

LAQUINTA



OWNER'S MANUAL

Version 2.01

For LaQuinta CM7418-1.0-00/B with update to SW versions:

System Software: 1.44

Video Software: version 10.050

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NOTES BEFORE USE

DO NOT TWIST THE LENS!!!! The camera has been pre-set to the standard settings and is ready to use; Compass is calibrated, SD card is formatted and the standard 8mm achromatic lens has been set in focus pre-delivery.

Next to the Touchscreen UI menu on the camera, there is a “LaQuinta” Android app available which usage requires only to use the manual On/Off Switch

Make sure that on your **Android device that your Bluetooth toggle is ON, and the LaQuinta app is granted access to Location Services of your phone/ tablet.** Otherwise your Bluetooth connection to the app will not work. There is NO NEED to connect the camera through your phone/tablet’s Bluetooth menu. Starting the app will automatically engage connection with the camera.

Plug in the irradiance sensor/GPS/IMU device into the camera and attach it on top of the UAV where it is unobstructed with full access to the outside light conditions. Place the sensor as far away as possible from the Drone’s GPS receiver in order to avoid possible interference between the 2 receivers.

Make sure (by checking in the sensor data menu tab) that the camera has GPS LOCK, before lift-off. Otherwise part of your flight may contain imagery without GPS data rendering your stitch impossible.,

After finishing, camera should be switched off with the on/off button

Transfer the images made to your pc/laptop by removing the microSD card (**not** by USB transfer, as USB port is for charging only).

After formatting the supplied 64Gb SDxc card in Windows (or other operating system) it will likely be formatted in ExFat. LaQuinta uses the FAT32 format and will therefore proceed to re-format it in the camera upon first insertion. The supplied SD card is already correctly formatted.

Make sure you set the clock correctly (see bottom page 13). In some cases the clock has reset itself due to long period no usage; consequence could be that the images will not record if the time and date is not logical

THE IMAGE SPECTRAL ORDER OF THE 1-LAYER / SINGLE LAYER TIFs IS: R-G-B-NIR
THE IMAGE SPECTRAL ORDER OF THE 4-LAYER / MULTI-LAYER TIFs IS: B-G-R-NIR

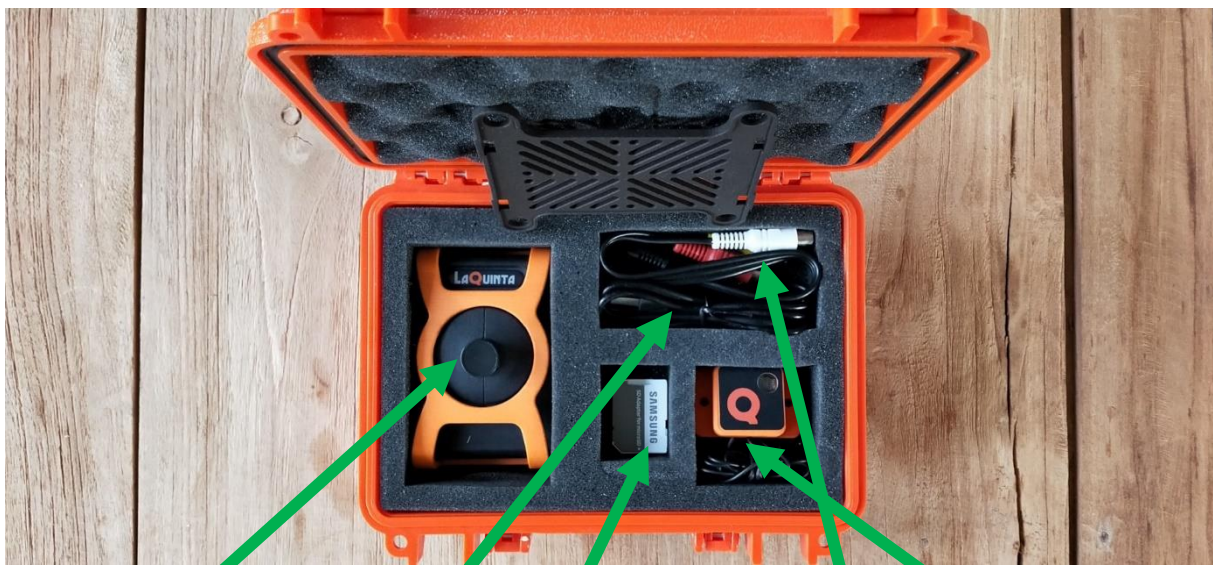
1.0 CONTENTS



LaQuinta Flight Case



TOP LAYER



LaQuinta Camera

USB A – microUSB charging cable

64GB (micro)SD card

Adapt-2-Light sensor

3.5mm – female RCA

- Yellow: Video-out (PAL)
- Red: Trigger Out
- White: Trigger In

BOTTOM LAYER



4 rubber dampers + locking pins
(For UAV Mount)

Wallcharger 5V/ 2A US Plug +
Worldwide adapter plugs:

- EU plug
- AU/China plug
- UK plug



LaQuinta (UAV) Mount

2.0 CAMARA SWITCHES AND CONNECTIONS



On-Off Switch

Micro-SD slot

Micro-USB port
(for charging only)

Trigger in/out/
Video-out (PAL)

Adapt-2-Light
sensor

LED indicators:

- Top left (GREEN: CAMERA ON WITH GPS LOCK)
- Bottom left (RED: CAMERA ON WITHOUT GPS LOCK)
- Top right (GREEN: CAMERA FULLY CHARGED)
- Bottom right (RED: CAMERA CHARGING)

- Top left green light will flash when recording without GPS lock
- Bottom left red light will flash when recording with GPS lock



Trigger in (W) / Trigger out (R) / Video-out Cable (Y)
(RCA Female)



Micro-USB charger (not for data-transfer)

3.0 CAMERA OPERATION -TOUCHSCREEN UI:-



1. TURN ON the camera with on/off switch on top. Touchscreen LCD will light up* (please note: it is a resistive screen, not a capacitive)

* Standard LCD on time is set 2min. After it goes dark, simply press the screen to light it up again. It will automatically be back in the main menu.



2. MAIN MENU ICONS

- Icon top left: **Recording start settings**
- Icon top right: **Sensory data (will all be embedded in the each captured TIF image)**
- Icon bottom left: **General settings (+ service menu)**
- Icon bottom right: **File manager**



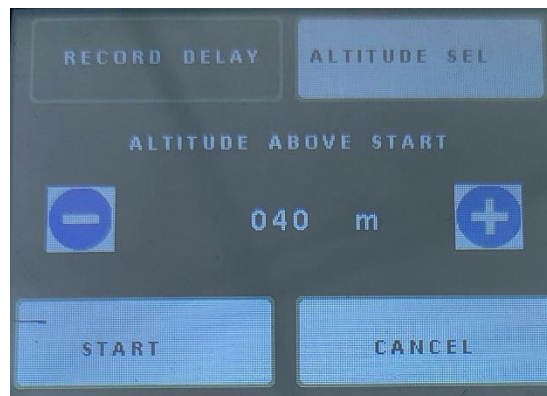
2a. ICON TOP LEFT: ABOVE MENU APPEARS WHEN PRESSING MAIN MENU ICON TOP LEFT:

Recording start settings

* PLEASE REFER TO THE LAQUINTA (ANDROID or iOS) APP QUICK START GUIDE FOR THE CORRECT PROCEDURES BEFORE LIFT-OFF. IMPORTANT ASPECT IS TO FIRST CHECK ON THE APP SENSOR DATA TAB TO WAIT UNTIL YOU HAVE GPS-LOCK BEFORE DEPARTURE.

A) RECORD DELAY: (selected if marked white left top) chooses amount of time before recording starts, for this recording session only: (30sec/1min/3min/5min)

B) ALTITUDE SEL: (selected if marked white right top) select the desired flight height above lift-off for the camera to start triggering automatically once it reaches the desired height. It will start triggering approximately 10m below the assigned height and will stop once the flight height drops back down to more than 10m below the set height.





2b. ICON BOTTOM LEFT: ABOVE MENU APPEARS WHEN PRESSING MAIN MENU ICON BOTTOM LEFT:

General settings

- A) **Framerate:** Top line sets the Framerate (FPS – Frames Per Second)
- Standard setting is 1 FPS.
 - "-" and "+" controls the framerate from 0.1 up to 1.5 FPS incrementally with 0.1 per press.

- c. Pressing “-” below 0.1 enters Trigger mode (when wanting to manually control taking images)



For detailed explanation on how to use the manual trigger function, see page 16

- d. Pressing “+” above 1.5, mode changes to AUTO => This triggers the 2nd line:



- B) **Overlap Mode:** With this mode you can set the camera to trigger on the basis of percentage % of overlap with the previous picture. Generally, an overlap of 70-80% is advised for most image stitching software in order to properly function. The sideways overlap between lanes is determined by the flight path.

C) Exposure (AEX) settings:

- **SEMI AUTO MODE:** “-” and “+” sets the AEX output image brightness from low > medium > high > very high. This is a personal preference setting on how bright you want your images to appear on your PC screen. Please note it is personal preference. It had no bearing or relevance to the outside weather/ brightness conditions. Medium setting is advised.



- **MANUAL MODE:** Set the exposure manually with a predefined measured light intensity (LUX). This will cause the camera to keep exposure fixed regardless of scenery. Only to be

used in uniform lighting conditions

D) **Service menu.** Sets things such as time zones, language settings etc. **FOR FURTHER EXPLANATION OF THE SERVICE MENU, SEE CHAPTER 4.**

E) **Return** press takes you back to main menu



2c. ICON TOP RIGHT: ABOVE MENU APPEARS WHEN PRESSING MAIN MENU ICON TOP RIGHT:

This shows all the sensory data real-time. It is also the data that will be embedded in each photo TIF as metadata. Also as a separate PIXDATA.TXT file in the folder of the SD card.



2d. ICON BOTTOM RIGHT: ABOVE MENU APPEARS WHEN PRESSING MAIN MENU ICON BOTTOM RIGHT

14021900 Depicts the folder containing images of your flight (multiple folder appear when SD card contains several flights; folder name is made up of date + # of flight that day: DD-MM-YY-##)



- Press folder name to enter folder image content (left image above)
- Press .TIF file to obtain a monochrome depiction of the image obtained [for verification purposes only!] (right image above)

4.0 SERVICE MENU

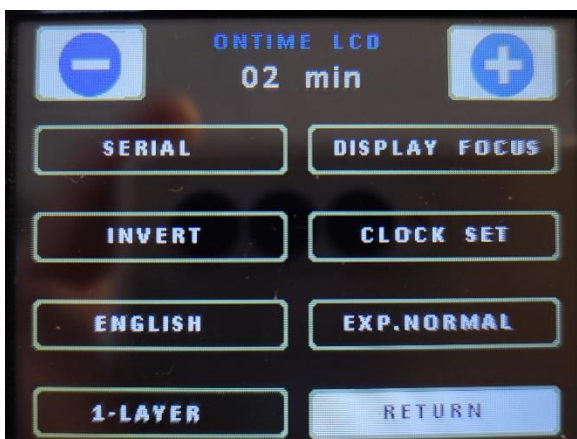
Start the camera and wait until main menu appears:



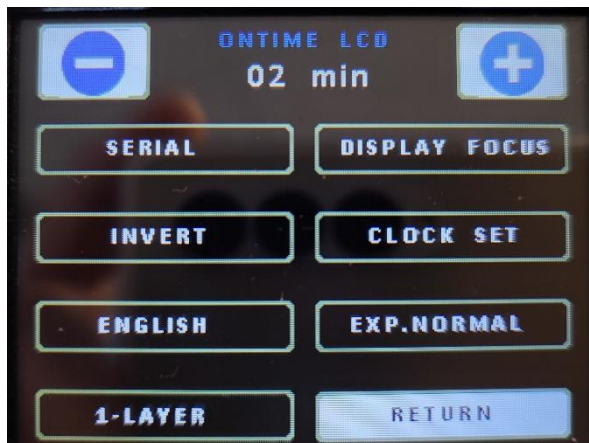
1. Press the settings menu button on the bottom left corner



2. Press SERVICE MENU in the lower left corner



SERVICE MENU: →



Top Line: LCD on time →

- a) Standard setting: 2min (countdown starts after last button touch)
- b) "-" and "+": adjustable to LCD on from 1min → 20min)

SERIAL button: Press to see Camera Serial # and internal SW versions



DISPLAY FOCUS button:



Take off the lens cap and allow ~10 seconds for the contour imager to appear.

Point the camera at a large object preferably outside (for example a tree or a wall with some defining characteristics like windows etc) at least 10 meters away from you. If you see highly contrasting lines around object edges (see example image below), then the camera is correctly in focus.



"NORM" or "FAST" Exposure: speed of AEX adjustments; Always set to NORM [unless you have a situation in which you fly over a highly reflective surface (sunny day with water bodies) for longer than ~30 sec. In that case choose FAST.

INVERT button: Press to turn display 180°

LANGUAGE button: Press to switch between English, German, French and Spanish

CLOCK SET button: Press to adjust clock date, time and temperature settings



- Press SET TIME to set hour (Top line “-“and “+”) and minutes (2nd line “-“and “+”)
- Press DATE to set day (Top line “-“and “+”) and month (2nd line “-“and “+”)
- Press YEAR (appears instead of DATE) to set year (Top line “-“and “+”)
- Press bottom left button to switch between 24h or AM/PM setting
- Press °C or °F button to switch between temperature standard

1-LAYER MODE / 4-LAYER TIFF MODE button: Press to set the output image format

- **4-LAYER TIFF MODE** = multilayer tiff, containing 4 separate image files, 1 per part of the spectrum in B-G-R-NIR. Best used for SW packages such as Inpho/ Trimble and many Python based libraries
- **1-LAYER MODE** = Standard setting in which all 4 band spectral information is contained in a single TIF file (R-G-B-NIR). Most convenient for SW Packages such as AgiSoft Photoscan, Pix4D and Pix4D engine based packages.

5.0 Trigger signals from the LaQuinta camera

The camera has an 3.5mm- RCA connector with four connections.

The camera can be equipped with a mating cable with 3 cinch connectors at the end, see figure 1.



Figure 1: LaQuinta camera with standard trigger cable

The standard cable can be used to get the analog video (PAL CVBS) from the camera, input an external trigger signal or output a trigger signal to trigger an external device to the camera.

The 3 cinch connectors have the following function:

- Yellow: video out PAL CVBS into 75Ohm
- Red : External trigger Output
- White : trigger Input

To synchronize the camera to an external source follow the followings steps:

Turn on the camera with on/off switch on top. Touchscreen LCD will light up.

Enter into the settings menu (see figure 2)

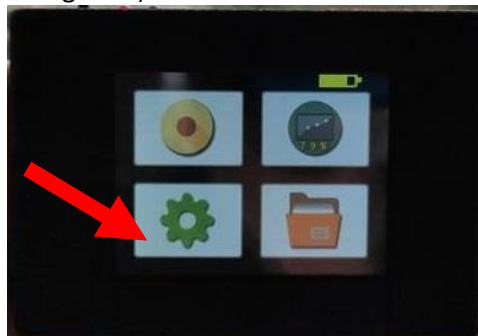


Figure 2: entering setting menu

The following menu will open (figure 3):



Figure 3: 1st setting menu page

In the top line you see the Frame Rate function. Press the – button till you see TRIGGER (see figure 4).



Figure 4.

Switch the camera off again.

Connect an TTL trigger pulse (amplitude 3.3Vpp to max 5Vpp) to the white cinch connector of figure 1. Note the frequency of the trigger pulse should not exceed 1.5 Hz.

The pulse can also be a open collector pull-down signal (to ground), this can be realized with a transistor, fet or an electronic switch. See figure 5.

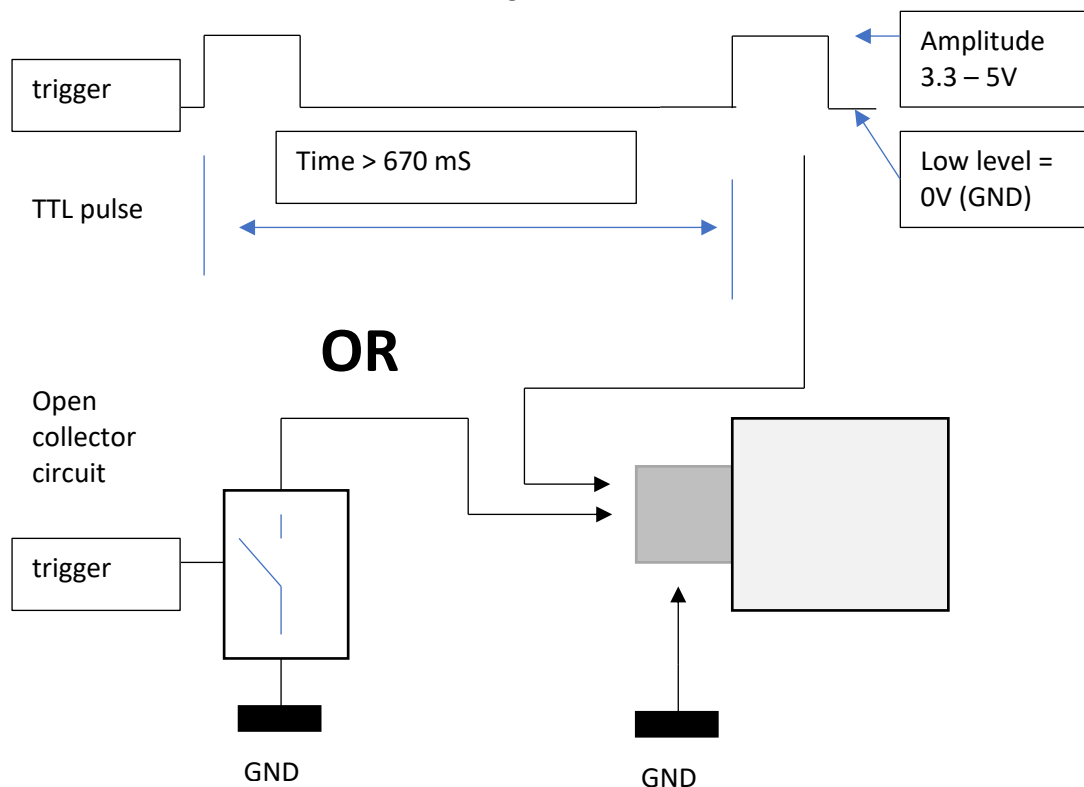


Figure 5: connection to white cinch connector.

If you use a pulse this must be DC coupled (no capacitors in between).

When you assured yourself that all connection are made correctly, switch on the camera again.

Start recording as described in the owner's manual.

In case you do not want to use the cable provided by DB2, you can make your own cable. You need a 3.5 mm RCA jack with 4 connection, make sure the connections are as shown in figure 6.

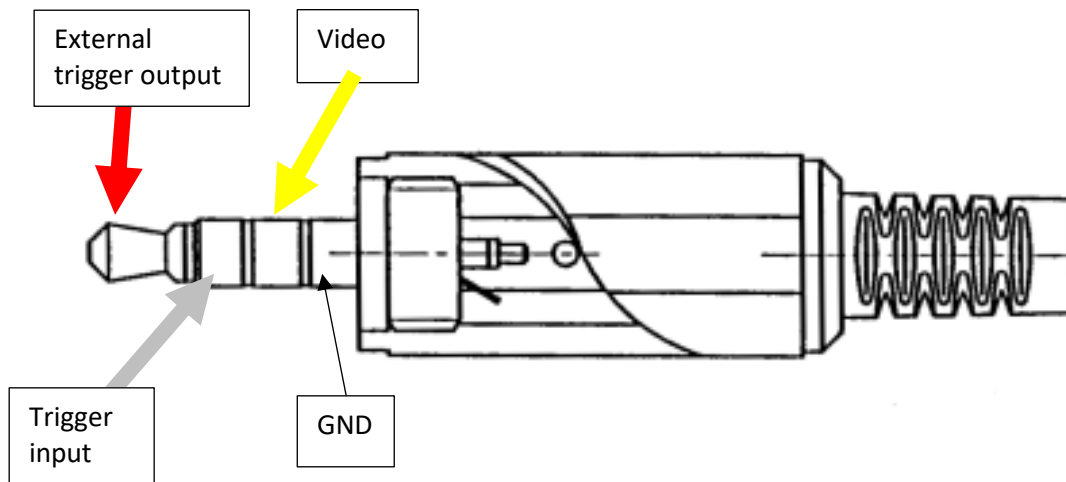


Figure 6: connections of the 3.5 mm RCA jack (4 pole).

NOTES:

1. *Make sure the camera is switched off before you plug in or remove a connector from the camera. If you connect or disconnect a connector while the camera is switched on this may cause damage to the camera.*
2. *Make sure that the external trigger pulse (including eventual noise or distortion peaks) never exceed the 5V! Preferred solution is therefore open collector or a switch to ground.*
3. *If you make your own cable please double check the connections before connecting the cable to the camera.*
4. *DB2 is not responsible for any damage that may be caused by (partly) not correctly following the instructions here above.*

6.0 TROUBLESHOOTING:

1. UNRESPONSIVE TOUCHSCREEN:

This happens sometimes when the camera hasn't been used for some time. In order to recalibrate the touchscreen please do the following:

- Before turning the camera on, keep a finger pressed on the touchscreen and switch the camera on.
- A light blue screen will appear which indicates to press the screen (with a pointy tool like a pen) on wherever the X is marked . Perform a total of 3 presses on the X.
- After finished, turn the camera off and switch it back on.
- The camera will go back to the regular menu and touch should work again (do keep in mind it is a resistive touchscreen, not a capacitive like a smartphone, so there is a need to press a little longer and harder than with f.i. a phone)

2. NO GPS LOCK:

Make sure the Adapt-2-Light sensor is placed on top of your UAV (or other vehicle) in full clear unobstructed sight of the sky. First time GPS lock should -under least favourable circumstances- not take longer than 5minutes

3. DARK IMAGES:

Make sure the lens-cap is removed. As the order of our 4-Layer / Multilayer TIF files is B-G-R-NIR, the first image you will likely see is the BLUE spectrum. As generally there is not much reflectance in crops within the Blue Spectrum, these images may appear dark.

4. CAMERA DOES NOT TURN ON:

Make sure that the battery is (fully) charged. Charging time for a completely empty battery is around 3 hours. While recording the battery will be operational for approximately 45min.

CONTACT INFO

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