

# **Z CAM E2**

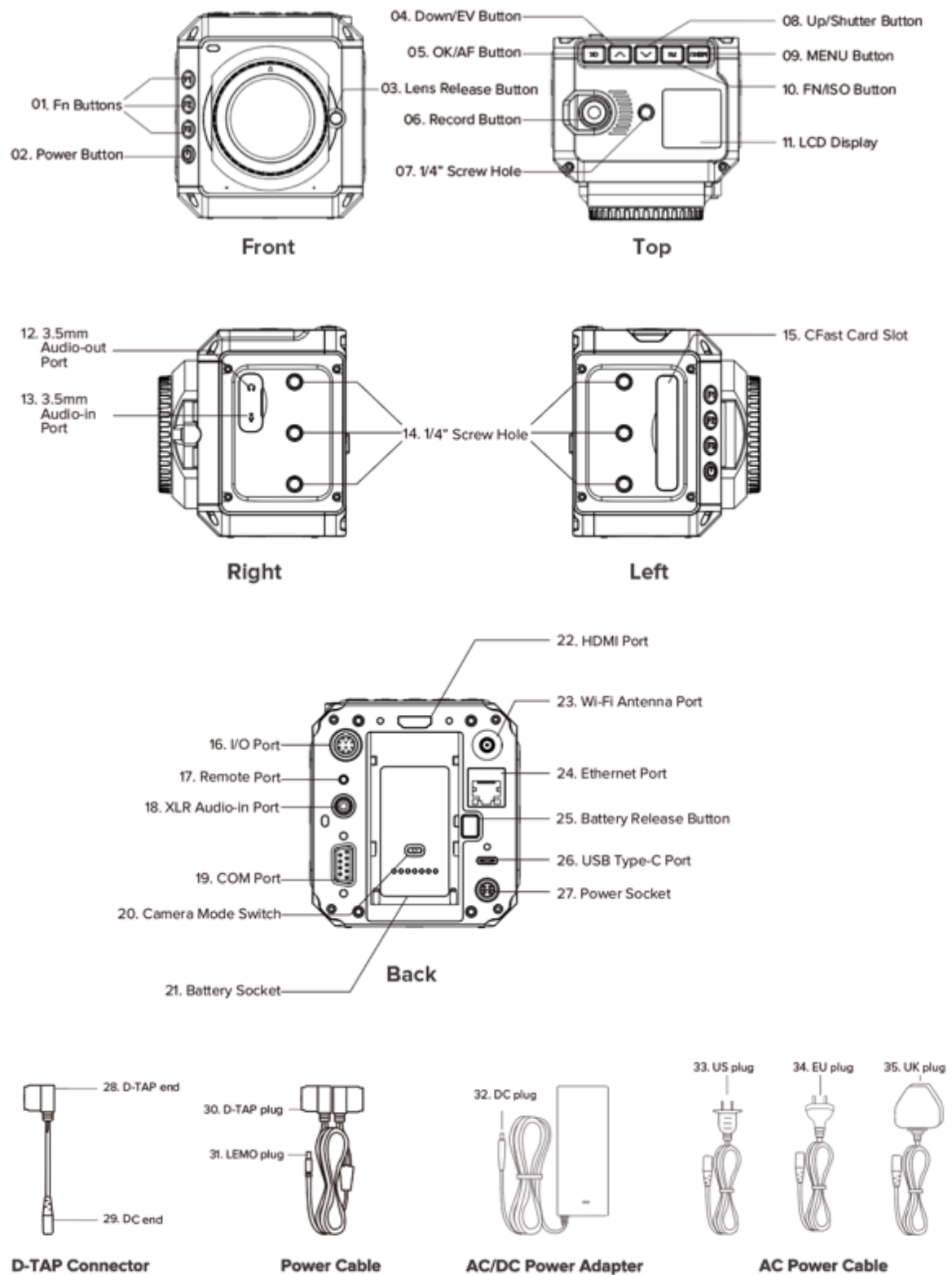
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## **User Manual**

(Firmware 0.82)

# 1. Introduction

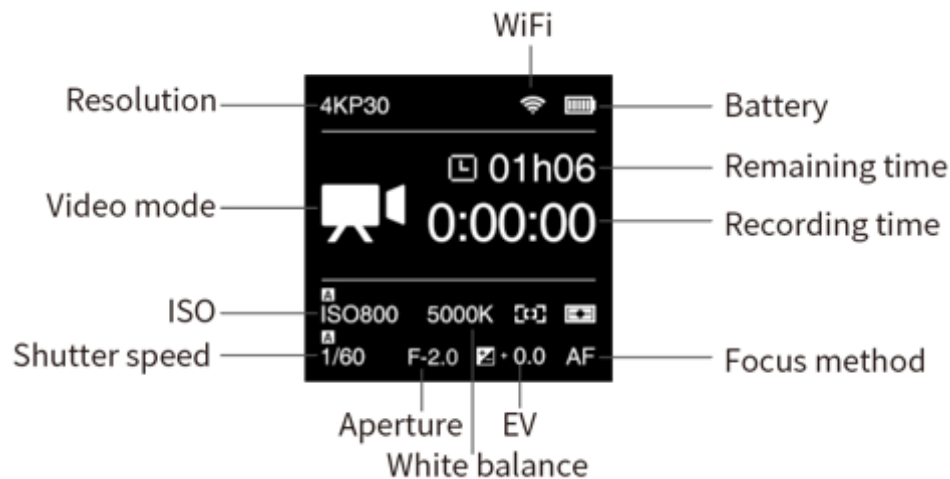
## 1.1. Camera Introduction



## 1.2. LCD Screen

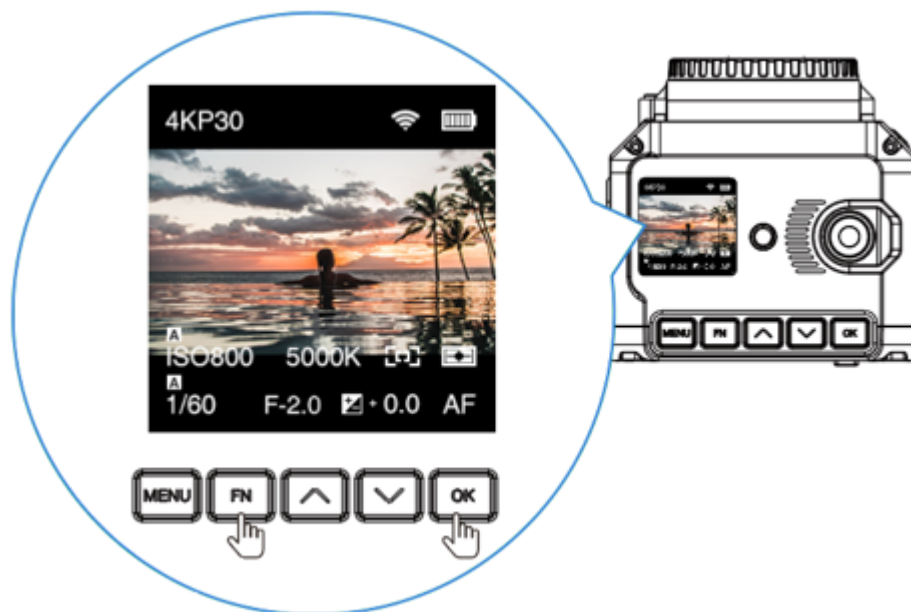
The content displayed on the LCD Screen will be different when the camera is in different mode.

- **Standby & Recording**



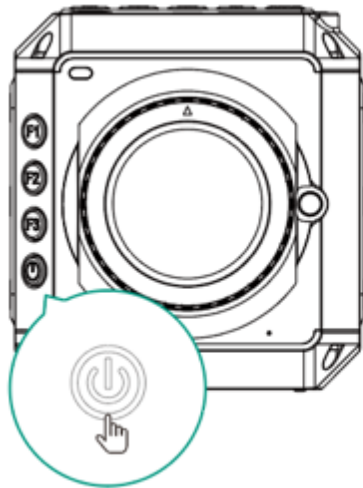
- **Preview**

Press **FN + OK** button when the camera is in **Standby** mode, it will switch to **Preview** mode. Press **FN + OK** again to come back to **Standby** mode.



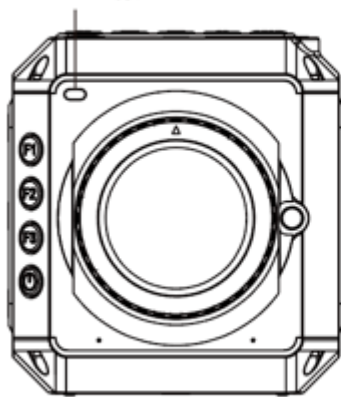
- **Playback**

Short press **Power** button when the camera is in **Standby / Preview** mode, it will switch to **Playback** mode. Short press **Power** button again to come back to **Standby / Preview** mode.



### 1.3. LED Indicator Status

LED Indicator

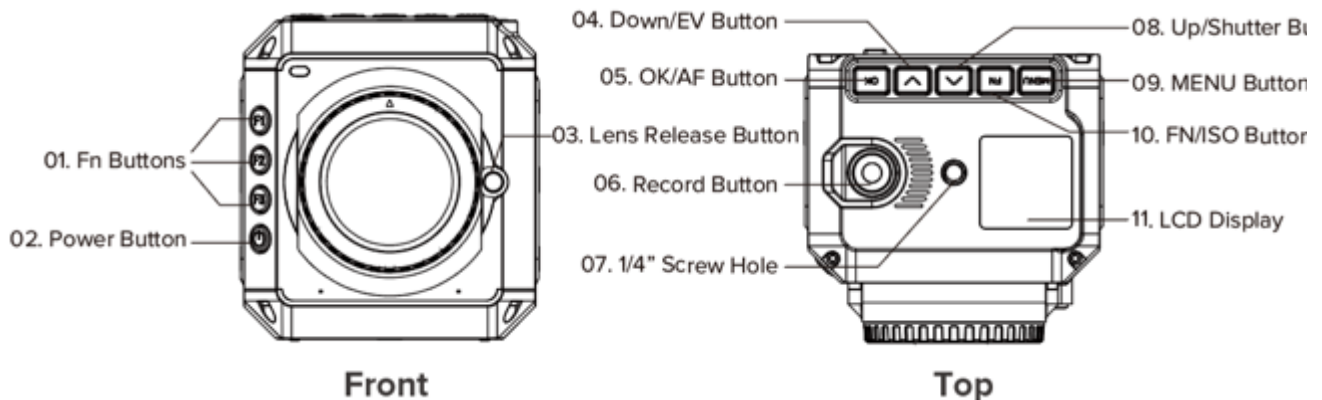


LED Indicator



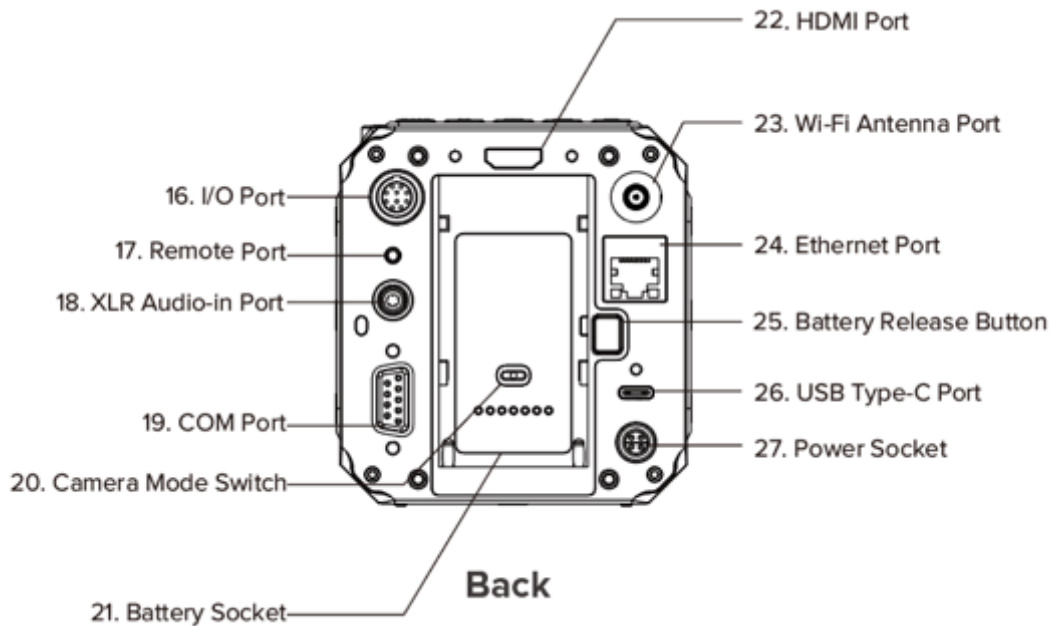
- **Green** : The camera is ready.
- **Red** : The camera is recording.
- **Flashing Red** (every 1s) : No memory card.
- **Flashing Red** (every 0.5s) : Memory card is full.
- **Flashing Red** (every 0.2s) : The camera is overheated.
- **Flashing Red** (very fast) : Critical error.
- **Flashing Red** (fast & slow alternant) : Low battery

## 1.4. Buttons



- **MENU:** Camera setting.
- **FN / ISO:** FN or ISO quick setting (**2.1 Quick Settings**).
- **Up / SHT:** Up selection (or add value) or Shutter Speed / Shutter Angle quick setting (**2.1 Quick Settings**).
- **Down / EV:** Down selection (or reduce value) or EV quick setting (**2.1 Quick Settings**).
- **OK / AF:** Confirmation or to trigger the AF function (**2.1 Quick Settings**).
- **F1:** AEL (Auto Exposure Lock) by default, can be changed to other quick settings (**2.10 System - Fn**).
- **F2:** AFL (Auto Focus Lock) by default, can be changed to other quick settings (**2.10 System - Fn**).
- **F3:** Aperture quick setting by default, can be changed to other quick settings (**2.10 System - Fn**).
- **Power button:** Long press for 3 seconds to power on / off the camera, short press to switch to / back from **Playback** mode.

## 1.5. Interfaces

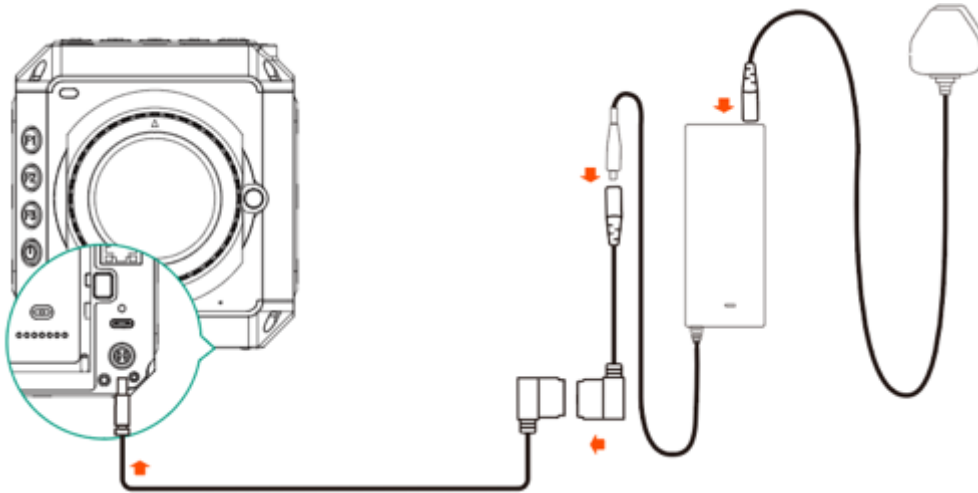


- **Wi-Fi:** 2.4GHz Wi-Fi antenna port, 802.11n supported.
- **Ethernet:** Gigabit Ethernet port for camera control, setting & live streaming (with Z CAM software installed on PC).
- **USB:** USB 3.0 Type C port for camera control and data transformation only.
- **HDMI:** HDMI 2.0 Type A port, video output up to C4K @60fps.
- **Remote:** 2.5mm jack socket, compatible with Sony LANC protocol.
- **XLR audio-in:** 5-pin LEMO port for dual-channel XLR microphone, require additional XLR audio connector (compatible with ARRI Mini XLR connector).
- **COM:** DB-9 connector with RS232 protocol supported;
- **I/O:** 10-pin LEMO port for multi-camera synchronization (with exclusive Z CAM E2 Sync Cable, not included).
- **Camera Mode Switch:** The switch to set working mode of camera, of which **M** (Master) and **S** (Slave) is for multi-camera synchronization (with exclusive Z CAM E2 Sync Cable, not included), and **I** for individual mode (default).

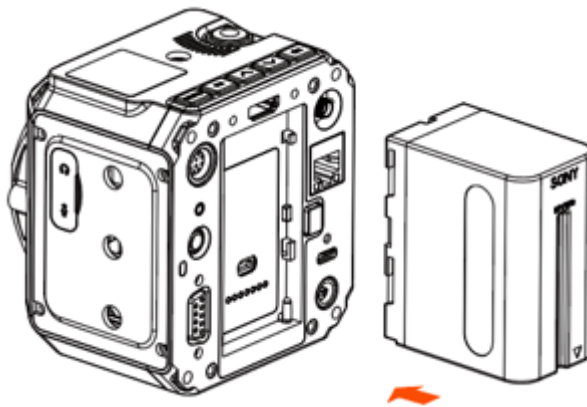
## 1.6. Power Options

- **External Power Source:** The camera comes with a LEMO power cable (D-TAP plug end), D-TAP/DC connector and AC/DC power adapter, which can use AC 100~240V

power source.



- **Battery:** The battery socket is compatible with SONY NP-F series batteries, including NP-F970/770/550 etc. (Battery not included in the box)

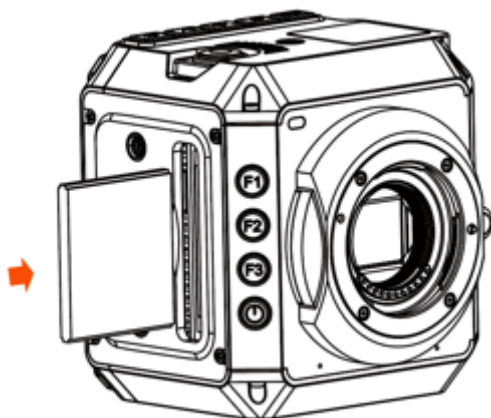


- **External Battery:** Connect the camera to a V mount battery (with D-TAP port) with the LEMO power cable (D-TAP plug).

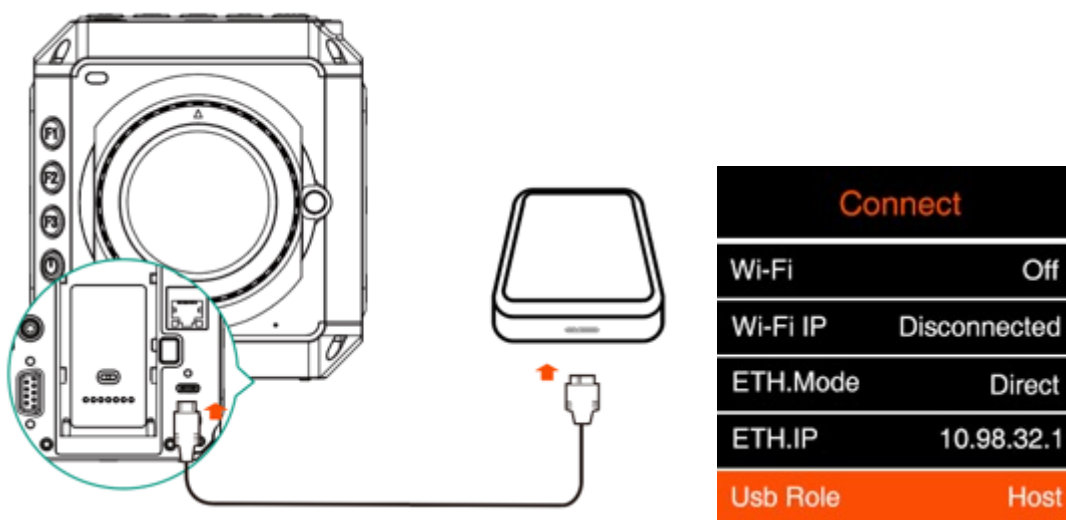
## 1.7. Storage

The camera uses CFast 2.0 card or SSD as storage.

- **CFast card:** The camera has 1 x internal CFast card slot, which supports CFast 2.0 standard. Insert the CFast card with correct direction, push it to the end until it's locked. To take out the CFast card, push in the card and it will be unlocked, then take it out from the slot.



- **SSD:** Connect the SSD through USB-C port on back of camera as storage. (Note: USB-C port must be in “Host” mode, see **2.9 Connect - USB** )



Please note that the SSD will NOT be recognized if there is CFast card in the camera.

## 2. Camera Settings

### 2.1. Quick Setting

When the camera is in **Standby** or **Recording** mode, some key settings can be quickly accessed by pressing the buttons on the camera.

- **ISO:** Press **FN** to set ISO, then press **Up** / **Down** to adjust the value, and **OK** to confirm.





- **Shutter Speed / Angle:** Press **UP** to set shutter speed / angle (refer to **2.5 Exposure – Shutter Operation** about shutter speed / shutter angle), then press **Up / Down** to adjust the value, and **OK** to confirm.



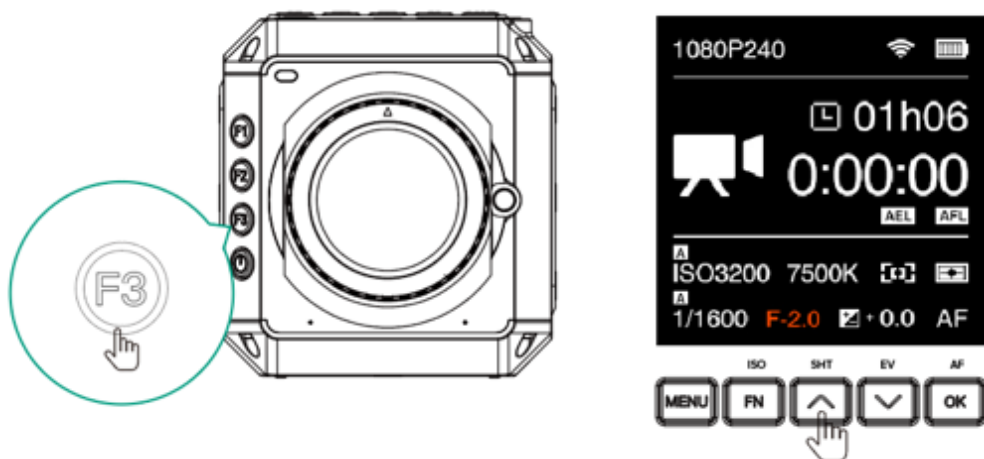
- **EV:** Press **DOWN** to set EV, then press **Up / Down** to adjust the value, and **OK** to confirm.



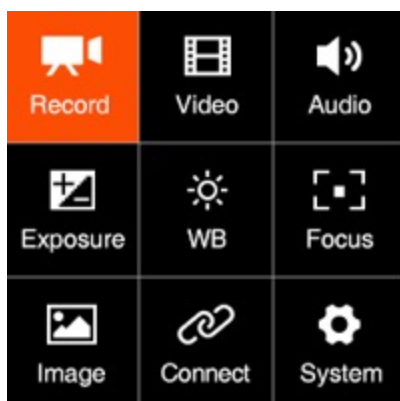
- **AF:** When focus is in **AF** mode, press **OK** to do auto focus.



- **Aperture:** Press **F3** to set the aperture, then press **Up** / **Down** to adjust the value, and **OK** to confirm. Please note that **F3** can be assigned to other quick settings besides **Aperture** (**2.10 System – Fn**)



## 2.2. Record



| Record         |       |
|----------------|-------|
| Movie Format   | 4KP30 |
| File Format    | MOV   |
| Split Duration | 5min  |
| Time Code      |       |
| Proxy File     | Off   |

- **Movie Format:** It's resolution & frame rate for video recording. Please note that the camera support three video systems including **NTSC**, **PAL** and **CINEMA (2.10 System – Video System)**. Movie formats for each video system are as below:

#### **NTSC**

| <b>Video Format</b>        | <b>Resolution / Frame Rate</b>              |
|----------------------------|---|
| 4K P23.98 / 30 / 60        | 3840x2160 @ 23.98 / 29.97 / 59.94 fps       |
| C4K P23.98 / 30 / 60       | 4096x2160 @ 23.98 / 29.97 / 59.94 fps       |
| 3696x2772 P23.98 / 30 / 60 | 3696x2772 (4:3) @ 23.98 / 29.97 / 59.94 fps |
| 1080 P23.98 / 30 / 60      | 1920x1080 @ 23.98 / 29.97 / 59.94 fps       |

#### **PAL**

| <b>Video Format</b> | <b>Resolution / Frame Rate</b> |
|---------------------|--------------------------------|
| 4K P25 / 50         | 3840x2160 @ 25 / 50 fps        |
| C4K P25 / 50        | 4096x2160 @ 25 / 50 fps        |
| 3696x2772 P25 / 50  | 3696x2772 (4:3) @ 25 / 50 fps  |
| 1080 P25 / 50       | 1920x1080 @ 25 / 50 fps        |

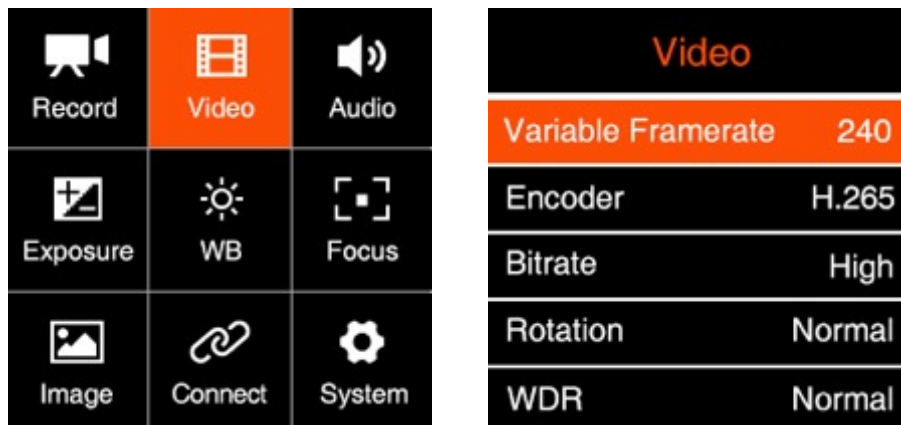
#### **CINEMA**

| <b>Video Format</b> | <b>Resolution / Frame Rate</b> |
|---------------------|--------------------------------|
| 4K P24              | 3840x2160 @ 24 fps             |
| C4K P24             | 4096x2160 @ 24 fps             |
| 3696x2772 P24       | 3696x2772 (4:3) @ 24 fps       |
| 1080 P24            | 1920x1080 @ 24 fps             |

Note: 1920 x 1080 resolution is not available when the **WDR** mode is activated (**2.3 Video – WDR**).

- **File format:** MOV / MP4
- **Split duration:** 5 / 10 / 20 min. The camera will split the video with the length set here automatically. 5 mins by default.
- **Time Code:** Set the time code, there are sub-items as below:
  - **Time Code Value:** Reset / Manual / Current.
    - 1) **Reset:** Reset the time code value to 00:00:00:00 (hour:minute:second:frame)
    - 2) **Manual:** Set the time code value manually (hour:minute:second:frame) .
    - 3) **Current:** Set the hour, minute, second with current system time of the camera, and set frames to 00.
  - **Count Up:** Rec Run / Free Run.
    - 1) **Rec Run:** Counts the time code only when recording video.
    - 2) **Free Run:** Counts the time code even when not recording video (including when the camera is power off)
  - **HDMI Display:** On / Off. To enable / disable the display of time code through HDMI output.
  - **Time Code Mode:** DF / NDF.
    - 1) **DF:** The camera modifies the difference between recorded time and time code. Seconds and frames are separated by “.”. (Example: 00:00:00.00)
    - 2) **NDF:** Records the time code without drop frame. Seconds and frames are separated by “.”. (Example: 00:00:00:00)
  - **Proxy File:** On / Off. To enable or disable proxy file recording during video recording, please note that it will not be available when the **Bit Rate** in **Video** is set to “High” (**2.3 Video**)
  - **Playback FR:** Default / VFR. When it’s set to **Default**, the frame rate of playback will be the same as set in **Movie Format**, when it’s set **VFR**, the frame rate of playback will be the same as set in **Variable Frame Rate (2.3 Video – Variable Frame Rate)**

## 2.3. Video



- **Variable Frame Rate (VFR):** With VFR you can set a different frame rate for capturing with a specific Video Format for recording, and you can capture a slow-motion or fast-motion footage.

Options of frame rate in VFR is related to the **Movie Format** and **Video System** as following:

### NTSC

| Video Format                | VFR Options (fps)                  |
|-----------------------------|------------------------------------|
| 4K / C4K / 3696x2772 P23.98 | None                               |
| 4K / C4K / 3696x2772 P30    | 30 / 45 / 60 / 75 / 90 / 105 / 120 |
| 4K / C4K P60                | 30 / 60 / 120                      |
| 3696x2772 P60               | 30 / 60                            |
| 1080 P30 / P60              | 30 / 60 / 120 / 240                |

### PAL

| Video Format             | VFR Options (fps)               |
|--------------------------|---------------------------------|
| 4K / C4K / 3696x2772 P25 | 25 / 50 / 75 / 100 / 120        |
| 1080 P25 / P50           | 25 / 50 / 100 / 120 / 200 / 240 |
| 4K / C4K / 3696x2772 P50 | 25 / 50 / 100 / 120             |

### CINEMA

| Video Format  | VFR Options (fps)   |
|---------------|---|
| 4K / C4K P24  | 20 / 21 / 22 / 23 / 24 / 48 / 60 / 72 / 84 / 96 / 108 / 120 |
| 3696x2772 P24 | 20 / 21 / 22 / 23 / 24 / 48 / 60                            |
| 1080 P24      | 20 / 21 / 22 / 23 / 24 / 48                                 |

- **Encoder:** H.264 / H.265. Options of **Encoder** is related to **Movie Format** and frame rate of **VFR** as following:

#### NTSC

| Video Format               | VFR (fps)                     | Video Encoding |
|----------------------------|-------------------------------|----------------|
| 4K / C4K / 3696x2772 P23.8 | None                          | H.264 & H.265  |
| 4K / C4K / 3696x2772 P30   | 30                            | H.264 & H.265  |
| 4K / C4K / 3696x2772 P30   | 45 / 60 / 75 / 90 / 105 / 120 | H.265          |
| 4K / C4K / 3696x2772 P60   | ALL                           | H.265          |
| 1080 P30 / P60             | 30 / 60 / 120                 | H.264 & H.265  |
|                            | 240                           | H.265*         |

\* It's 8-bit color for H.265 encoding when the VFR is set to 240.

#### PAL

| Video System             | VFR (fps)           | Video Encoding |
|--------------------------|---------------------|----------------|
| 4K / C4K / 3696x2772 P25 | 25 fps              | H.264 & H.265  |
| 4K / C4K / 3696x2772 P25 | 50 / 75 / 100 / 120 | H.265          |
| 4K / C4K / 3696x2772 P50 | ALL                 | H.265          |
| 1080 P25 / P50           | ALL                 | H.264 & H.265  |

#### CINEMA

| Video System                    | VFR | Video Coding  |
|---------------------------------|-----|---------------|
| 4K / C4K / 3696x2772 / 1080 P24 | ALL | H.264 & H.265 |

- **Bitrate:** High / Middle / Low. Value of the bitrate varies in different resolution and frame rate.

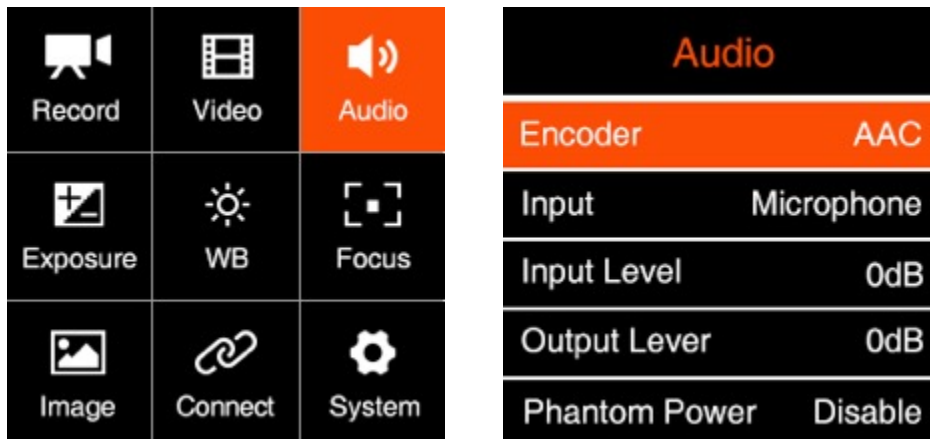
| Resolution           | Frame Rate<br>(fps)* | Bitrate (Mbps)** |     |     |
|----------------------|----------------------|------------------|-----|-----|
|                      |                      | High             | Mid | Low |
| 4K / C4K / 3696x2772 | FR ≤ 30              | 200              | 130 | 60  |
|                      | 30 < FR ≤ 60         | 230              | 150 | 100 |
|                      | 60 < FR              | 230              | 200 | 160 |
| 1080P                | FR ≤ 30              | 30               | 20  | 10  |
|                      | 30 < FR ≤ 60         | 60               | 30  | 15  |
|                      | 60 < FR              | 200              | 130 | 60  |

\* If **VFR** is activated, the frame rate here refers to the frame rate in **VFR**, otherwise it refers to the frame rate in **Movie Format**.

\*\* The bit rates for H.264 & H.265 encoding are the same.

- **Rotation:** Normal / Upside Down. Rotate the image by 180 degrees.  
Note: This setting is available only when the frame rate of recording is under 30fps (include 30fps).
- **WDR** (Wide Dynamic Range): Normal / WDR (available when camera is in Z-Log mode). When WDR is enabled, the dynamic range will be extended from 13 stops of Z-Log to 16 stops, with 1.5 stops increased for highlight and shadow part each.
- **Timelapse:** Off / Manual, when it's Off, the camera is in normal record mode. When it is set to a specific value, the camera is in time lapse video mode.

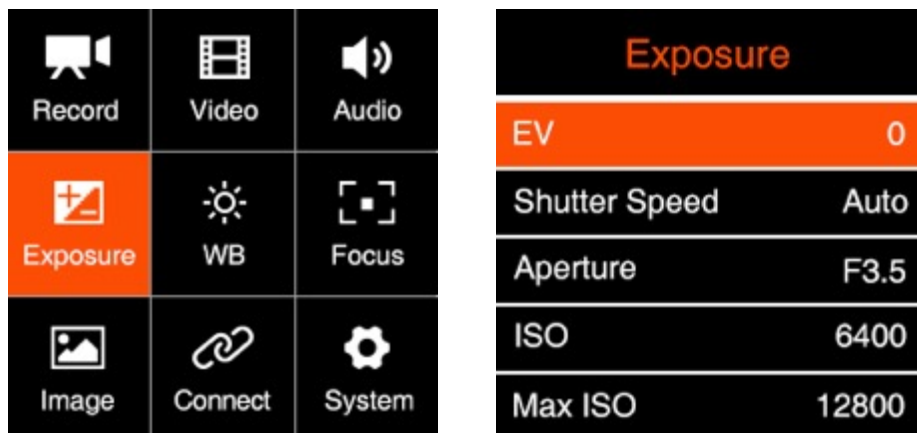
## 2.4. Audio



- **Encoder:** None / AAC / PCM
- **Input:** Off / Microphone (input from 3.5mm audio-in port) / XLR (need a connector to connect with XLR microphone).
  - Off: Turn off input audio.
  - Microphone: The camera will use built-in microphone as audio input if there is no external microphone plugged into the 3.5mm audio-in port, and will use the external microphone if there is one plugged into the 3.5mm audio-in port.
  - XLR: Input from XLR audio-in port, require additional XLR audio connector (compatible with ARRI Mini XLR connector).
- **Input Level:** -6 ~ 12 dB, can be set manually.
- **Output Level:** -6 ~ 6 dB, can be set manually.
- **Phantom Power:** Enable / Disable. Only available when “Input” is set to “XLR”, to enable or disable the phantom power of the XLR port.



## 2.5. Exposure



- **EV:** -3.0 ~ 3.0
- **Shutter Speed / Shutter Angle:** This setting depends on whether “Shutter Speed” or “Shutter Angle” is selected in **2.5 Exposure - Shutter Operation**  
**Shutter Speed:** Auto / Manual ( 1/24” ~ 1/8000”, up to 1/800” when WDR is activated)  
**Shutter Angle:** Auto / Manual ( 11.25° ~ 360° )
- **Aperture:** It shows the range of aperture of the lens, and can be adjusted manually if it's an electrical lens.
- **ISO:** Auto or Manual, the range of ISO depends on the setting of **Dual Native ISO**, and whether **Wide Dynamic Range (WDR)** is activated

| WDR    | Dual Native ISO | ISO         |
|--------|-----------------|-------------|
| Normal | Auto            | 160 ~ 25600 |
|        | Low             | 160 ~ 800   |
|        | High            | 800 ~ 25600 |
| WDR    | Auto            | 80 ~ 12800  |
|        | Low             | 80 ~ 400    |
|        | High            | 400 ~ 12800 |

- **Max ISO:** This setting will only be enabled when **ISO** is set to “Auto”. Range of **Max ISO** also depends on setting of **Dual Native ISO**, and whether **Wide Dynamic Range (WDR)** is activated

| WDR    | Dual Native ISO | Max ISO     |
|--------|-----------------|-------------|
| Normal | Auto            | 160 ~ 25600 |
|        | Low             | 160 ~ 800   |
|        | High            | 800 ~ 25600 |
| WDR    | Auto            | 80 ~ 12800  |
|        | Low             | 80 ~ 400    |
|        | High            | 400 ~ 12800 |

- **Dual Native ISO:** Auto / Low / High. Setting of the **Native ISO** here will determine the range of **ISO** and **Max ISO**, as listed above.
- **Max Shutter Speed / Max Shutter Angle:** This setting will be activated if Shutter Speed / Shutter Angle (**3.5 Exposure - Shutter Operation**) is in **Auto** mode.

**Max Shutter Speed:** Auto / Manual (1/30" ~ 1/800")

**Max Shutter Angle:** Auto / Manual (11.25° ~ 360° )

- **Metering Mode:** Center / Average / Spot, it sets the metering mode of exposure.

## 2.6. White Balance



| White Balance |          |
|---------------|----------|
| Mode          | Auto     |
| Kelvin        | 4200     |
| Tint          | 5        |
| Priority      | Ambiance |

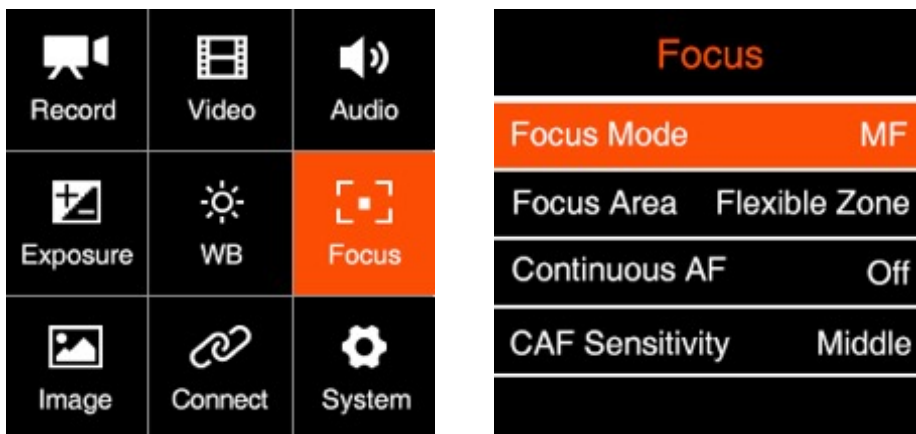
- **Mode:** Auto / Incandescent / Cloudy / D10000 / Fluorescent / Daylight / Shade / Manual (set in **Kelvin**)

- **Kelvin:** When **White Balance** is set to “Auto” or “Preset Value”, it shows the current color temperature, when **White Balance** is set to “Manual”, it can be adjusted manually (2300 K ~ 7500 K)
- **Tint:** -100 ~ 100, default is 0.
- **Priority:** Ambiance / White

**Ambiance:** To increase the intensity of the image’s warm color cast when shooting a tungsten-light scene.

**White:** To reduce the intensity of the image’s warm color cast when shooting a tungsten-light scene.

## 2.7. Focus



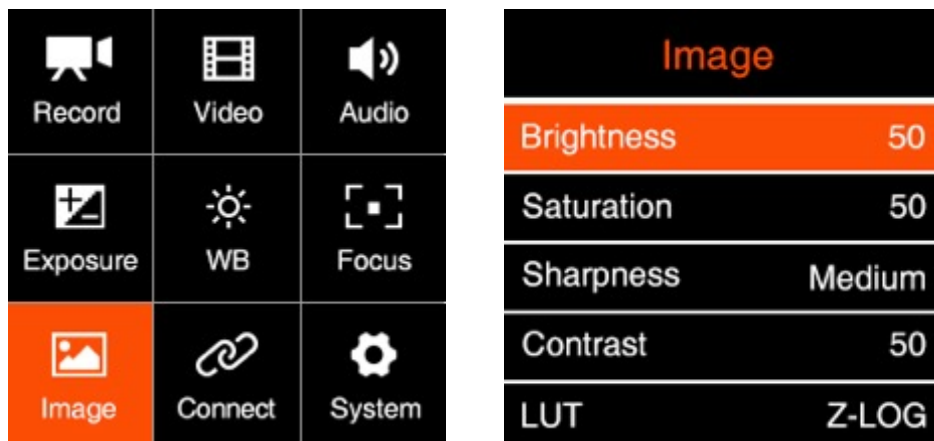
- **Focus Mode:** Manual Focus (MF) / Auto Focus (AF)
- **Focus Area:** Flexible (only for now\*). This will only be enabled when **Focus Mode** is set to “Auto Focus”.

**Flexible:** User can select the area of focus flexibly with iOS app by touching.

\* More options of Focus Area will be added in future firmware update.

- **Continuous AF (CAF):** On / Off. This will only be enabled when **Focus Mode** is set to “Auto Focus”. When CAF is activated, the camera will continuously adjust the focus as to follow the target object when it is moving, with the range set in **Continuous AF Range**, and the sensitivity set in **Continuous AF Sensitivity**.
- **Continuous AF Sensitivity:** High / Medium / Low. This will only be enabled when **CAF** is activated.

## 2.8. Image



- **Brightness:** 0~100, default is 50.
- **Saturation:** 0~100, default is 50.
- **Sharpness:** Strong / Medium / Weak, default Medium.
- **Contrast:** 0~100, default 50.
- **LUT:** Rec.709 / Z-LOG / FLAT.

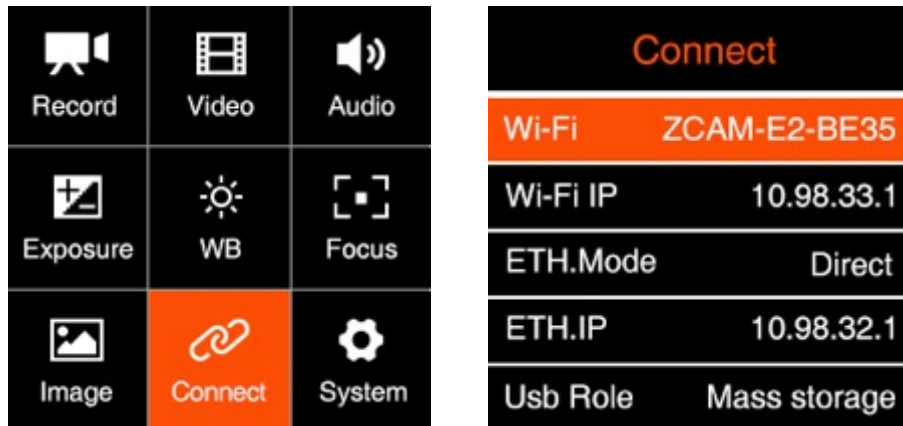
**Rec.709:** It is Rec.709 like color space, which is usually used for directly output.

**Z-LOG:** It is the Log developed by Z CAM, with 13 stops of dynamic range and reserve more detail in highlight area, good enough for post processing.

**FLAT:** It's 709 like curve with color information, and lower the contrast for easy post processing.

- **Luminance Level:** Full / Limited. The range of luminance level is 0~255 when it's set to Full, and 16~235 when it's set to Limited.

## 2.9. Connect



- **Wi-Fi:** Off / On. When the Wi-Fi is activated, here will show the Wi-Fi ID, which is ZCAM-E2-XXXX (last four digits which match to the camera ID), and the default password is: **12345678**, which can only be changed with iOS app (**6. Using Z Camera App**)

- **Wi-Fi IP:** Here will show IP address of the Wi-Fi when it's activated.

- **ETH. Mode (Ethernet Mode):** Direct / Router / Static

**Router:** Camera is connected to the computer through a router, IP address will be assigned by the router.

**Direct:** Camera is connected to the computer directly through Ethernet cable, camera will generate the IP address. The default is: 10.98.32.1

**Static:** to set the IP address with configuration file. (Please contact Z CAM's technical support if you want to set this)

- **ETH. IP:** IP address of the Ethernet when it's connected.

- **USB:** Host / Mass Storage / Network

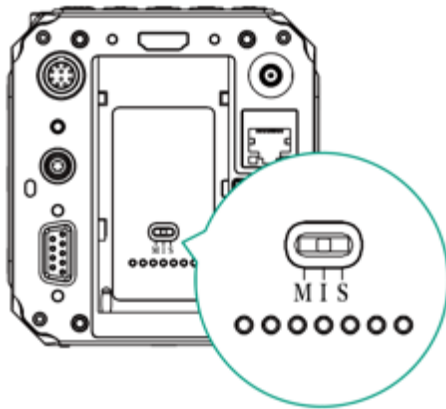
**Host:** The camera will act as a host device which can transfer data to external storage (SSD e.g.) or communicate with external device like iOS device with Z Camera app (**6. Using Z Camera App**).

**Mass Storage:** The camera will be recognized as a storage when it is connected to a computer (PC / Mac), and the file on the CFast card inside the camera can be accessed.

**Network:** The camera will act as a RNDIS device.

- **HDMI OSD:** On / Off. Turn on / off camera status on HDMI display.

- **HDMI Format:** Auto / Manual (options supported by the HDMI display). When it's set to Auto, the camera will select the suitable format (resolution & frame rate) from the HDMI display. Or you can select from a list of formats supported by the camera manually.
- **Multi Camera: Single / Master / Slave** The status matches to the status of the **Camera Mode Switch** on the back of the camera.



**Single (I):** The camera is working as an individual device.

**Master (M):** The camera is working as Master device in multi-camera synchronization setup. It will trigger all the Slave ones to start / stop recording.

**Slave (S):** The camera is working as the Slave device in multi-camera synchronization setup. It will be triggered by the Master one to start / stop recording.

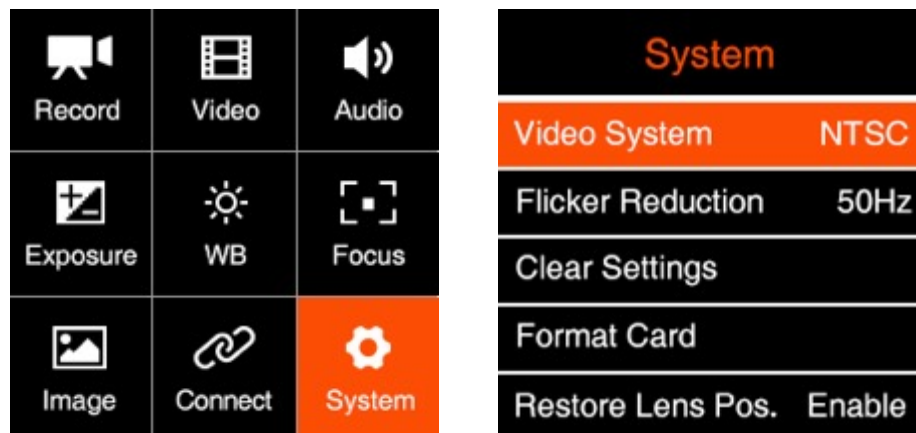
- **UART Role:** Controller / Pelco D / Multiplexer. It's to set the camera's role in UART application.

**Controller:** The camera will be controlled by UART command from a computer through COM port.

**Pelco D:** The camera will control the external device like a gimbal through COM port with Pelco D protocol.

**Multiplexer:** Need 3<sup>rd</sup>-party device to support.

## 2.10. System



- **Video System:** NTSC / PAL / CINEMA. Different frame rates in **Video Format** for recording and frame rates in **VFR\*** for capturing are supported by these three Video System as below:

| Video System | Frame Rate in Video Format (fps) | Frame Rate in VFR (fps)                                     |
|--------------|----------------------------------|---|
| NTSC         | 23.98 / 30 / 60                  | 30 / 45 / 60 / 75 / 90 / 105 / 120 / 240                    |
| PAL          | 25 / 50                          | 25 / 50 / 75 / 100 / 200 / 240                              |
| CINEMA       | 24                               | 20 / 21 / 22 / 23 / 24 / 48 / 60 / 72 / 84 / 96 / 108 / 120 |

\* Please note that the available frame rates in **VFR** also depends on the resolution & frame rates in **Video Format**.

- **Flicker Reduction:** 60Hz / 50Hz. It's set to eliminate light flicking caused by the frequency of the electricity, which is 60Hz in North America and some parts of Asia. (South Korea, Philippines, Taiwan of China), And 50Hz for China mainland, other countries and regions.
- **Clear Settings:** Clear all the Settings in the camera and set them to default values.
- **Format Card:** Format the CFast card or the external SSD connected through USB Type C port (if there is no CFast card in the camera). **Please note that formatting will erase ALL DATA in the storage!**
- **Restore Lens Pros:** Disable / Enable. When it's set to "Enable", the camera will remember the latest focusing position of the lens when the camera is shut down, and

restore it when it's powered on again (with the same lens only).

- **Assist Tools:** There is three sub-items in this setting: Display / Peak / Exposure

**Display:** On / Off. To enable or disable the assist tool on the display. Please note that when the assist tool is enabled, the effect will be output through HDMI together with the video stream. So you would need to turn it off if you are using external recorder though HDMI connection.

**Peak:** Enable (On / Off) / Color (Red, Green, Blue, Orange, White). To enable / disable the Peak tool and set the color of peaking focus.

**Exposure:** Tool (Zebra / False Color / Disable) / Zebra1 Setting (55~100) / Zebra2 Setting (0~50). To select the assist tool for exposure (Zebra / False Color) or disable it. If the Zebra is selected, the setting of Zebra1 & Zebra2 will be effective.

- **Desqueeze Display:** 1x / 1.33x / 1.5x / 2x. When the camera is using an anamorphic lens, it's to set the de-squeeze ratio as to resize the image correctly.

- **Profile: Export Profile / Import Profile**

**Export Profile:** Export current Fn configuration to a file and save it in the memory of the camera.

**Import Profile:** Import saved configuration file from the memory of the camera.

- **Fn:** to set the function of the buttons on the camera.

**Fn Button:** ISO/None. It's set to **ISO** quick setting by default.

**F1 Button:** AE Lock / AF Lock / Aperture / Peak / Exposure Tool / White Balance / HDMI OSD / None. It's set to **AEL** by default, and can be changed to other quick settings.

**F2 Button:** AE Lock / AF Lock / Aperture / Peak / Exposure Tool / White Balance / HDMI OSD / None. It's set to **AFL** by default, and can be changed to other quick settings.

**F3 Button:** AE Lock / AF Lock / Aperture / Peak / Exposure Tool / White Balance / HDMI OSD / None. It's set to **Aperture** quick setting by default, and can be set to other quick settings.

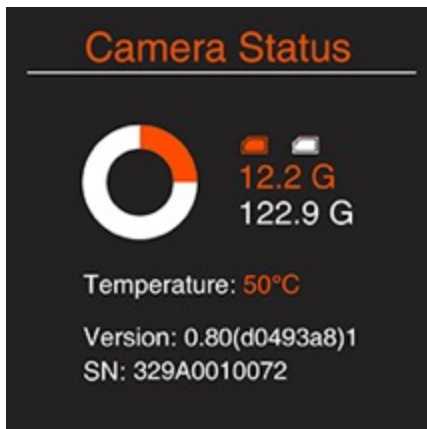
**Up Button:** Shutter / None. It's set to **Shutter** quick setting by default.

**Down Button:** EV / None. It's set to **EV** quick setting by default.

- **LCD Brightness:** 10 ~ 100, default 50.
- **Record Indicator:** On / Off, set both front LED light and back LED light on / off



- **Auto Power OFF:** Off / 30s / 1min / 2mins / 4mins / 8mins / 15mins. It sets the time of auto power off when the camera is not recording and no operation during this time slot.
- **Language:** 简体中文 / English
- **Date / Time:** Set the date and time of the camera.
- **Camera Status:** Displays the current status of the camera, including storage capacity (used and remaining space), temperature (inside the camera), firmware version and camera ID etc.



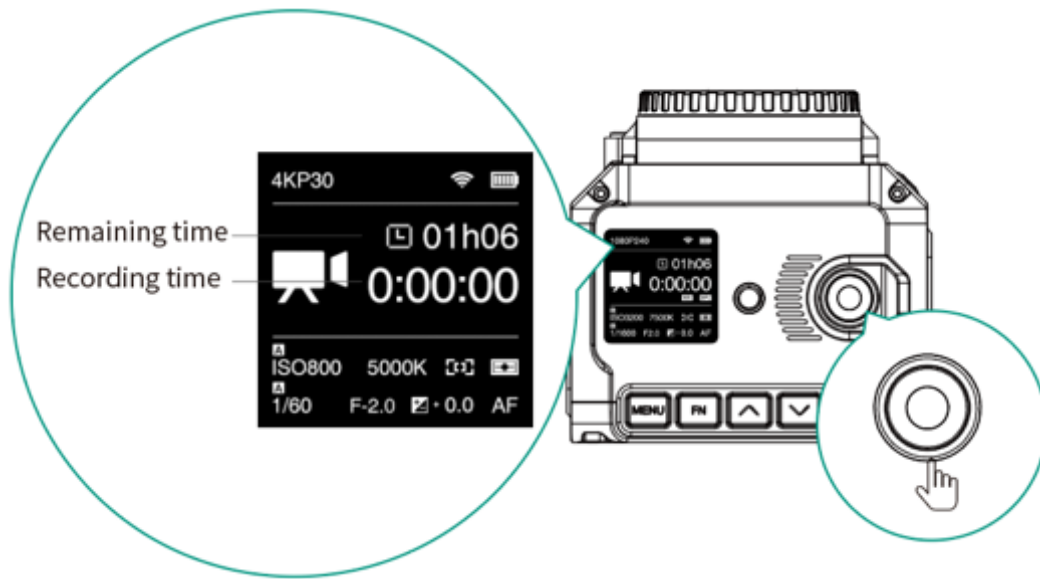
- **Version:** Firmware version of the camera.

## 3. Video Recording

### 3.1. Start / Stop Recording

While camera is in **Standby** mode with CFast card inserted or SSD connected (and the storage is not full), press **Record** button to start recording, and press **Record** button again to stop recording.

The recording time and remaining time for recording (depends on the capacity of the storage) would appear on the screen.



### 3.2. Variable Frame Rate (VFR) Video Recording

VFR will enable you to record a footage with higher / lower frame rate in capture than in playback, which is usually called slow motion / fast motion.

To record a 4K @120fps footage with playback frame rate in 30fps for example, you would need to follow the steps as below:

- 1) In **System** setting, choose “NTSC” in **Video System**.
- 2) In **Record** setting, Choose “4K30P” in **Movie Format**, and “Default” in **Playback FR**.
- 3) In **Video** setting, Set **Variable Frame Rate (VFR)** into 120.
- 4) Go back to the standby status, an “VFR 120” icon would show up on LCD screen, which means the camera is working with VFR in 120fps.

Note: The available **Movie Format** and **VFR** range will be different when the camera is in different **Video System**. Refer to **2.2 Record** and **2.3 Video**.

### 3.3. Wide Dynamic Range (WDR) Video Recording

With WDR enabled, you can get a wider dynamic range (16 stops) than normal Z-LOG mode which would acquire more details on the highlights and shades, setting steps as following:

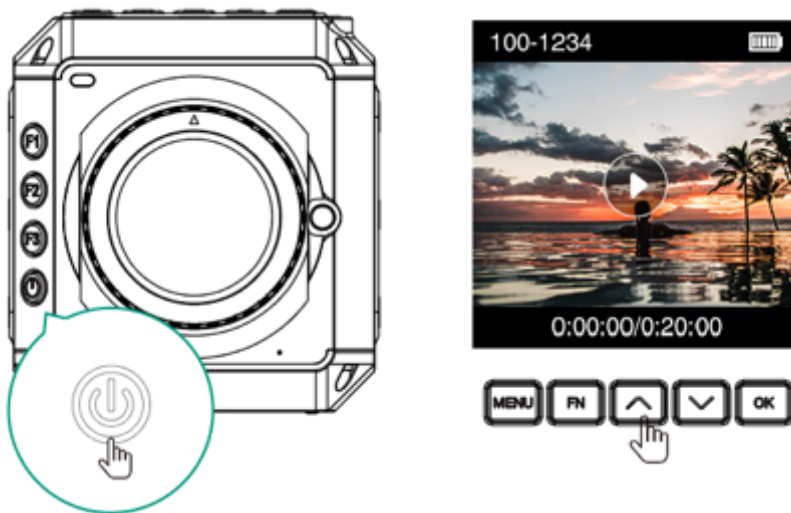
- 1) In **Image** setting, Set **LUT** to “Z-Log”;
- 2) In **Video** setting, Set **WDR** to “WDR”, then the camera will reboot after confirmation.
- 3) After reboot, an “WDR” icon would show up on LCD screen, which means WDR is activated.

Note: Max VFR in WDR mode will be half of it in normal mode. That is 4K @60fps / 1080P @120fps (NTSC or CINEMA) or 4K @50fps / 1080P @100fps (PAL). Please check **2.3 Video** for more detail

## 4. Video Playback & File Management

### 4.1. Video Playback

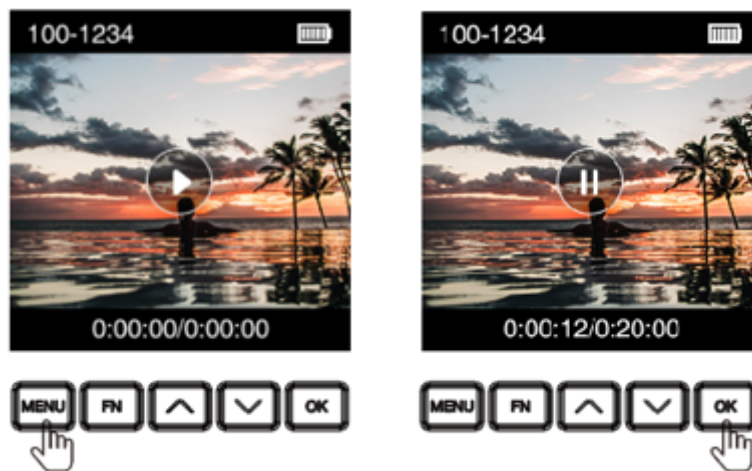
While camera is in **Standby** mode, short press **Power** button to enter into **Playback** mode, LCD screen (or the external monitor connected through HDMI) would show the thumbnail of the latest video in the storage. Press **Up** / **Down** button to browse among footages.



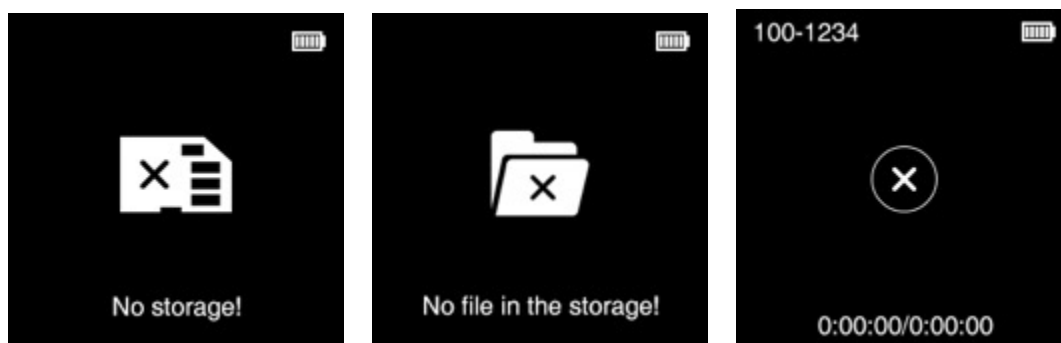
Press **OK** button to play the selected footage. When the footage is being played, press the **Up** / **Down** button to speed up / slow down (2x faster / slower).



When the footage is being played, press **OK** button to pause / resume, and press **MENU** button to stop it.



Please note if there is no storage in the camera, or there is storage in the camera but no video footage in the storage (or other files not supported), there will be alert message on the screen.



## 4.2. Delete Video

Under Playback mode, press FN button when the video is not playing, there will be pop-up confirmation message "Delete the file?", select "Confirm" and then press **OK** to delete.

Note: The deleted file is not restorable, please double check before this action.

## 4.3. Download Video

Besides taking out the CFast card to get the footages recorded, you can also get the footages from the camera (with CFast card inside) from a computer through an USB Type

C cable:

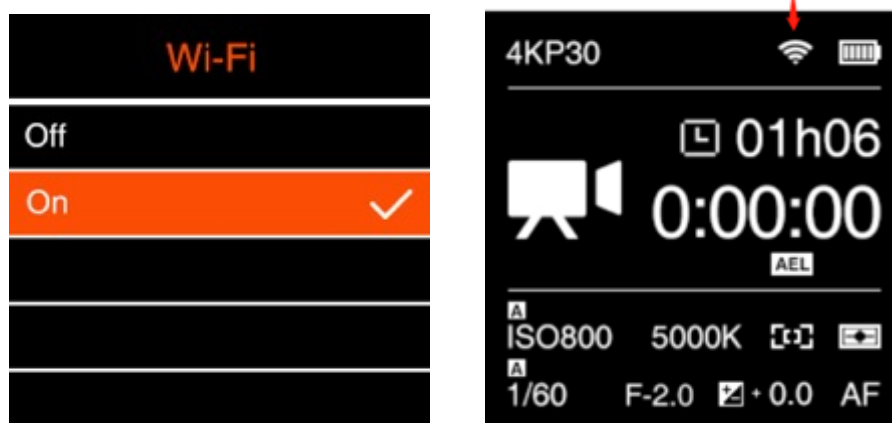
- 1) Power on the camera.
- 2) In **Connect** setting, set **USB** to “Mass storage”.
- 3) Connect the camera to a computer with an USB Type C cable, an “USB” icon would show up on LCD screen, then it's connected successfully.
- 4) PC will detect the camera and shows it as external storage device. You can access & manage the files in the CFast card inside the camera.

## 5. Connect to the Camera

### 5.1. Wi-Fi Connection

You can connect the camera to an external iOS device (iPhone / iPad) or a computer (PC / Mac) through Wi-Fi with following steps:

1. Install a Wi-Fi antenna to the **Wi-Fi Antenna Port** of the camera.
2. In **Connect** setting menu, set the **Wi-Fi** to “On”, go back to **Connect** setting, there will show the Wi-Fi ID: ZCAM-E2-XXXX (last 4 digits match to camera ID) on the **Wi-Fi** item.
3. Press **MENU** to go back to **Standby** screen, there will be a **Wi-Fi** icon on top of the screen.



4. Connect to the camera from the iOS device or a computer with that Wi-Fi ID, and the default password of the Wi-Fi is **12345678**. (not changeable for now)

| Connect  |              |
|----------|--------------|
| Wi-Fi    | ZCAM-E2-BE35 |
| Wi-Fi IP | 10.98.33.1   |
| ETH.Mode | Direct       |
| ETH.IP   | 10.98.32.1   |
| Usb Role | Mass storage |

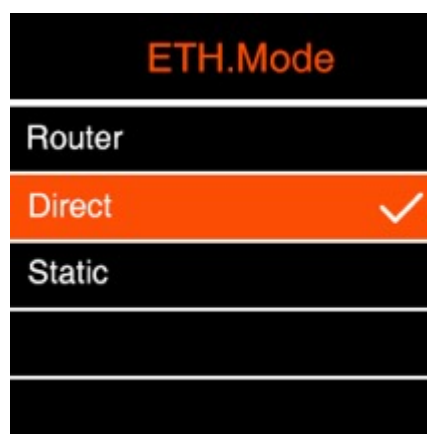
## 5.2. Ethernet Connection

There are 2 options to connect the camera to a computer through Ethernet: **Direct Connection** or **Connection through a Router**:

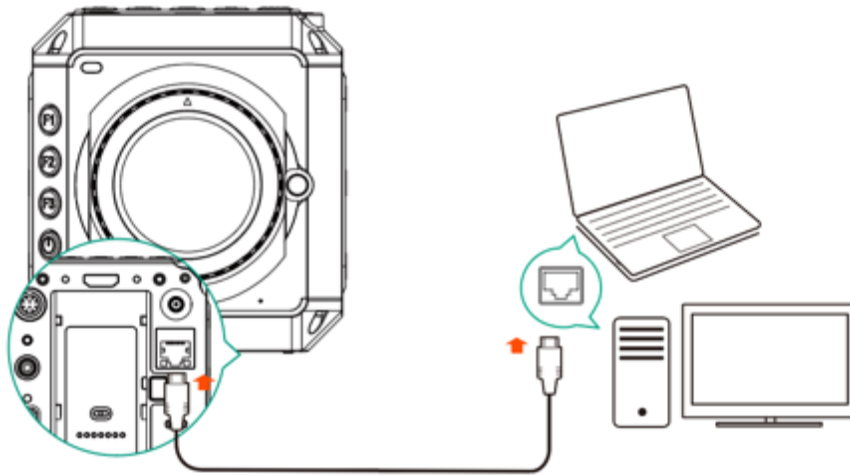
### Direct connection

Follow the steps below to set up direct Ethernet connection between the camera and the computer:

1. Set the **Network Mode** to “Direct” in **Connect** setting (default).



2. Connect the camera to a computer with an Ethernet cable.



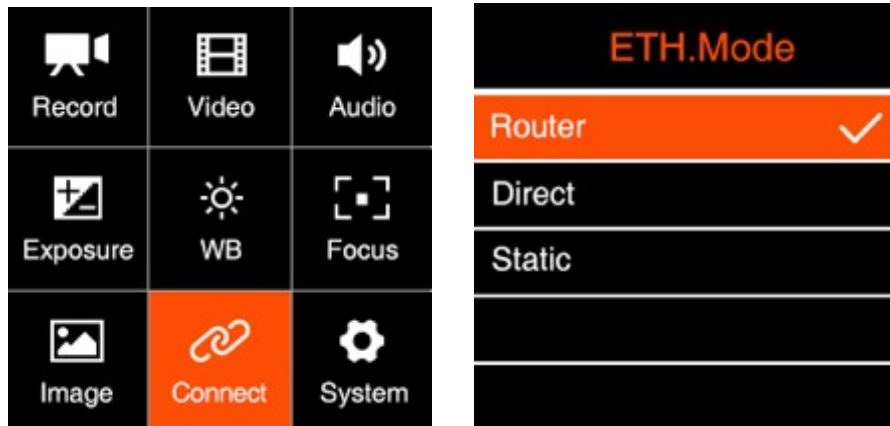
3. Open a browser on the PC / Mac, type in the address: <http://10.98.32.1/www/index.html>. You will see the page below if it's connected successfully.



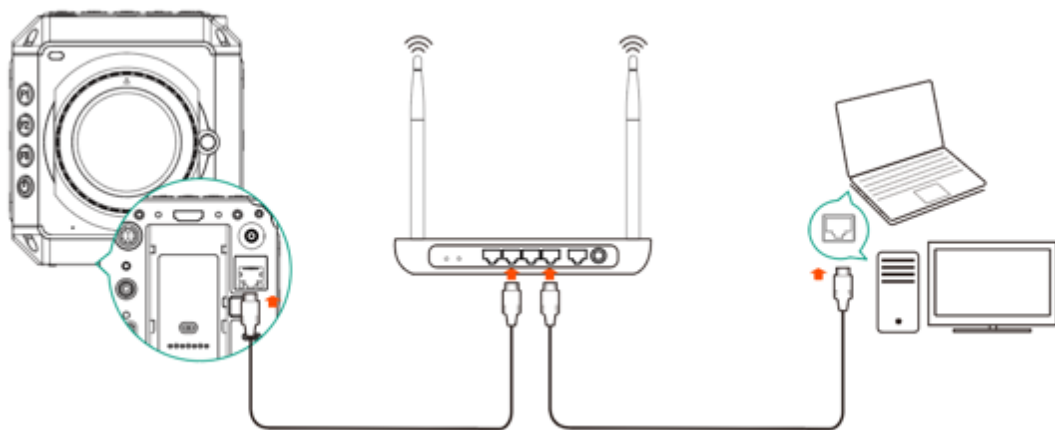
## Connection through a Router

You can set up an Ethernet connection between the camera and a computer through a router with following steps:

1. Set the **Network Mode** to "Router" in **Connect** setting (2.9 Connect - Ethernet mode)

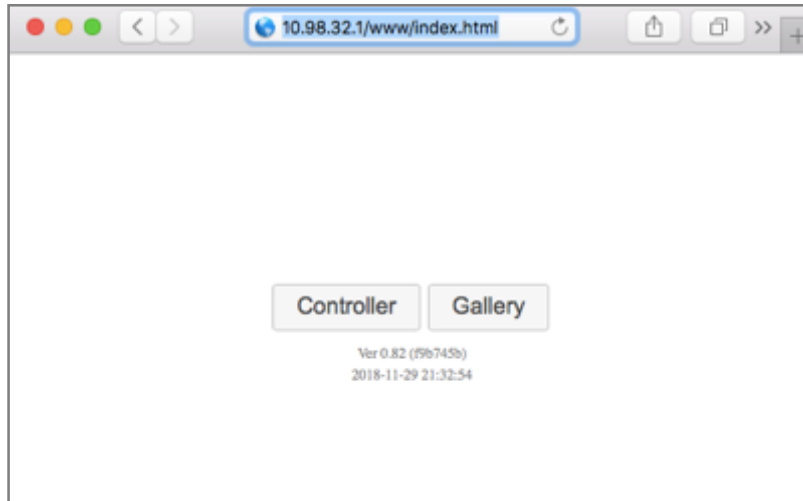


2. Connect the camera to a router with an Ethernet cable, then connect the router to the computer with ethernet cable or Wi-Fi. (Note: Camera and PC should connect to the LAN port of router, not WAN port)



3. Open a browser on the PC / Mac, type in the address: <http://10.98.32.1/www/index.html>. You will see the page below if it's connected successfully.

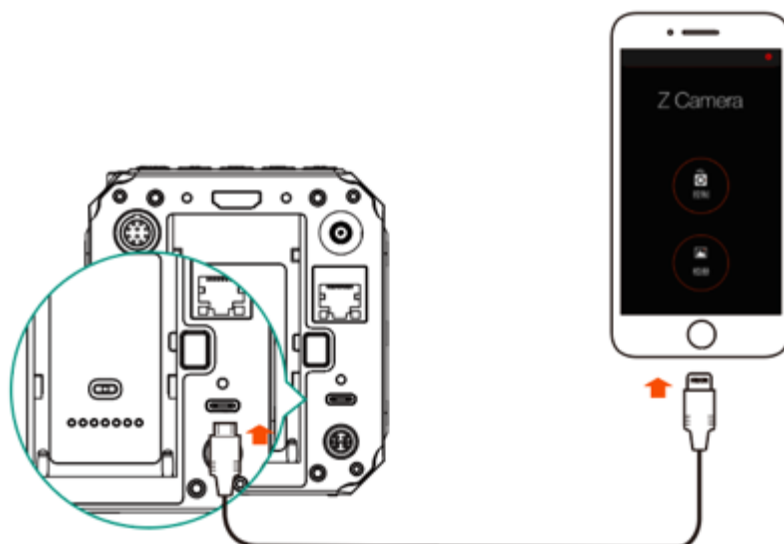




## 6. Using Z Camera App

Download and install the **Z Camera** App from Apple App Store to your iOS device (iPhone or iPad), then you can use this device to live view and control the camera including start / stop recording and most of the settings, with following steps

- Connect to camera: Connect the iOS device to the camera with an USB Type C to Lightning cable as below, or through Wi-Fi (**5.1 Wi-Fi Connection**).



1. If it's the 1<sup>st</sup> time to connect the device to the camera, there will be a pop-up message on your iOS device "Trust this device?", click "Yes" and it will ask you to input password, which is the password to unlock your iOS device.
2. Open **Z Camera** App, if the camera is connected successfully, the "Control" icon will

be activated (it's gray color if there is no connection) and there will be a small USB or Wi-Fi icon on (depends the connection method you use). Click the "Control" icon and you will come into the live-view and control pannel.

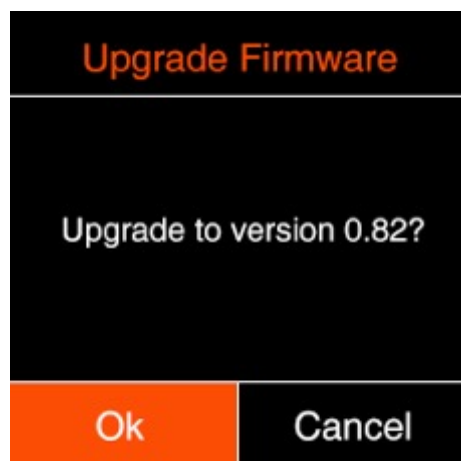
3. Details about the Z Camera app will be added in the future update of the document.

## 7. Firmware Upgrade

Follow the steps below to upgrade the firmware of the camera:

- 1) Download the latest version of firmware (**update.zip**) for Z CAM E2 from Z CAM's website: <http://www.z-cam.com/firmware-update/>.
- 2) Put the **update.zip** file to the root directory of the CFast card.
- 3) Insert the CFast card to the camera and power it on. Please make sure there is enough power in the battery (suggest to use a fully charged battery) or use the AC/DC power adapter.
- 4) If the firmware version of file in the card is higher than the camera's one, there will be a pop-up message for firmware upgrade. Select "OK" and press **OK** button, the camera will upgrade the firmware\* and restart the camera after it's finished.
- 5) If the version of the **update.zip** file in CFast card is the same as or lower than the camera's one (to refresh or downgrade the firmware), there will be no pop-up message when the camera is powered on. Go to **Version** in **System** setting, press **OK** button and you will see the pop-up message for firmware update. Select "OK" and press **OK** button to update the firmware\*.

\* Please make sure the camera will not power off during the firmware upgrade / update process.



**Please note that it's at your own risk to upgrade / update the firmware of the camera, and Z CAM will be not responsible to any damage to the camera or data lost if you are not following the steps above correctly.**

## **8. Camera Maintenance**

- As the camera is a precise instrument, please do not flop it or let it suffer physical strike.
- As the camera is a non-waterproof of camera, please do not use it in water or a humid environment.
- If water accidentally invades the camera, please shut it down, take off the battery (if any) and the memory card, and make the camera dry within 24 hours.
- As the camera's heating range is 0-40°C, please do not place or use the camera in an environment where the temperature is lower than 0°C or higher than 40°C.
- Please do not let the camera and the already installed lens face the sun.
- Please do not touch the image sensor while removing the lens.
- Please do not blow off any dust on the sensor with a dust blower.
- Please do not use any detergent containing organic solvent to clean the camera body and the lens.
- Please use soft lens cloth to clean the camera body regularly.
- Please do not disassemble the camera by yourself.
- Please do not place the camera in a darkroom, a lab or other places where corrosive chemicals are stored.

*Disclaimer: All product features and technical specifications stated above are subjected to Z CAM™'s sole interpretation and explanation.*

## **FCC CAUTION**

### Federal Communication Commission (FCC) Radiation Exposure Statement

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

#### FCC statements:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.