Planimator Manual

Version 1.0

Contents

About the Planimator

App requirements:

1. System Android 4.0 or higher.
2. Device screen size at least 480x800 pix

The optimal screen (resolution) for the app is 1080x1920 pix. It also may work with other screen resolutions, but the alignment of controls at the screen may not be optimal.

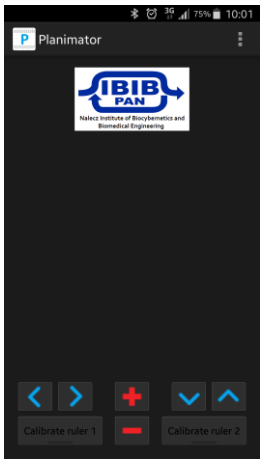
Some tips for the measurements with the Planimator app:

1. Use rulers with thick ticks.
2. Use short rulers – about 2 cm longer than a measured wound.
3. Use self-adhesive rulers and cut out their non-adhesive parts.
4. During taking a picture assure good lightning to shorter the exposition time and reduce the possibility of taking a shaky picture.

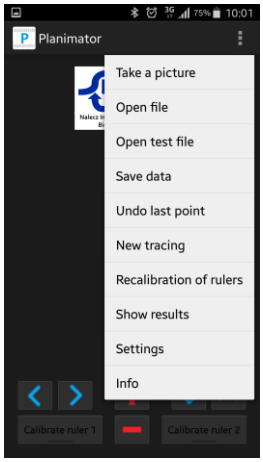
1. Taking a measurement

Please, enter the coefficients of distance-to-camera equation to enable the correction with calculated angle of camera tilt.

1. Place one ruler above a wound and the second below it. Alternatively rulers may be placed at right and left sides of the wound.
2. Start the Planimator app.
3. Open the app menu by touching the button  or a hardware application menu button if the device is equipped with such and controlled by Android.

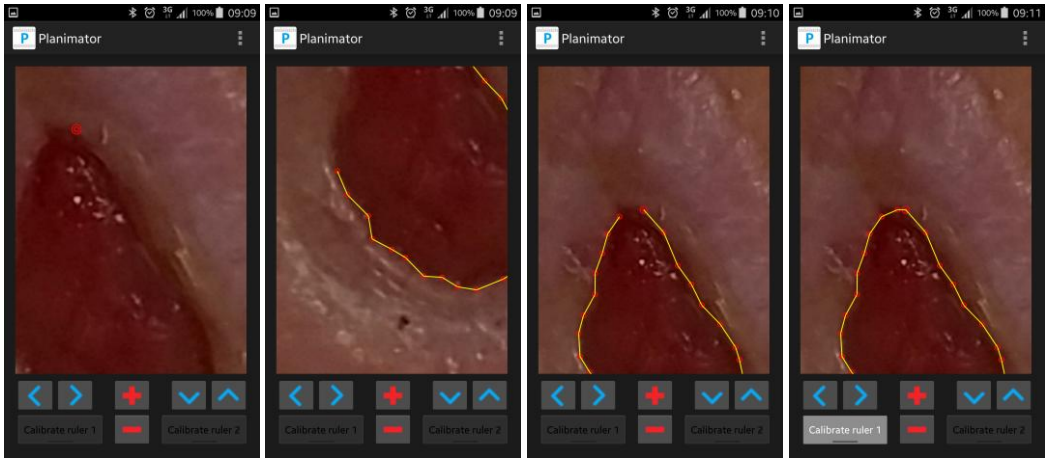


4. Choose ‘Take a picture’ from the menu.

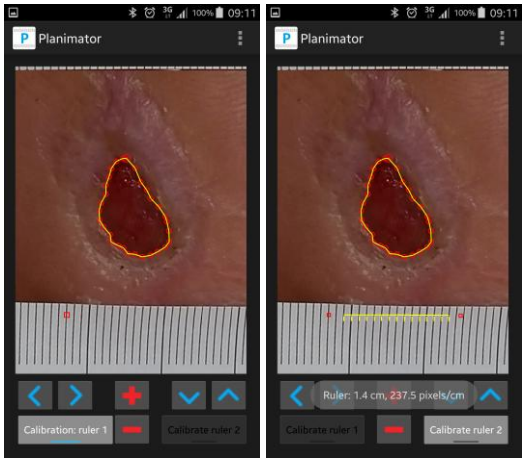


5. The camera app will start. Make sure to frame the picture to see the wound in the middle of the screen; both rulers must be also visible. Take a picture and press the button Ok if it is not blurred nor shaky.

6. Make the wound outline by touching the screen at wound edges. Use + or − buttons to zoom the picture, and other navigation buttons (^, <, v, >) to scroll the picture, if necessary. Automatic scrolling will move the picture if the last point is close to the edge of the picture. The last point of the tracing will automatically close the tracing, if it is placed close enough to the first point. Use the option 'Undo last point' if you want to erase the last point of tracing. The option 'New tracing" in the menu enables to start a new tracing. The option 'Recalibration of rulers' enables to repeat the calibration of rulers.



7. Touch the button 'Calibrate ruler 1' to start calibration of ruler 1; touch one of the rulers to mark a start point of a calibration line segment, then touch the same ruler a second time to mark the end point of the line segment. The line segment at the ruler needs to be parallel to the ruler's edge. The length of the calibration line segment should be comparable to the wound's width, but not shorter than 1 cm.



8. Touch the button 'Calibrate ruler 2' to start calibration of ruler 2; touch the second ruler to set a start point of calibrating line segment, then touch the same ruler a second time to set the end point of the line segment.

9. Value of calculated area will be displayed at the top of the wound picture.

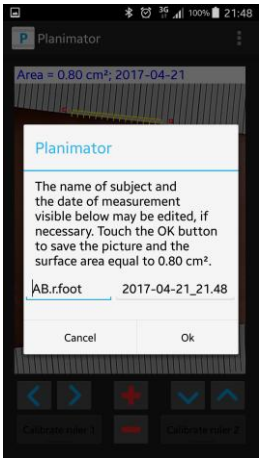
2. Saving the measurement result and the picture with tracing

When the wound area is calculated it can be saved. Before saving it is possible to zoom the picture to save only the tracing and ruler:

To save the data and the picture:

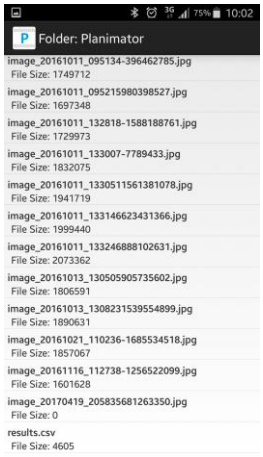
1. Choose “Save data” from menu.

2. Enter the name of the subject (i.e. ‘Foot’) and edit if necessary the date and time of wound measurement. Touch the “Ok” button.



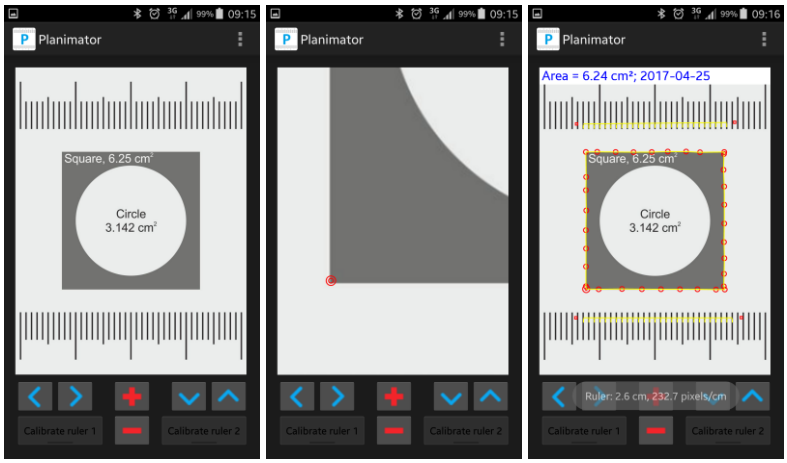
3. Opening a file with wound image or a saved tracing picture

1. Choose “Open file” from menu. List of files to open will be shown. Raw wound images are saved as JPG files with “image_” at the beginning of filename. Files with wound tracing are saved with a subject’s name at the beginning of filename. When raw wound image is open, a wound measurement will be possible based on such a picture.



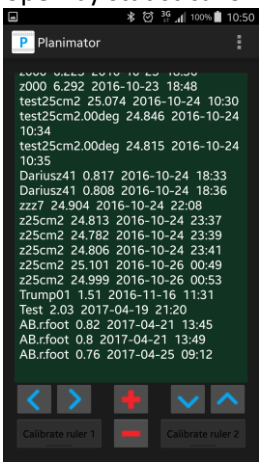
4. Opening the test file

1. Choose “Open test file” from menu. A test file will be displayed with a square, a circle and 2 rulers. A test measurement is possible at these two figures; area of the square is 6.25 cm² and area of the circle is 3.142 cm².



5. Displaying the saved measurement results

1. Choose “Show results” from menu. The results of all saved measurements will be displayed. Scroll the displayed text to the end if you can not see the latest results. The file is located in the Planimator folder in Downloads and it is named ‘results.csv’. It can be copied to a computer and open by statistical or spreadsheet software.



6. Displaying details of tracing and technical information

1. Choose “Info” from menu. The details will be displayed.

7. Distance equation for advanced mode

To enable the Planimator app to calculate the camera tilt angle, which is necessary for the correction of measurement result, carry the described below procedure. It will enable to estimate the coefficients from the distance-to-camera equation.

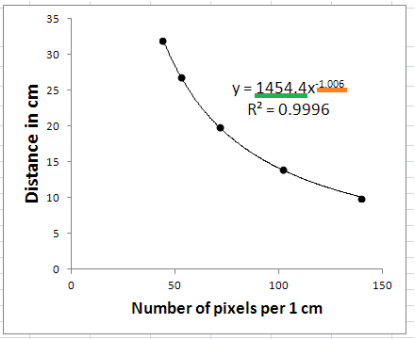
1. Take a picture of a ruler from a certain distance using the Planimator app. Note the distance.

2. In the Planimator make a fake wound tracing and calibrate the ruler at the picture.

3. Open the details form by choosing ‘Info’ from the app menu. Note the number of pixels per 1 cm for the ruler 1; It is given as ‘Ruler 1 calibration’.

4. Open a statistical software or a calculation spreadsheet, and enter at first column the noted number of pixels and the noted distance at the next column. Repeat the steps 1 to 3 for different distances (8 to 30 cm) and enter the results at the columns. Make an XY graph from these two columns, and add a trend line choosing power function.

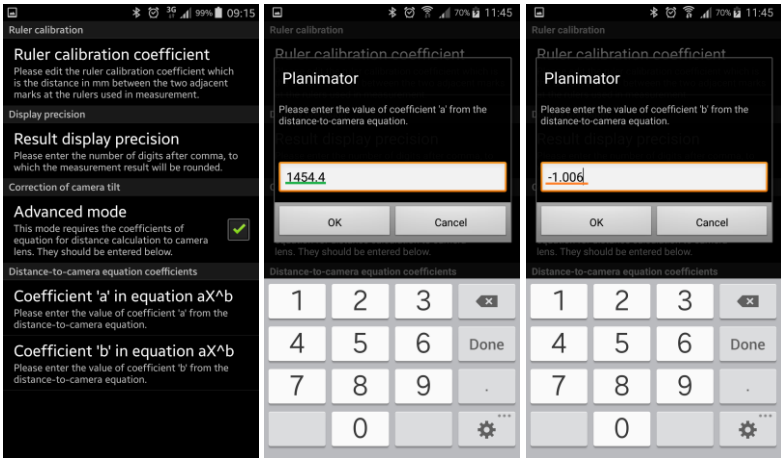
Number of pixels per 1 cm	Distance in cm
140	10
102	14
71,4	19,9
53	27
44	32



5. Display the equation at the graph, and use the value in front of *x* as the coefficient 'a', and the value from exponent as the coefficient 'b' in the Planimator settings. To enter these two

coefficients mark ‘Advanced mode’ in the settings to enable the items for entering the coefficients.

The coefficients ‘a’ and ‘b’ in distance-to-camera equation were calculated for some devices and are automatically loaded. These devices are: Samsung Galaxy S4 (model GT-I9505), Samsung Galaxy S5 (model SM-G900F), HTC Evo 3D (model HTC EVO 3D X515m), and Samsung Galaxy Note (model SM-P605).



8. Distance between ruler ticks

1. Choose ‘Settings’ from the menu and touch the ‘Ruler calibration coefficient’. Enter the correct value and touch the ‘Ok’ button.

9. Display precision

1. Choose ‘Settings’ from the menu and touch the ‘Result display precision’. Enter number of digits to be displayed after the decimal and touch the ‘Ok’ button.