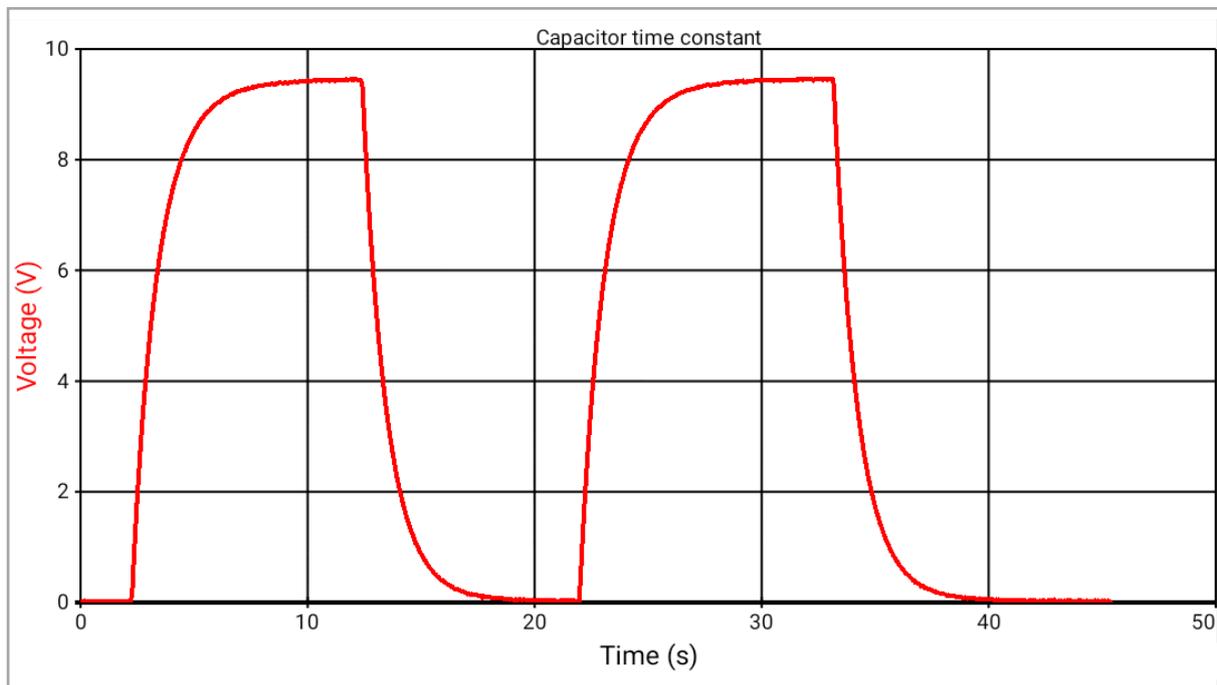


EasySense Android software guide



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DO254 Issue 1

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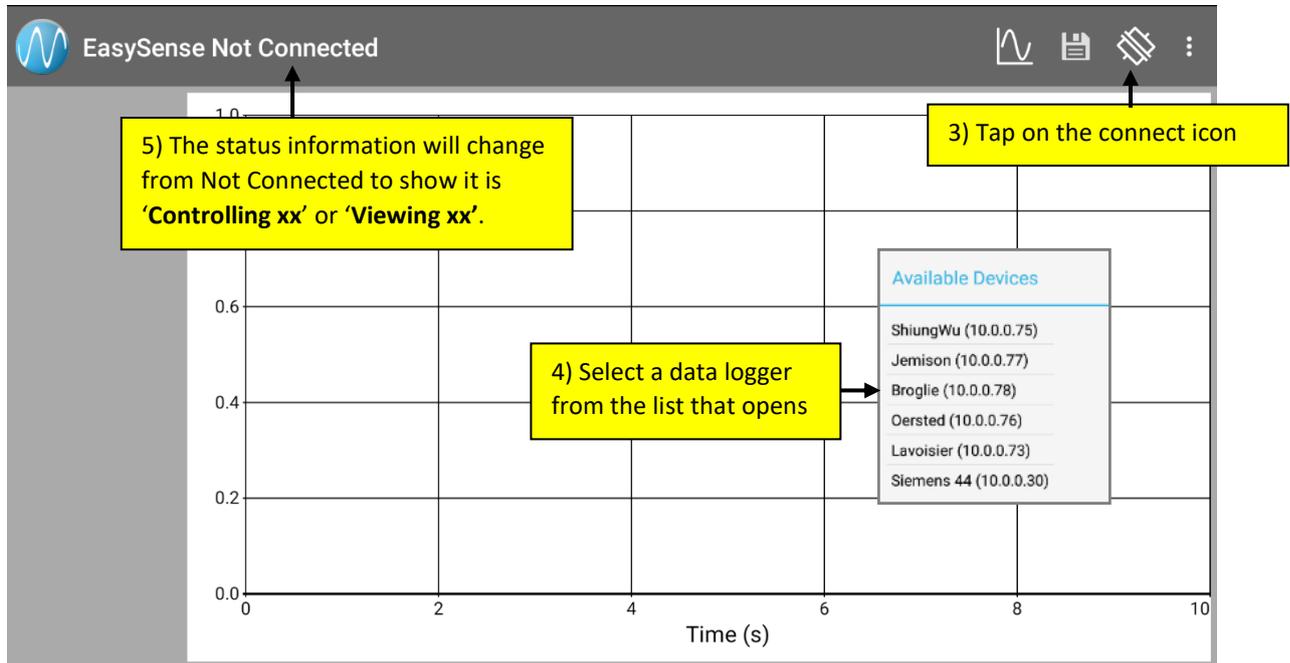
Compatibility

Computer	Android
Data Loggers	EasySense VISION WiFi EasySense V-Log ⁴ WiFi EasySense V-Log ⁸ WiFi



To connect to a data logger

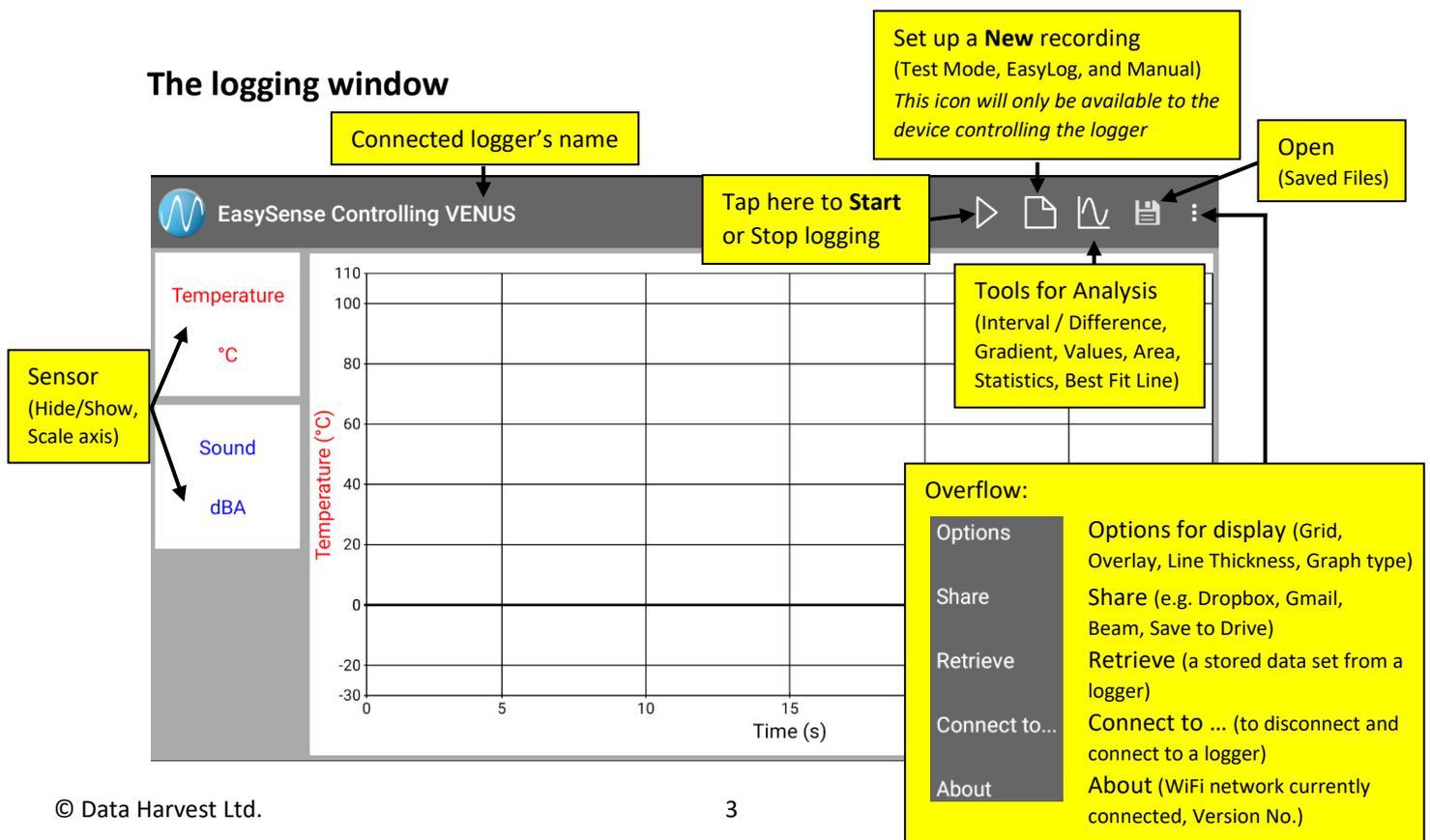
- 1) Ensure the Android is connected to the same network as the data logger (Settings, WiFi).
- 2) Start the **EasySense** App on the Android.



The first device (Android, iPad or PC Windows) that connects to a data logger becomes the Controller and has access to set up a new recording and start and stop logging. Subsequent devices that connect have Viewing rights only.

Notes: Once a connection is established the connect icon will move to the overflow list. If you select Connect to.. whilst Controlling or Viewing xx, it will automatically disconnect the logger.

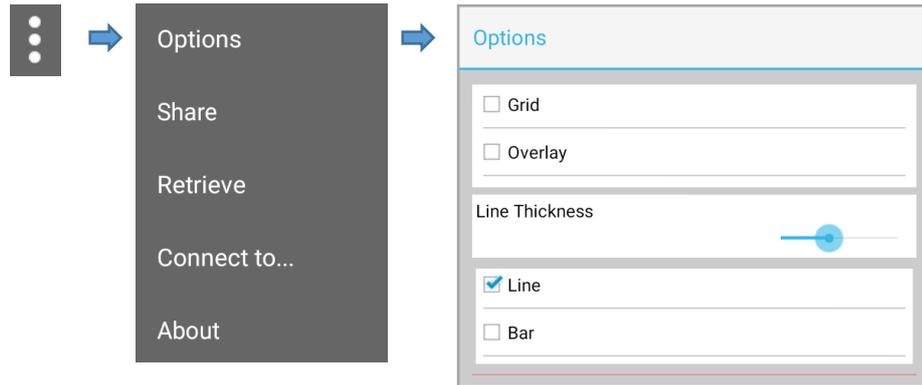
The logging window



Recording data

-  To begin recording, simply tap on the Start icon.
-  During logging the icon will show a square. Tap on this icon to stop data being recorded before the selected duration has passed.
-  If you want to repeat the last experiment (clear data but keep all the settings the same) simply tap on the Start icon again.

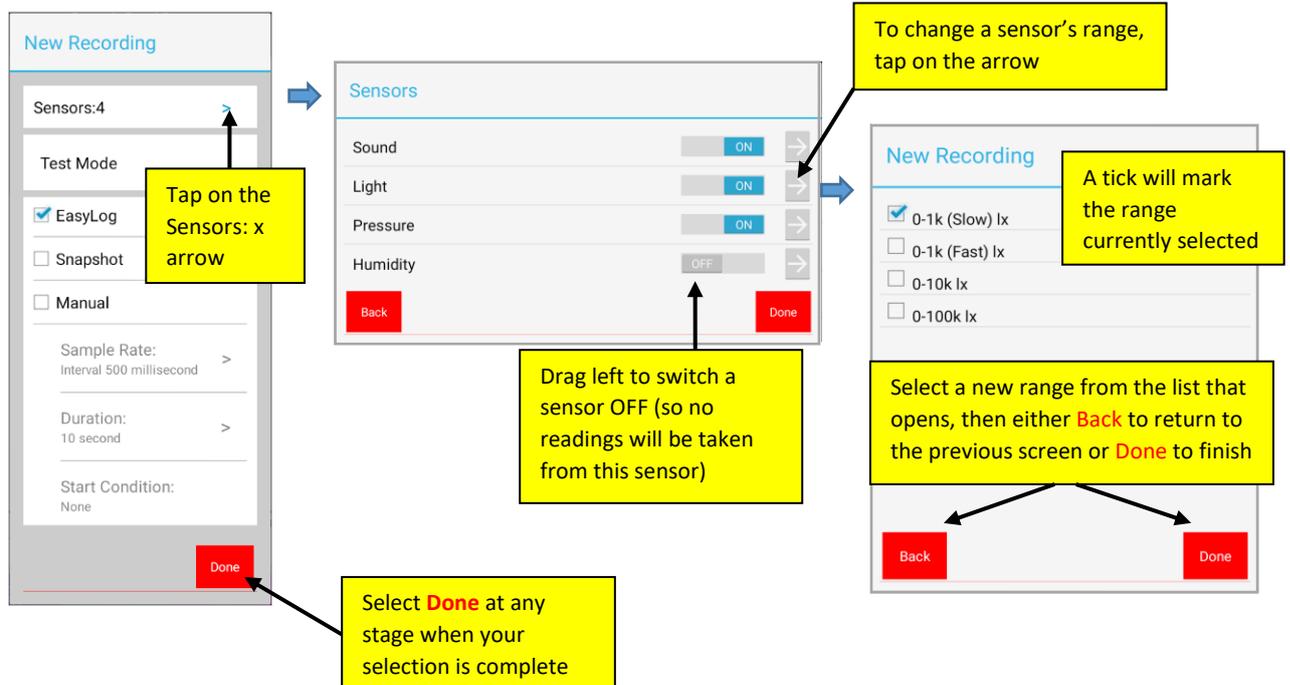
If you want to graph a new set of data, without the previous set of data being erased select Overlay before you select Start.



New recording

Select the **New** icon to set up a new investigation e.g. to change logging mode, duration of a recording, or to identify a change of sensors or change a sensor's range

Sensors – use to deselect any sensors from which readings are not required or to change a sensor's range

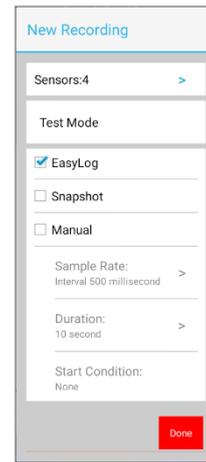


Choose your mode of logging:

- **Test Mode** – use to establish the sensor/s current value.
- **EasyLog** - pre-set to record sensor values **continuously** as a line graph until stopped.

With EasyLog selected tap on **Done**.

To begin recording select the Start icon ►. Logging will start with a time span of 30 seconds and when it has elapsed the time span will double automatically. This will continue until the recording is stopped by selecting the Stop icon ■.

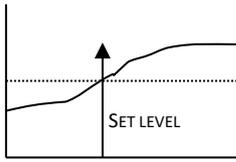


- **Manual** - use to record sensor values against a **chosen time span** as a line graph display. Choose the time span and interval between samples.

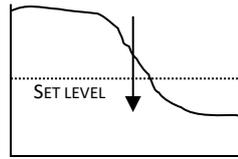
The diagram illustrates the configuration steps for Manual mode. It shows two stages of the 'New Recording' screen. In the first stage, 'Manual' is selected under 'Test Mode'. Annotations include 'Select Manual' pointing to the checkbox, and 'Select duration or sample rate' pointing to the 'Sample Rate' and 'Duration' fields. In the second stage, the 'Duration' is set to '10 seconds' and 'Sample Rate' is '2/second (500ms)'. Annotations include 'Scroll to the right time span for the experiment' pointing to the '10 seconds' option, and 'Scroll to the right interval between samples being taken' pointing to the '2/second (500ms)' option. A note at the bottom states: 'The number of samples that will be taken with this set up will alter automatically', with an arrow pointing to 'Total number of samples = 20'.

If FAST logging (with a sample rate of less than 20 ms) then the option to set a start condition will become available.

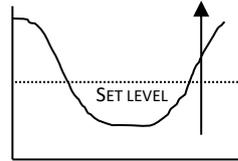
The diagram shows the 'Start Condition' screen. At the top, 'None' and 'On Level' are options, with 'On Level' selected. Below, there are three rows: 'Humidity' with 'lower than', 'Sound' with 'rises above', and 'Light' with 'falls below'. A text input field shows '80.0'. Annotations include: 'Select 'None' for recording to begin as soon as you tap on the Start icon. (Default condition)' pointing to 'None'; 'Select 'On Level' to delay the start until a set condition is reached. Select: a. The trigger sensor b. Whether the value should be higher than, lower than, rises above or falls below c. Enter the sensor's trigger value' pointing to the 'On Level' option, the 'Sound' row, and the '80.0' input field respectively.



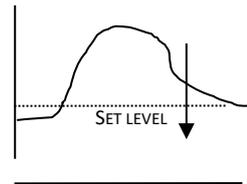
Higher than - start recording when the value is above the set level.



Lower than - start recording when the value is below the set level.



Rises above – logging will not start until the value from a sensor rises up above the set level.



Falls below - logging will not start until the value from a sensor falls below the set level.

Select the **Start** icon ►. Recording will start when the start condition is met. The recording will stop when the selected time span has passed.

Note: While FAST logging there is no screen display of data until the recording has finished.

Select the **Stop** icon ■ to stop data being recorded before the selected duration has passed.



Analysing captured data

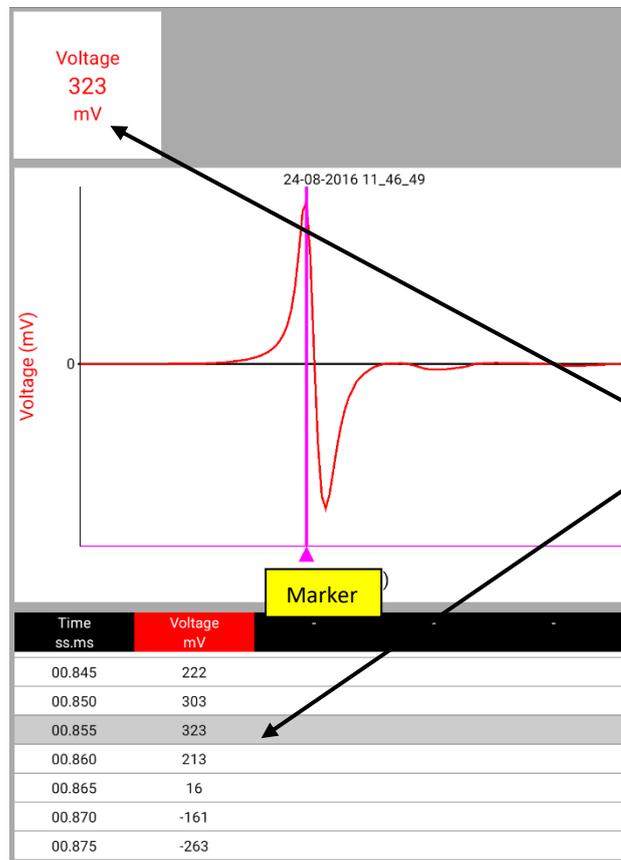
The **Tools** menu has a number of Analysis tools to study the captured data.

Tools

- Interval / Difference
- Gradient
- Values
- Area
- Statistics
- Best Fit Line

Values

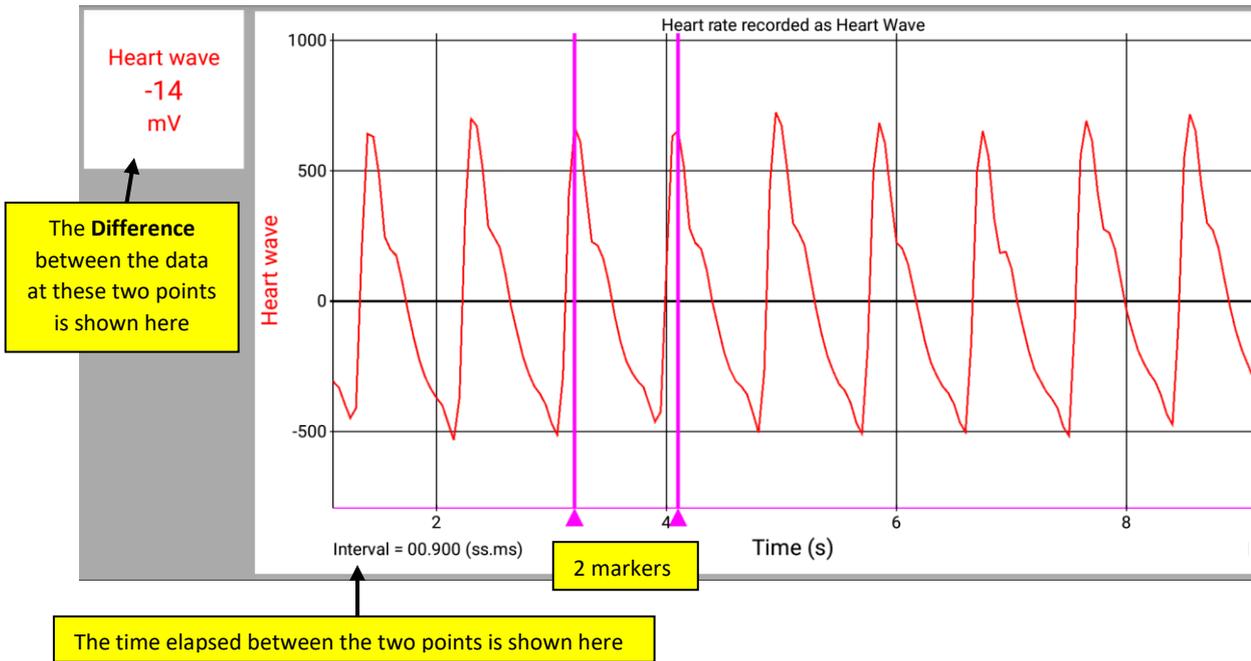
Drag the marker to select a data point.



The **Value** at the marker point is shown in the data box and highlighted in the table

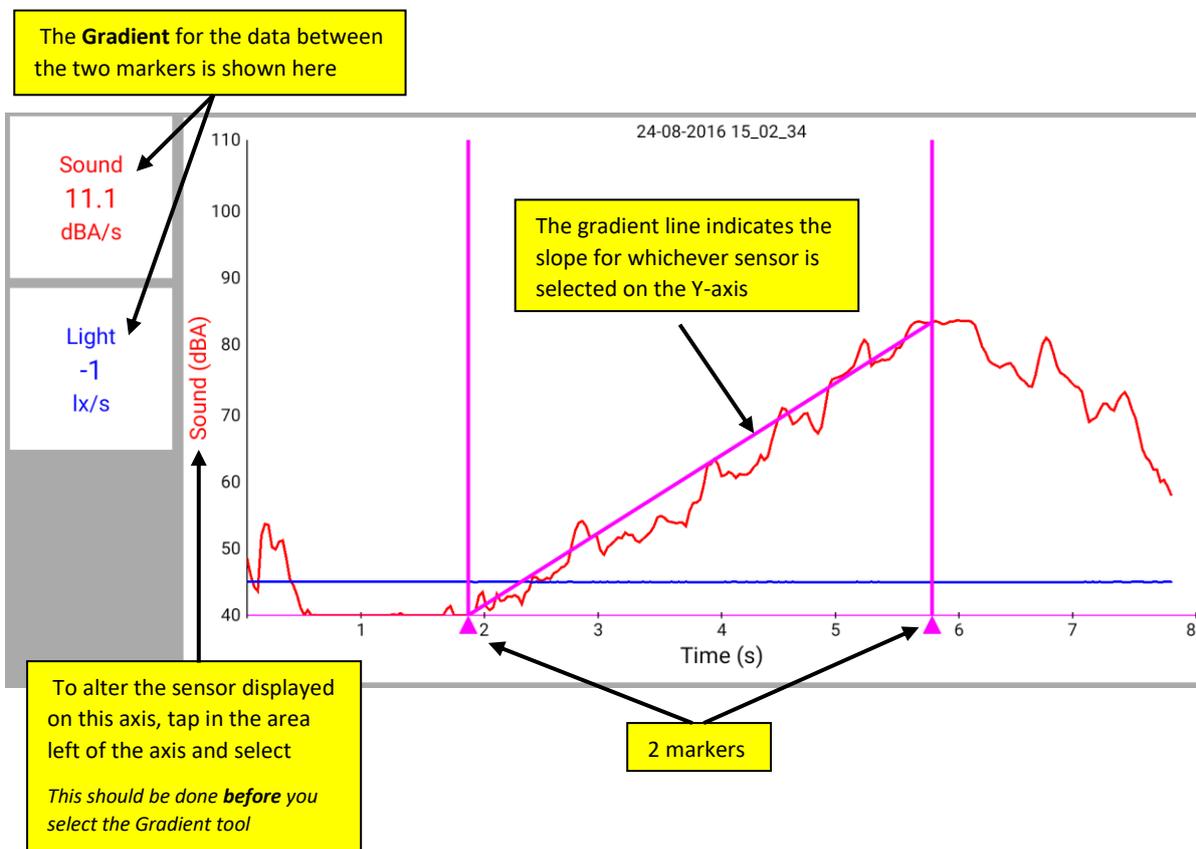
Interval/ Difference

Drag the 2 markers to choose two points.



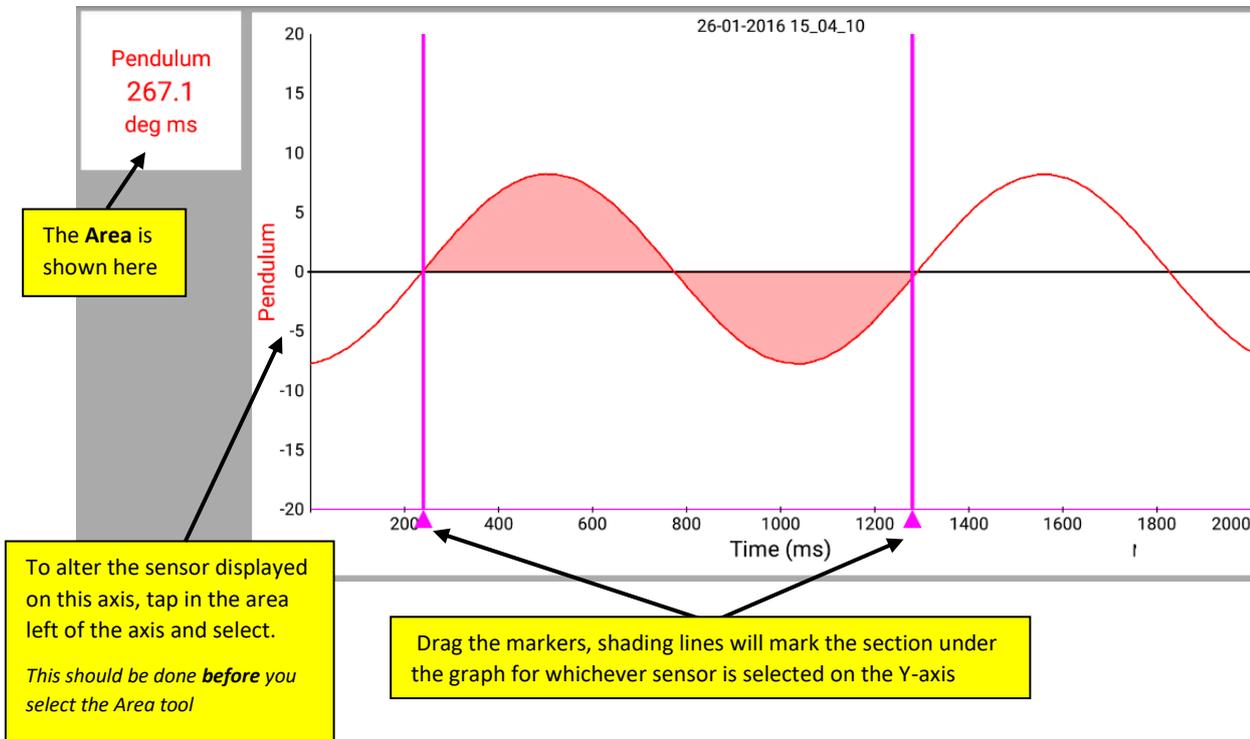
Gradient

Drag the 2 markers to choose two points.



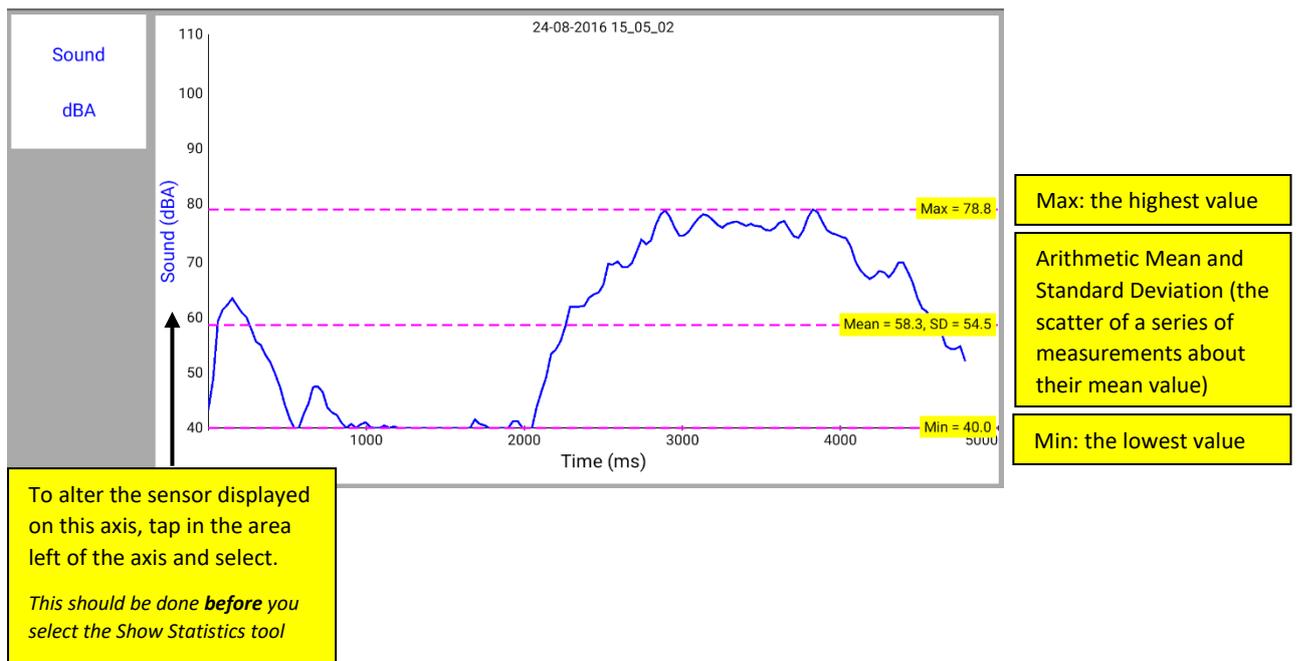
Area

This feature is used to calculate and display the area under a chosen section of the graph. The calculation for area is performed on the data from all channels. The units correspond to the product of the Y and X-axis.



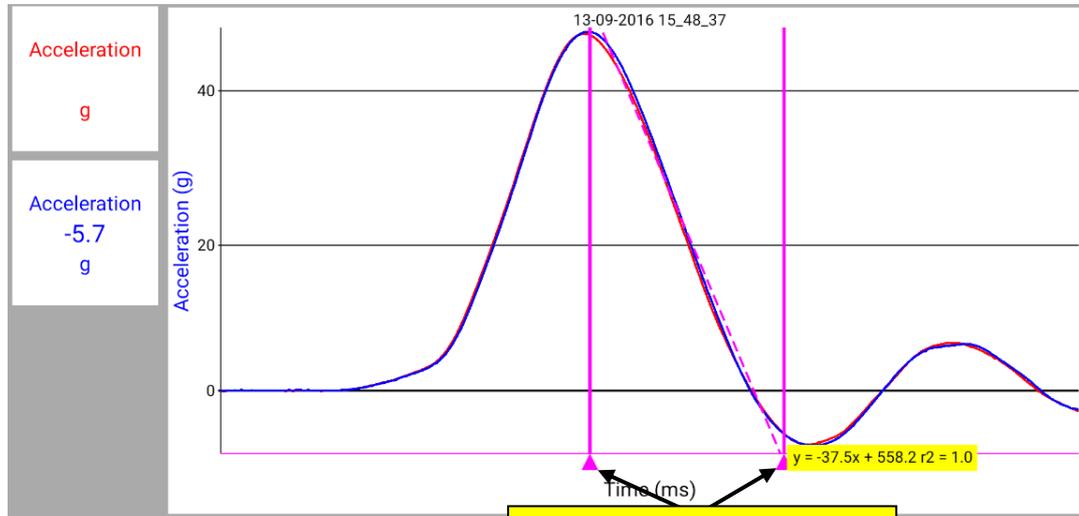
Statistics

Calculates and displays statistical information about the data collected from the data channel currently selected on the Y-Axis.



Best Fit Line

Automatically calculates and draws a linear best fit through the data at the two points selected for the data channel currently selected on the Y-Axis



Drag the markers to the two points between which to fit the line

$$y = (mx + c), r^2$$

y = the data channel selected

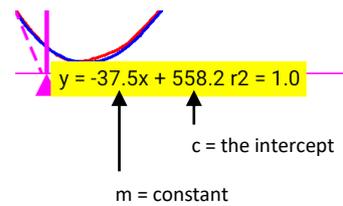
x = how far along (i.e. time or reading number)

m = the constant of the slope (gradient between two points)

c = the y axis intercept

r² = the coefficient of determination and is a measure of goodness of fit

e.g. when r² equals 1.0, all points lie on a straight line with no scatter.



Displaying data

Data Value boxes

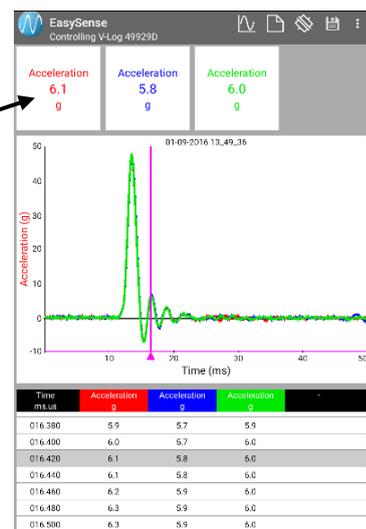
The value recorded by a sensor is displayed in a data value box. The colour used in a data value box corresponds to the colour of the plotted line and the y-axis label on the graph.

The Table display

When Android is landscape the graph area will automatically fill the window. To expose the table rotate to portrait.

Drag in the table area to scroll the data.

When the Values tool is used, data selected on the graph will be highlighted in the table.



Zoom

To magnify an area so that it can be seen in greater detail, pinch two fingers and move apart to zoom in or pinch together to zoom out on both the X and Y axis. To expand the magnified area further, repeat the above.

Double tap to switch zoom OFF and return to the original graph.

X and Y axis

Drag left (OFF) to hide this sensor's graph line and value box from view, drag right (ON) to show

To alter the sensor, tap in the area left of the y-axis.

Select the sensor to display on the y axis from the list
This option will not be available while an Analysis tool is in use

Sensors

- Heart wave ON
- Stethoscope ON
- ECG/EKG ON

Stethoscope mV

ECG/EKG μ V

Heart wave (mV)

Time (ms)

Tap below the graph area for the x-axis options

Time:

- Time - elapsed time in milliseconds (ms), seconds (s), minutes (m), hours (h) and days (d).
- Absolute Time - clock time for the duration of the recording [Absolute Time (hh:mm:ss)].
- Seconds - elapsed time in seconds

Reading Number

Show/Hide sensor, Autoscale, Sensor settings

Tap in the sensor's data value box.

ECG/EKG 1603 μ V

Set to its original scale

Select User to let you alter this sensor's minimum and maximum limits manually

Apply the same scale to any sensors of the same type connected

Drag left (OFF) to hide this sensor's graph line and value box from view.
To show again tap in the area left of the y-axis and drag to ON

Applies Auto scale to this sensor's data using

- the minimum to maximum value
- a minimum of zero to maximum value

Sensor

ECG/EKG ON

- Default
- Min to Max
- 0 to Max
- User
- Scale all ECG/EKG sensors

Heart wave (mV)

Time (ms)

Time ms	Heart wave mV	Stethoscope mV	ECG/EKG μ V
000	-768	444	1660
002	-766	292	1650
004	-771	118	1655
006	-779	-1	1672
008	-781	-2	1670
010	-772	108	1682
012	-770	219	1670

Options: Grid, Overlay, Line thickness, Line or Bar graph

Overflow icon (top right of screen)

Tap **Options** for Overlay, Grid, Line thickness and graph type menu

Select **Grid** to mark the graph area with a faint grating

With **Overlay** selected a new set of data can be added to the graph without the previous set of data being erased - useful for repeating an experiment to compare data

Use to change between a line or bar graph

Drag to increase or decrease the thickness of the graph line

Title

EasySense Controlling VENUS

Tap in the area above the graph to enter or edit the Title

Changing a sensor's range

Some *Smart Q* sensors have multiple ranges e.g. a Light Level sensor. The way to change a sensor's range to one more suitable for an experiment is

1. Select the New recording wizard icon
2. Tap on the Sensors: x arrow
3. Tap on the sensor's arrow
4. Select a new range from the list that opens, then either **Back** to return to the previous screen or **Done** to finish

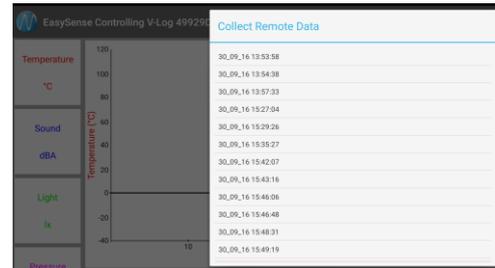
The current range is marked by a tick

Retrieve

Select **Retrieve** (from the overflow menu ) to collect stored data from a logger.

A dialog box will open showing a list of the data files stored in the data logger's memory, tap on a file to open

Retrieved data can be used in the same way as real-time data i.e. it can be analysed, saved and printed.



Share

Use to access share file transfer tools e.g. if your Android is connected to a network with Internet access you can send a data file via email or add to Dropbox. The list available will depend on what apps are installed on your tablet.

Send file to:



Add to Dropbox



Gmail



Save to Drive



Android Beam

File options

Open file

To load previously saved data files select  or **Open** from overflow menu  and tap on a file to open.

Delete file

Select Open file, locate the file in the saved file list, touch and long hold the file and select **Delete**.

Saving files

Data is auto-saved within the program. The file name auto-defaults to the creation date & time.

File name

Select Open file, locate the file (default name is the creation date & time), touch and long hold the file, select **Move**, then **Rename** and type in a new name.

EasySense Software Multi-user Site Licence

Definitions

The following expressions have the meanings given here:

- **'DHG'** means **Data Harvest Group Limited**, being owner of all intellectual property rights in the Software
- **'Documentation'** means both printed and electronic user documentation.
- **'Software'** means the program supplied.

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