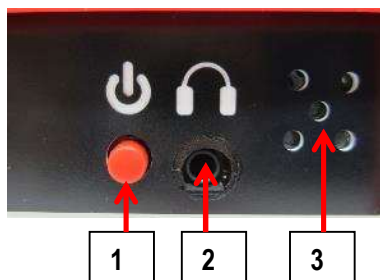
## Cleaning

- All surfaces of this system are non porous and should be cleaned / disinfected between each patient.

## Operating the Control Unit

What's what?

Front of the Control Unit



1. **On / Off Button**  
Single press - on / off
2. **Headphone Socket**  
Insert only nCounters supplied mono headphone into this socket.
3. **Speaker**

There are **separate touch screen controls** to adjust the **volume** for the speaker and headphone.

Top of the Control Unit



4. **Four LEDs**  
Two yellow and two red LEDs indicate how far the patient is above / below target.  
No lights indicate that target has been achieved.  

<b>A</b>	<b>LED Yellow 1:</b>	0-5 under / over target
<b>B</b>	<b>LED Yellow 2:</b>	6-10 under / over target
<b>C</b>	<b>LED Red 1:</b>	11-15 under / over target
<b>D</b>	<b>LED Red 2:</b>	16+ under / over target

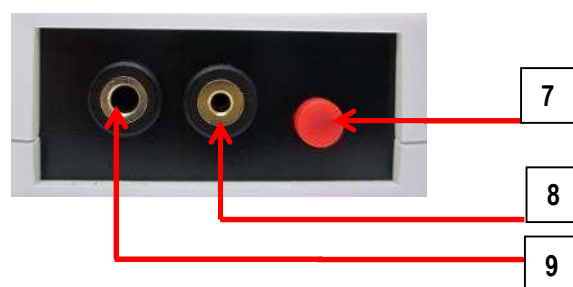
At the end of a training session, a **four column bar graph** represents the number of seconds each LED was "on" giving immediate feedback to patient and therapist on overall performance.

5. **Graphic display screen**
6. **Reset Button**  
Use with pin to press switch inside unit if program becomes "frozen"

## Operating the Node (wireless unit)

What's what?

Front of the Node (wireless unit)



7. **On / Off Button**  
Single press - on / off. Turning off the Control Unit turns off the Node.
8. **Heel Socket**  
Plug from heel sensor pad is inserted here.
9. **Forefoot Socket**  
Plug from forefoot sensor pad is inserted here.

**Different sized sockets ensure that the sensor plugs are fitted into the correct socket.**

Top of the Node (wireless unit)



Flashing yellow LED means the Node is communicating with the Control Unit.



Firmly attach Node to ankle strap using Velcro™

## Accessories

### Headphone



To be plugged into socket on Control Unit

### For audio feedback –

- **lower pitch** indicates patient is getting **closer** to target.
- **higher pitch** indicates patient is getting **away** from target.

### Insoles

Three different sized insoles are provided for holding forefoot sensor pad and heel sensor pad in place.

Sizes: Small, Medium, Large



### Sensor Pads

Two sensor pads for detecting weight



**Forefoot sensor pad** – place “X” directly under ball of foot and use Velcro™ to secure pad in correct position.

**Heel sensor pad** – place “X” directly under heel of foot and use Velcro™ to secure pad in correct position.

These sensor pads are positioned on the appropriately sized insole and plugged into the Node.

## Pouch with strap

### For attaching Control Unit to patient

Attach strap to pouch as shown below.

Place pouch on patient ensuring it is safely and securely in position – lengthen strap as desired.

Alternatively, the pouch can be attached to the belt worn by the patient by using the belt strap at the rear of the pouch.

Once the therapist has finalized the patient settings, the Control Unit is inserted securely into the pouch. The patient and therapist will still be able to receive feedback from the LEDs and access the headphone / speaker.



*Control Unit Pouch*



*Attached using belt*



*Control Unit in position*



*Attached using strap*

## Ankle Strap

For securing Node (wireless unit) to ankle using Velcro™



*Ankle Strap*



*Node attached to strap at ankle*

## Instructions: Using the PLLM\_Touch to provide feedback on weight-bearing

To obtain accurate results and maintain comfort we recommend that the patient wears shoes with an insole that can be easily removed such as runners / sneakers.

### Positioning the forefoot sensor pad and heel sensor pad on the insoles and connecting the Node.

1. Choose an nCounters' insole that fits easily into the patient's shoe. If there is already an insole in the patient's shoe it is a good idea to remove it.
2. The sensor pads can be moved along the insoles to ensure the correct position. Securely attach the sensor pads to the insole by using the Velcro™.
3. **For forefoot sensor pad** place 'X' under the ball of patient's foot and then attach the pad via the Velcro™ to the insole.
4. **For heel sensor pad** place 'X' directly under the patient's heel and then attach the pad via the Velcro™ to the insole.
5. Insert the nCounters' insole with the two sensor pads into the patient's shoe. Then place the patient's foot inside the shoe on top of the sensor pads. Wrap the ankle strap round the ankle.
6. Plug the forefoot sensor pad lead and heel sensor pad lead into the Node. The sockets are clearly marked.
7. Attach the Node to the ankle strap using the Velcro™ .
8. Then ask the patient to transfer weight through the sensors for approximately 30 seconds to condition the sensors.

**For the best result, DO NOT turn the Node (wireless unit) on until after the patient has "conditioned" the sensors in the foot pads**

9. The forefoot sensor pad or heel sensor pad can be used separately. For example if you are trying to encourage weight through the heel.
10. **Position the pouch** safely and securely onto the patient using the strap as shown on page 4. The Control Unit is only inserted into the pouch after the settings have been finalized by the therapist.
11. The patient's shoe with the sensor pads should be standing on a set of bathroom scales, until the scales display the desired weight
12. **Turn on**  
**FIRST** the Node with a single press of the on / off button.  
**NEXT** turn on the Control Unit with a single press of the on / off button  
**Welcome Screen** appears:



Figure 1: Welcome Screen

Then you are asked if the patient has walked on the sensor pads. If the answer is "no" it is best to turn both units off (by pressing the on / off button again) and encourage the patient to transfer weight through the sensor pads for approximately 30 seconds and start again from Step 12.

### 13. No Sensor

If no sensor has been detected it means you have not turned on the Node and your Control Unit will turn off after displaying "No Sensor".



Figure 2: "No Sensor" Screen

14. **Sensors connected**

If the sensors have been discovered you will see displayed "Joined Heel and Forefoot".



Figure 3: "Confirmation" screen

15. **Understanding the mode**

**Inv (inverse) or Nor (normal) mode**

**Inv mode** means the patient gets feedback when their weight to their affected limb falls below the target – use this mode to **encourage** weight - bearing.

**Nor mode** means the patient gets feedback when their weight to their affected limb is above the target – use this mode to **discourage** weight-bearing.

The next screen (Figure 4) appears so therapist and patient may choose to use either **Inv** or **Nor** mode.

16. **Select Mode and Set Level**

Once the mode has been selected and the correct weight is put through the scales, press the "Level" button and feedback will be given in consideration to this weight. Once this level has been received by the Control Unit the words "Got it", will briefly appear on the screen (Figure 4).

**NB Inv (inverse) mode is the default setting**

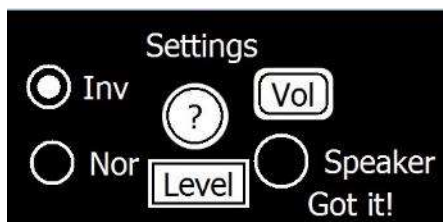


Figure 4: "Mode and Level Settings" screen

17. **"?" Help Screen**

**If in doubt about any of the functions of any of the keys on any of the screens press the '?' button for further information.**

For example Figure 5 is the help screen for "Mode and Level Settings":

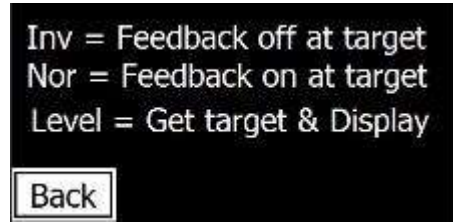


Figure 5 "Mode and Level Settings Help" screen

18. **Adjust Level**

The next screen (Figure 6 "Main" Screen) appears and shows what the value of the level is and gives the therapist an opportunity to adjust the level up and down as required.



Figure 6 "Main" Screen

The adjusted level will change when the plus or minus buttons are touched. To activate the new level you must press "OK" otherwise the change will have no effect.

19. **Audio Feedback / Headphone**

Audio feedback is always on via headphone. **Plug in only the headphone that came with your device into the headphone socket on the Control Unit.** It will automatically detect your headphone has been plugged in and "HP IN" will be displayed.

20. **Adjust volume**

Pressing the "Vol" (Volume) button allows therapist to increase and decrease the volume for the headphone and speaker. Just press on "Vol" if you want to change the volume on the headphone or press speaker button if you want to change volume on speaker. If you want to go back to the "Main" screen press "Result".

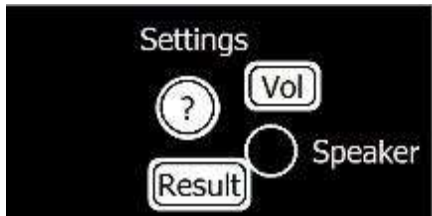


Figure 7 "Audio Source" screen

Use this screen (Figure 7) to select audio source. Audio feedback is always on via headphone. If "Vol" is selected you will taken to Figure 8 "Headphone Volume" screen to adjust to adjust Volume for the headphone.

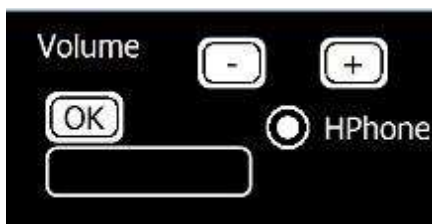


Figure 8 "Headphone Volume" screen

Press "OK", once Volume is at correct level. to take you back to "Settings" screen (Figure 7) then press "Result" to go back to "Main" screen (Figure 6).

### 21. Selecting and adjusting Speaker Volume

By pressing the Speaker button on "Audio Source" screen (Figure 7) you will turn on the speaker and go to "Speaker Volume" screen (Figure 9) and adjust volume for the speaker.



Figure 9 "Speaker Volume" screen

Press "OK", once Volume is at correct level. to take you back to "Settings" screen (Figure 7) then press "Result" to go back to "Main" screen (Figure 6).

### 22. Turning off the Speaker volume

Return to the "Audio Source" screen (Figure 7) and ensure the Speaker button is "unchecked".

### 23. Feedback

The patient will now be receiving **audio feedback** either via speaker and / or headphone.

#### Understanding the four LEDs:

Also 4 LEDs will light up the side of the Control Unit depending on how far "under / over" the patient's weight -bearing is from the target.

LED **Y1** Yellow 1: 0-5 under / over target

LED **Y2** Yellow 2: 6-10 under / over target

LED **R1** Red 1: 11-15 under / over target

LED **R2** Red 2: 16+ under / over target

**No lights indicate that target has been achieved.**

Once your session has finished, press the on / off button on the Control Unit and the following "Error" screen will appear (Figure 10). The Node will be turned off (the yellow LED should stop blinking).

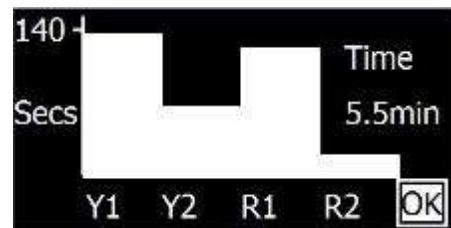


Figure 10 "Error" screen

### 24. Understanding the "Error" screen

This screen comes on when the therapist presses the red button to turn unit off.

The number shown at top of screen (in this instance 140 secs) changes, as this number is the maximum number of errors in seconds made for any one LED.

The graph indicates number of seconds each LED was "on" for and that is error time.

The time is the total session time in minutes.

### 25. Turning off the Control Unit

Press "OK" on the "Error" screen to turn Control Unit off. The "Goodbye" screen (Figure 11) will appear and allow the unit to turn itself off.



Figure 11 "Goodbye" screen

## Using the PLLM\_Touch to discourage weight-bearing

**Nor mode** means the patient gets feedback when their weight to their affected limb is above the target – use this mode to **discourage** weight-bearing

To do this everything is the same as for encouraging weight-bearing, until the therapist reaches Step 16.

At Step 16 the therapist selects "**Nor**" on the: "Mode and Level Settings" screen Figure 4. Then the patient will receive feedback whenever the weight through the forefoot and heel sensor pads exceeds the threshold set by pressing the "Level", button.

## Troubleshooting

If the two units stop communicating the Control Unit will turn itself off and display "**Transmit Error**", and you will have to turn off the Node (wireless unit).

Probable causes for "**Transmit Error**":

- **Low Battery**
- Two units are **out of range**
- An **object between** the two units is **disrupting transmission**

Transmit errors usually occur early on, when patient is beginning to receive feedback.

To conserve power try to ensure that the Level button is pressed soon after it appears.

## Warranty

- This device comes with a 12 month warranty on parts from date of purchase.
- Wherever possible a replacement unit will be provided while yours is being repaired.
- **Free** firmware and software upgrades are available for the first 12 months of purchase

## Returns / Repairs Policy

All items for return or repair must have a returns number given by nCounters attached to it.

Items should be sent to:

### nCounters

PO BOX 2336  
KEW VICTORIA 3101  
AUSTRALIA

**Did you know, nCounters now has a portable Data Logger to record data while your patient is walking. The data can be imported and displayed in Excel using nCounters' easy to use software.**

**The Data Logger uses the same sensor pads and insoles as for your PLLM\_Touch.**

**The Data Logger is another useful tool to motivate your patients to reach their treatment goals faster.**

### Visit our website:

[www.ncountersonline.com](http://www.ncountersonline.com)

For tips on different ways of using the PLLM\_Touch and for any updates on products or services to complement your device from nCounters.