

CamCal

Software Application for SP20

Rear Camera Calibration

User Guide



Why is SP20 Rear Camera Calibration Required?

SP20 Rear Camera



The main purpose of the SP20 rear camera is to provide an accurate view of the ground below the SP20. However a misalignment of the camera with the body of the SP20 unit usually exists introducing a bias in all measurements made. This will be the case for example when using the rear camera to log field data from within the GIS (MobileMapper Field) or Survey (Survey Mobile) Spectra application.

What's more, the degree of misalignment varies from an SP20 to another, thus making the bias a quantity specific to each SP20 unit.

CamCal Icon



For this reason, Spectra has developed the *CamCal* application so that users can eliminate the biases specific to their own SP20 units. *CamCal* has to be run individually on each SP20 to make the bias determination accurate.

The calibration process has to be performed once, but needs to be repeated every 3 or 6 months, depending on how often you use your SP20.

The overall calibration process only takes a few minutes.

Required Accessory

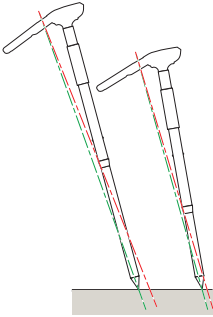


The Spectra monopole, or any other pole, is required to perform the calibration.

You will have to change the monopole length twice during the process and the difference between the two lengths should be at least 20 cm.

With its four preset lengths, from 1.00 m to 1.30 m, the Spectra monopole (see picture) appears to be the best option for this procedure.

Calibration Principle



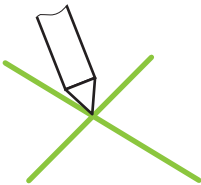
During the calibration process, you will have to take two pictures using the rear camera. These will be taken at two different lengths of the monopole, onto which you will have first installed your SP20 unit.

After shooting each of the two pictures, CamCal will ask you to drag it on the screen so that the tip of the monopole appears at the center of a cross-hair, which occupies a fixed, central position on the screen.

After you have made this adjustment for each of the two pictures, CamCal will be able to determine the bias, which will subsequently allow Spectra applications to correct all their measurements for this bias.

What Calibration Requires

- The two pictures should be shot in portrait orientation to make them usable in the calibration process.
For some reason, the picture you will shoot may mistakenly be interpreted as a landscape image. In that case, reject the picture and take a new one after giving more tilt to the monopole.
- The camera lens must be focused on the tip of the monopole. Before taking the picture touch the tip, where seen on the screen, so that the camera can focus on this point. This is to make sure the picture will not be blurred around this point.
- The tip of the monopole should be put down on the ground. This will give better mechanical stability to the assembly and therefore better quality for your pictures.



To help you locate the tip of the monopole on the two pictures, it is a good idea to draw two intersecting and perpendicular lines on the ground. By placing the tip of the monopole precisely at their intersection point, it will be easier to place the tip (hidden on the pictures) at the center of the cross-hair (more details in step 12, *page 5*).

What Calibration Does not Require

- You don't need to hold the monopole in vertical position. On the contrary, giving some angle to the monopole is recommended to prevent the camera from mistakenly interpreting the picture as one in landscape format.

Camera Calibration Steps

CamCal can be downloaded from:


<https://spectrageospatial.com/sp20-gnss-handheld/>

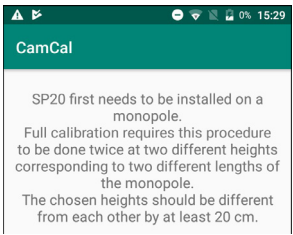
(Link to CamCal posted in SUPPORT section)




After downloading/installing CamCal on your SP20, do the following:

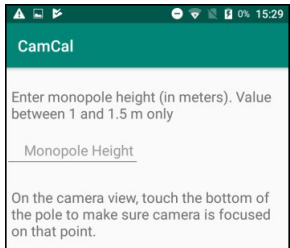
1. Secure the adapter onto the back of the SP20. This accessory is part of the standard supply. Then fasten the SP20 with its adapter onto the monopole.
2. Set the monopole length to one of the possible four height values. Keep in mind the value you have just set.
3. Turn on the SP20 and then put down the monopole on the ground, its tip placed exactly at the intersection of two intersecting and perpendicular lines drawn on the ground.


4. On the Android applications screen, touch . This starts CamCal. A message then shows up (see below) recalling you to first install the SP20 on a monopole, which you have just done.

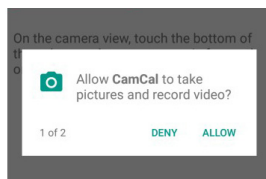
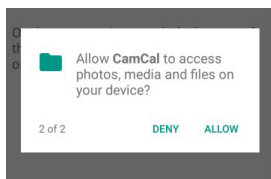


The second part of the message explains the two steps of the process.

5. Click  located in the lower-right corner of the screen. A new screen is displayed.

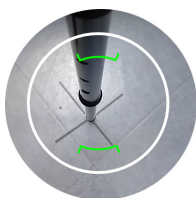



6. Enter the height value you've just set for the monopole.
7. Touch  located in the lower-right corner of the screen.
8. Accept the two settings that follow, each time by touching **ALLOW** (You will be asked only once).

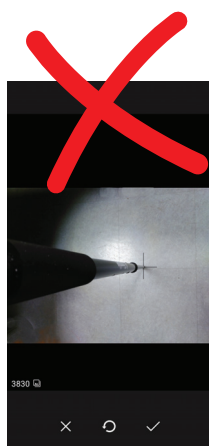
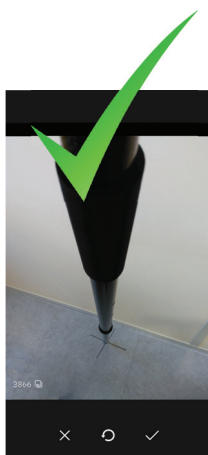




Then the screen shows what the rear camera really sees.

9. Touch the screen where the tip of the monopole is located in order to let the camera focus on that point. A symbol shows where the camera is focusing on:



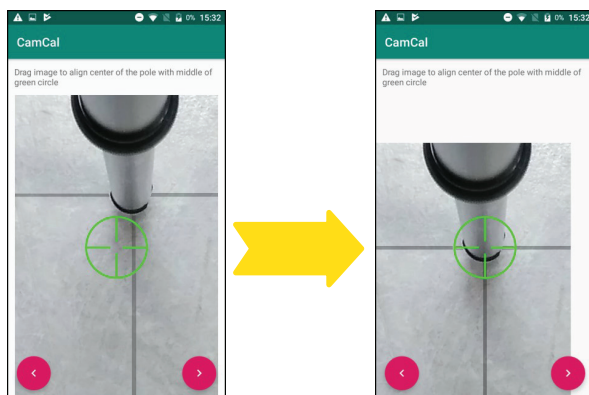
10. Take the first picture by touching . As a result, CamCal shows the picture you've just taken. CamCal will show either a picture taken in portrait or landscape format.




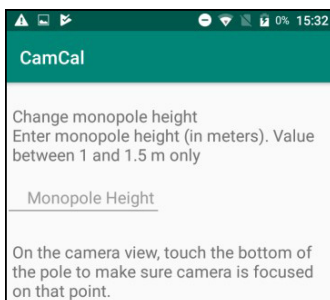
11. Touch  to accept the portrait format, or  to reject the picture in landscape format. In the latter case, change the tilt of the monopole and/or make a step to get a different view on the camera and then take another picture to get a valid one.

With a valid picture, the next screen shows the picture you have just taken with a superimposed green cross-hair at the center of the screen.

12. Touch the screen with a finger and drag the picture so that the monopole tip appears at the center of the cross-hair. Use the lines drawn on the ground to make this adjustment as accurate as possible (see example below).




13. Touch  after you have been able to place the monopole tip within the cross-hair. A new screen is displayed:

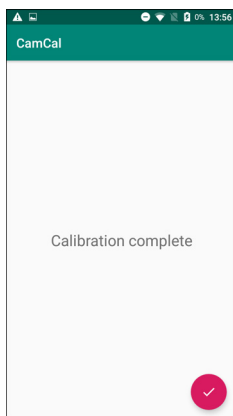
The screenshot shows the 'CamCal' app interface for entering monopole height. It has a teal header with 'CamCal'. Below the header, the text reads: 'Change monopole height', 'Enter monopole height (in meters). Value between 1 and 1.5 m only'. There is a text input field labeled 'Monopole Height'. At the bottom, there is a note: 'On the camera view, touch the bottom of the pole to make sure camera is focused on that point.'

14. Change the length of the monopole (by more than 20 cm compared to the first height setting).
15. Resume the procedure from step 6 above.

In step 6, enter the new height value, different from the first one by more than 20 cm.

Step 8 will be skipped this time as the two questions of step 8 only have to be answered once.

After the second picture has been taken, you have repositioned the monopole tip at the center of the cross-hair and touched , a message will appear to inform you that the **"Calibration [is] complete"**.



From now on, all data collection performed using the camera view on MobileMapper Field and/or Survey Mobile will be corrected for the bias due to bad camera alignment.

16. Touch  to quit CamCal.

Once the calibration is complete, you can be sure the view provided by the rear camera and the antenna height entered in the application match up. This will guarantee that the accuracy of all your measurements only depend on the accuracy of the GNSS position calculation.