



PLMS Analysis Software

Getting Started Guide

Document Reference: 30176
Version: 1.0.23
Date of current revision: 04/12/2019



The MotionWatch is a Class I Medical Device (EU)

Please refer to the PLMS Analysis Software User Guide for more in depth information about the use of this software.

**REGULATORY AND SAFETY INFORMATION FOR THE MOTIONWATCH
PRODUCT CAN BE FOUND IN THE USER GUIDE.**

Document revision history located at end of document

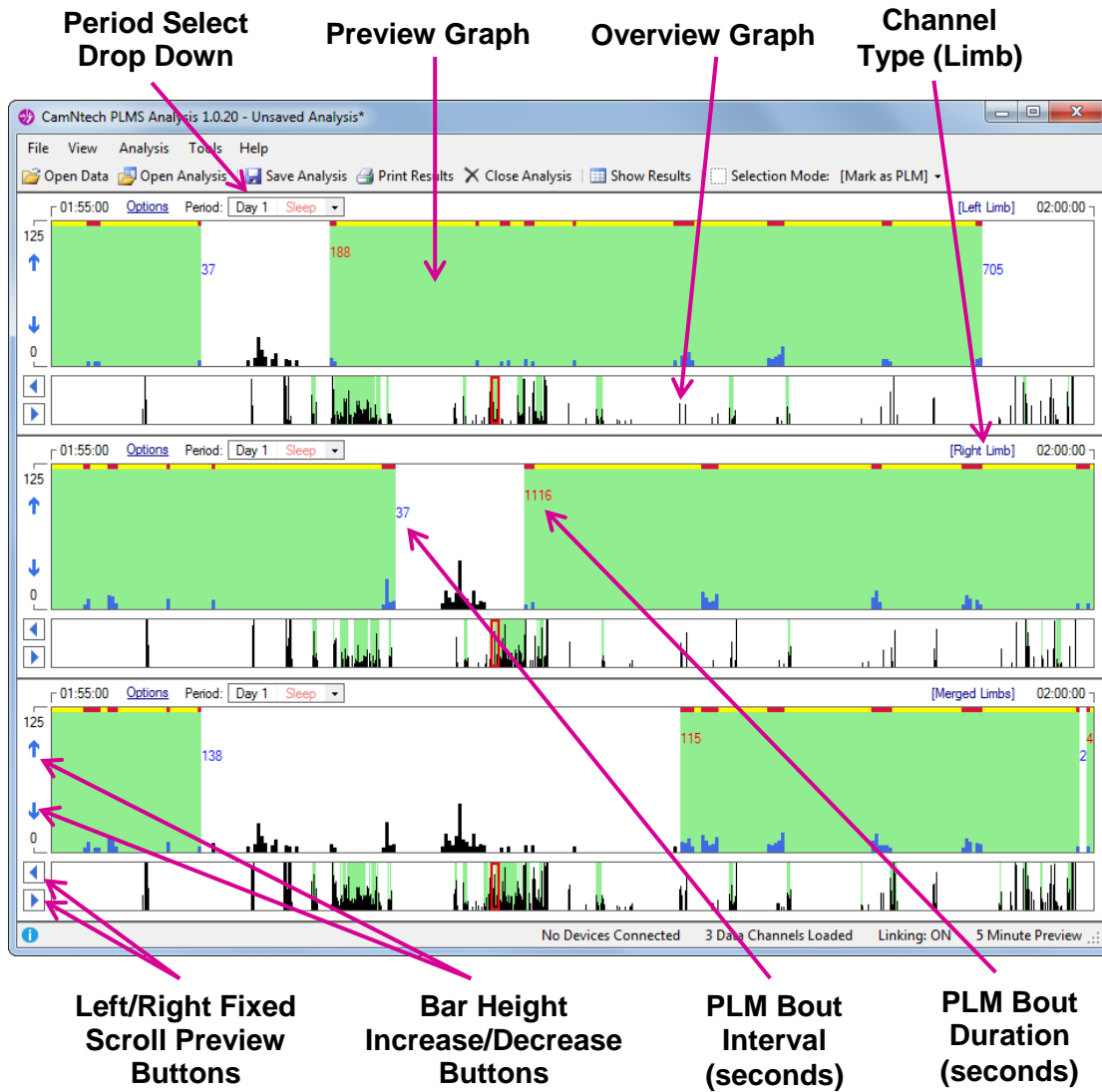
CamNtech Ltd, Manor Farm, Fenstanton, Cambridgeshire, PE28 9JD, UK

Contents

Main Window Overview	3
1 Software Installation	4
1.1 Running the Installer	4
2 Running the Software	7
2.1 First Run	7
2.2 The Main Window	7
3 Setting-up Recordings	9
3.1 Connecting a MotionWatch	9
3.2 Mounting a MotionWatch	10
4 Opening Recordings	12
4.1 Downloading Recordings	12
4.2 Analysis Setup	13
5 Viewing Data	16
5.1 Stepping Through Data	16
5.2 Changing Periods / Days	17
5.3 Changing the Height of Graph Bars	17
5.4 Linking / Unlinking Channels	18
6 Analysing Data	19
6.1 Adding, Removing & Restoring PLM Markings	19
6.2 Viewing Index Information	23
6.3 Display PLM Bout / Non-PLM Bout Durations	23
6.4 Adding Annotations	24
7 Results	26
7.1 Viewing Results	26
7.2 Printing Results	27
7.3 Viewing Periodicity	29

Main Window Overview

The following image identifies the main components referenced in this document.



1 Software Installation

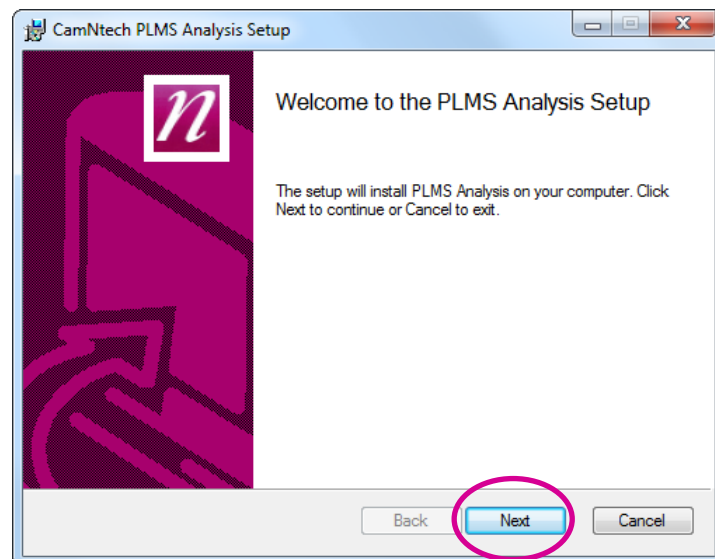
1.1 Running the Installer

If your software is already installed, proceed to section 1.2.

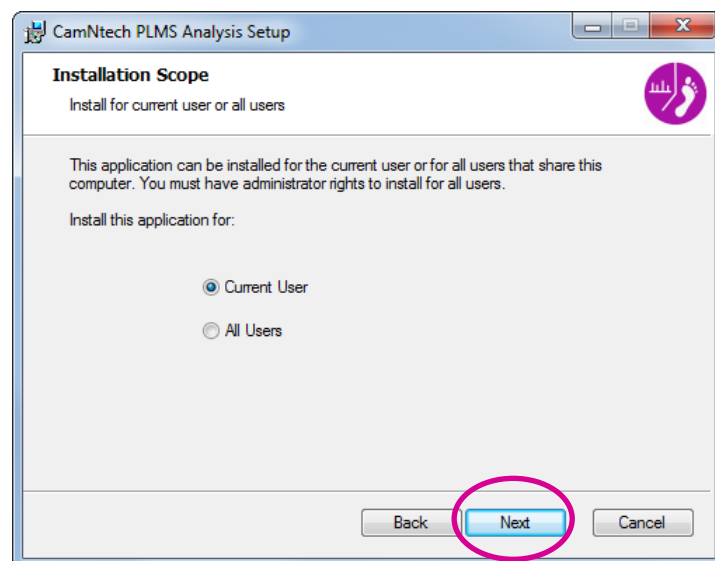
Download the installer (.msi) from the CamNtech website:
www.camntech.com/downloads

Double click on the downloaded .msi file to run the installer then follow the installation process.

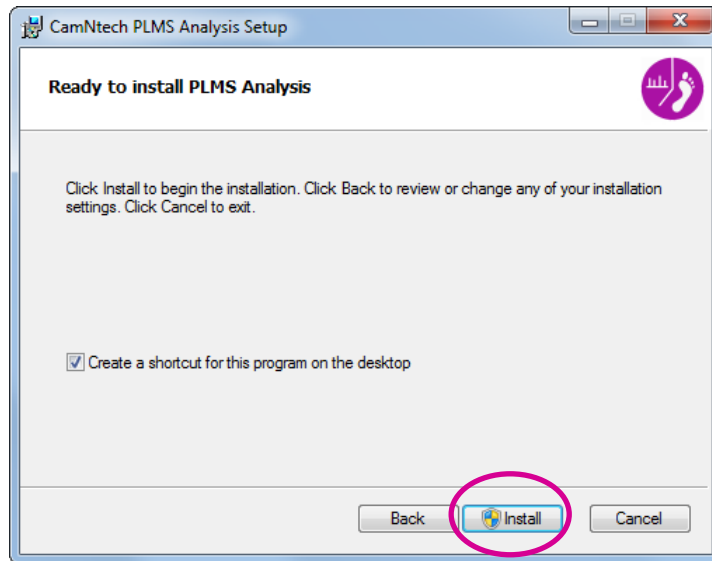
A message warning that 'Publisher cannot be verified' may be displayed – click 'Run' to accept (this is a Windows security warning and is not a problem).



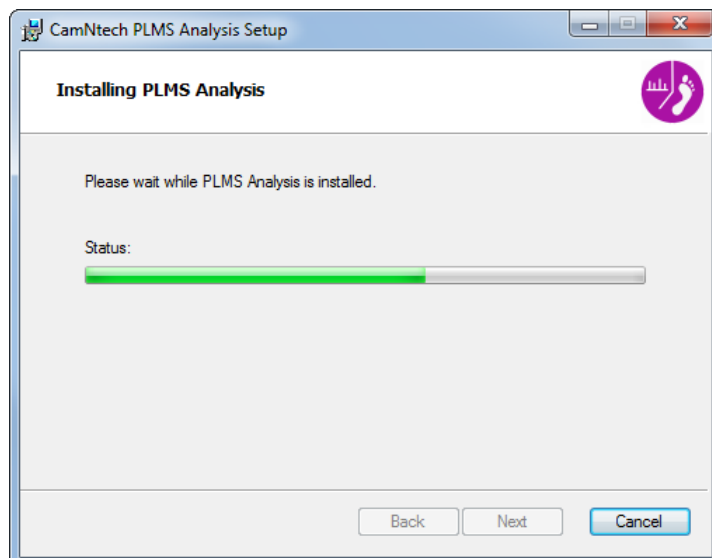
Click the '**Next**' button



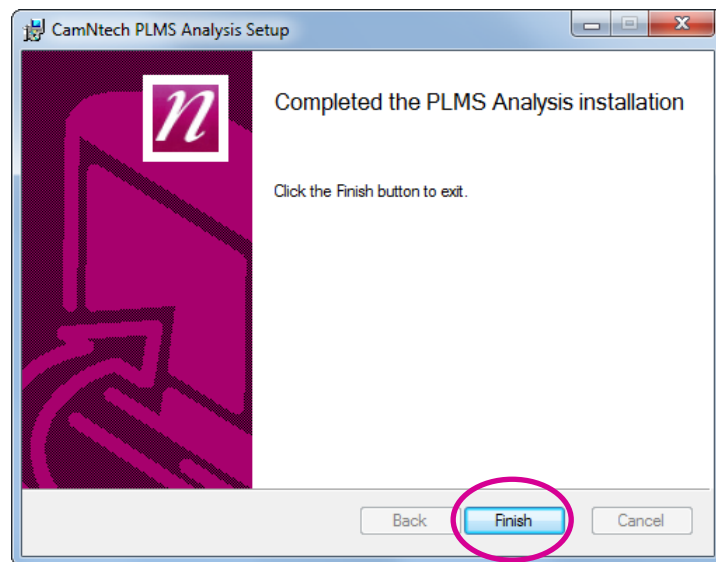
Click the '**Current User**' option, and click the '**Next**' button



Ensure the **'Create a shortcut...'** is checked
Click the **'Install'** button to start the install process



When the installation has completed, click **'Finish'** to close the installer.



2 Running the Software

2.1 First Run

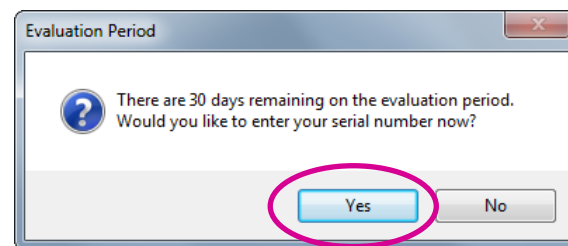
Locate the program shortcut on the desktop or in the Windows Start menu.



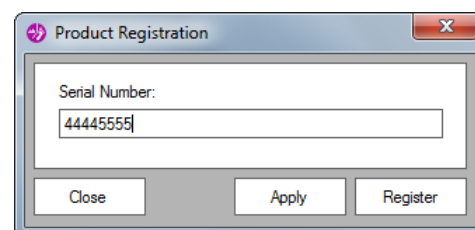
Double click/click on the program shortcut to start the software.

If your software is already registered, proceed to section 1.3.

If this is the first time that software has been run on this computer, or the software is unregistered the following dialog will be shown:



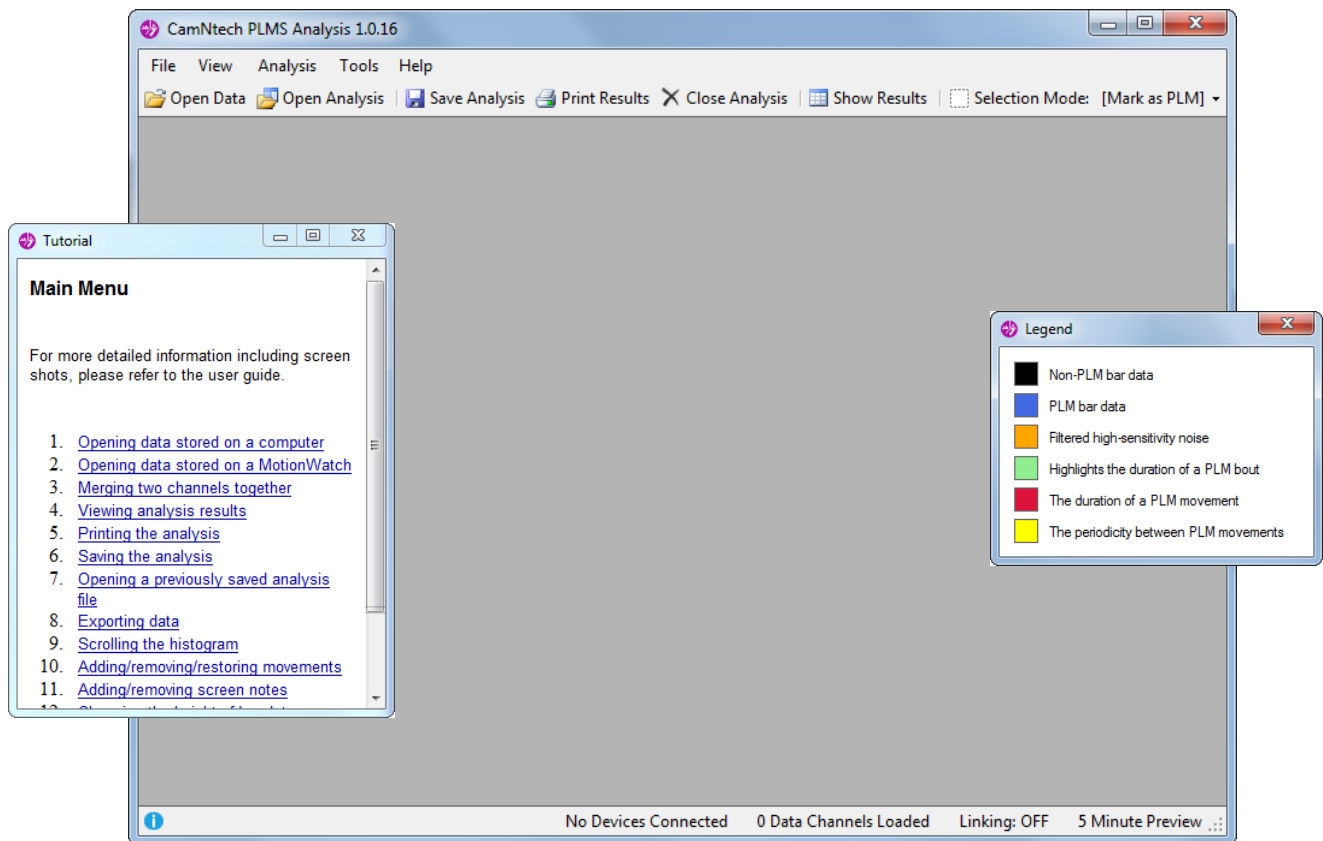
Click '**Yes**' to proceed to the registration form (alternatively, you may click '**No**' to continue with evaluation period of the software).



Enter your serial number into the text field, and click '**Apply**' to activate the software.

2.2 The Main Window

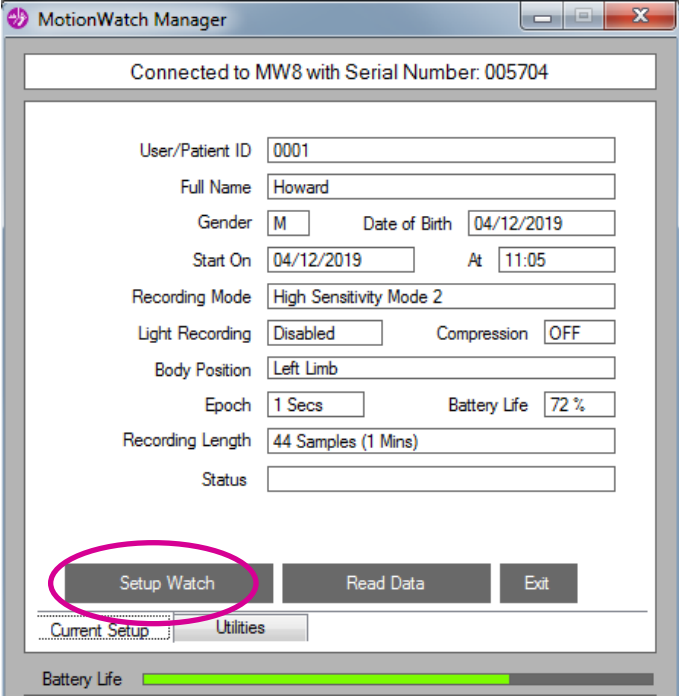
The main window should now be shown, with the '**Legend**' and '**Tutorial**' boxes shown to the left and right (unless they have been previously disabled in the settings):



3 Setting-up Recordings

3.1 Connecting a MotionWatch

With the software running, connect a MotionWatch to the PC using a USB cable. The MotionWatch will be detected and the following window will be shown:

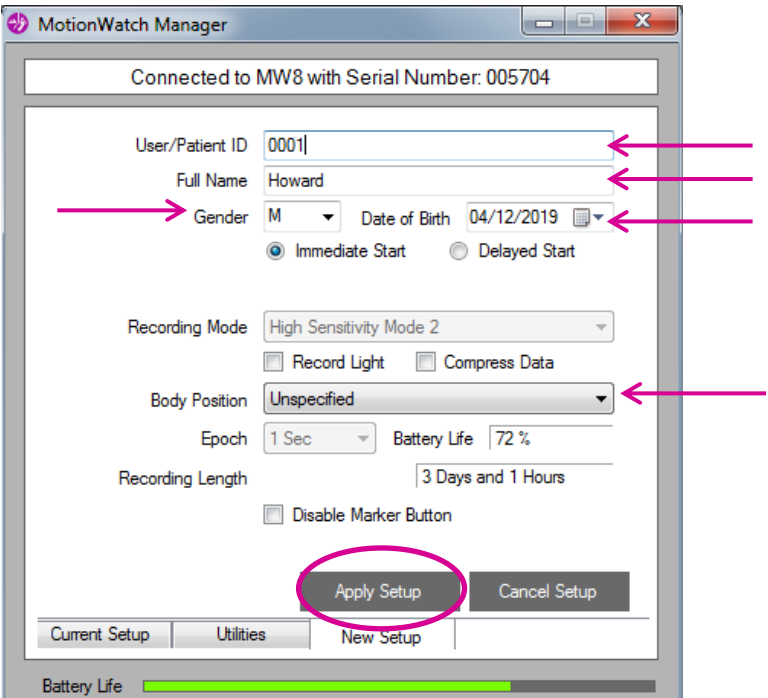


The MotionWatch Manager window displays the connection status: "Connected to MW8 with Serial Number: 005704". The setup fields are as follows:

Field	Value
User/Patient ID	0001
Full Name	Howard
Gender	M
Date of Birth	04/12/2019
Start On	04/12/2019
At	11:05
Recording Mode	High Sensitivity Mode 2
Light Recording	Disabled
Compression	OFF
Body Position	Left Limb
Epoch	1 Secs
Battery Life	72 %
Recording Length	44 Samples (1 Mins)
Status	

At the bottom, there are three buttons: "Setup Watch" (circled in pink), "Read Data", and "Exit". Below these are tabs for "Current Setup" and "Utilities". A "Battery Life" progress bar is at the very bottom.

Click on the '**Setup Watch**' button. The following setup form will be shown:



The MotionWatch Manager window displays the detailed setup form. The fields are as follows:

Field	Value
User/Patient ID	0001
Full Name	Howard
Gender	M
Date of Birth	04/12/2019
Start Mode	Immediate Start
Recording Mode	High Sensitivity Mode 2
Record Light	<input type="checkbox"/>
Compress Data	<input type="checkbox"/>
Body Position	Unspecified
Epoch	1 Sec
Battery Life	72 %
Recording Length	3 Days and 1 Hours
Disable Marker Button	<input type="checkbox"/>

At the bottom, there are three buttons: "Apply Setup" (circled in pink), "Cancel Setup", and "New Setup". Below these are tabs for "Current Setup", "Utilities", and "New Setup". A "Battery Life" progress bar is at the very bottom. Pink arrows point to the User/Patient ID, Full Name, Gender, Date of Birth, Body Position, and Apply Setup buttons.

Enter a **User ID**, **Name**, **Gender**, **Date of Birth**, and select a desired **Body Position** for the limb mounting.

Click the '**Apply Setup**' button to set up the MotionWatch.

The confirmation message 'Device Setup OK – DISCONNECT IMMEDIATELY' will be shown.

Disconnect the MotionWatch from the PC by removing the USB cable to close the window.

You may repeat this process for a second MotionWatch, which would be assigned to the right limb.

3.2 Mounting a MotionWatch

The MotionWatch should be attached, face-up, to the provided mounting strap.

The strap should be mounted on the top of the foot, as far forward to the big toe (Hallux) as is possible whilst being secure and comfortable to wear.

The following images demonstrate two mounting positions, one above the balls of the foot and one closer to the big toe:





4 Opening Recordings

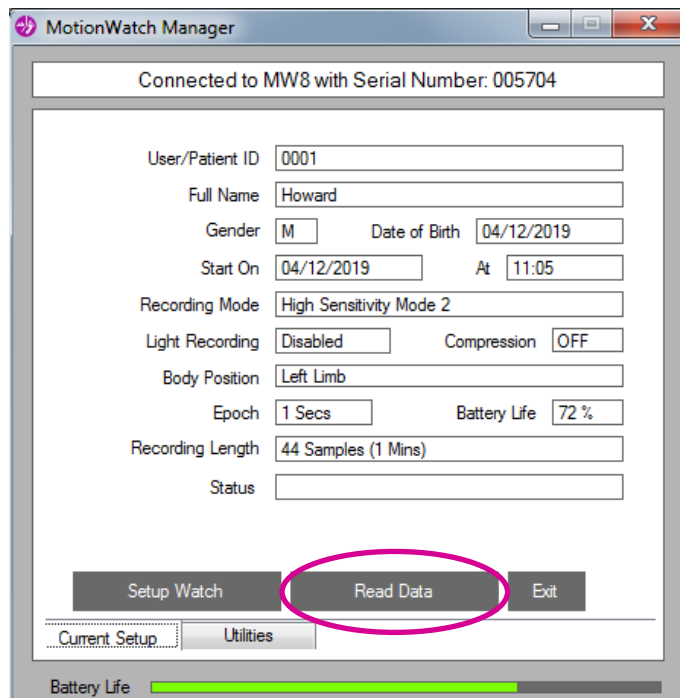
4.1 Downloading Recordings

For this section, we'll use the MotionWatches which were set up in the previous section.

Remove the MotionWatch from the mounting strap and remove the lid.

Connect the MotionWatch to the PC using a USB cable.

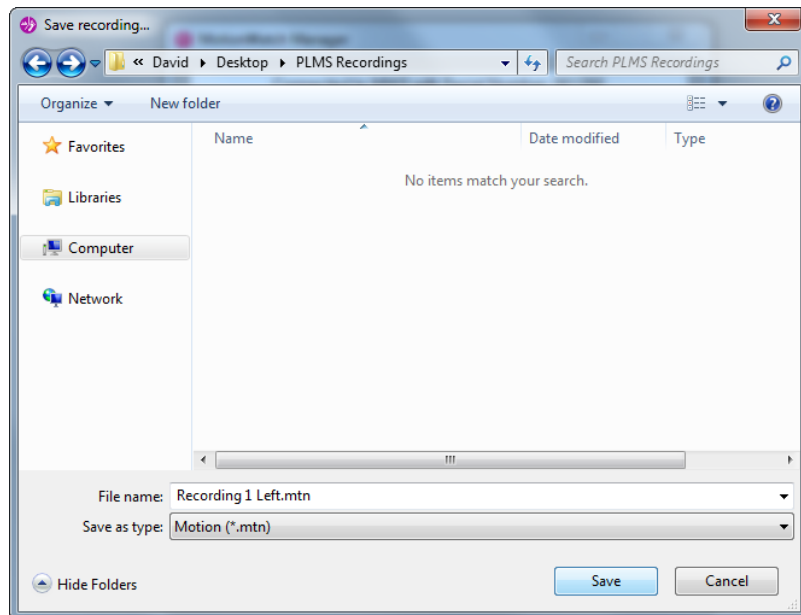
With the software open, the following window should be shown:



Click in the '**Read Data**' button to download the recording from the MotionWatch.

When the download process has completed, save the file to your computer.

Repeat the above steps for the second MotionWatch (if applicable).



4.2 Analysis Setup

For this section we will use the two included demonstration files, rather than the downloaded ones from the previous section as the demo files contain a good amount of activity which will give a more realistic demonstration of the analysis functions.

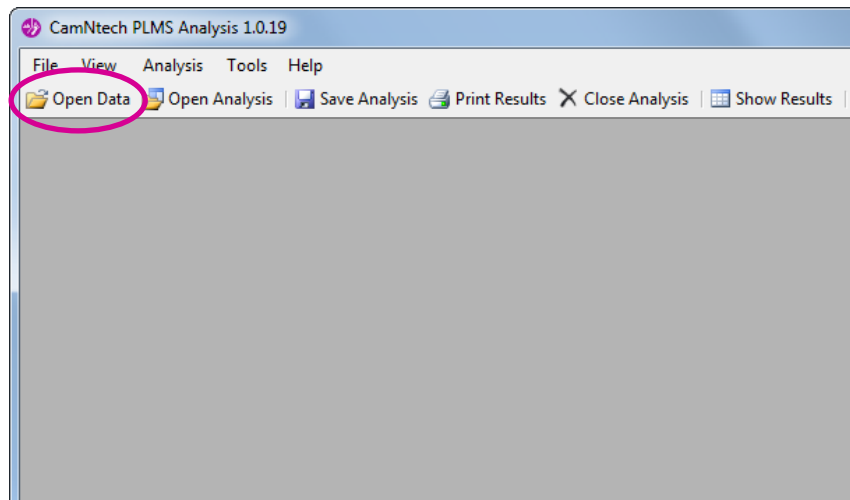
The two demo files are “**Demo Left Limb.mtn**” & “**Demo Right Limb.mtn**” and are installed by default along with the main application. These are installed to the following folder:

[Drive Letter]/Users/[User Name]/My Documents/PLMS Analysis Data/

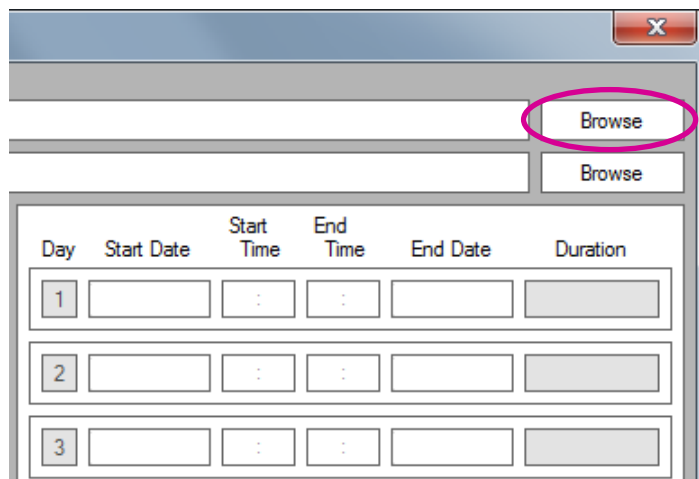
For example:

C:/Users/David/My Documents/PLMS Analysis Data/

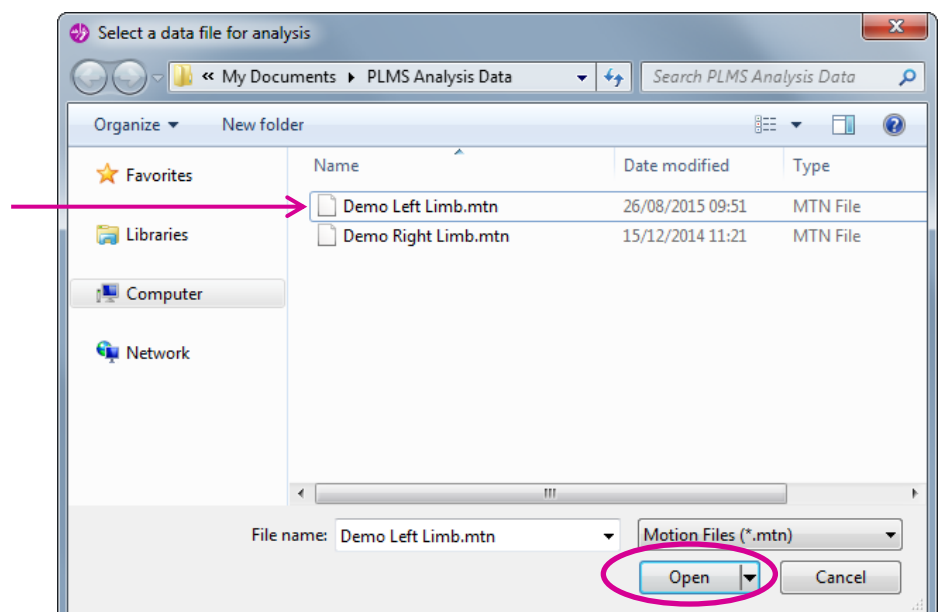
Click on the ‘**Open Data**’ menu button to open the **Setup Analysis** window.



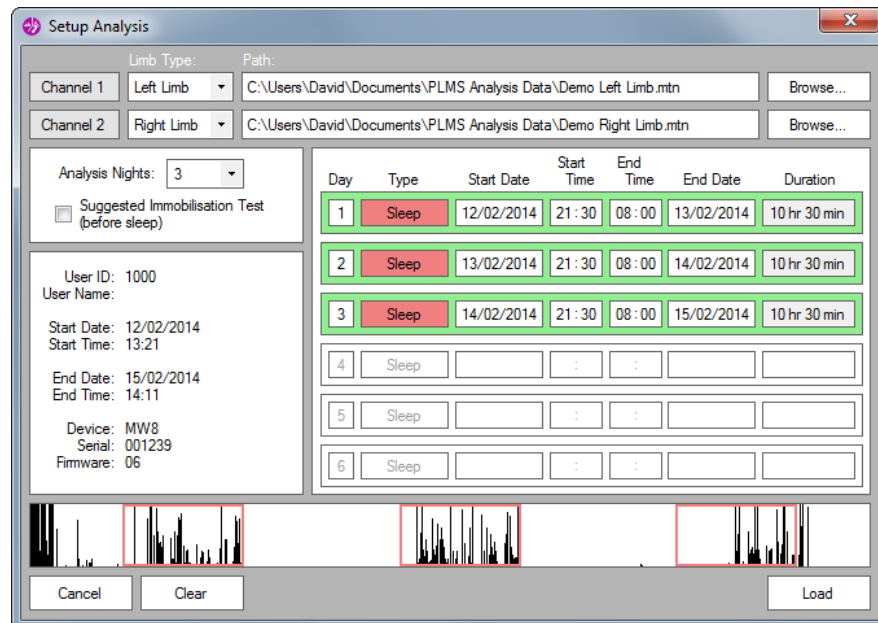
Click on the '**Browse**' button for the Channel 1, to locate the recording file for the first channel.



Locate the file "**Demo Left Limb.mtn**", click on it and then click the '**Open**' button.



Click on the **'Browse'** button for Channel 2 and locate the file **"Demo Right Limb.mtn"**, click on it and then click on the open button.



Select the number of nights by clicking on the **'Analysis Nights'** drop down and clicking on a value, and then check the date and time ranges for the test, and click the **'Load'** button to load the channels.

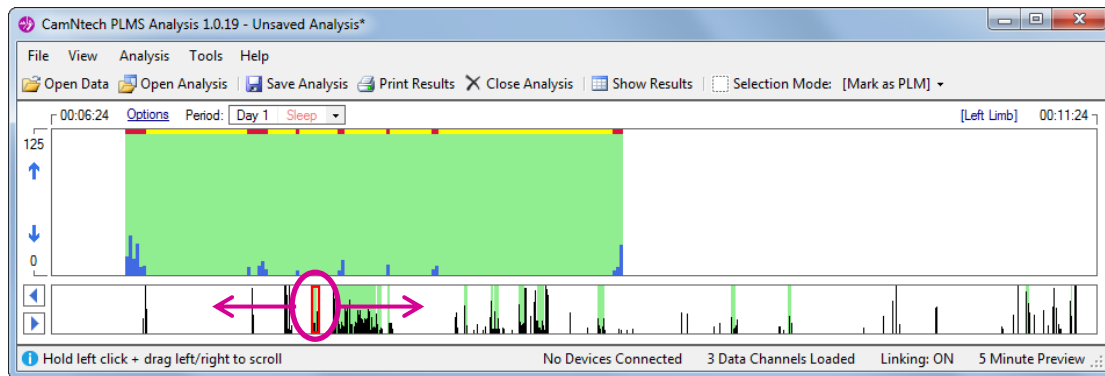


The left and right data channels will automatically be merged (if the setting is enabled and if both channels are alike).

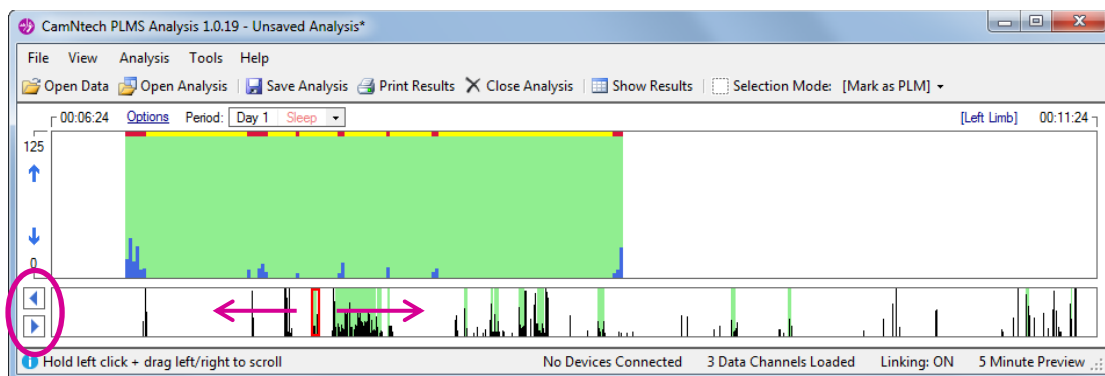
5 Viewing Data

5.1 Stepping Through Data

Hold down the **Left Mouse Button** on the overview graph for the top channel, and drag the mouse to the left and to the right. This allows you to quickly jump to a specific point in the recording.

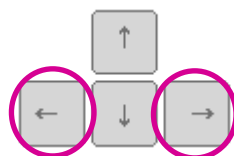


Click on the **Left** and **Right** arrow buttons to the left of the overview graph to step through the recording in fixed steps (default of 5 minutes).



Hold down the **Left Mouse button** on the **Left** and **Right** arrow buttons to continuously scroll **Left** and **Right** on the overview graph.

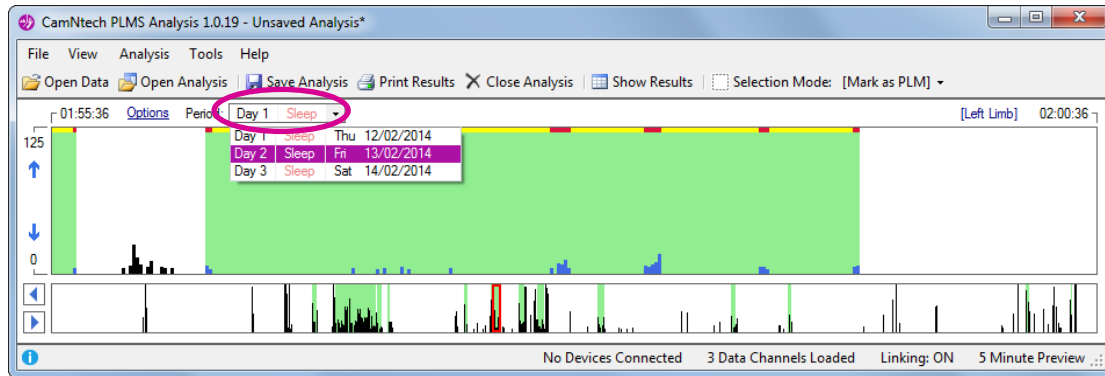
Press the **Left** and **Right** keys on the keyboard to also step through the data in the same way.



Scroll the **Mouse wheel** forwards and backwards to finely scroll through the data in 1 second steps.

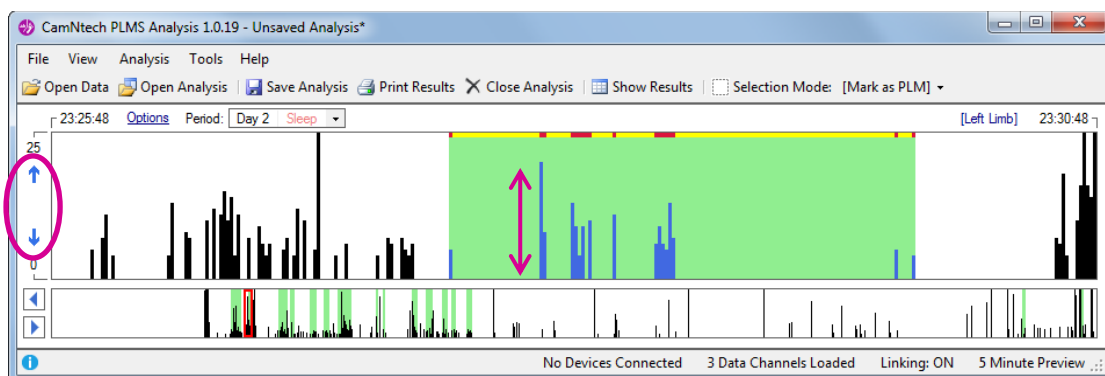
5.2 Changing Periods / Days

Click on the Period selection dropdown, and click on the period 'Day 2'.

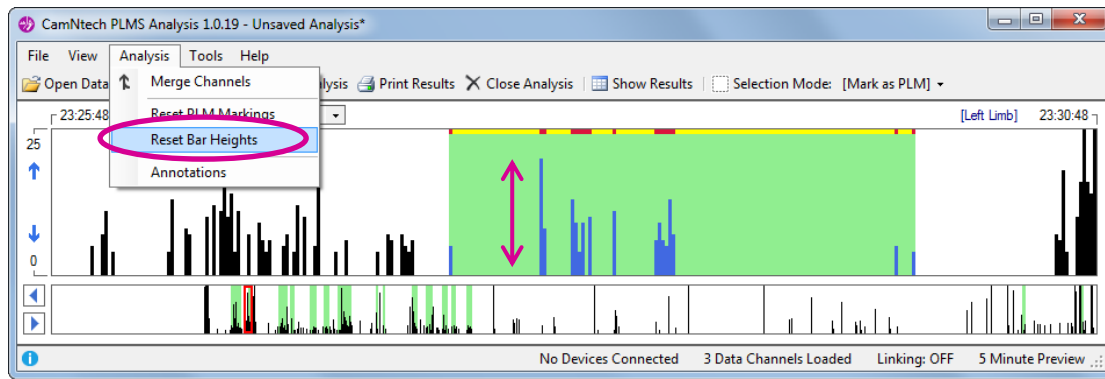


5.3 Changing the Height of Graph Bars

Click on the **Up** and **Down** bar height arrows to increase and decrease the height of the bar data in the preview graph.



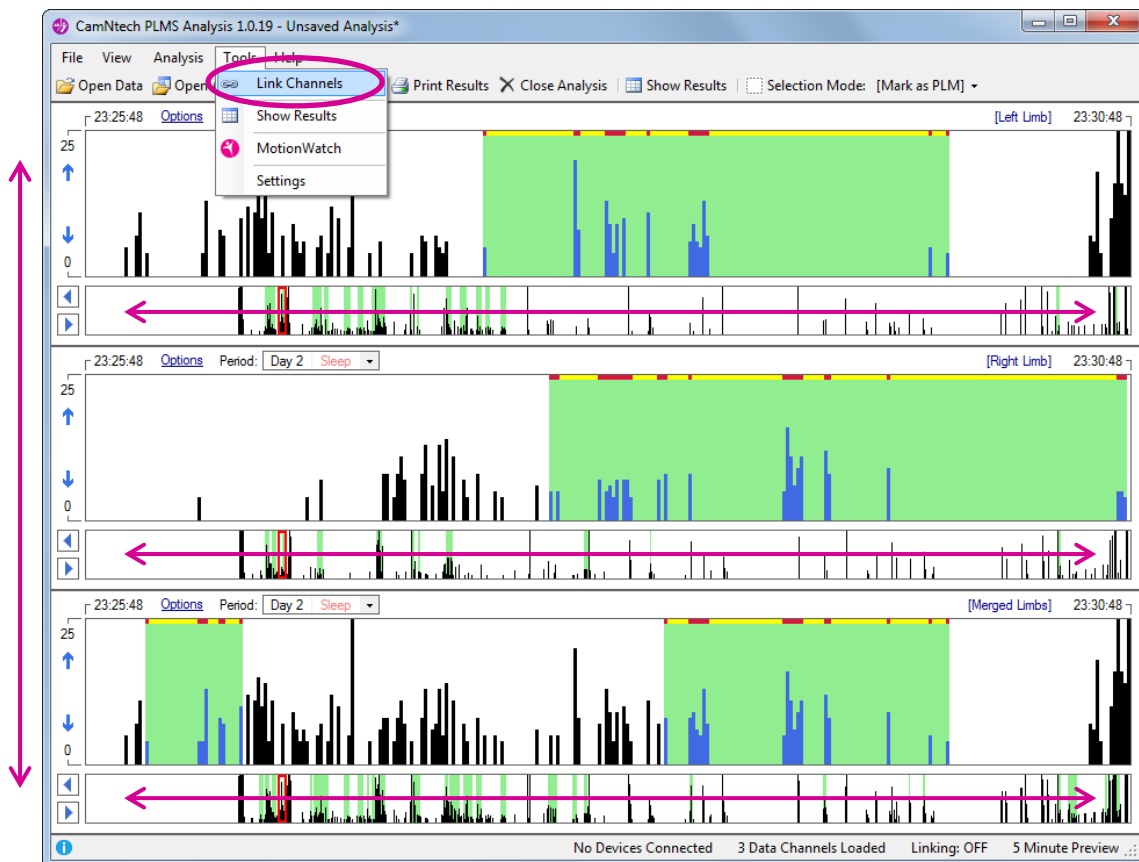
Click on the '**Analysis**' menu, and click on the '**Reset Bar Heights**' menu item to reset all channels' bar heights to the default height value. Click '**Yes**' on the confirmation dialog that follows.



5.4 Linking / Unlinking Channels

Channels are automatically linked (unless the option is unset in the 'Tools' menu). This allows the user to view all loaded channels simultaneously to identify points of interest between the channels.

Click on the 'Tools' menu, followed by either the 'Link Channels' or 'Unlink Channels' menu items to enable or disable channel linking.



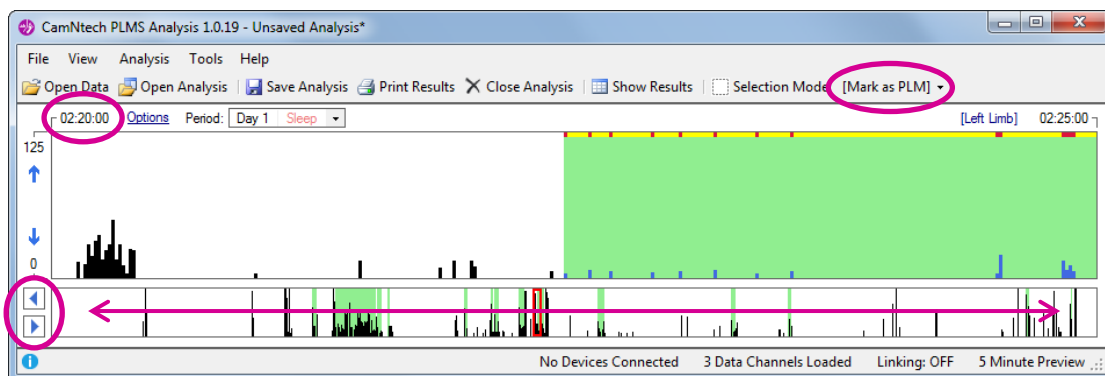
6 Analysing Data

6.1 Adding, Removing & Restoring PLM Markings

The application uses algorithms to detect which movements are considered to be PLM. There may be however, bouts of movement which should or should not be counted as PLM in certain scenarios (for example, when it is known that a patient was awake at a specific time in the test period). The application therefore allows full control over the PLM markings, allowing a technician to fine tune the results as needed as it is believed by some clinicians that the rules of PLM can be restrictive in certain instances. However, the PLM algorithms in the application follow the scoring rules fully under normal use.

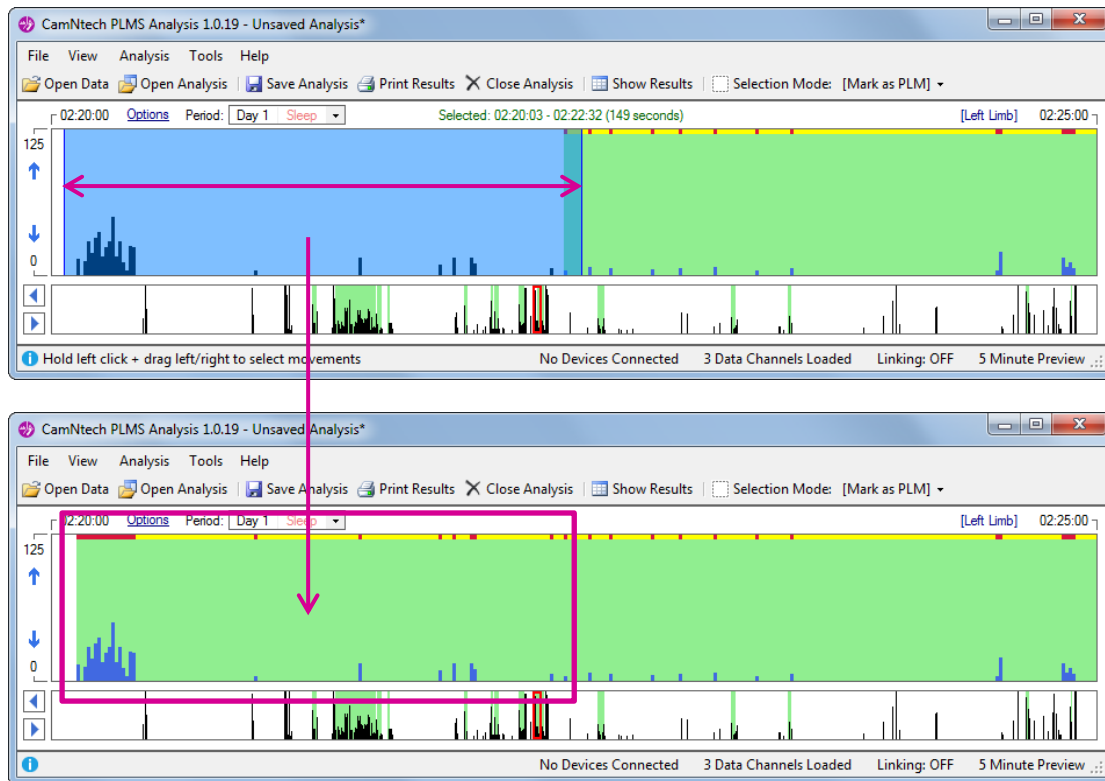
Ensure the current **Period** for Channel 1 is set to '**Day 1**'.

Set the preview graph to **02:20:00** by either scrolling the overview graph or holding down the **Left Mouse Button** on the **Right** arrow button.



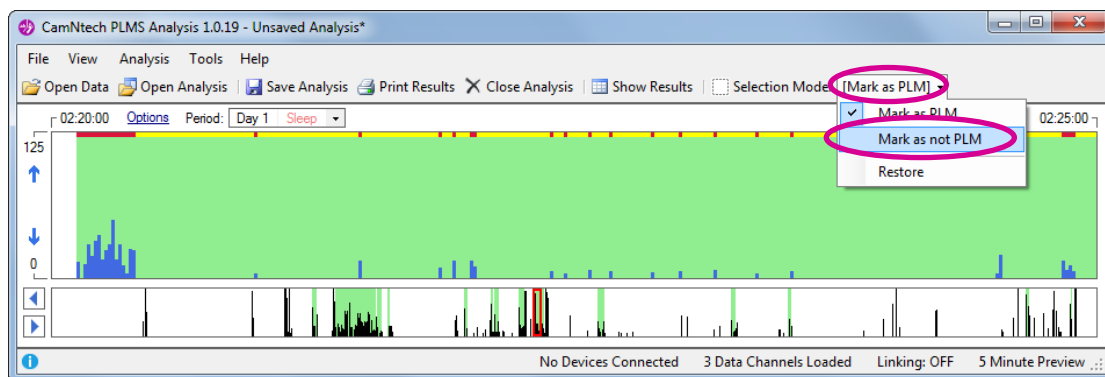
Ensure the **Selection Mode** drop down is set to '**Mark as PLM**'.

Move the mouse to just before the first large movement on the left of the preview window, press and hold the **Left Mouse button** and drag the mouse over to the green PLM bout on the right, and release the mouse button.

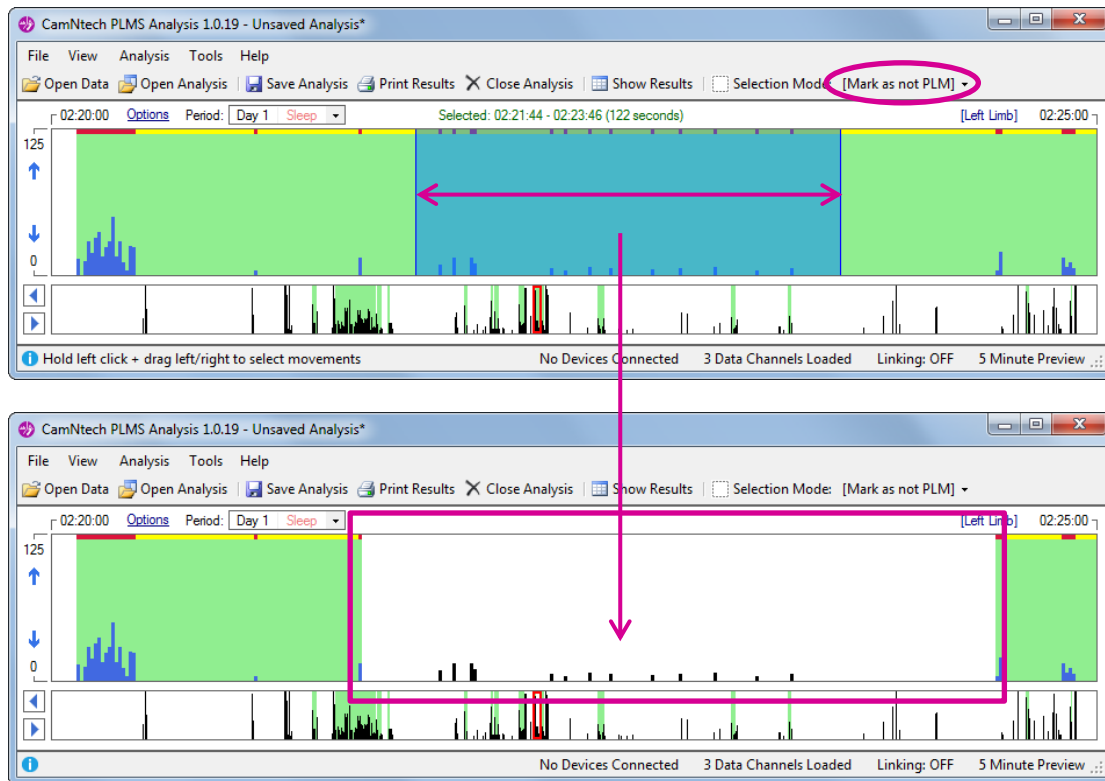


The selected movements have now been marked as PLM.

Click on the **Selection Mode** drop down and click on 'Mark as Not PLM'.

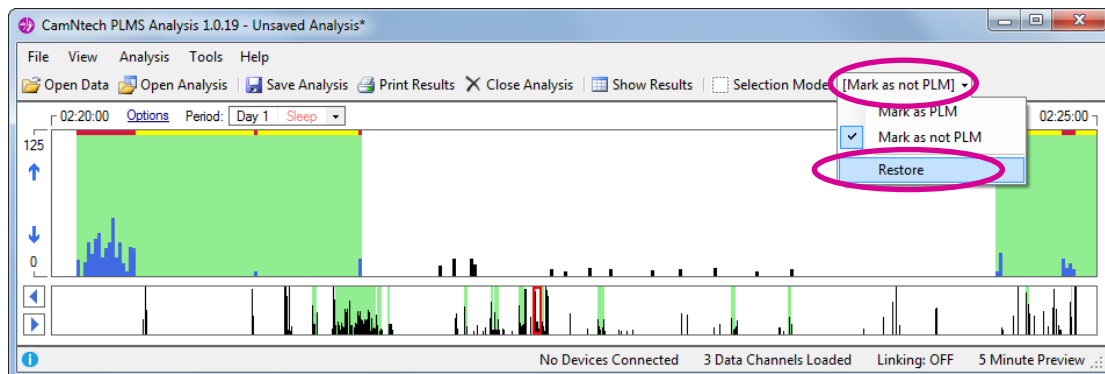


Move the mouse to just before the set of three movements, press and hold the **Left Mouse button** and drag the mouse over to the end of the sequence of nine movements, and release the mouse button.

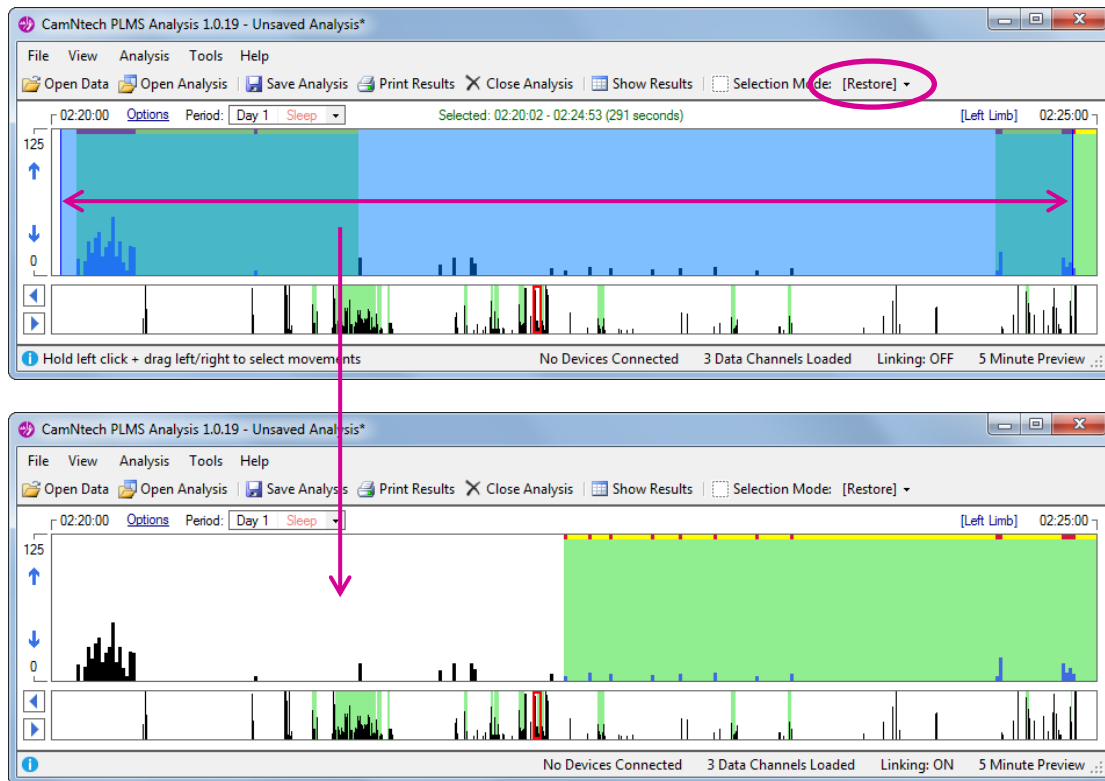


The selected movements have now been marked as not PLM.

Click on the **Selection Mode** drop down and click on **'Restore'**.



Move the mouse to the very left of the preview graph, press and hold the **Left Mouse button** and drag the mouse over to the very end of the preview graph, and release the mouse button.

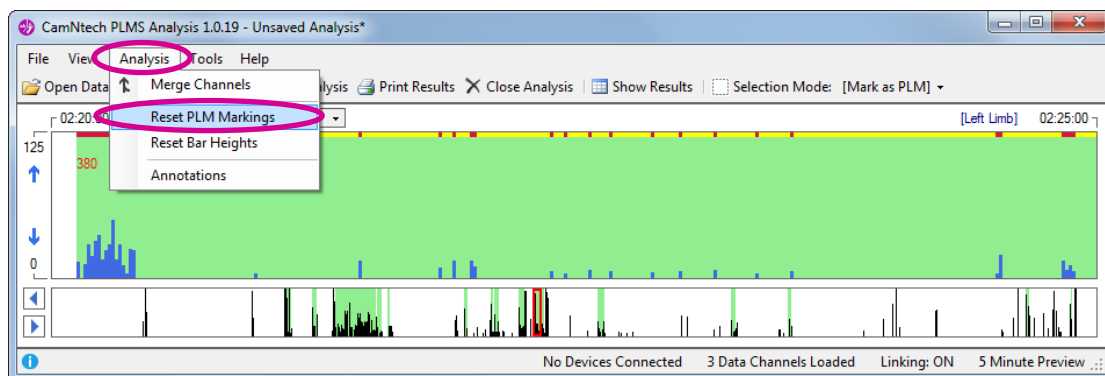


The markings are now restored to those created by the PLM algorithm.

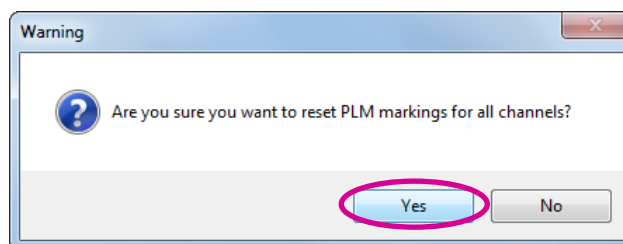
Click on the **Selection Mode** drop down and click on **'Mark as PLM'**.

Move the mouse to the very left of the preview graph, press and hold the **Left Mouse button** and drag the mouse over to the very end of the preview graph, and release the mouse button.

Click on the **'Analysis'** menu, and then click the **'Reset PLM Markings'** menu item.



Click the **'Yes'** button on the confirmation dialog box which shows.

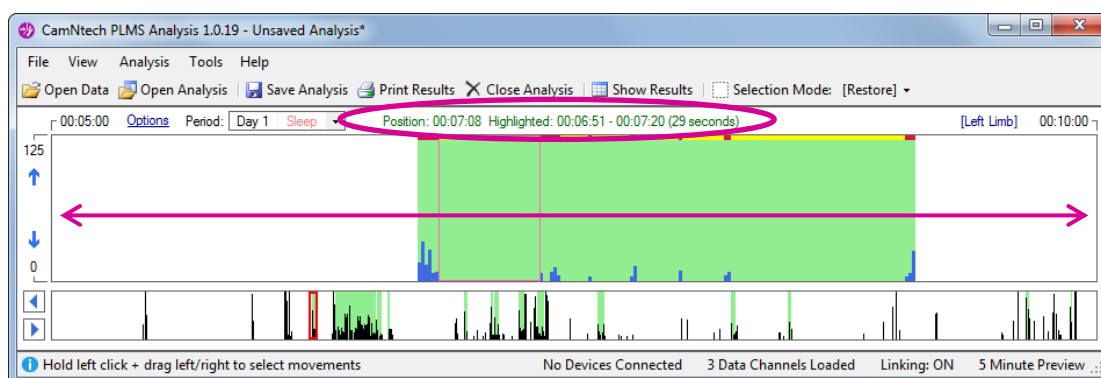


The PLM markings for the entire analysis project have now been reset to those created by the PLM algorithm.

6.2 Viewing Index Information

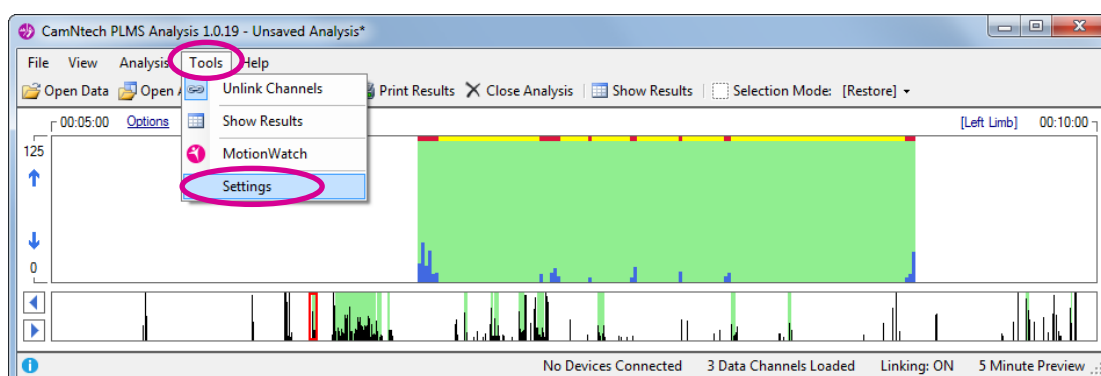
Set the preview graph to **00:05:00** by either scrolling the overview graph or holding down the **Left Mouse Button** on the **Right** arrow button.

Without pressing any mouse button, move the mouse cursor from the left of the preview graph to the right of the preview graph, whilst taking note of the information label at the top of the channel.

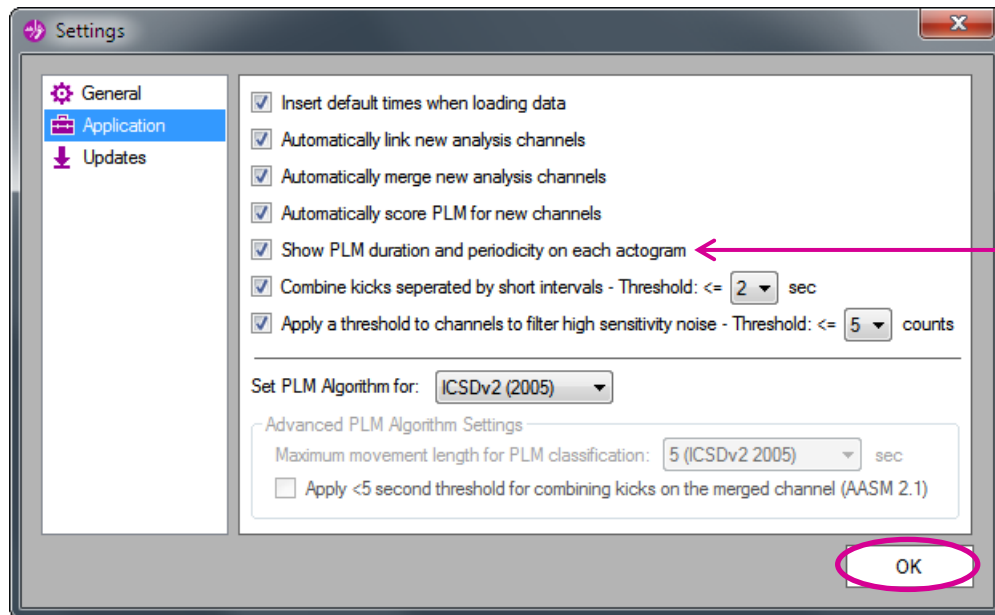


6.3 Display PLM Bout / Non-PLM Bout Durations

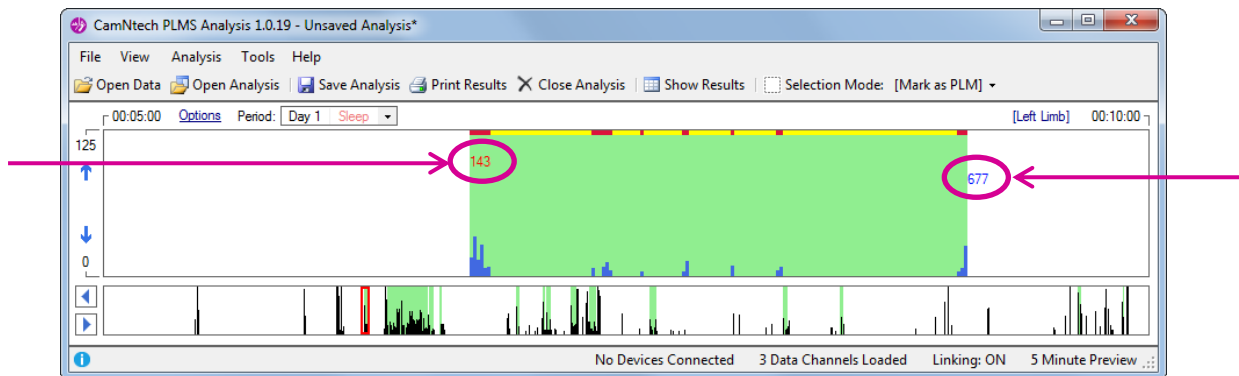
Open the application settings by clicking on the **'Tools'** menu, and then clicking the **'Settings'** menu item



Ensure that the '**Show PLM duration and periodicity...**' checkbox is checked, and then click the '**OK**' button.

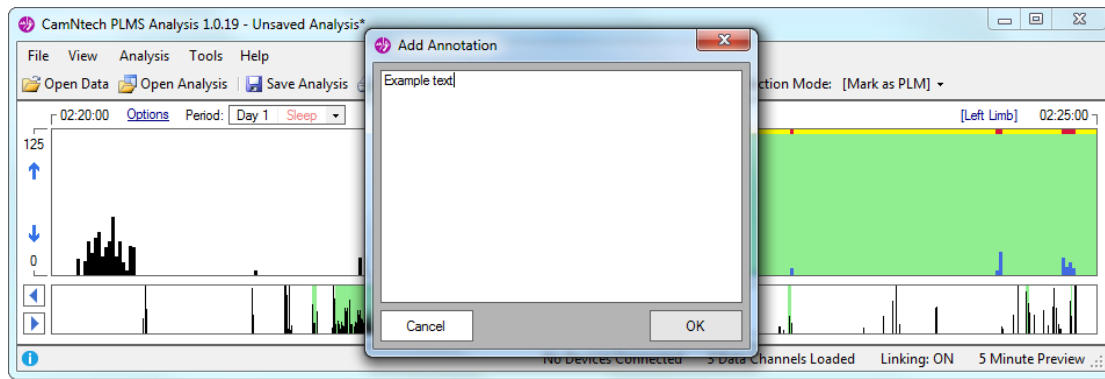


The **duration** of PLM bouts, and the **periodicity** between PLM bouts are now printed on the preview graph. The numeric values represent the total time in seconds.



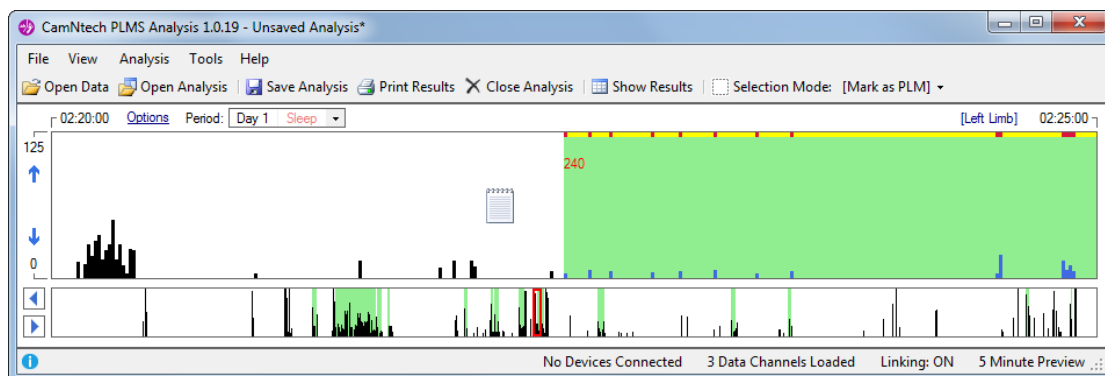
6.4 Adding Annotations

Move the mouse cursor over the preview graph, press and hold the **Ctrl** key and click the **Left Mouse Button**.



Enter some text into the text field and click the 'OK' button.

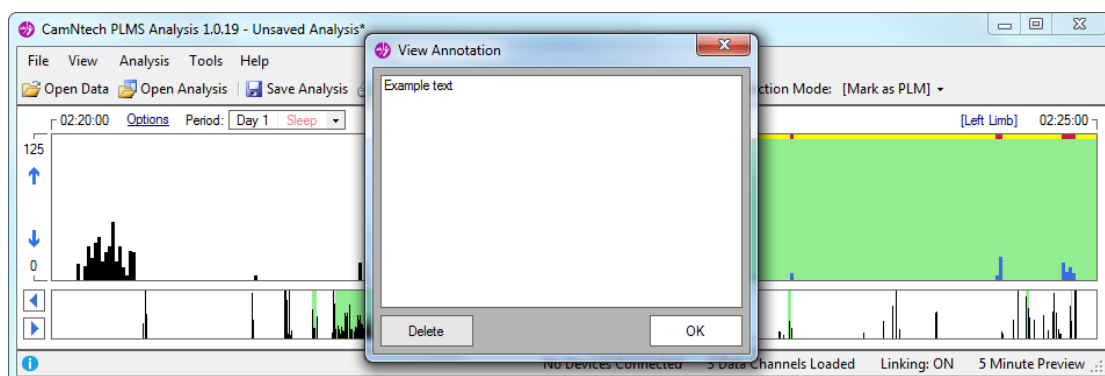
The annotation is now added to the channel. Annotations are saved when the analysis session is saved.



The annotation is displayed using a notepad icon on the preview graph.

Move the mouse cursor over the preview graph, press and hold the **Ctrl** key and click the **Left Mouse Button**.

Click the 'Delete' button to delete the annotation.



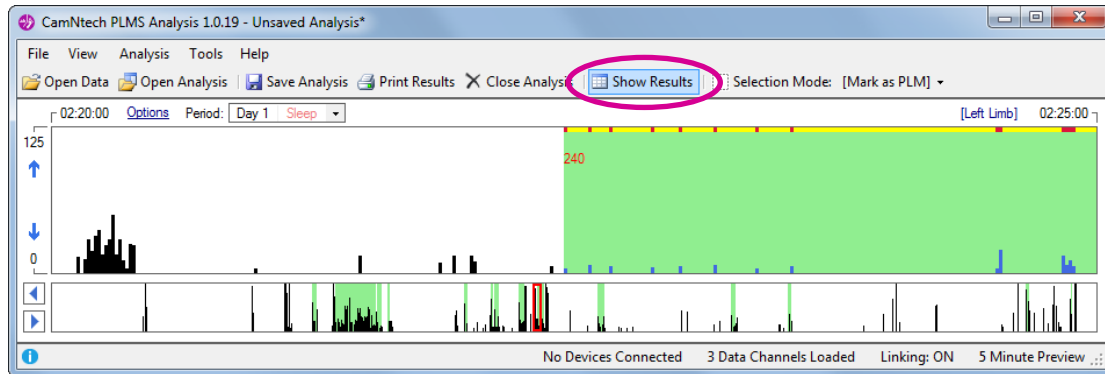
Click the 'Yes' button on the confirmation dialog box.

The annotation is now deleted from the channel.

7 Results

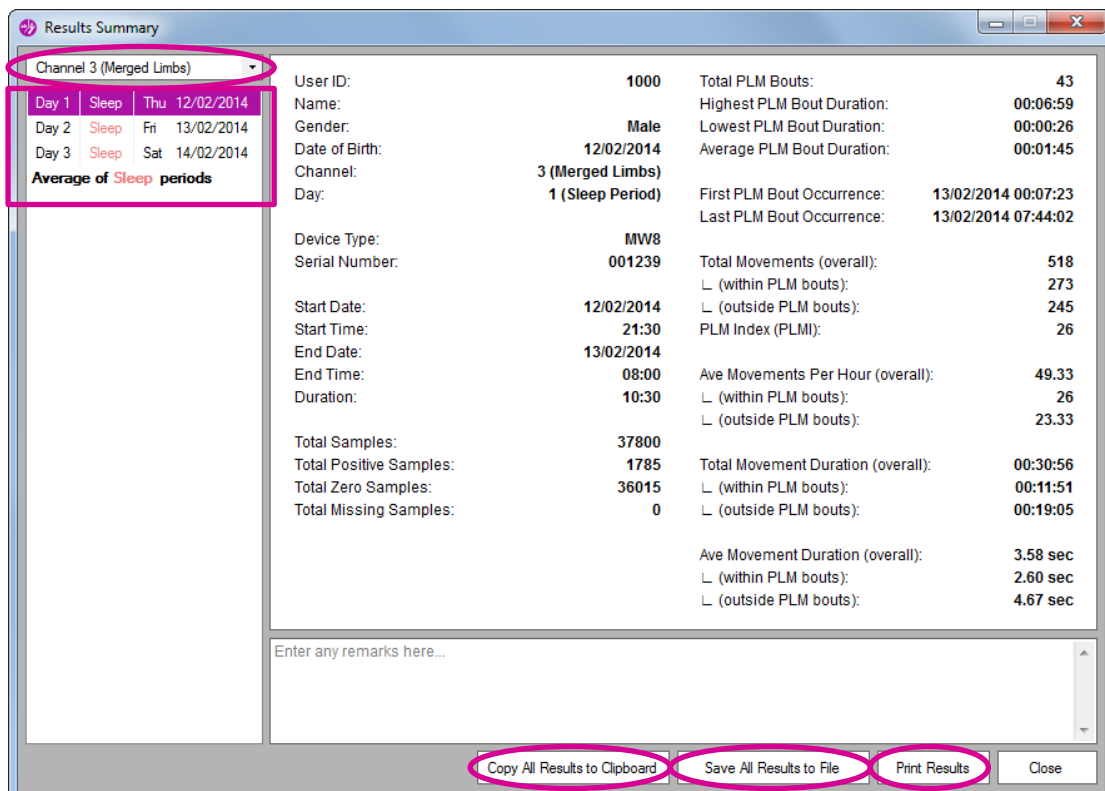
7.1 Viewing Results

Click on the **'Show Results'** button.



Click on the channel drop down to switch between channels.

Click on the items in the list of period items.



Click on the **'Copy All Results to Clipboard'** button, and click the **'OK'** button on the dialog box which follows. Open an external spreadsheet application or text utility and press the **Ctrl** and **V** keys together to paste in the results.

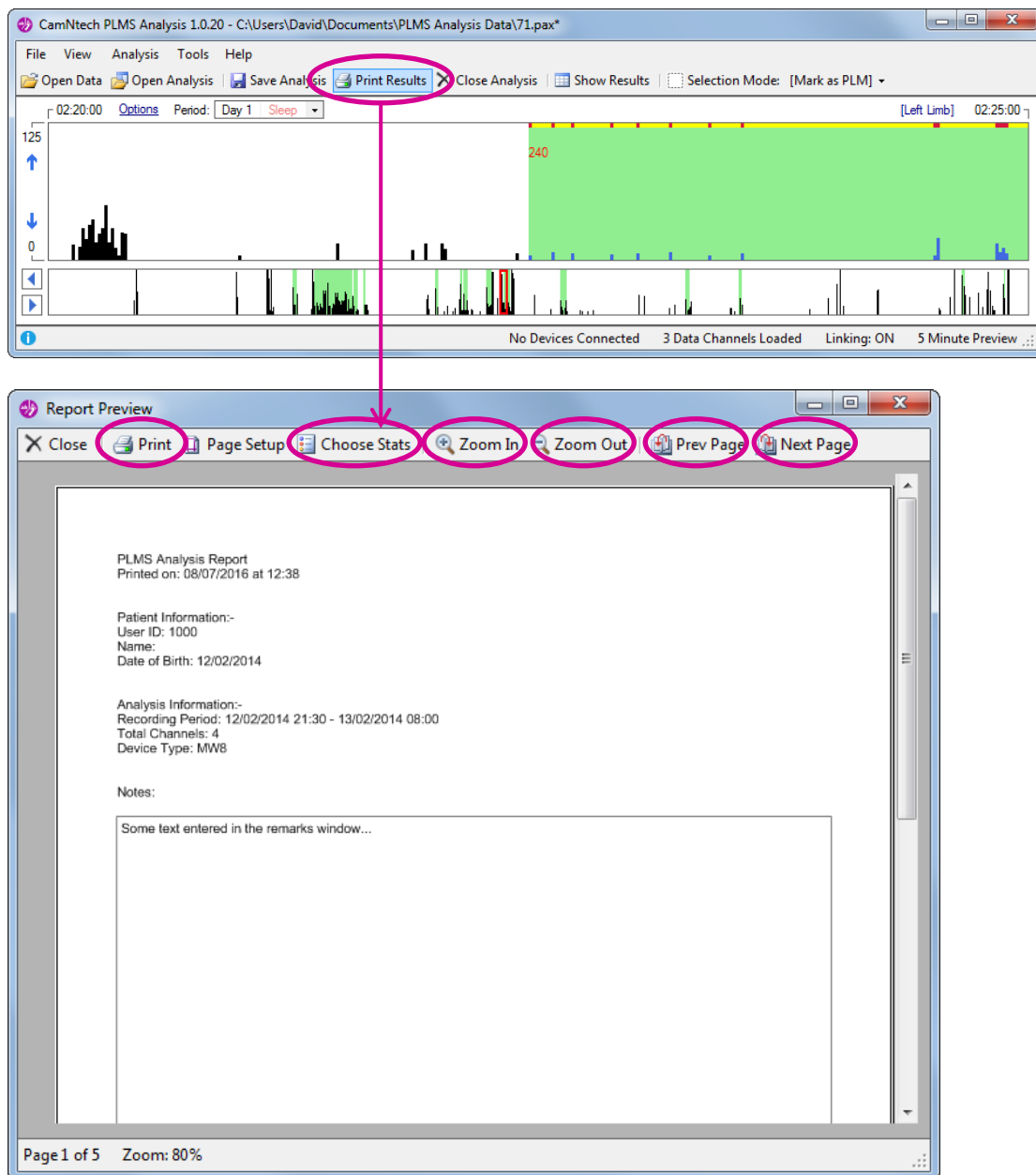
Click on the **'Save All Results to File'** button, enter a filename and click the **'Save'** button to save all results to a text file.

Click on the **'Print Results'** button to open the report preview window for printing (discussed ahead).

Enter some text into the remarks text field, and click the **'Close'** button. The entered text will be retained.

7.2 Printing Results

Click on the **'Print Results'** menu item.

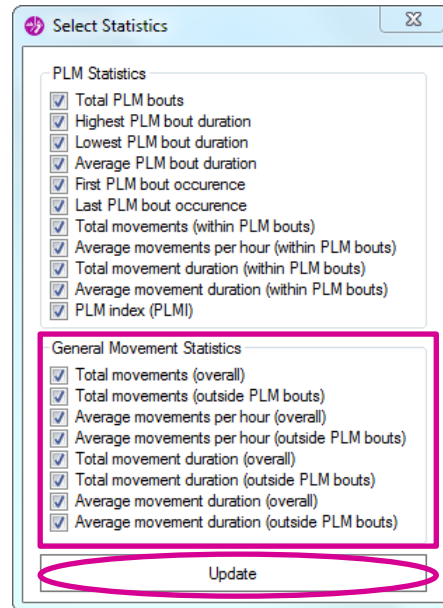


Repeatedly click the **'Next Page'** menu button and view each page in the report.

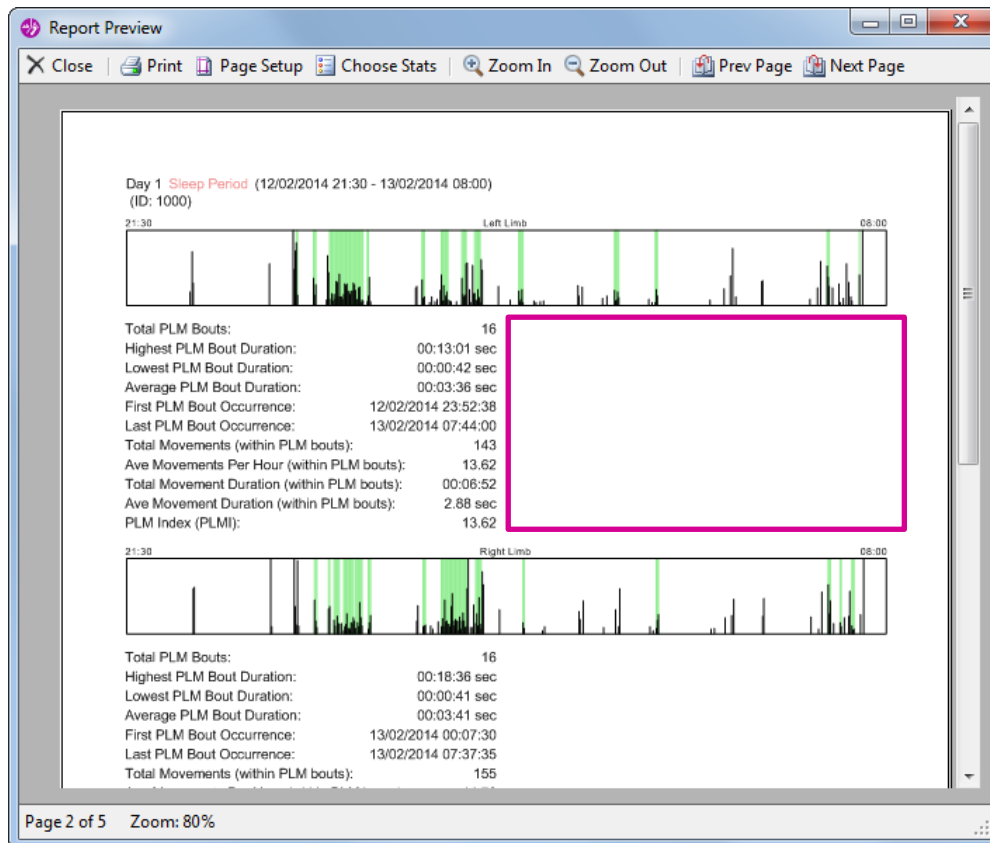
Repeatedly click the **'Prev Page'** menu button until the page for **'Day 1 Sleep Period'** is shown.

Click the **'Zoom In'** and **'Zoom Out'** menu buttons to view the report at different zoom levels.

Click on the **'Choose Stats'** menu button to open the stat selection window.



Deselect all of the checkboxes in the **'General Movement Statistics'** and click the **'Update'** button.

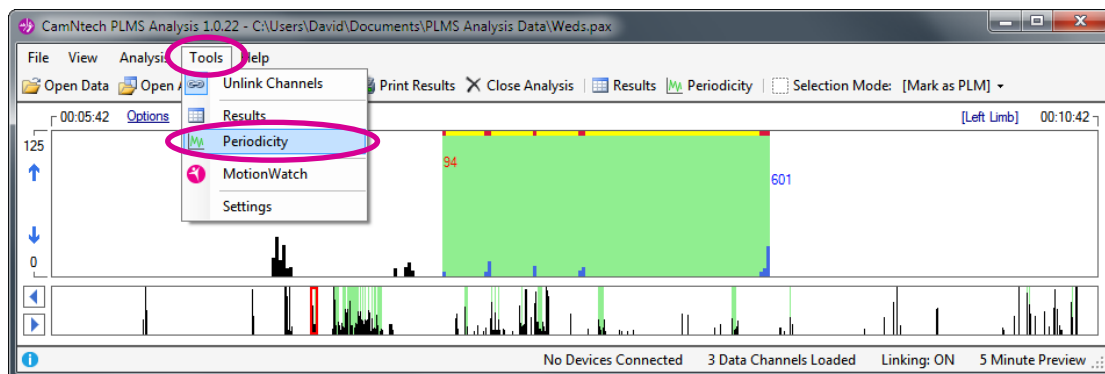


The deselected stats have been removed from the report.

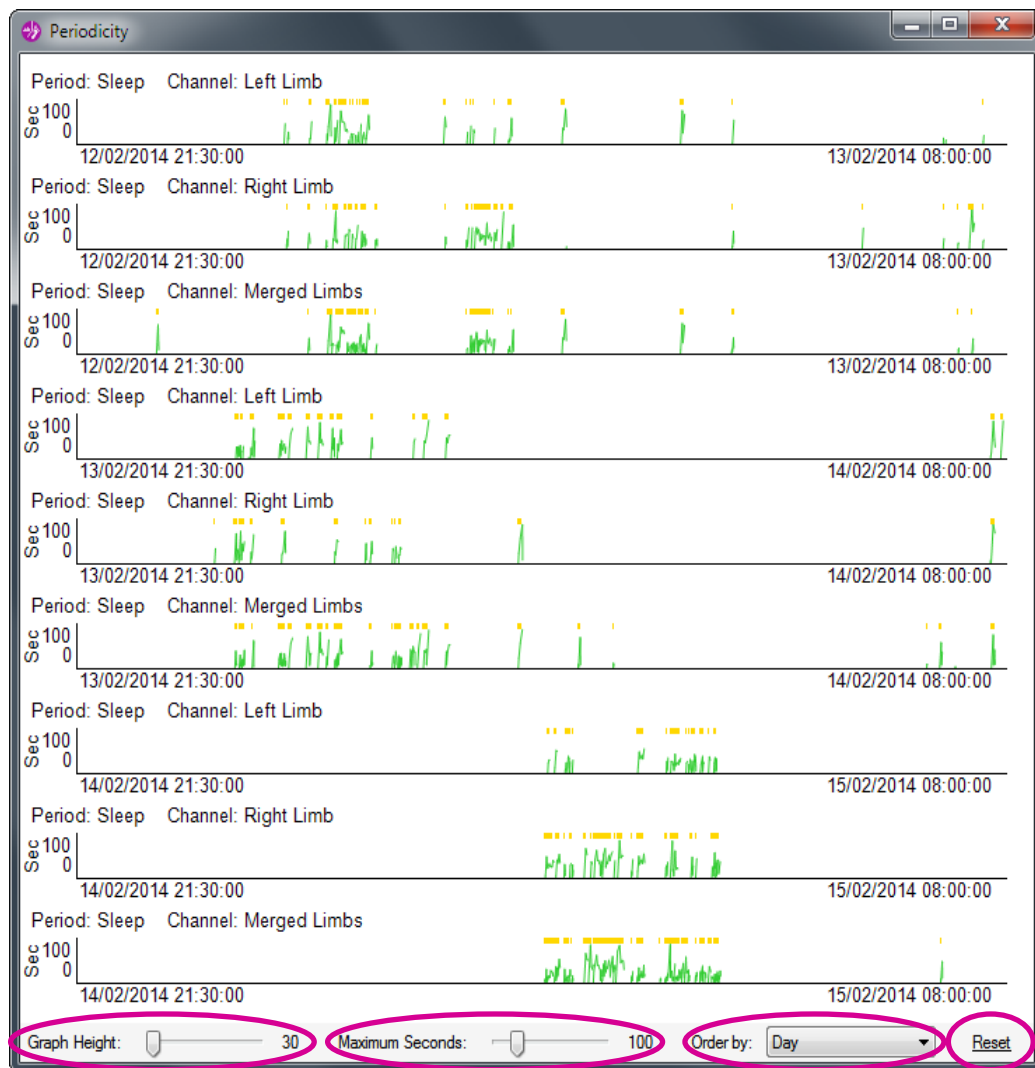
Click on the **'Print'** menu button to print the report.

7.3 Viewing Periodicity

Click on the **'Tools'** menu and then click the **'Periodicity'** menu item.



The following window will be shown:



To change the height of the graphs, move the **'Graph Height'** slider to the left or right.

To change the amount of maximum seconds on the Y axis, move the **'Maximum Seconds'** slider to the left or right.

To change the order of the graphs, click the **'Order by'** drop down and select either the **'Day'** or **'Channel'** option from the list.

Click the **'Reset'** button to reset these options.

--End of guide--

You have reached the end of this getting started guide. For more in-depth information about using this application, please read the **'PLMS Analysis – User Guide'**.

Document Revision History

[illegible]