


AngleCam Guide

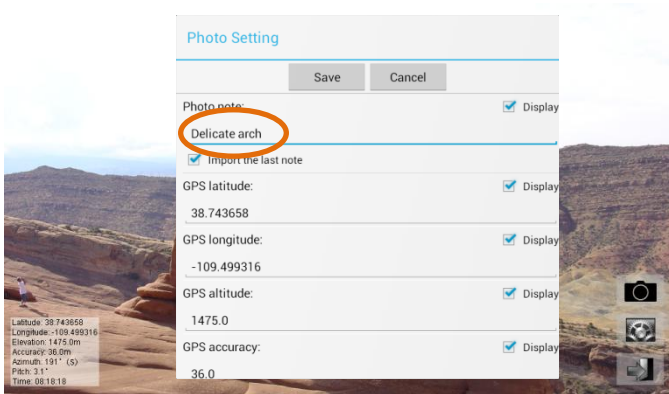


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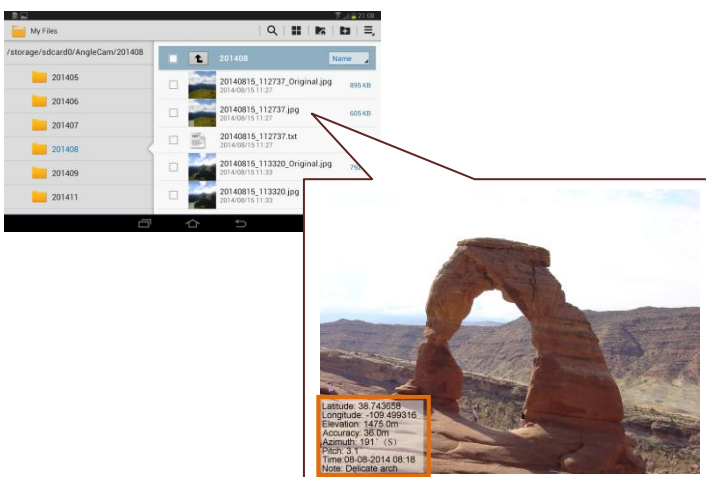
Quick Start Guide



(1) Open AngleCam, and then click button  to take a picture.



(2) Leave a message, and save it.



(3) The picture has been saved on your mobile device. The file location is under the primary external storage directory + /DCIM/AngleCam/ directory.

AngleCam Guide

AngleCam is a scientific camera combined with GPS information (including latitude, longitude, altitude and accuracy), pitch angles and azimuth angles. In addition, AngleCam can leave a message, and put all information together into a photograph.

(1) Introduction



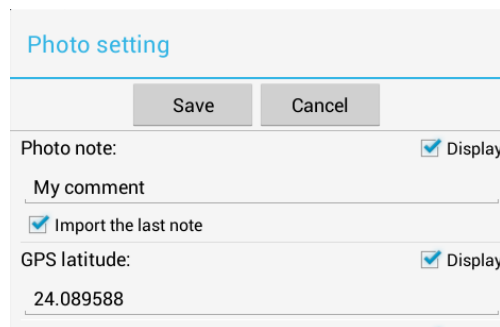
Like other camera applications, you can see a preview screen while opening AngleCam. The top middle of the screen displays azimuth information. The left/right middle displays pitch angle and

offset angle information. The lower-left corner of the screen displays GPS, azimuth angle, pitch angle and time information. The lower-right corner has three buttons. They mean “taking a picture,” “setting,” and “exit.”

(A)  Taking a picture

Press this button will take a picture. You can leave a message or modify information while pressing the button. The picture will be saved after pressing “Save” button.

If the checkbox “Import the last note” is toggled on (checked), the last note will be imported when you take next picture.

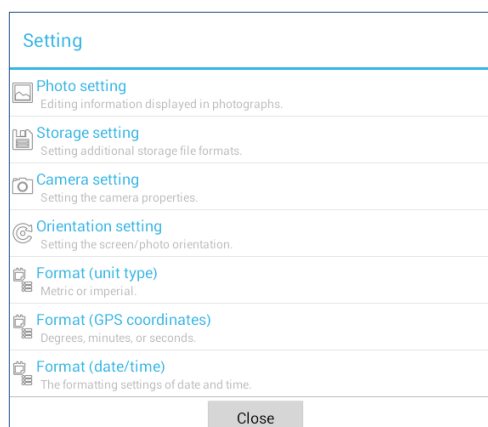


Saved pictures display the information which you’re interested in the lower-left corner. If you don’t want to display some information, you can unchecked the right side checkboxes “Display.” Also, you can modify information if you don’t like it.

In addition, if you do not need to write/modify “photo note” or other information every time, you can check “quick mode” on setting (discussed in the next section). This function can directly save pictures without a pop-up dialog box.

(B)  Setting

The settings can be divided into three parts. The basic settings include “photo setting,” “storage setting,” “camera setting,” and “orientation setting.” The format settings include “unit type setting,” “GPS coordinates setting,” “azimuth angle setting,” “pitch angle setting,” and “date/time setting.” The advanced settings include “sensor angle correction,” and “camera visible angles.” When you first use this application, we recommend that you adjust the settings.



(i) Photo setting

The photo setting let you edit information which you want to display in photographs. It includes your comment, GPS information, angle information, date/time information, etc. The details are described below.

- Display photo note: Display or hide user note in photographs.
- Display GPS latitude: Display or hide GPS latitude.
- Display GPS longitude: Display or hide GPS longitude.
- Display GPS altitude: Display or hide GPS altitude.
- Display GPS accuracy: Display or hide GPS accuracy.
- Display azimuth angle: Display or hide azimuth angle information. You can set its format on the “format (azimuth angle).”
- Display pitch angle: Display or hide pitch angle (top-bottom rotation) information and offset angle (left-right rotation) information. You can set its format on the “format (pitch angle).”

- **Display time:** Display or hide date/time information. You can set its format on the “format (date/time).”
- **Display central point:** Display or hide a central point in photographs. For professional users, this feature can accurately calculate the angle between “the location of a mobile device” and “a target object.”
- **Photo size:** Set photo resolution. The default value is 2048x1536 pixels. Depends on your mobile device, this value may be smaller. If a resolution shows “(Non-recommended),” it means this photo size is too small or too large.

Attention: Photographs require post processing. If picture size (number of pixels) is too large, it may cause incomplete pictures. Moreover, the application may be interrupted if the system does not have enough resource.

- **Quick mode:** “Quick mode” indicates you cannot leave a note while taking a picture, but you can leave a message here.

(ii) Storage setting

When taking pictures, the system saves pictures with information which you're interested. If you want to save other storage file formats, you can set them here.

- **Save original file:** Save additional files for original pictures.
- **Save text file:** Save additional files for text information.

For more storage information, please see “(2) Storage” section.

(iii) Camera setting

The camera setting let you set camera properties. The details are described below.

- **Camera ID:** Set camera ID such as back-facing camera, front-facing camera, or other cameras.
- **Photo size (the same as “photo size” on the “photo setting”):**
Set photo resolution. The default value is 2048x1536 pixels. Depends on your mobile device, this value may be smaller. If a resolution shows “(Non-recommended),” it means this

photo size is too small or too large.

Attention: Photographs require post processing. If picture size (number of pixels) is too large, it may cause incomplete pictures. Moreover, the application may be interrupted if the system does not have enough resource.

- Flash mode: Sets the flash mode. If you do not choose “off” or “auto,” the mode will set “off” after closing app.
- Quick mode (the same as “quick mode” on the “photo setting”): “Quick mode” indicates you cannot leave a note while taking a picture, but you can leave a message on the “photo setting.”
- Camera shutter sound: Set camera shutter sound. You can uncheck the option to turn off camera sound into silent mode.

Attention: Some mobile devices may not be able to close this sound because of the factory setting.

(iv) Orientation setting

The orientation setting let you set screen orientation and

photo orientation.

- Orientation: Set screen/photo orientation. “Automatic” would detect your device orientation automatically. The advantage is that the system will automatically determine the appropriate photography direction. The disadvantage is that it needs to constantly detect direction. It will affect the performance of use. Also, it may affect you to crawl angle value. The orientation will be changed when the offset angle is greater than 70 degrees. “Landscape” means the orientation is the horizontal direction. “Portrait” represents the orientation is the vertical direction. No matter how a mobile device is rotated, the orientation is fixed.
- Forcibly rotating photos: Some mobile devices' photo orientation is wrong. There will be differences of 90 degrees in comment direction and photo direction. Tick the checkbox if your mobile device cannot properly rotate photos. Note that the checkbox should not be checked if your mobile device can properly rotate photos.

Attention: The camera preview screen would be correct. However, it does not mean the orientation of photographs is correct. You can take a vertical picture (portrait), and make sure the photograph is good.

- Help us improve: This option will collect your “forcibly rotating photos” value to our server. The purpose is to assist other users who use the same mobile devices to set the values. Please be assured that it does not collect your personal information.

(v) Format (unit type)

Set a format of unit types in photographs. The formats include “metric (m, km)” and “imperial (ft, mi).”

(vi) Format (GPS coordinates)

Set a format of GPS coordinates. The formats include “degrees (0.000000°),” “minutes (0 ° 00.000’),” and “seconds (0°00’00”).”

(vii) Format (azimuth angle)

Set a format of azimuth angles. The formats include “degree and direction,” “degree only,” and “direction only.”

(viii) Format (pitch angle)

Set a format of pitch angles and offset angles. The formats include “pitch angle and offset angle,” “pitch angle only,” and “offset angle only.”

(ix) Format (date/time)

Set a format of date and time. The formats include “YYYY-MM-DD hh:mm:ss,” “MM-DD-YYYY hh:mm:ss,” “DD-MM-YYYY hh:mm:ss,” “YYYY-MM-DD hh:mm,” “MM-DD-YYYY hh:mm,” “DD-MM-YYYY hh:mm,” “hh:mm:ss,” and “hh:mm.”

[YYYY] indicates a four-digit year, 0000 through 9999.
[MM] indicates a two-digit month of the year, 01 through 12.
[DD] indicates a two-digit day of that month, 01 through 31. [hh] refers to a zero-padded hour between 00 and 23. [mm] refers to a zero-padded minute between 00 and 59. [ss] refers to a zero-padded second between 00 and 59.

(x) Sensor angle correction (Optional)

This option provides angle corrections if a mobile device's angle sensors are not accurate.

- **Azimuth angle:** The new azimuth angle is the sensor value plus this value. Unit: degree. Minimum:0; Maximum:359.
- **Pitch angle:** The new pitch angle is the sensor value plus this value. If the horizontal yellow line is too high, enter a positive value; otherwise enter a negative value. Unit: degree. Minimum:-90; Maximum:90.
- **Offset angle:** The new offset angle is the sensor value plus this value. If the yellow line is from the bottom left to the top right, enter a positive value. Conversely, if the yellow line is from the top left to the bottom right, enter a negative value. Unit: degree. Minimum:-90; Maximum:90.
- **Help us improve:** This option will collect your angle setting value to our server, but it does not collect your personal information. The purpose is to assist other users who use the same mobile devices to set the angle values.

(xi) Camera visible angles (Optional)

Setting accurate camera viewing angles could help "horizontal" maintain accurate horizontal position when a mobile device is tilted.

- Portrait viewing angle: Portrait viewing angle (portrait orientation) is the maximum vertical angle at which a display can be viewed with acceptable visual performance. Unit: degree.
- Landscape viewing angle: Landscape viewing angle (landscape orientation) is the maximum vertical angle at which a display can be viewed with acceptable visual performance. Unit: degree.

You can rotate the mobile device, and place the horizontal line on the top edge or on the bottom edge. Watch a distant object, and make sure the horizon is in the same place.

Attention: The value of viewing angles only affects the horizontal position of the camera preview. Incorrect value will affect the accuracy of the horizontal position, but it will

not affect the validity of sensor angles.

- Help us improve: This option will collect your angle setting value to our server, but it does not collect your personal information. The purpose is to assist other users who use the same mobile devices to set the angle values.

(C)  Exit

Exit the application program.

(D) Basic information

Basic information includes GPS information, azimuth angle information, pitch angle information, and date/time information.

The details are described below.

- GPS information: Display users current GPS coordinates information, including latitude, longitude, altitude/elevation, and accuracy. The formatting setting is on “setting” → “format (GPS coordinates).” If the GPS feature does not receive a valid signal, it shows “waiting for a valid GPS signal.” If the GPS feature does not open, it shows “the GPS feature does not open.” The altitude/elevation information

may be empty if your device uses Wi-Fi-based positioning system (WPS).

- Azimuth angle : Display the current azimuth angle of the mobile device. It is numbered clockwise with north as 0° , east as 90° , south as 180° , and west as 270° . The formatting setting is on “setting” → “format (azimuth angle).”
- Pitch angle and offset angle: Display the current pitch angle and offset angle of the mobile device. The pitch angle value is 0° while the mobile device is toward the front. If it rotates upward, the pitch angle receives a positive value; otherwise, it receives a negative value. Another value is the current offset angle. It is used to determine whether the mobile device tilts (left-right). Basically, this value should be 0° . The formatting setting is on “setting” → “format (pitch angle).”
- Time: Display the current time. The formatting setting is on “setting” → “format (date/time).”

(E) Horizontal

The purpose of the horizontal line is to maintain accurate horizontal position when a mobile device is tilted. If you think the horizontal line is not accurate, you can manually set on “setting” → “sensor angle correction” and “camera visible angles.”

Attention: Inaccurate horizontal line only affects the horizontal position of the camera preview. It does not affect the validity of sensor angles.

(F) Central point

The central point let users know where the photo center is. For professional users, this point can accurately calculate the angle between “the location of a mobile device” and “a target object.” Moreover, you can go to “setting” → “photo setting,” and then set “display central point” checkbox to be checked if you want to display a central point in photographs.

(G) Azimuth angle

The same as “Azimuth angle” on the “(D) Basic information.”

(H) Pitch angle and offset angle

The same as “Pitch angle and offset angle” on the “(D) Basic information.” The upper value means a pitch angle, and the lower value means an offset angle.

(2) Storage

After taking pictures, photographs are saved on your mobile device, the primary external storage directory. The directory name is /DCIM/AngleCam/. It contains subdirectories which are composed of present year and present month. The file names are composed of present date and present time.

(A) Normal picture

Pictures include notes and extra information. The format of pictures is [date]_[time].jpg (e.g. 20140101_180003.jpg).

(B) Original picture

Pictures do not include notes or any extra information. The format of pictures is [date]_[time]_Original.jpg (e.g. 20140101_180003_Original.jpg).

It's optional. You can go to “setting” → “storage setting,” and then set “save original file” checkbox to be checked.

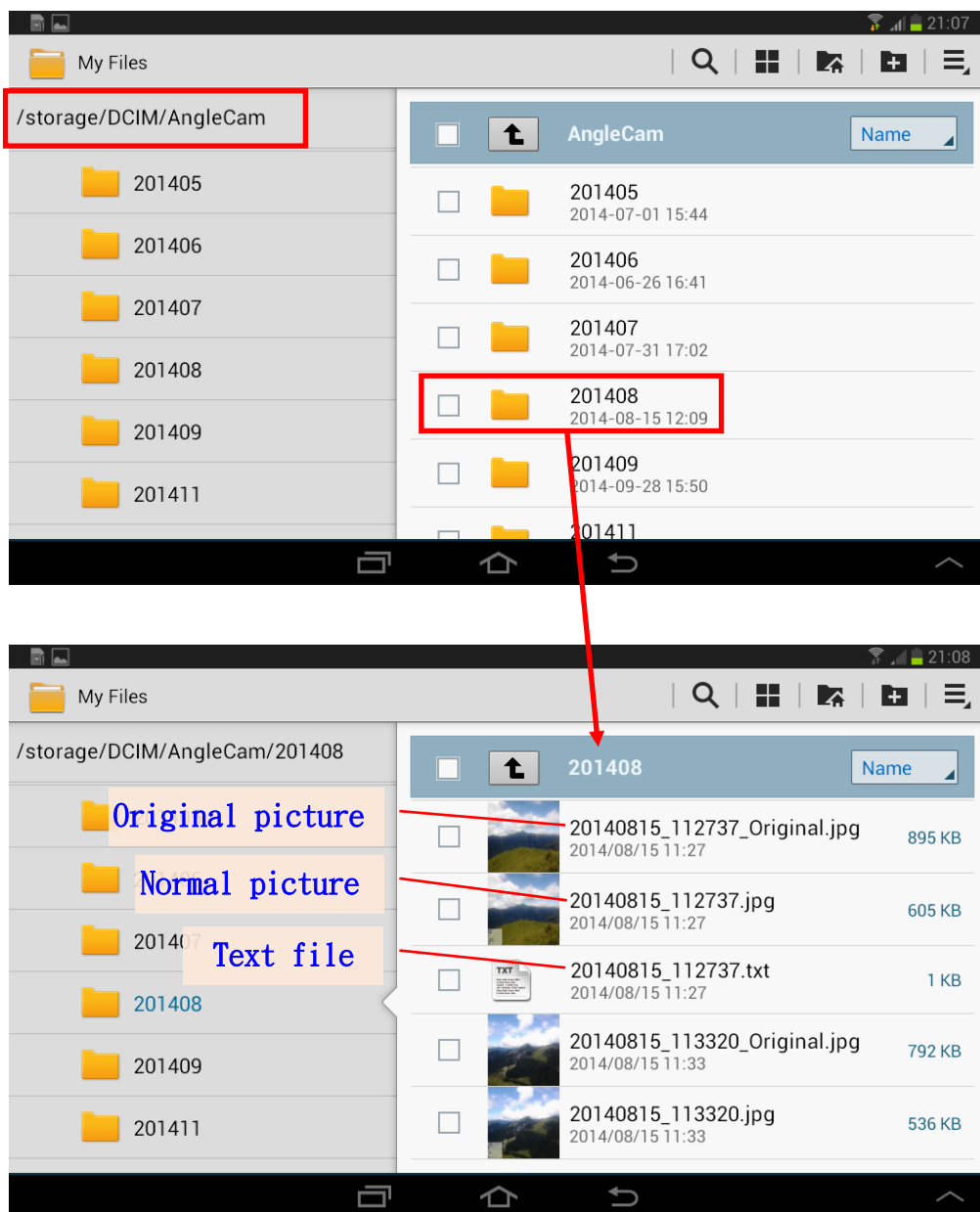
Attention: Due to an extra picture, storage time will be longer.

(C) Text file

Text files include extra information such as user note, GPS

information, angle information, date/time, etc. The format of files is [date]_[time].txt (e.g. 20140101_180003.txt).

It's optional. You can go to “setting” → “storage setting,” and then set “save text file” checkbox to be checked.



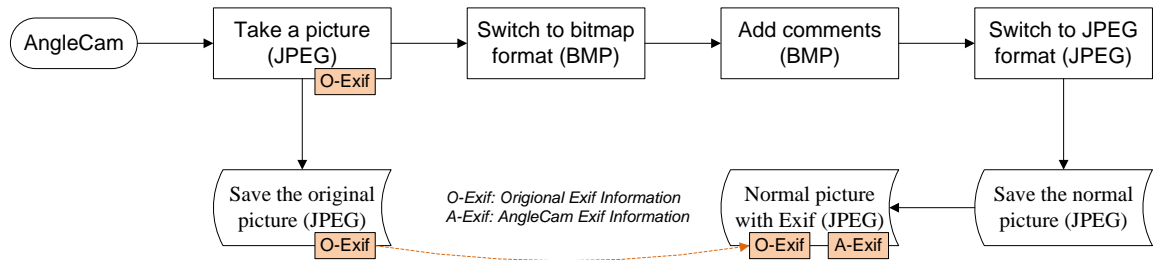
(D) Exif Information

We tried to put whole information into Exif tags. However, due to the restriction of Android API development, AngleCam cannot store Exif tags directly. Normal pictures are processed under the Bitmap format, but Exif tags must be stored under the JPEG format. Hence, if you want to have a more complete Exif information, you must set "save original file." The information of Exif tags is as follows:

(i) With original picture

- Original picture: Include device model information; camera information such as aperture, ISO, and exposure time; and device GPS information.
- Normal picture: Include device model information; camera information such as aperture, ISO, and exposure time; GPS information (It could be user-defined coordinates. However, the GPS coordinates format must be “degrees (0.000000°)”); azimuth angle, pitch angle, and offset angle information (They are saved in the UserComment tag; Code 37510).

- Text file: Include device model information; camera information such as aperture, ISO, and exposure time.



(ii) Without original picture

- Normal picture: Include device model; GPS information (It could be user-defined coordinates. However, the GPS coordinates format must be “degrees (0.000000°)”); azimuth angle, pitch angle, and offset angle information (They are saved in the UserComment tag; Code 37510).
- Text file: Include device model.

(3) Who supposed to use this application?

1. Normal users who want to straighten a skewed horizon.
2. Normal users who want to add comments to photographs.
3. Normal users who want to add GPS information, pitch angles, or azimuth angles to photographs.
4. Professional users who want to measure a pitch angle between a target point and the mobile device.
5. Professional users who want to measure an azimuth angle between a target point and the mobile device. (Azimuth angles may produce large errors depends on mobile devices.)

(4) Others

1. If you have any comments, questions, or feedback, please contact us.
2. If you have other special requirements, please contact us. We may design a customization app for you.

Email: derekrservice@gmail.com