

Z CAM E2N

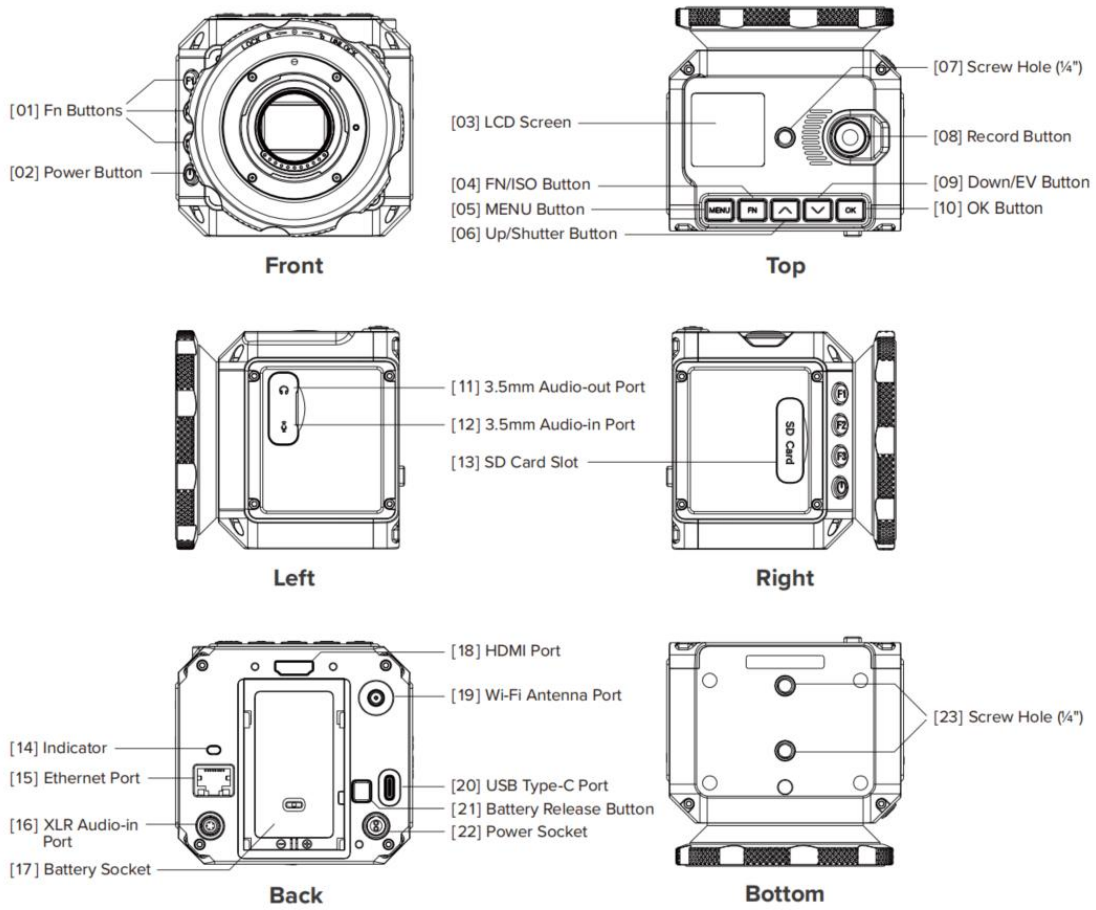
User Manual v1.0

Draft

(Firmware 0.9.5)

1 Introduction

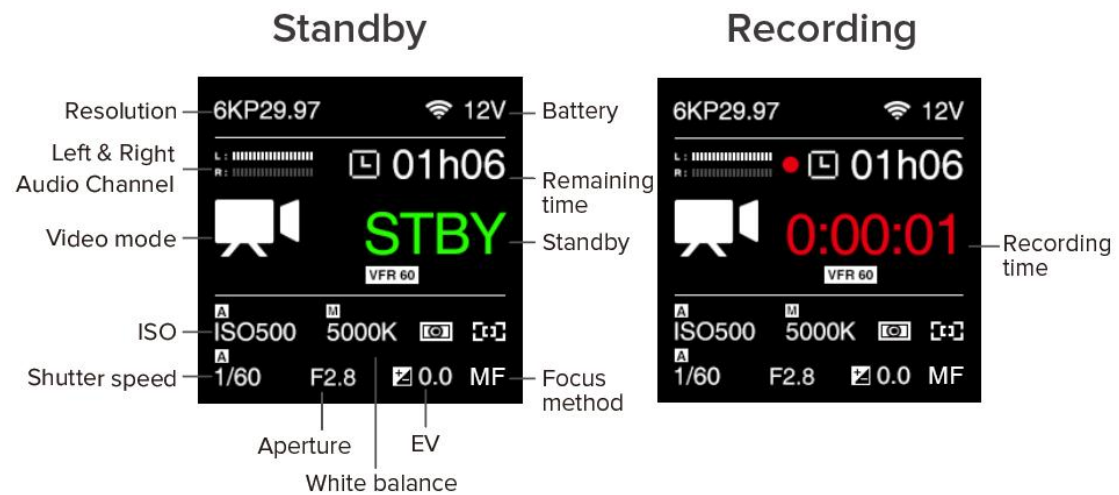
1.1 Camera Introduction



1.2 LCD Screen

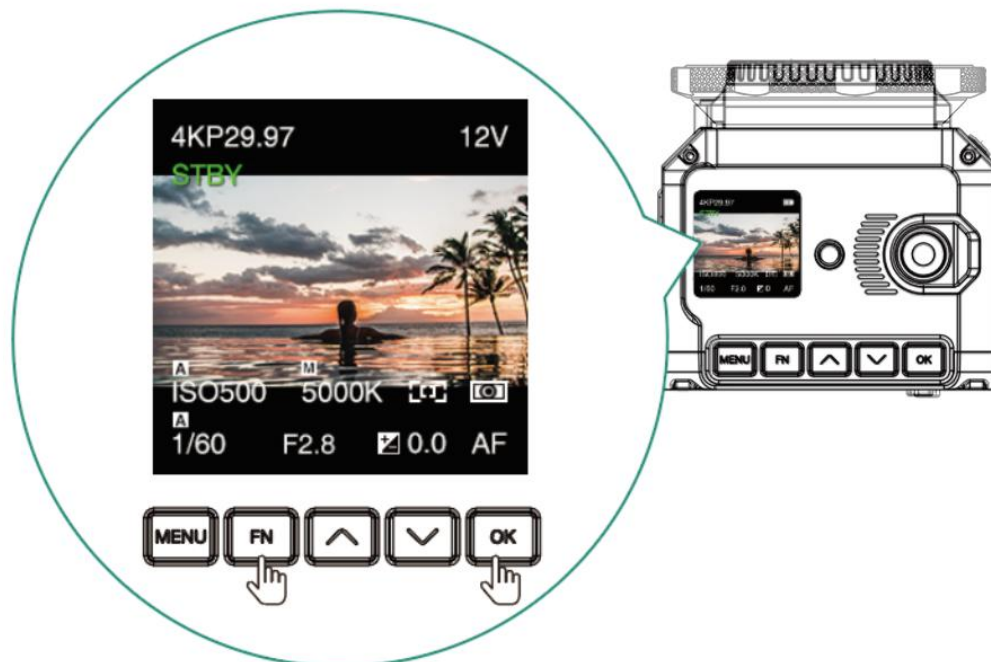
The content displayed on the LCD Screen will be different when the camera is in different mode.

- **Standby & Recording**



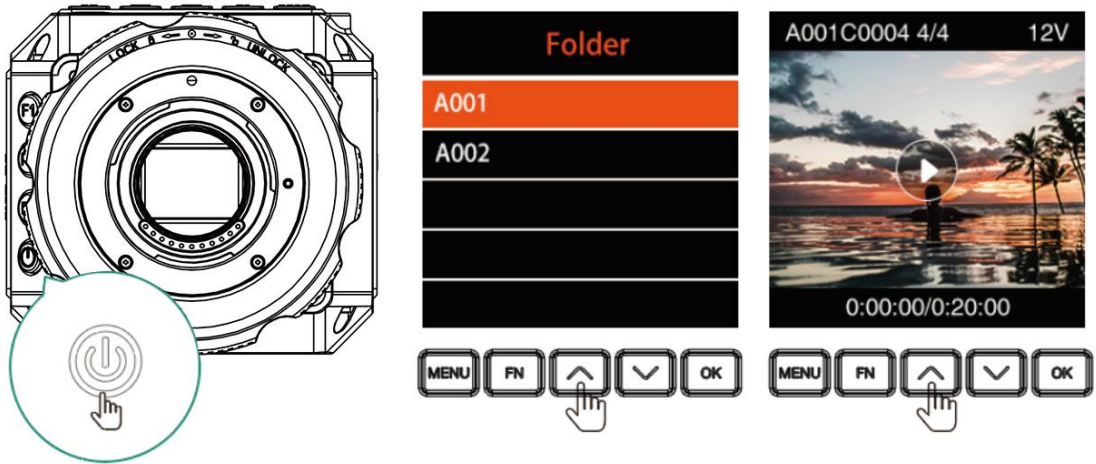
- **Preview**

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.

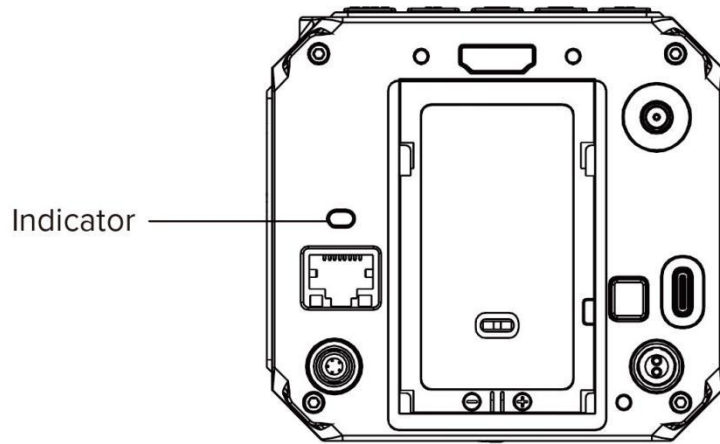


- **Playback**

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.

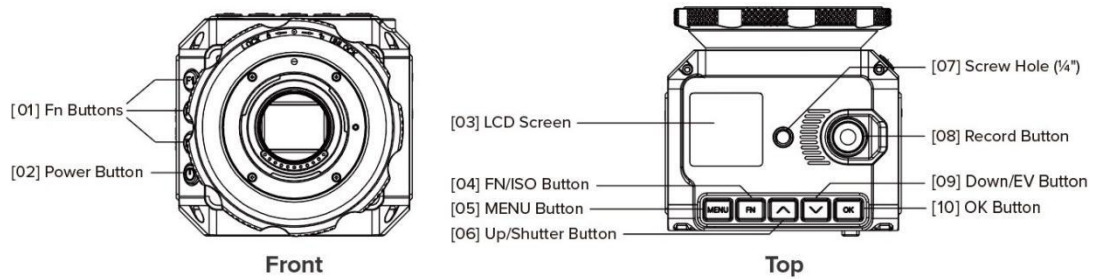


1.3 LED Indicator Status



Green	Standby
Red	Recording.
Flashing Red (every 1s)	No memory card.
Flashing Red (every 0.5s)	Memory card is full.
Flashing Red (every 0.2s)	Camera overheat.
Flashing Red (very fast)	Critical error.
Flashing Red (fast & slow alternant)	Low battery

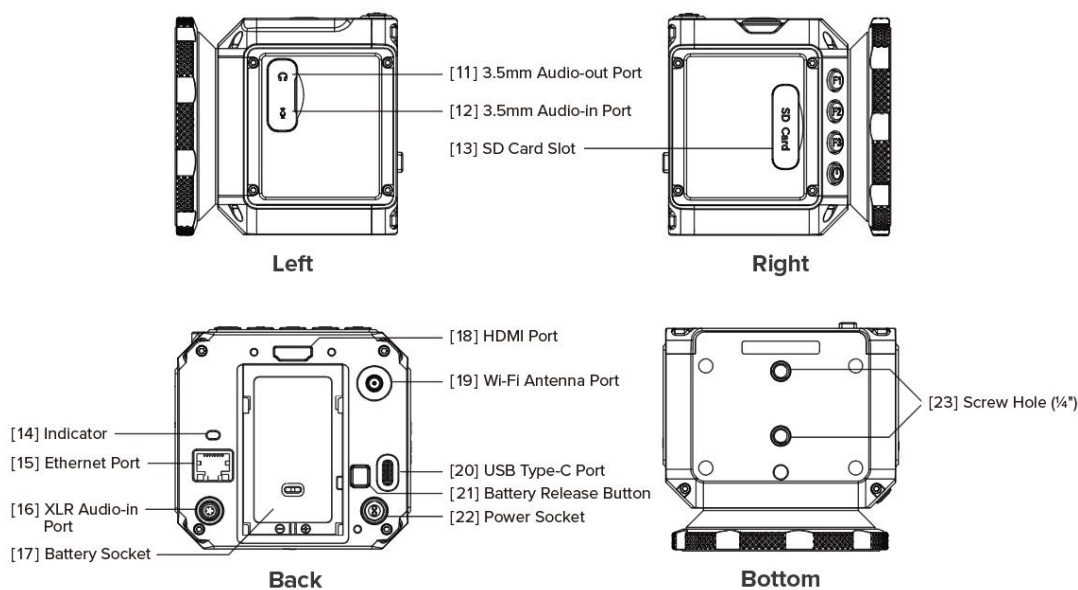
1.4 Buttons



- **MENU button:** Camera settings.
- **FN / ISO button:** FN function in camera settings, or ISO quick setting in standby / preview / recording mode by default.
- **Down / EV button:** Down selection (or add value) in camera settings, or Shutter Speed / Shutter Angle quick setting in standby / preview / recording mode by default. EV quick setting in standby / preview / recording mode by default.
- **Up / Shutter button:** Up selection (or reduce value) in camera settings, or Shutter Speed / Shutter Angle quick setting in standby / preview / recording mode by default.
- **OK button:** Confirmation in camera settings.
- **Record button:** Press to start recording, press again to stop recording.
- **F1 button:** AE Lock (Auto Exposure Lock) by default.
- **F2 button:** Load profile by default.
- **F3 button:** Aperture quick setting by default.
- **Power button:** Long press for 3 seconds to power on / off the camera, short press to switch to / back from **Playback** mode.

* Note: Quick setting function of all buttons can be changed in system menu (**2.10 System – User button**).

1.5 Interfaces

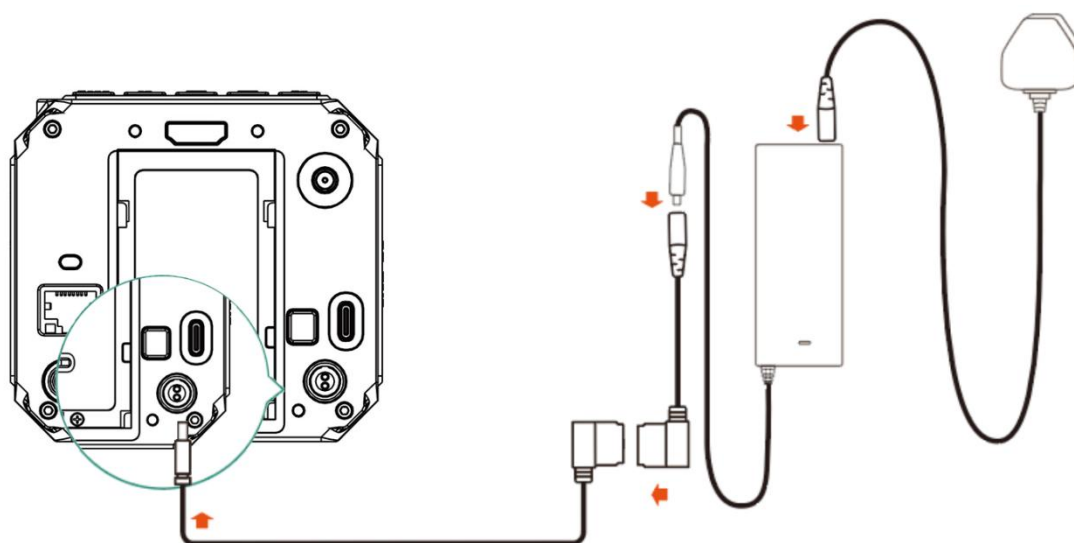


- **3.5mm Audio-out Port:** 3.5mm (TRS) jack socket for support stereo output, can be connected to headset or earphone.
- **3.5mm Audio-in Port:** 3.5mm (TRS) jack socket for stereo audio input (Mic Level & Line Level supported), can connect to microphone or audio output device.
- **SD Card Slot:** SDXC Class 10 SD card, recommend to use UHS-I Speed Class 3 (U3) type for 4K recording.
- **Ethernet Port:** Gigabit Ethernet port for camera control, setting & live preview, PoE+ (IEEE 802.3 at) supported.
- **XLR Audio-in Port:** 5-pin LEMO port for dual-channel XLR microphone, require additional XLR audio connector (compatible with ARRI Mini XLR connector).
- **Battery Socket:** LP-E6 series compatible (Battery not included).
- **HDMI Port:** HDMI 2.0 Type A standard port, video output up to 4K @60fps.
- **Wi-Fi Antenna Port:** 5GHz Wi-Fi antenna port, 802.11ac supported.
- **USB Type-C Port:** USB 3.0 Type C port for camera control and data transformation only. USBSerial converter is supported.
- **Power Socket:** DC 12V 5A (2-pin LEMO socket).

1.6 Power Options

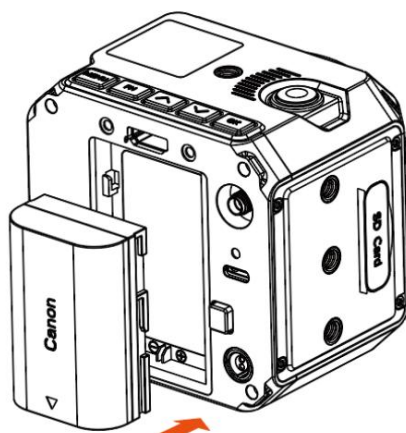
- **12V DC Power:** Connect AC DC power adapter (12V/5A) DC output to the Power Socket through a LEMO connector, and connect AC DC power adapter AC input to AC power outlet (110~240V, 50/60 Hz).

** Note: The AC-DC power adapter and LEMO connector are optional accessories and not included in the standard package.*



- **Camera Battery:** Mount LP-E6 battery onto Battery Socket of camera, gently push downwards until the battery locks into place. Or use a V Mount battery, connect the camera to a V mount battery (with D-TAP port) with the D-TAP power cable (D-TAP plug).

** Note: Battery & D-TAP power cable is not included in the standard package.*

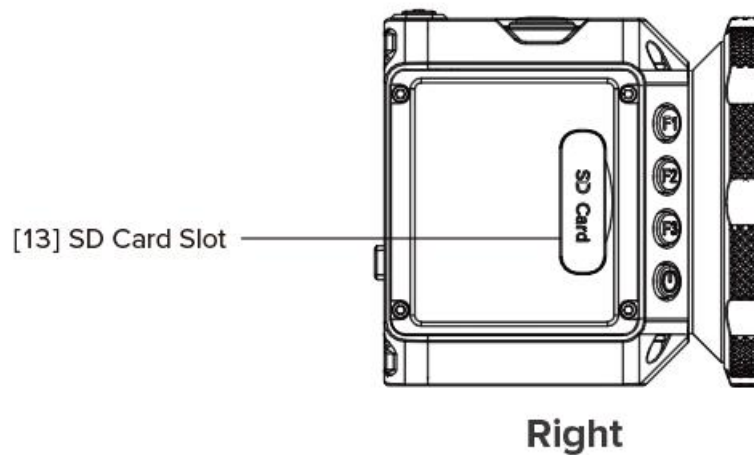


- **PoE+ (Power over Ethernet, IEEE 802.3 at):** Connect a network cable (category 5e or higher, shielded twisted pair) to the Ethernet Port. For more information on the connection, refer to the instruction manual of the PoE power supply device.

** Note: Network cable is not included in the standard package.*

1.7 Storage

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



Attention: When using a SD Card on Z CAM E2N for the first time, please format it before recording (**System – Format Card**).

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.

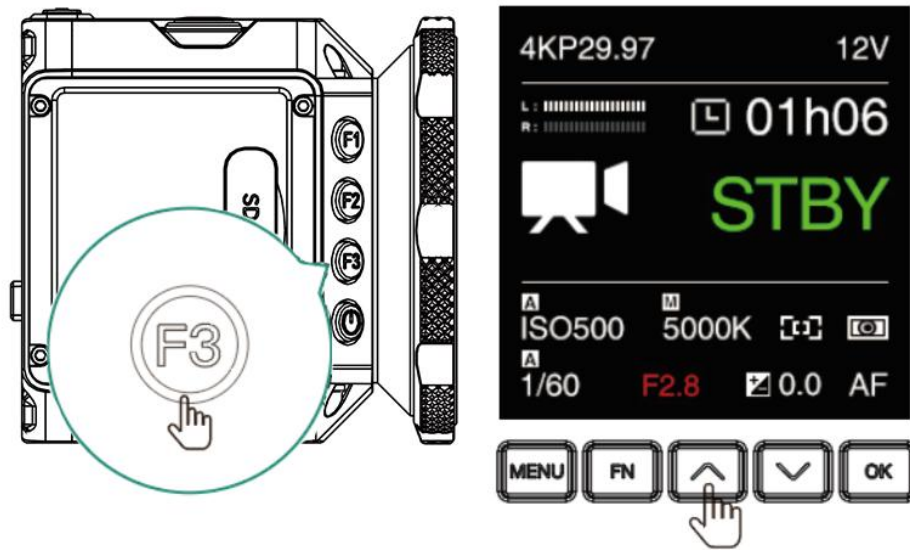
- **ISO:** Press **FN** to set ISO, then press **Up / Down** to adjust the value, and **OK** to confirm.



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



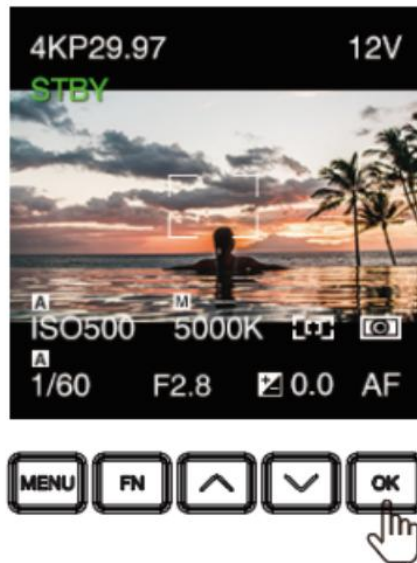
- **Aperture:** Press **F3** to set the aperture, then press **Up / Down** to adjust the value, and OK to confirm.



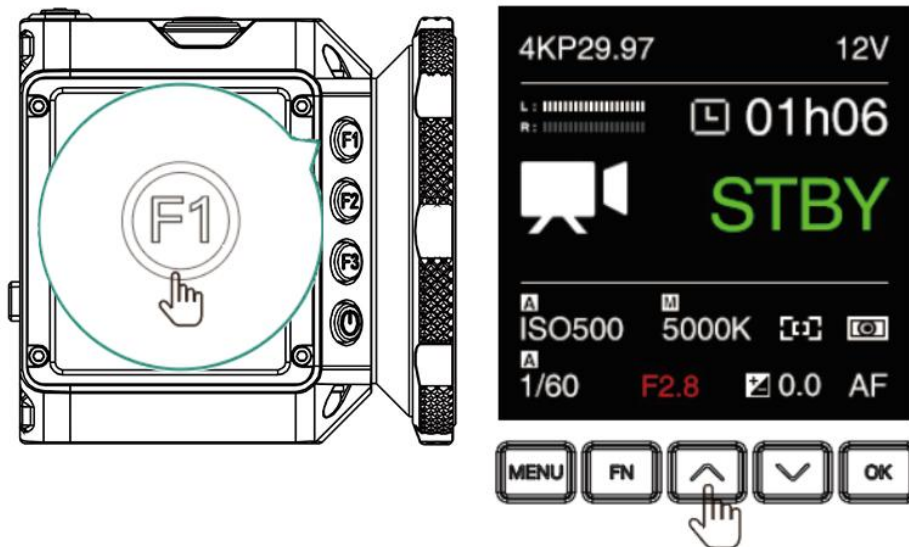
- **EV:** Press **Down** to set EV, then press **Up / Down** to adjust the value, and **OK** to confirm.



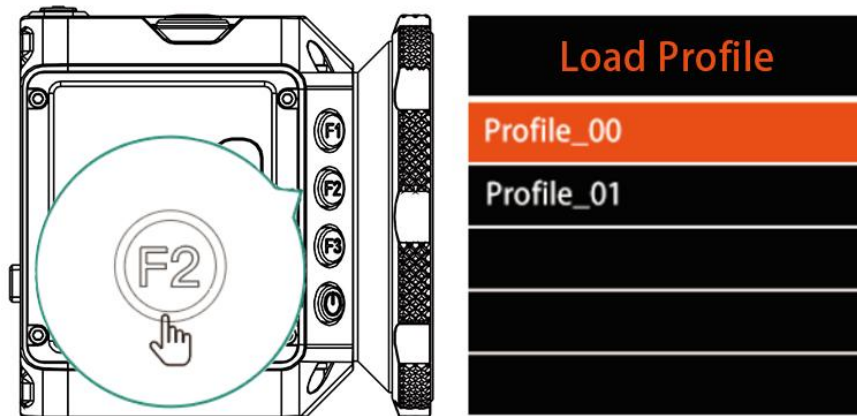
- **AF:** When focus is in AF mode (requires a lens with auto-focus function), press OK to trigger the auto-focus.



- **AEL (F1):** Press **F1** to lock the exposure, then press again to unlock



- **Load profile (F2)**: Load the configuration saved in the camera. (System - User Profile).



Note: Quick setting function on the buttons can be changed in system setting (2.10

System – User Button).

2.2 Record



- **Resolution**

Resolution	<p>C4K 2.4:1 / 4K (Low Noise) / 4K / 4K 2.4:1 /</p> <p>3696x2772(Low Noise) / 3696x2772 / 3312x2760 /</p> <p>S16 16:9 / S16 / 1920x1080</p>
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- **Project FPS:** Frame rate of the video project. It will be different when the resolution is set to different values.

Resolution	Frame Rate (fps)
4K (Low Noise) / 3696x2772(Low Noise) / 3696x2772 / 3312x2760	23.98 / 24 / 25 / 29.97
C4K 2.4:1 / 4K / 4K 2.4:1 / S16 16:9 / S16 / 1920x1080	23.98 / 24 / 25 / 29.97 / 50 / 59.94

- **Variable Framerate:** With VFR you can set a different frame rate for capturing based on the Project FPS for recording, in this way you can get a slow-motion or fast-motion footage. VFR options are related to the Resolution and Project FPS in Record setting. And the maximum VFR is related to the exact resolution, see below:

Resolution	Max Variable Frame Rate (fps)
C4K 2.4:1	60
4K (Low Noise)	30
4K	60
4K 2.4:1	60
3696x2772(Low Noise)	30
3696x2772	30
3312x2760	30
S16 16:9	60
S16	60

1920x1080	240
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- **VFR Control:** Coarse / Fine
 - **Coarse:** Adjust based on the camera's preset value within the range of VFR.
 - **Fine:** VFR fine control within the range of VFR, 1 frame per step.
- **File Format:** MOV / MP4
- **Split duration:** 5 / 10 / 15 / 20 / 30 / 60 / 120 min. The camera will split the video with the length set here automatically.

Note: After the first section via camera automatically splitting, the out of sync problem between audio and video will happen. You need to use "Z CAM Video Concatenator" to merge the video section before the post editing and processing. The download link as below:

<http://www.z-cam.com/cn/software-update/>

- **Time Code:** Set the time code, there are sub-items as below:
 - **Time Code Source:** Internal
 - **Time Code Value:** Reset / Manual / Current
 - **Reset:** Reset the time code value to 0.
 - **Manual Input:** Set the time code value manually 00:00:00:00.
(hour:minute:second:frame).
 - **Current Time:** Set time according to the camera system setting time.
 - **Count Up:** Rec Run / Free Run.
 - **Rec Run:** Counts the time code only when recording video.
 - **Free Run:** Counts the time code even when not recording video (including when the camera is power off).
 - **Time Code Mode:** DF / NDF.
 - **DF:** The camera modifies the difference between recorded time and time

code. Seconds and frames are separated by “.”. (Example: 00:00:00.00)

- **NDF:** Records the time code without drop frame. Seconds and frames are separated by “.”. (Example: 00:00:00:00)

- **HDMI Display:** On / Off. To enable / disable the display of time code through HDMI output.

- **Playback FR:** Default / VFR. When it's set to Default, the frame rate of playback will be the same as set in Project FPS, when it's set VFR, the frame rate of playback will be the same as set in Variable Frame Rate (**Record – Variable Framerate**).

- For example: Set "Record - Project FPS" to 29.97, and "Record -Variable Framerate" to 120. If the Playback FR is set to "Default", the playback frame rate of the video is 29.97fps (4-fold slow motion). If the Playback FR is set to "VFR", the playback frame rate of the video is 120fps (normal speed).

- **Meta Setup:** Set the camera metadata, include “Camera ID” and “Reel Name”.

- **Camera ID:** A ~ Z

- **Reel Name:** 001 ~ 999

- **Pre Roll:** On / Off. Set Pre Roll to ON, there would appear one red flashing circle on the left of remaining recording time. To press Record button to start recording, the camera will automatically save the first 5 seconds before pressing record button.

- **Pre Roll Duration:** 1s / 3s / 5s / 7s / 10s

2.3 Video

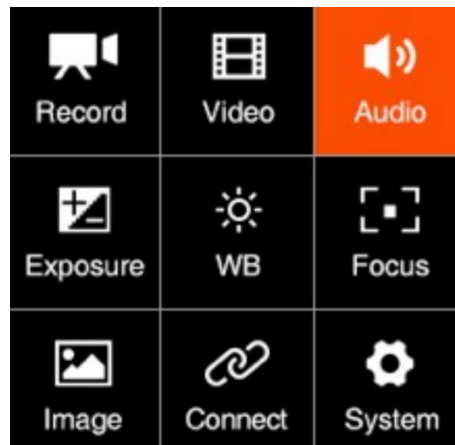


- **Encoder:** H.264 / H.265.
- **Bitrate:** High / Medium / Low. Value of the bitrate varies in different resolution and frame rate.
- **Luminance Level:** Full / Limited.
- **Rotation:** Normal / Upside Down. Rotate the image by 180 degrees.
- **Note:** This setting is available only when the frame rate of recording is under 30fps (include 30fps). The display on the LCD and the video output from HDMI will not be rotated during preview and recording in current firmware, and only the video recorded in the storage will be rotated when it's set to "Upside Down".
- **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.



- **Photo Quality:** JPEG / RAW.

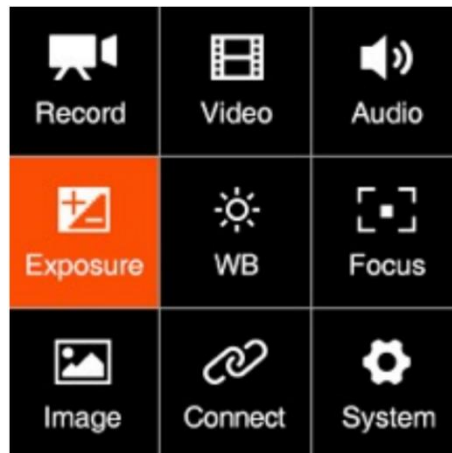
2.4 Audio



- **Input:** Off / Microphone / XLR / Mic Left + XLR Right / Mic Right + XLR Left
 - **Off:** Turn off all audio input.
 - **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:** Take XLR port as audio-in.
 - **Mic Left + XLR Right:** Take 3.5mm audio-in(microphone) left channel, and XLR port right channel to merge for audio-in.
 - **Mic Right + XLR Left:** Take 3.5mm audio-in(microphone) right channel, and XLR port left channel to merge for audio-in.
- **Noise Reduction:** Off / On.
- **Input Gain**
 - **Control:** Auto / Manual
 - **Left Gain:** -10 ~ 12 dB, can be set manually.
 - **Right Gain:** -10 ~ 12 dB, can be set manually.
- **Encoder:** None / AAC / PCM.
- **Output Gain:** 0 ~ 12 dB, can be set manually.

- **Phantom Power:** Enable / Disable. Available when “Input” is set to “XLR,” “Mic Left + XLR Right” and “Mic Right + XLR Left” to enable or disable the phantom power of the XLR port.
- **Audio Level Display:** Disable / Enable, enabling this setting displays the audio level on the standby screen.

2.5 Exposure



- **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.
- **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 (1/30"~1/8000")*.
 - **Shutter Angle:** Auto / Manual (1°~ 360°).
- **Aperture:** It shows the range of aperture of the lens, and can be adjusted manually if it's an electrical lens. Only for lenses with electronic contacts. If the lens used is a purely mechanical without electronic contacts, the aperture value is not shown here.

- **ISO:** Auto / Manual (500~102400).
- **Min ISO:** 500~3200, this setting will only be enabled when **ISO** is set to “Auto”.
- **Max ISO:** 1000~102400, this setting will only be enabled when **ISO** is set to “Auto”.
- **Max Shutter Speed / Max Shutter Angle:** This setting will be activated if Shutter Speed / Shutter Angle is in **Auto** mode.
 - **Max Shutter Speed:** Auto / Manual (1/30"~ 1/1600")*.
 - **Max Shutter Angle:** Auto / Manual (1°~ 360°).

** Minimum shutter speed “1” is optional only when variable frame rate is set to “1”.*

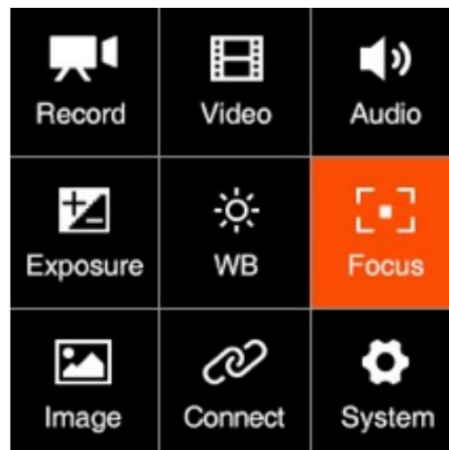
- **Metering Mode:** Center / Average / Spot, it sets the metering mode of exposure.
- **Shutter Operation:** Speed / Angle.
- **Shutter Angle Ctrl.:** Coarse / Fine, this setting will only be enabled when **Shutter Operation** is set to “Angle”.
- **ISO Control:** Fine / Native ISO.
 - **Fine:** ISO can be set in detail value within ISO range (according to standard ISO definition).
 - **Native ISO:** only native ISO can be selected.
- **AE Speed:** Slow / Normal / Fast.
- **Lock In Record:** Off / On. Enable this function, it will automatically lock the exposure during recording.

2.6 White Balance



- **Mode:** Auto / Incandescent / Cloudy / D10000 / Fluorescent / Indoor / Daylight / Shade / Manual
- **Kelvin:** When White Balance **Mode** is set to “Auto” or “Preset Value”, it shows the current color temperature, when White Balance **Mode** is set to “Manual”, it can be adjusted manually (2300 K ~ 30000 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.
- **Lock In Record:** Off / On. Enable this function, it will automatically lock the white balance during recording.

2.7 Focus



- **Focus Model:** MF (Manual Focus) / AF (Auto Focus)
- **Focus Area:** Flexible Zone / Human Track. This will only be enabled when Focus Mode is set to “Auto Focus”.
 - **Flexible Zone:** Can move focus area via Up / Down button.
 - **Human Track:** The camera can detect whether there is a human body in the picture. If yes, the focus area will keep tracking the human body automatically.
- **Focus Area size:** Small / Medium / Large. This will only be enabled when Focus Mode is set to “AF” and Focus Area is set to “Flexible Zone”.
- **Change Focus Area:** Move the focus area via Up / Down button. This will only be enabled when Focus Mode is set to “AF” and Focus Area is set to “Flexible Zone”.
- **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.
- **Live CAF:** On / Off. This will only be enabled when CAF is set to “On”. Active continuous focus in real time according to the scene.
- **CAF Sensitivity:** High / Medium / Low. This will only be enabled when CAF is activated.

- **MF Assist:**

- **Preview:** On / Off.

- **Recording:** On / Off.

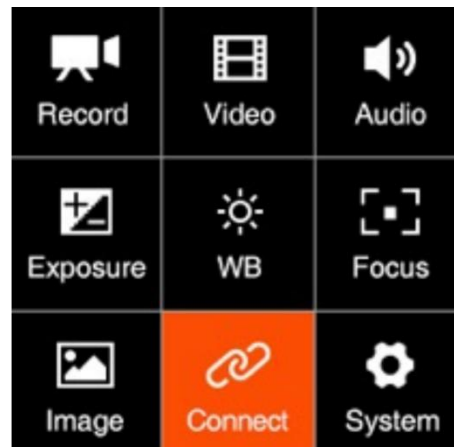
This will only be enabled when Focus Mode is set to MF. When it is set to On, the image in the focus area will be enlarged to 2 x size on the screen (both LCD display and HDMI output) when the focus is being adjusted manually. And it be set for Preview and Recording separately.

2.8 Image



- **Image Profile:** Rec.709 / Concert / Vivi 0 / Vivi 1 / Vivi 2
- **Sharpness:** Strong / Medium / Weak, default is Medium.
- **Noise Reduction:** Medium / Weak / Off, default is Weak.
- **Brightness:** 0~100, default is 50.
- **Saturation:** 0~100, default is 50.
- **Contrast:** 0~100, default 50.

2.9 Connect



- **Network:** Wi-Fi / Wi-Fi IP / Channel / ETH. Mode / ETH. IP
 - **Wi-Fi:** Off / On. When the Wi-Fi is activated, here will show the Wi-Fi ID, which is ZCAM-E2-XX-XXXX (last four digits which match to the camera ID), and the default password is: **12345678**, which can only be changed with iOS app (**Using Z Camera App**).
 - **Wi-Fi IP:** Here will show IP address of the Wi-Fi when it's activated.
 - **Channel:** 36 / 40 / 44 / 48 / 149 / 153 / 157 / 161 / 165.
 - **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:** Mass Storage / Serial / USB Camera.
 - **Mass Storage:** The camera will be recognized as a storage when it is connected to a computer (PC / Mac), and the file on the SD card inside the camera can be

accessed.

- **Serial:** The camera will be controlled by UART command from a computer through USB port.
- **USB Camera:** The camera will be recognized as a USB camera when it is connected to a computer (PC / Mac).
- **HDMI:** Display Info. / OSD Layout / Format / Use EDID.
 - **Display Info.:** On / Off. Turn on / off camera status on HDMI monitor.
 - **OSD Layout:** Type 1 / Type 2
 - Type 1: Assist tool as waveform etc. display on the video directly.
 - Type 2: Add the black frame area to display assist tool.
 - **Format:** Auto / Manual (options supported by the HDMI display).
 - Auto: The camera will select the most suitable format (resolution & frame rate) from the HDMI monitor.
 - Manual: Here will list the formats supported by the HDMI monitor for the user to select manually.
 - **Use EDID:** Disable / Enable. This setting determines whether the camera automatically reads the EDID information of the HDMI connected monitor.
- **Multi Camera:** PixelLink / EzLink.
 - **PixelLink:** Single / Master / Slave.
 - **EzLink:** Single / Master / Slave.
- **HTTP:** HTTPS / Authentication / Load Certificate.