

CoroCAM 7

User Manual v1.4

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Introduction

The CoroCAM 7 is a professional grade handheld combined UVc and Visible camera.

The combined suite of sensors enables the operator to detect corona, arcing, sparking conditions.

Please read through the manual carefully to get the most out of your camera.

If you have further questions please feel free to contact us:
support@uvirco.com

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Warnings



If the camera carries a laser warning label, then it is fitted with a laser and the following applies: This product is classified as a Class 3R laser product, according to the following standards IEC/EN 60825-1 “Safety of laser products, Part 1: Equipment classification and requirements”.



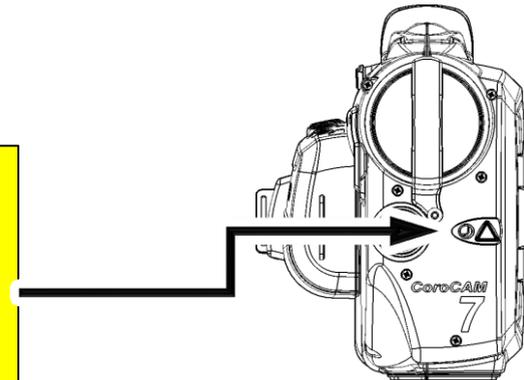
Class 3R: A Class 3R Laser is considered safe if handled carefully, with restricted beam viewing. With a Class 3R laser, the maximum permissible exposure can be exceeded, but the risk of injury in most cases is relatively low. For visible continuous laser radiation, the accessible emission limit (AEL) for Class 3R is limited to 5 times the AEL for Class 2 (i.e. limited to 5mW).

Laser Hazard Precautions



- Laser pointer beam divergence is 1.0mRad.
- Never direct a beam onto another person, especially their face.
- Do not shine a laser beam onto a mirror or mirror-like surface.
- Do not look at the beam through binoculars or a telescope.
- NEVER aim any laser towards an aircraft or vehicle that is in motion. This is unsafe to vehicle operators

Laser radiation is emitted from this aperture. Avoid direct eye exposure.



Warnings



Never point the camera directly into the sun, as this can damage the visible and infrared channel cameras.



To prevent electrical shock, do not expose the mains adaptor to rain or moisture and do not open the protective housing

Warnings



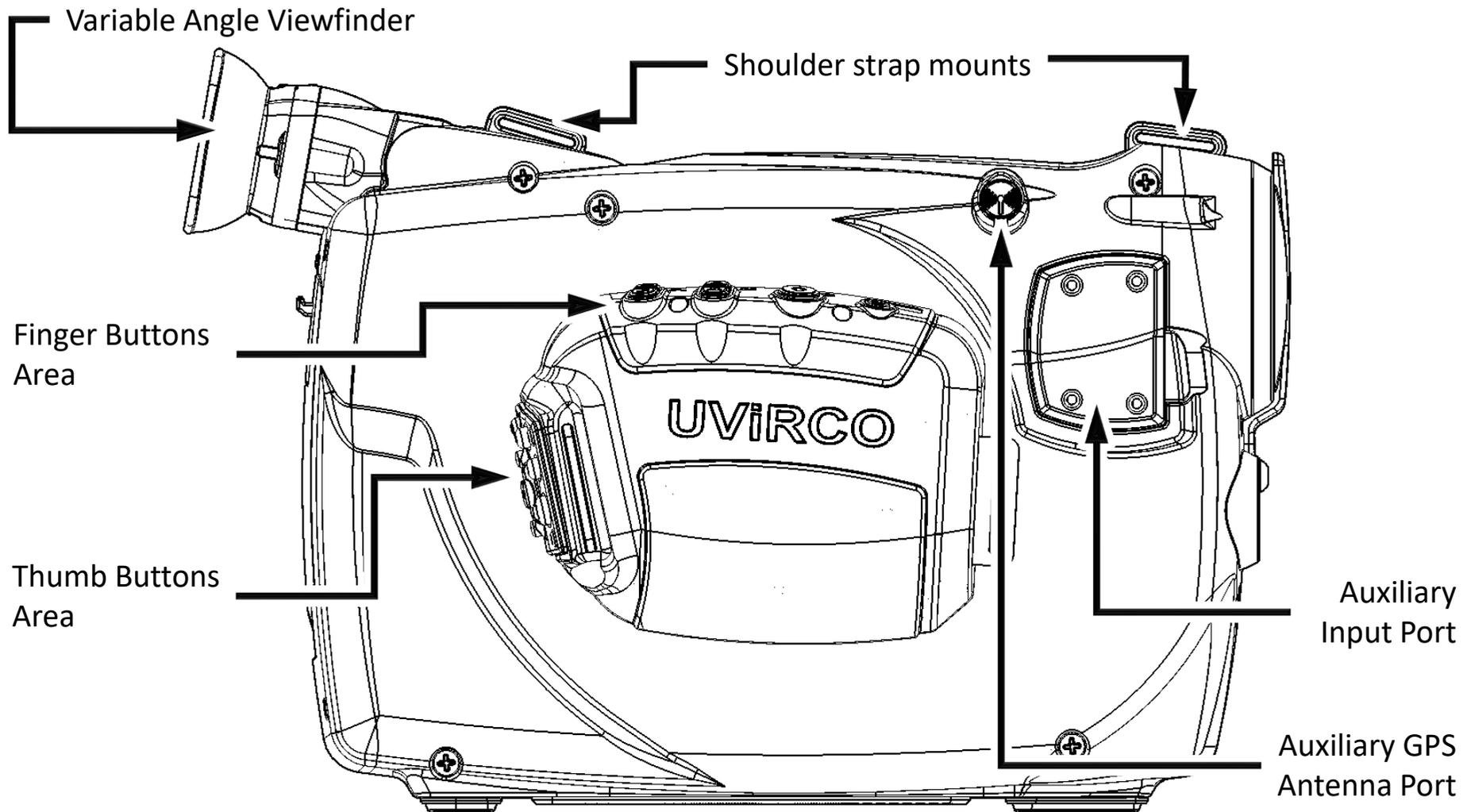
To prevent damage to the equipment, do not expose the camera or accessories to extreme temperatures, excessive moisture or shock, especially with the battery or port covers open.



Ensure that camera is switched off when stored in a closed container; heat build-up in the unit can lead to damage. The use of properly recharged batteries will reduce heat built-up during normal operation.

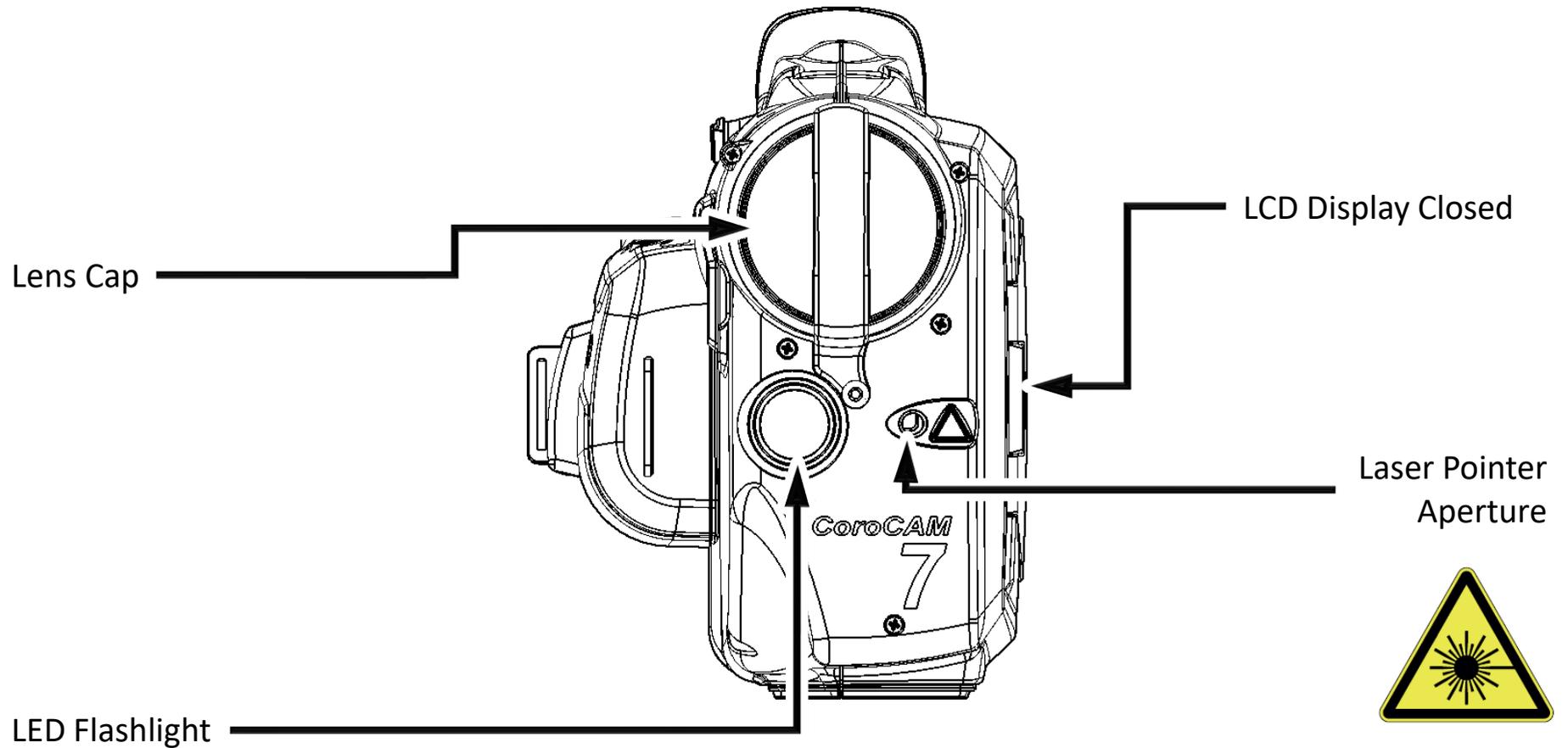
Familiarisation

Right View



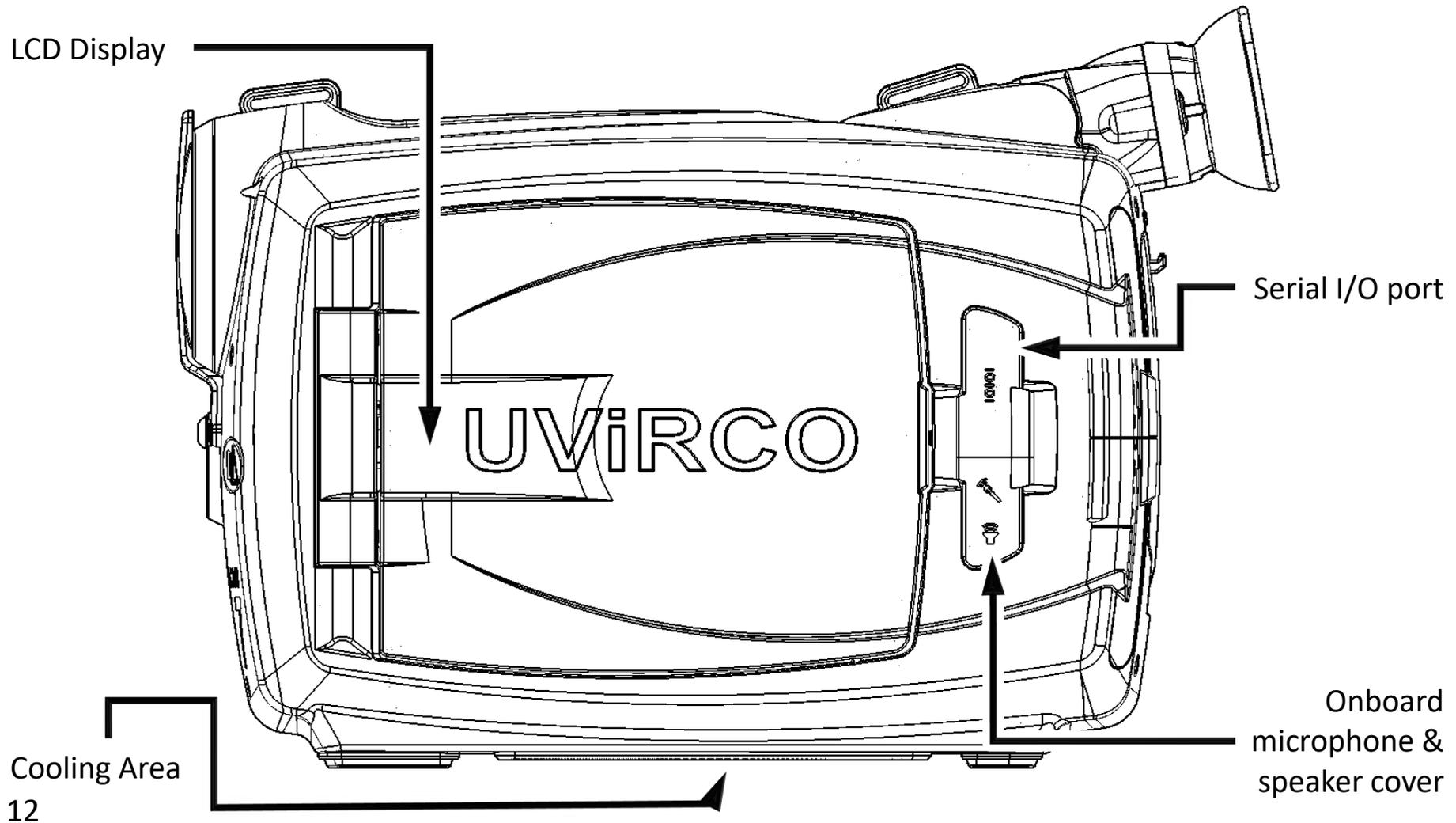
Familiarisation

Front View



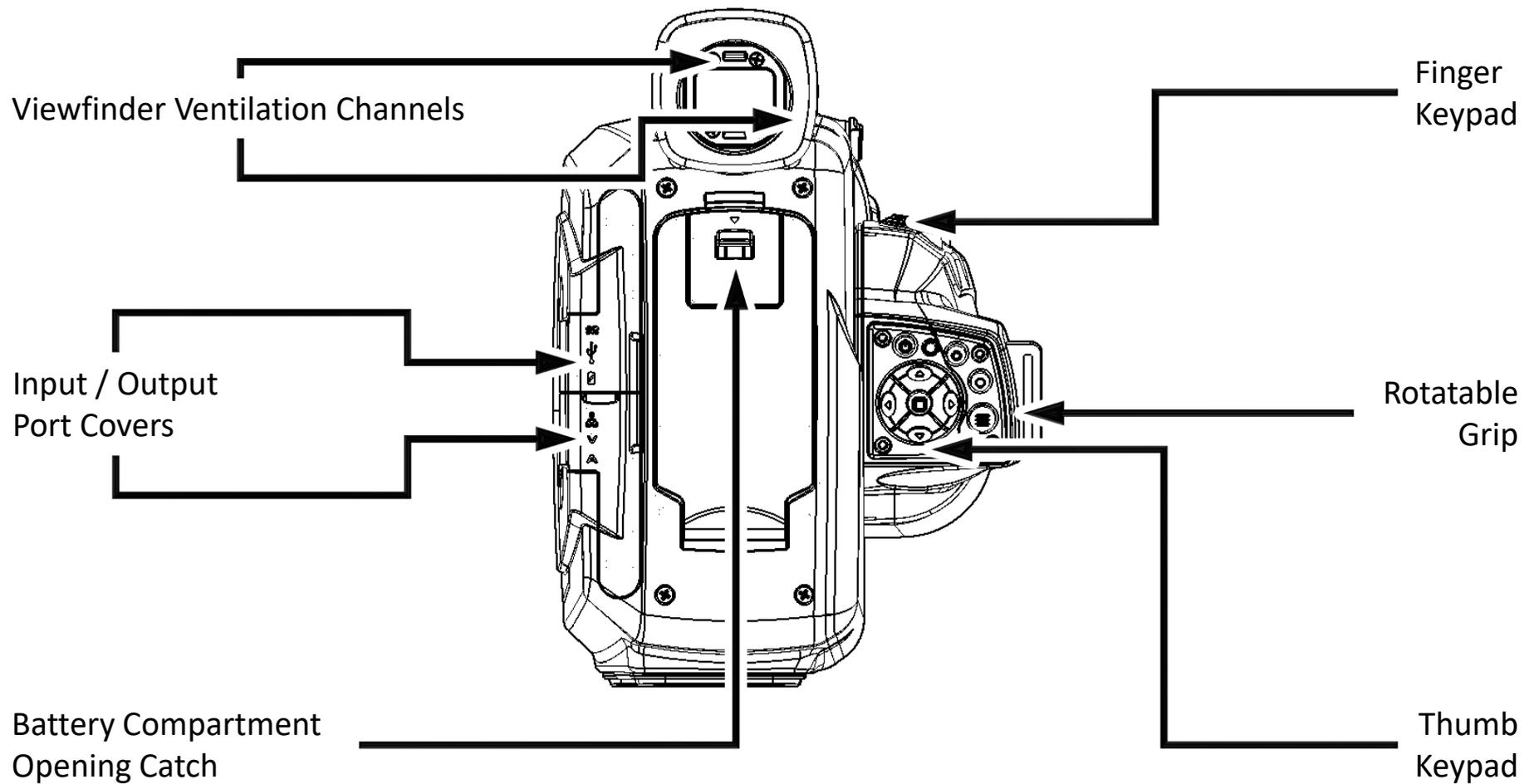
Familiarisation

Left View



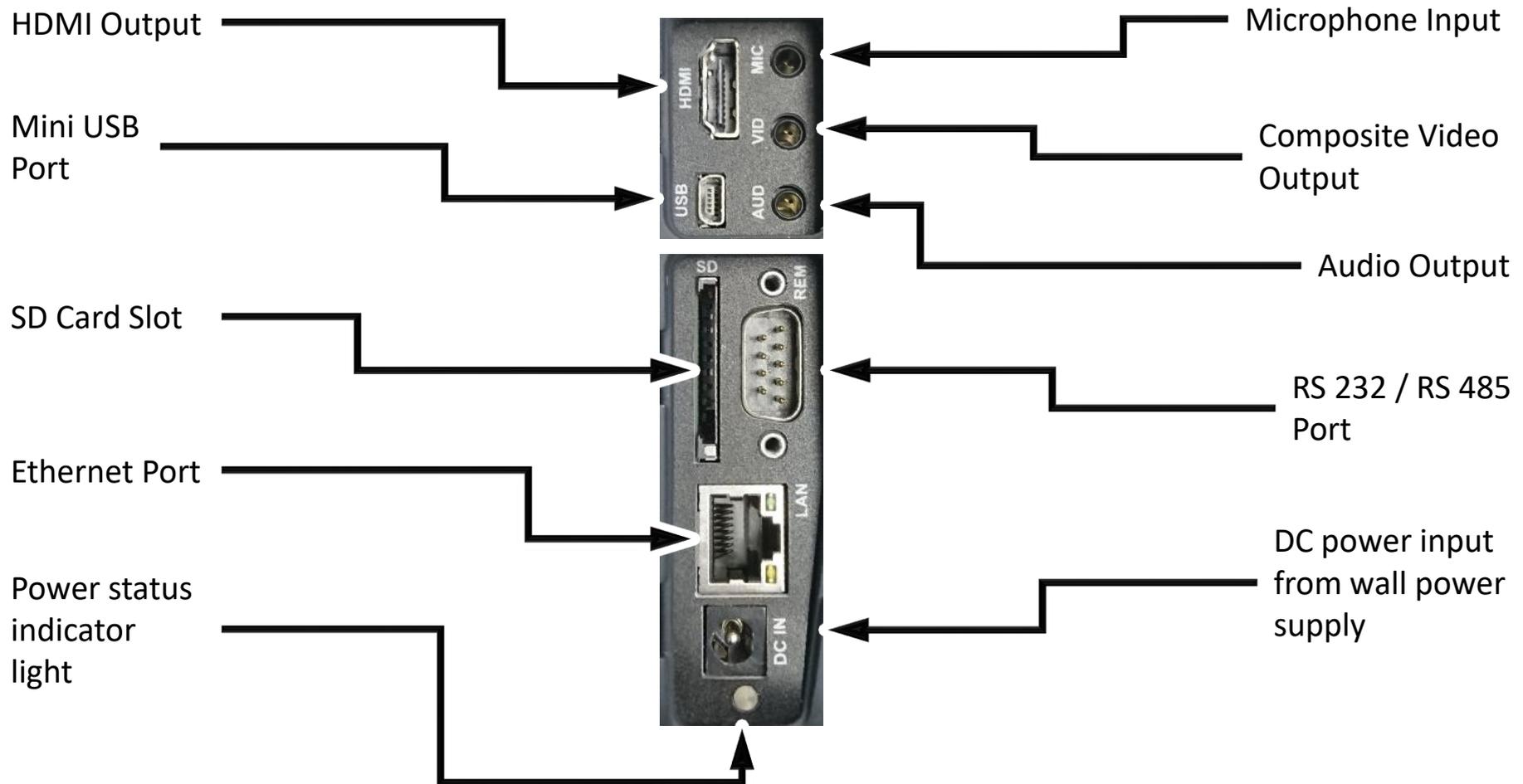
Familiarisation

Back View



Familiarisation

Data Port



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Installing Batteries

Charge the NP-F770 model battery that was supplied with the camera. Refer to charger manual for details.

To open the battery compartment pull the catch down and flip open the cover.

Insert the battery into the battery compartment. Take care to note that the connection pin holes must be on the inside of the camera.

Inserting the battery incorrectly may damage the connectors.

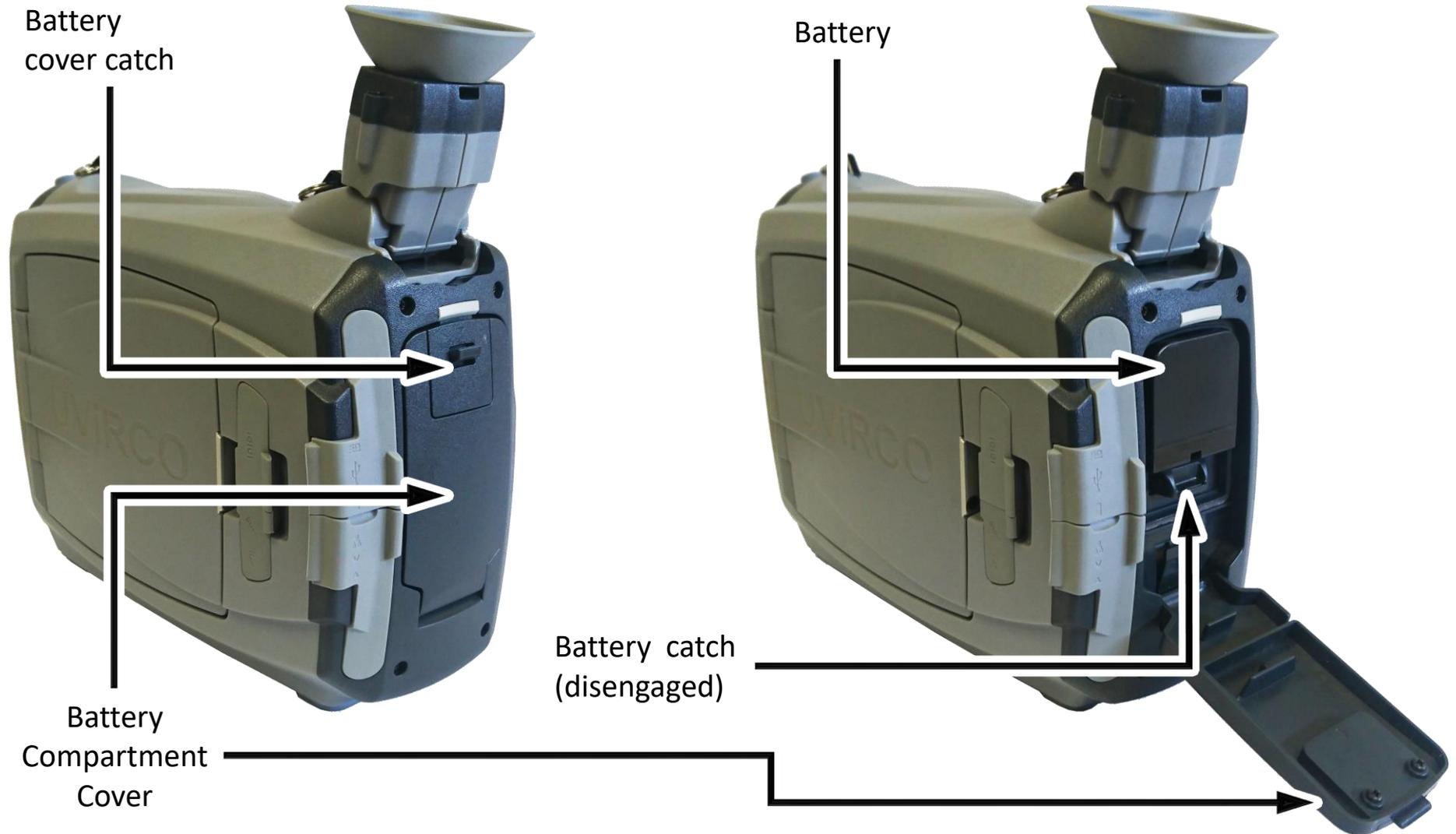
Push the battery in until the battery release catch closes.

Close the battery compartment cover and ensure the catch connects.

When not in use remove the battery from the camera.

Note: The battery may be charged in the camera when the camera external power supply is plugged in and used.

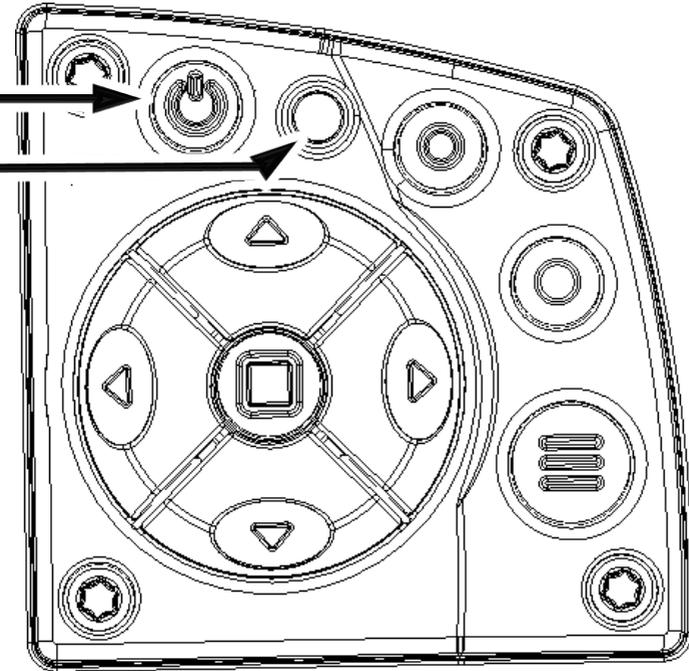
Installing batteries



Powering Up

Press the power button.

- The red LED next to the power button will light up
- The viewfinder display will power up.
- Flip open the LCD display to power it up.

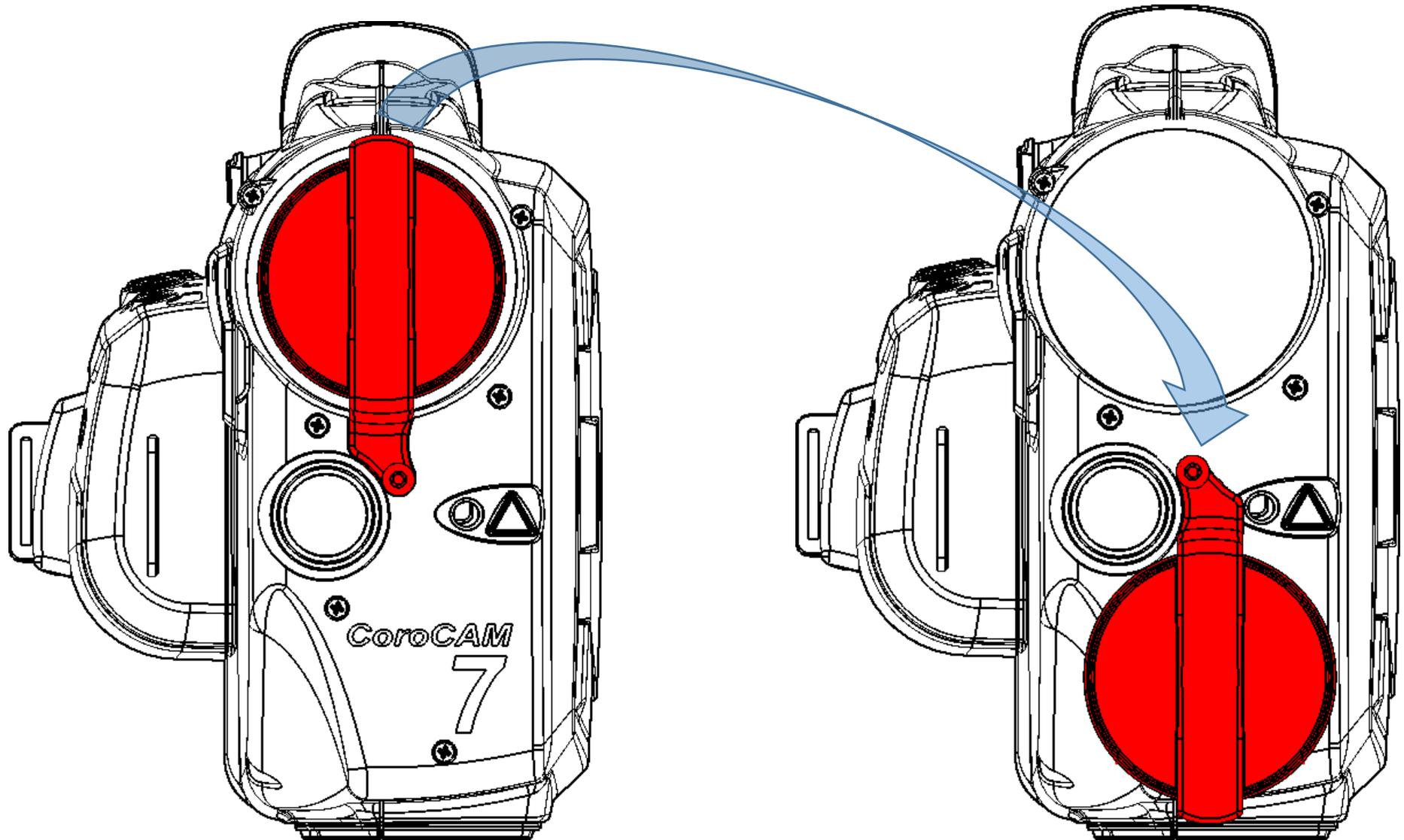


The first time the camera is powered up it will start in its factory profile.

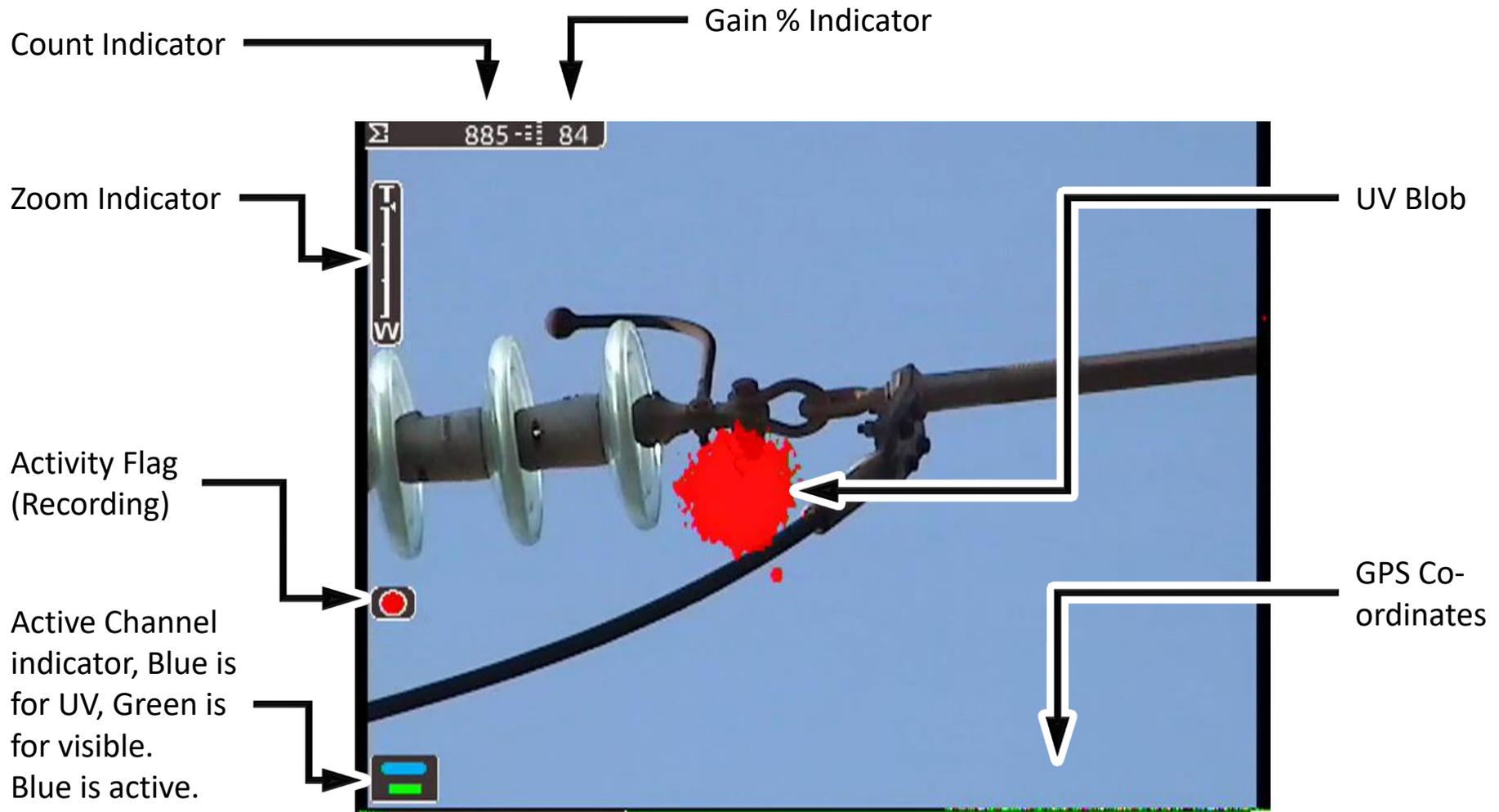
Future startups will be with the last *loaded* profile.

To shutdown the camera press and hold the power key for 3 seconds.

Open the lens covers



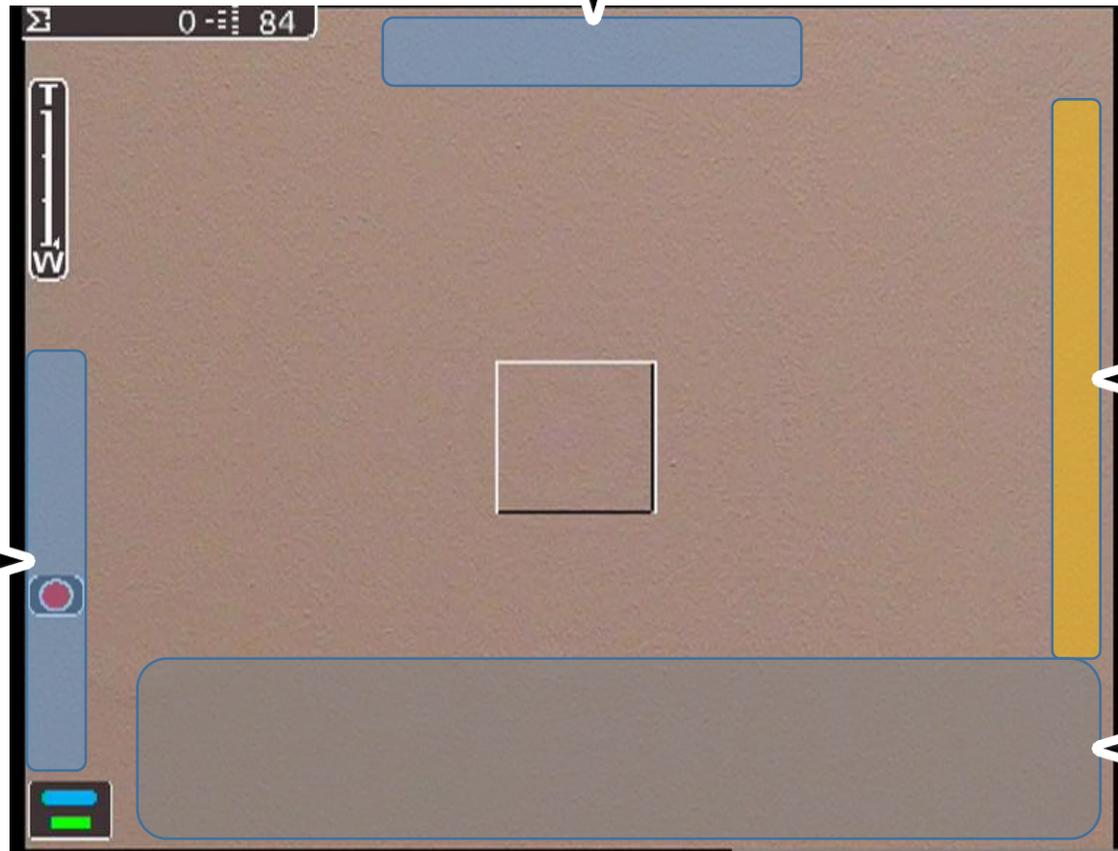
The Display



The Display

Activity Indicator Area

Settings indicator area



Warning indicator area

Menu & Sub-Menu Area

Settings Flags

There are 6 possible flags in the settings indicator area:

-  Recording not possible, camera is booting or no SD card present
-  No UV flag indicates that current settings will likely not result in UV detection
-  Long Integration mode is on
-  Noise Reduction mode is on
-  Recording is being made
-  Camera is in manual focus mode

Activity Flags

There are 2 possible flags in the activity indicator area:

-  UV NUC is displayed while the UV camera performs a Non-Uniformity Correction, the period it takes to perform a NUC depends on the integration period, which can be set up to 6 seconds long.
-  ALT is displayed when the ALT key was pressed to put the camera in ALT mode. In ALT mode each following keys alternate function is activated.
The ALT flag will disappear after the next key press.

Warning Flags

There are 5 possible flags in the warnings indicator area:

-  No Battery in the camera, running on external power.
-  Battery Low
-  Slave Focus is draining the battery faster.
-  Internal over temperature warning, switch off camera to avoid damage.
-  Laser pointer is on, see laser precautions on page 7.

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Camera Modes

The camera has 2 modes:

- Immediate
- Menu

In Immediate mode the operator can set a number of the camera core variables without entering the menu system.

In Menu mode the menu icons are shown and values can be changed.

Immediate Mode

In Immediate Mode the keys have 2 possible functions:

- Main
- Alternate

The main functions is accessed by simply pressing the key.

The Alternate mode is activated by pressing the ALT key. The ALT Flag will show indicating the camera is in ALT mode.

Any key pressed while the camera is in ALT mode will have it's alternate function activated and ALT mode will be exited.

Immediate Mode Key Functions

Finger Buttons Area

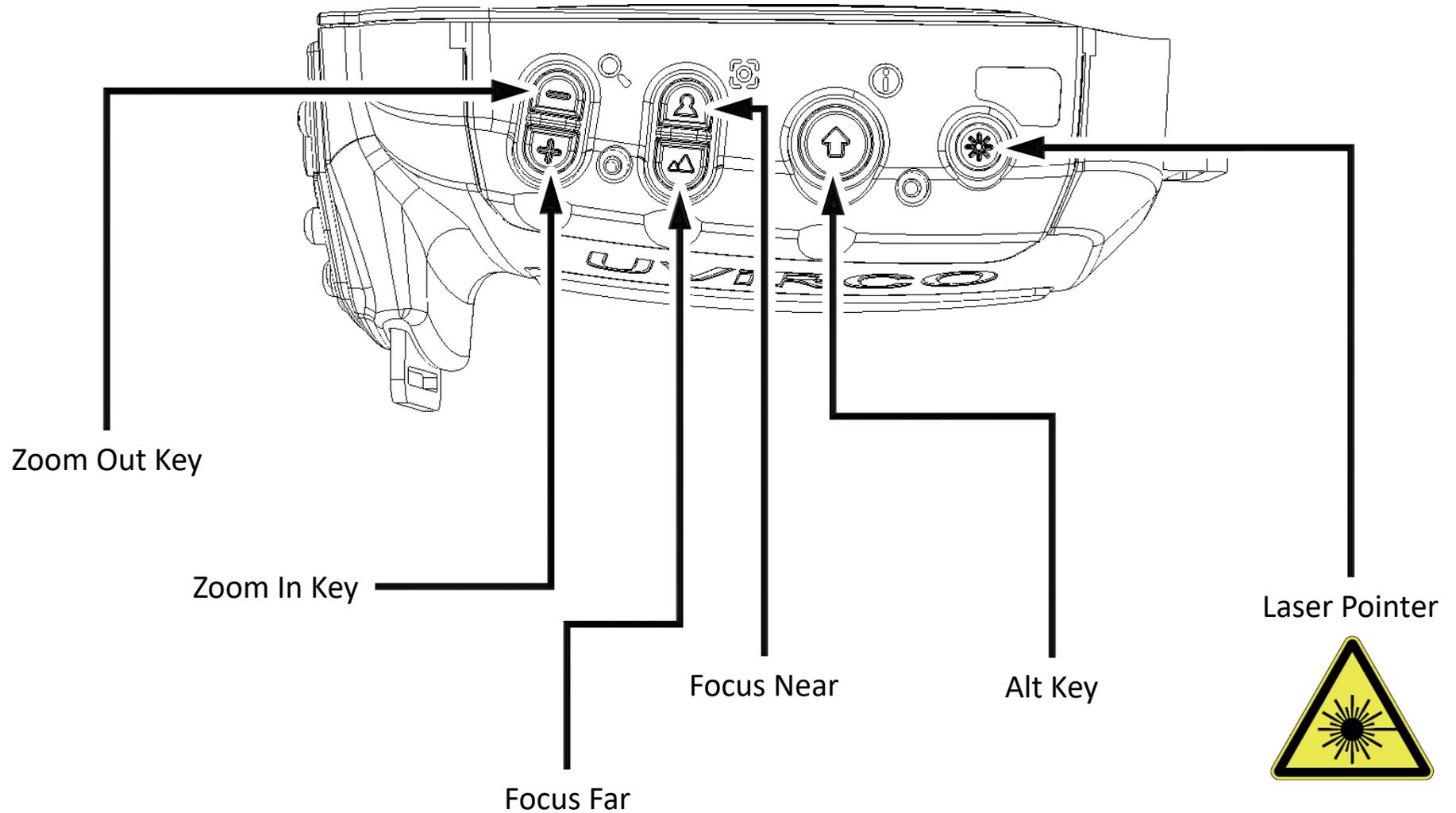
- The Zoom keys zooms the camera in or out.
- The Focus keys sets the camera focus from near to far(infinite).
- The Alt key activates each keys alternate function.
- The laser key fires the pointer laser. Wait 3 seconds for activation.



Long press the laser key to keep the laser on. The laser will switch off when the key is released.

Refer to page 7 for precautions.

Immediate Mode Key Functions

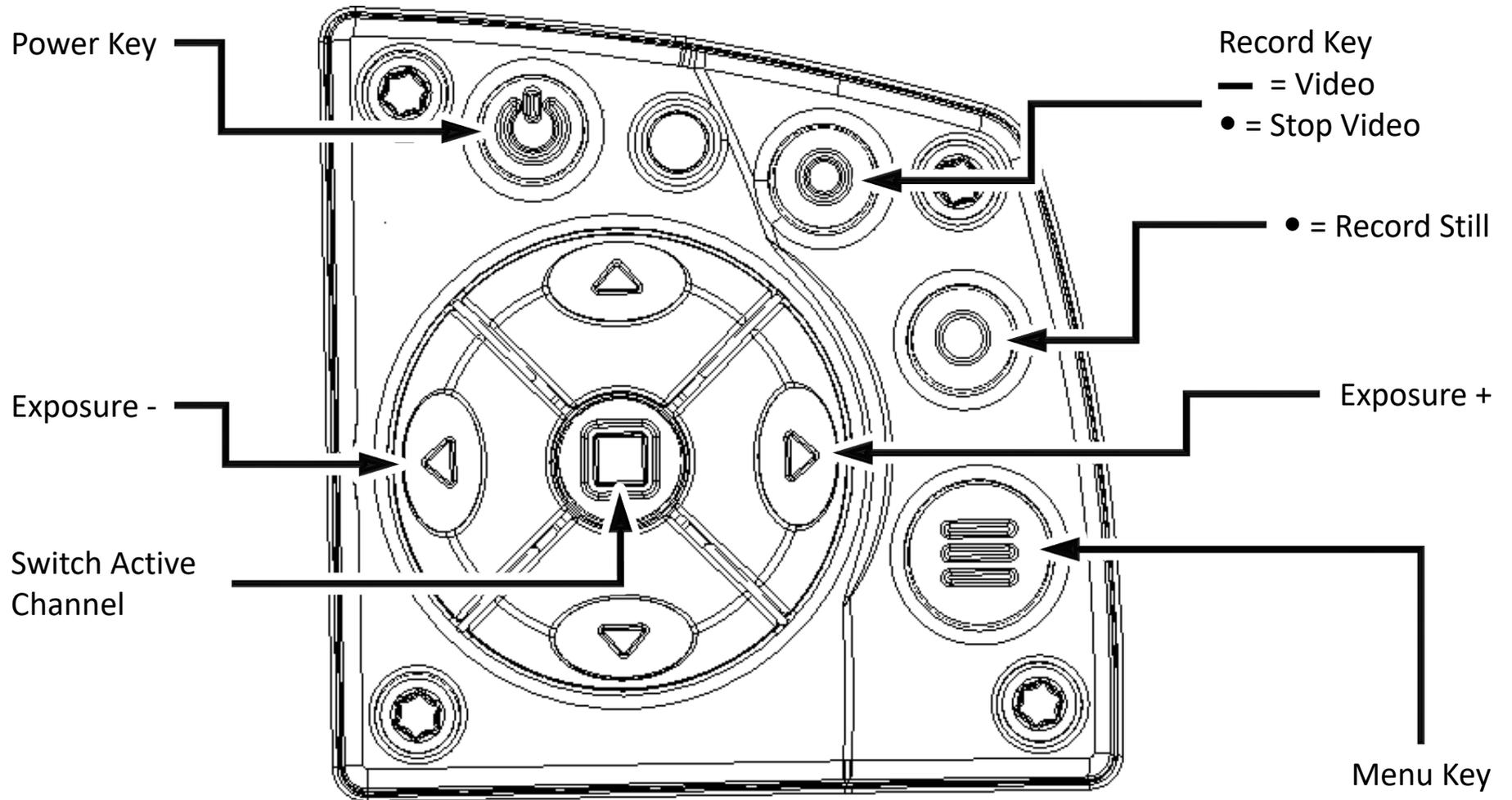


Immediate Mode Key Functions

Thumb Buttons Area

- The Power key starts the camera.
 - After a 3 second long press of the power key the camera will shutdown.
- Long press of the Dot key starts a video (AVI) recording. To stop the recording, short press the Record key.
- Short press the Hollow Dot key to capture an image (JPG).
- The Menu key causes the currently selected channel menu to appear.
- Depending on the selected channel the left and right keys sets the UV Gain or Visible Exposure.
- The Set key toggles between the UV and Visible channels.

Immediate Mode Key Functions

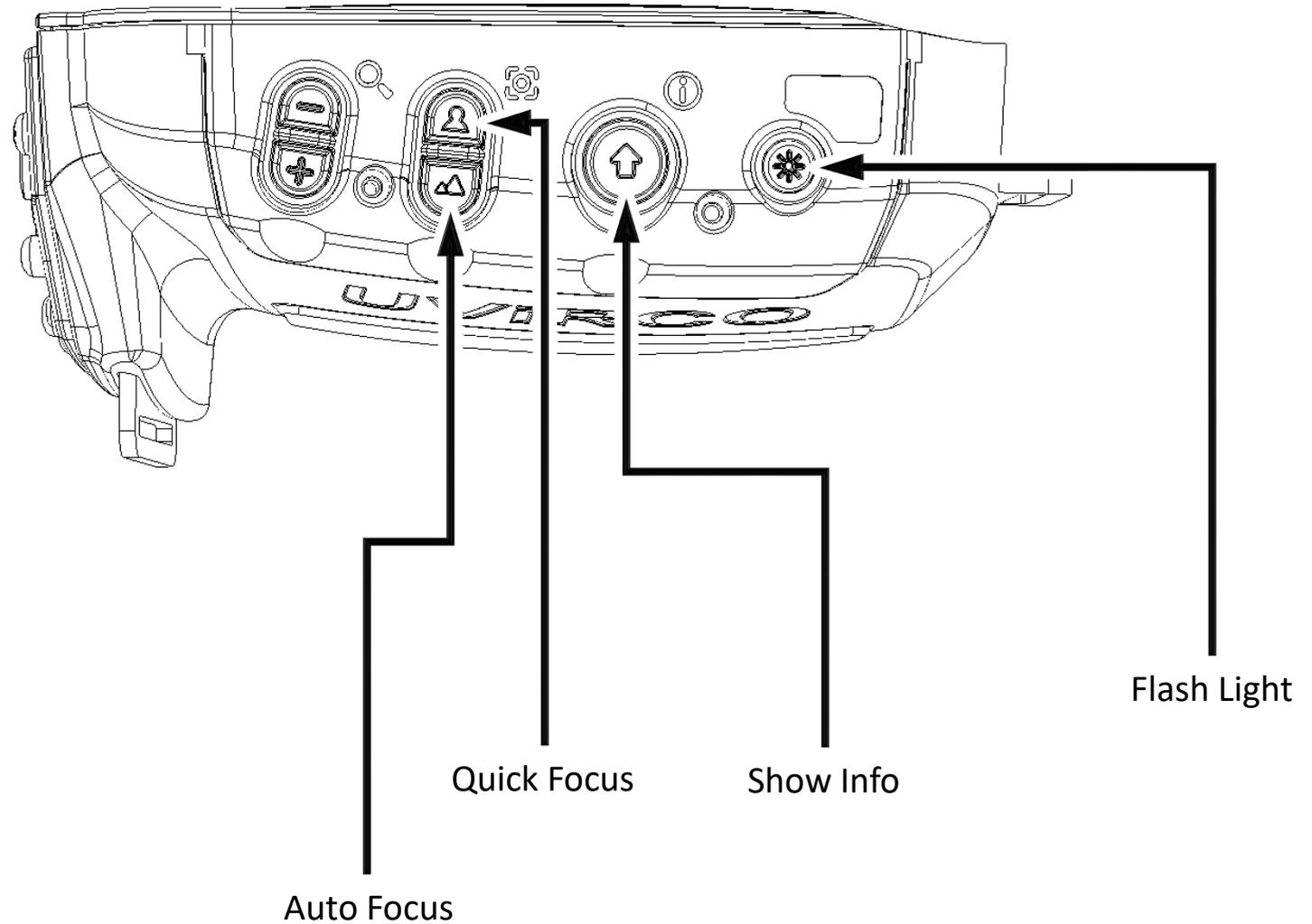


Immediate Mode Key Alternate Functions

Finger Buttons Area

- Pressing the Near Focus key will activate the Slaved UV Focus.
- Pressing the Far Focus key will cause the UV channel to perform a focus match to the visible channel focus position.
- Pressing the Alt key again will show the Info screen which contains information relating to the current camera condition.
- Pressing the Laser key will switch on the flashlight. If the Alt mode was not activated first then the laser will fire, please see laser precautions on page 7.

Immediate Mode Key Alternate Functions

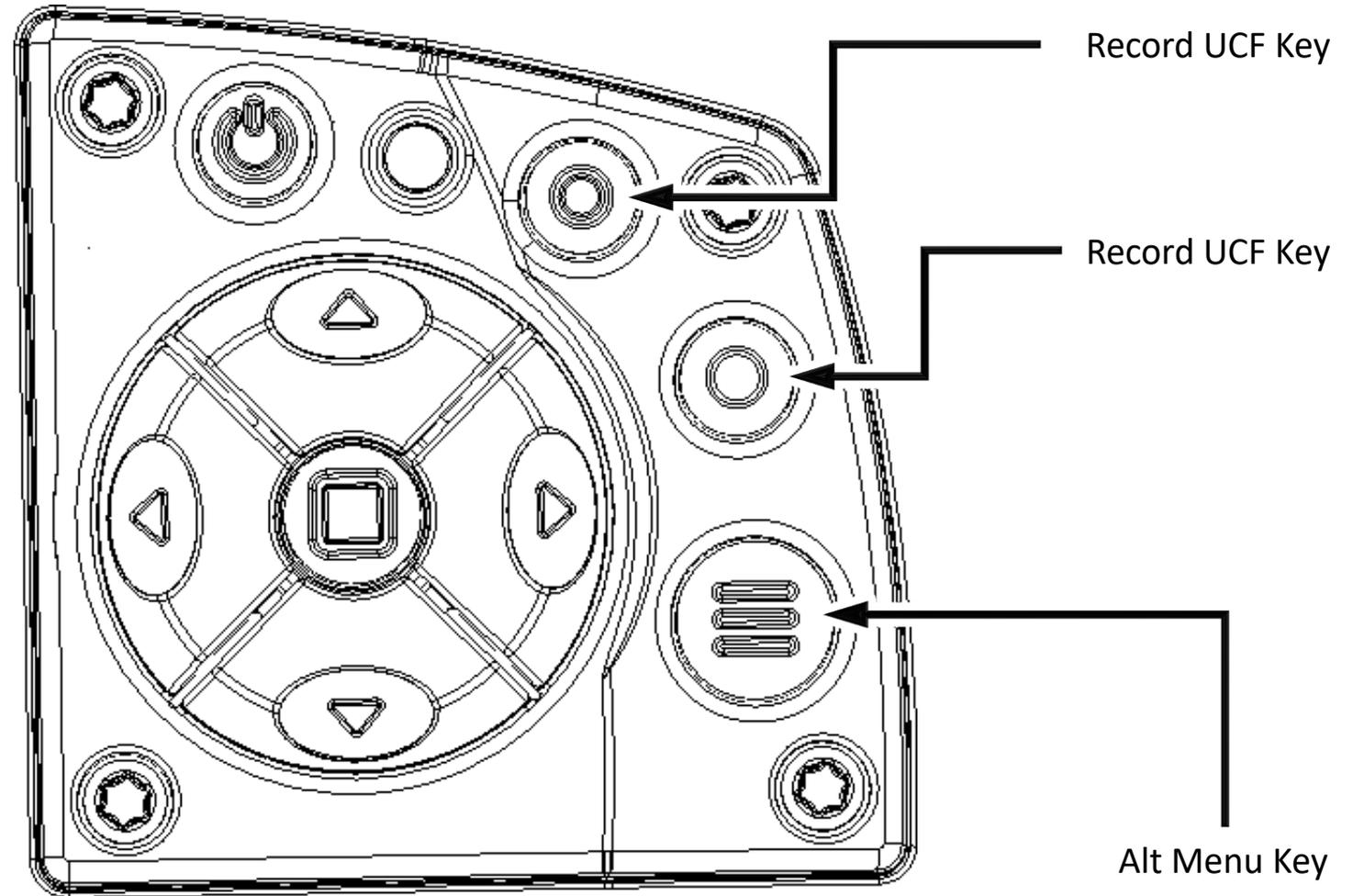


Immediate Mode Key Alternate Functions

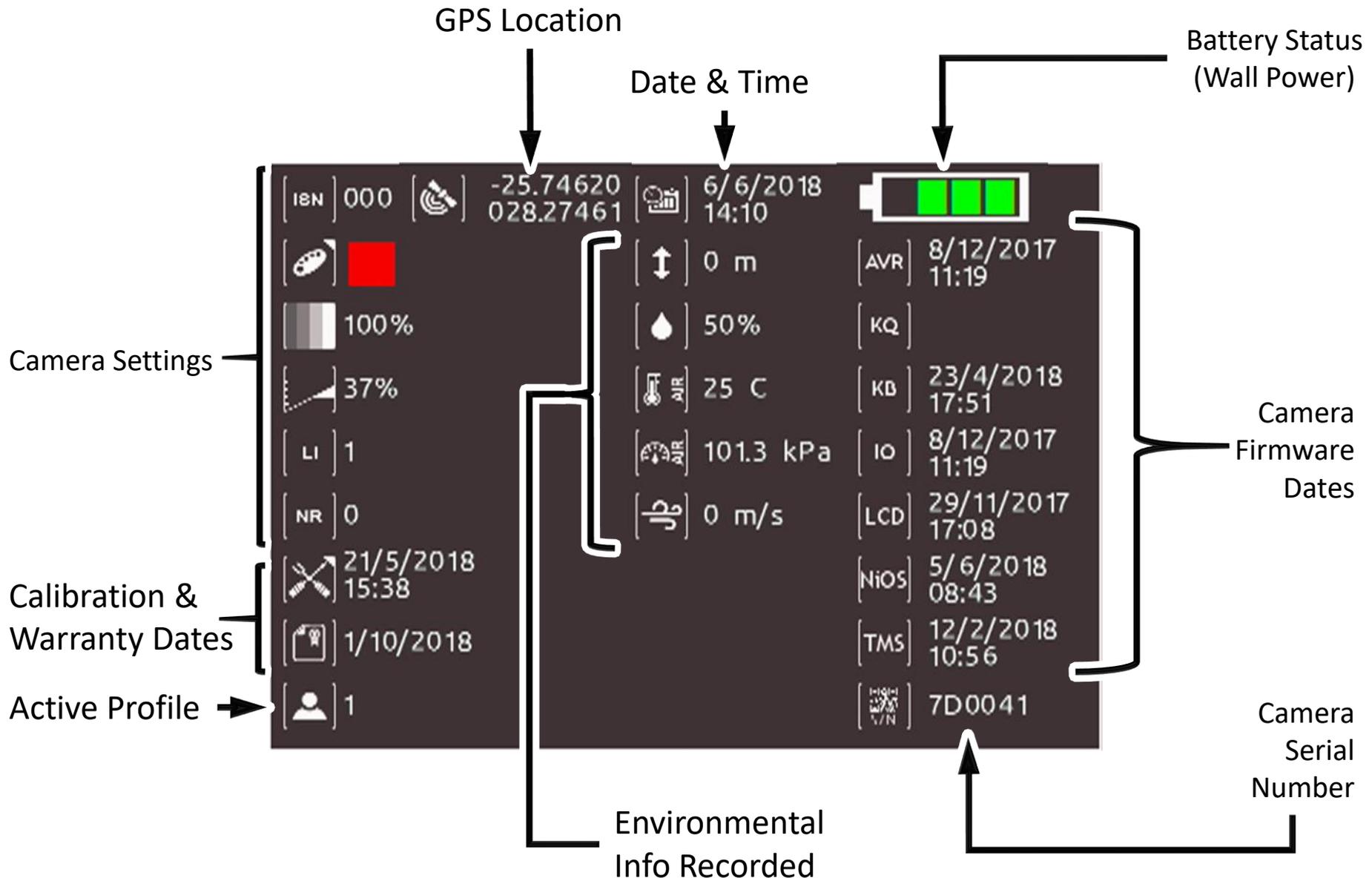
Thumb Buttons Area

- Pressing the Dot key will record a UCF file containing radiometric data – this will take a couple of seconds.
- Pressing the Hollow Dot key will record a UCF file containing radiometric data – this will take a couple of seconds.
- Pressing the Menu key will cause the Setup Menu to appear.

Immediate Mode Key Alternate Functions



The Info Screen

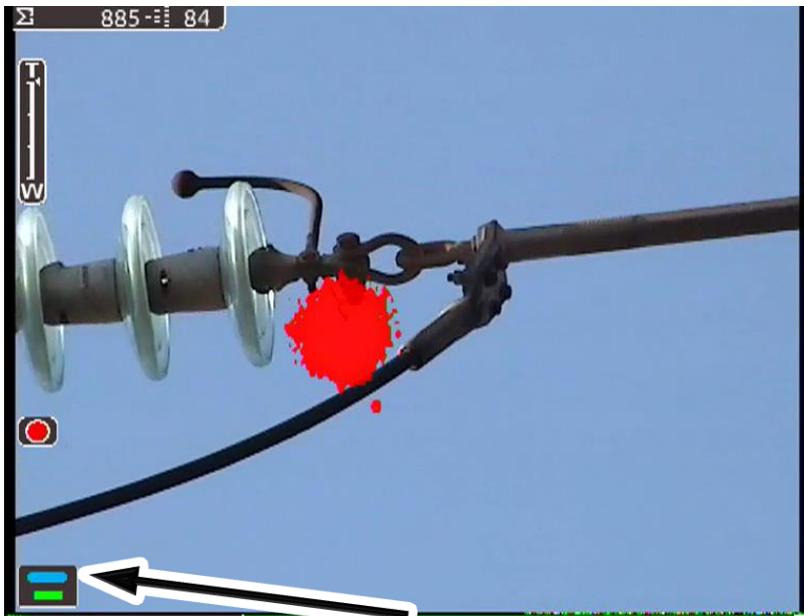


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Menu Mode

To activate the Menu Mode the operator short presses the Menu Key in Immediate Mode.

The menu bar related to the currently active channel indicated will be displayed, one of the 2 below:



UV Channel Active



Visible Channel Active

Menu Mode

The UV Channel menu allows changing of the UV camera settings.



The Visible Channel Menu allows changing of the visible camera settings.



Menu Mode Navigation

Switch the active menu by pressing any of the Focus keys in the finger area.

Navigate the menu icons by using the Nav Left & Nav Right keys in the thumb area to select icons.

The selected icon is indicated by at least a  indicator above it.

There are icons for 2 classes of variables:

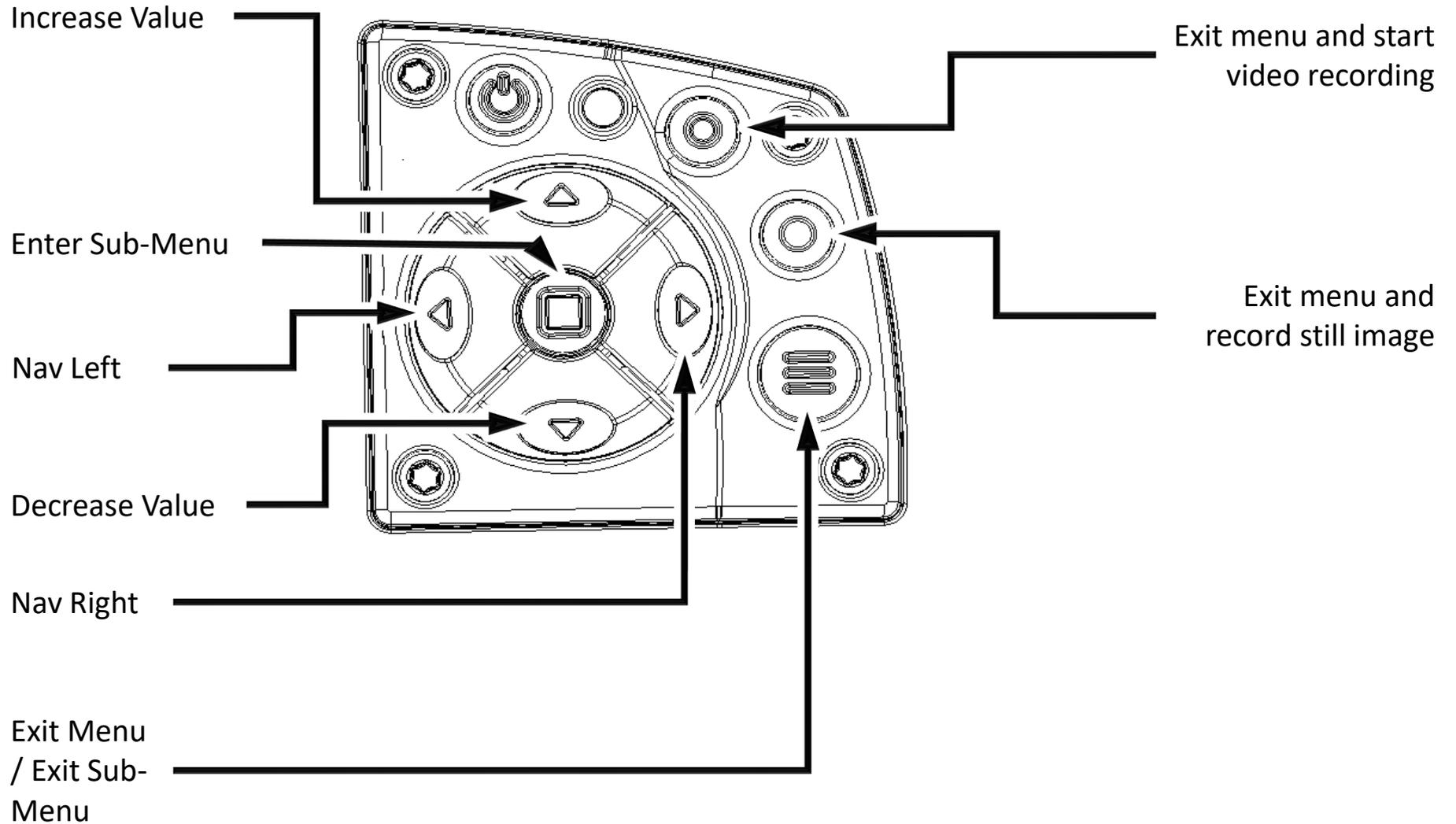
- Value icons
- Sub-menu icons

Set enters the sub-menu of sub-menu icons.

Exit the menu by pressing the Menu key.

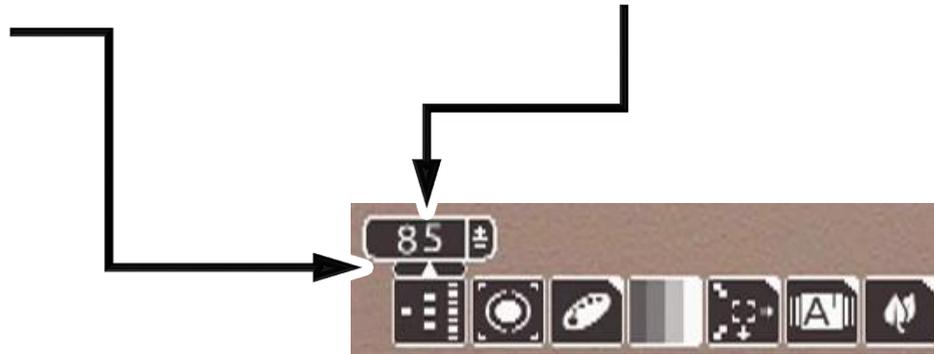
If no key is pressed after 12 seconds the menu will disappear.

Menu Mode Keys

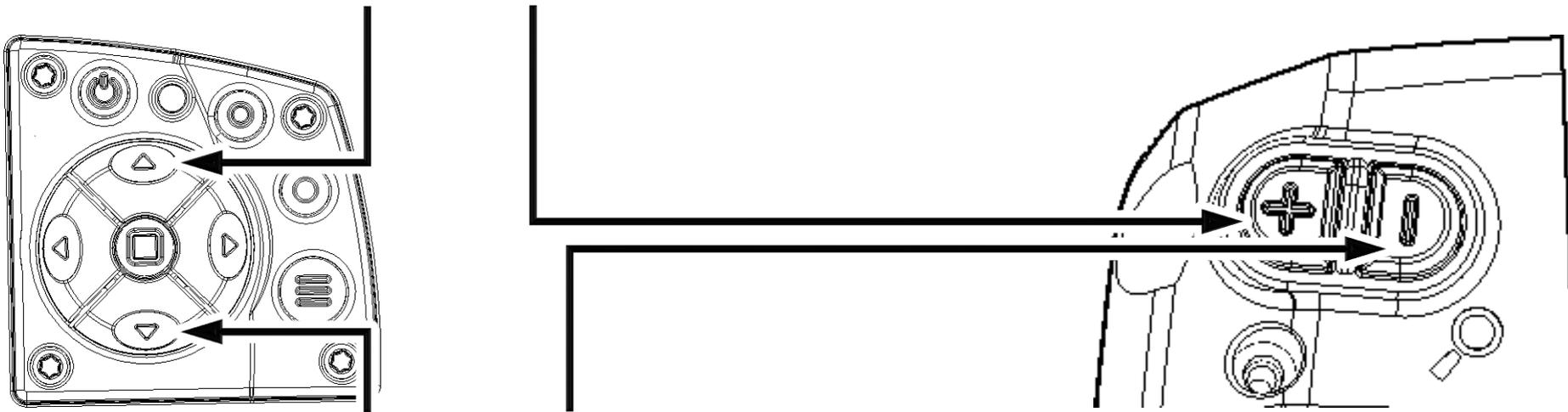


Changing Values

When a Value icon is selected a value box appears above the icon.

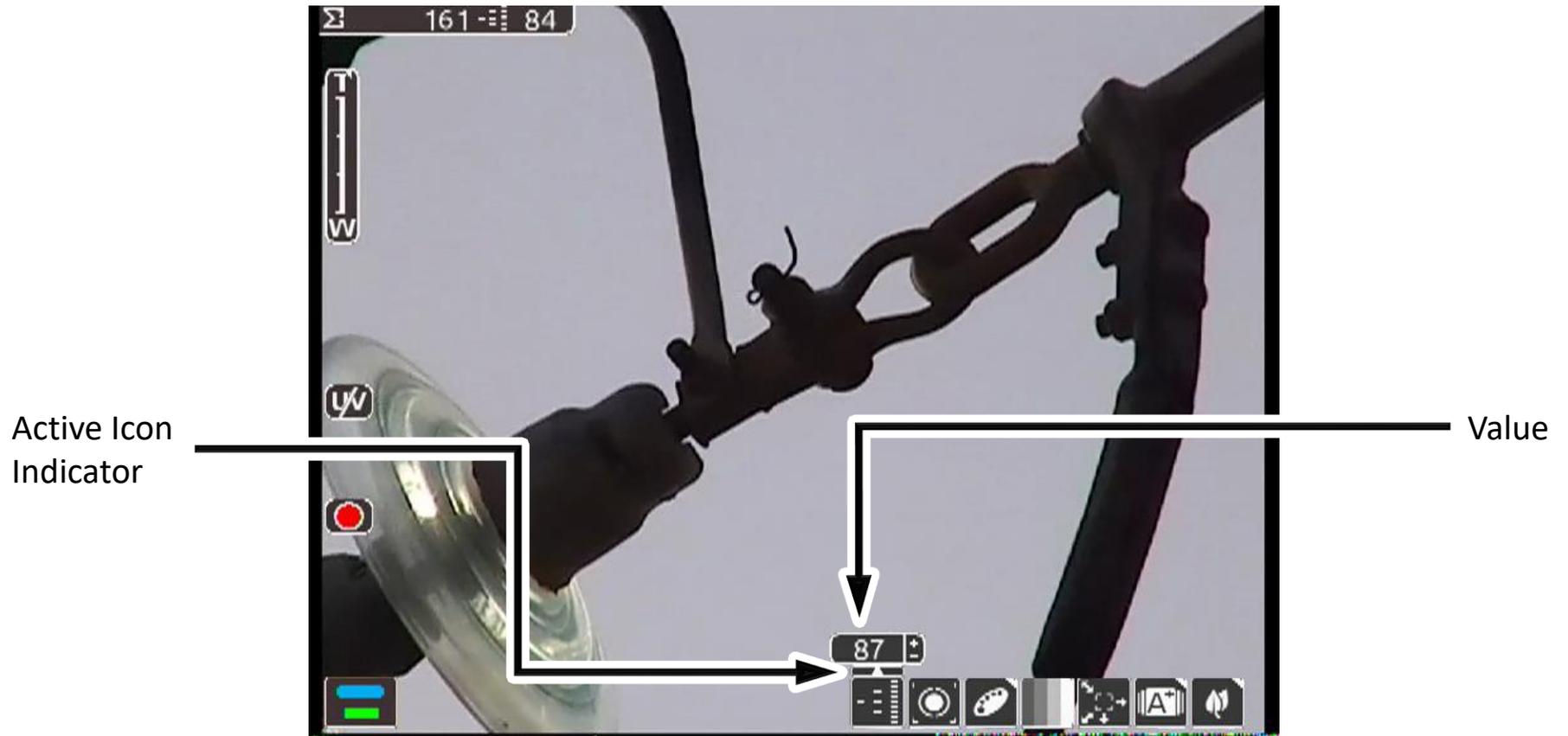


Pressing the Up or Plus keys to increase the value.



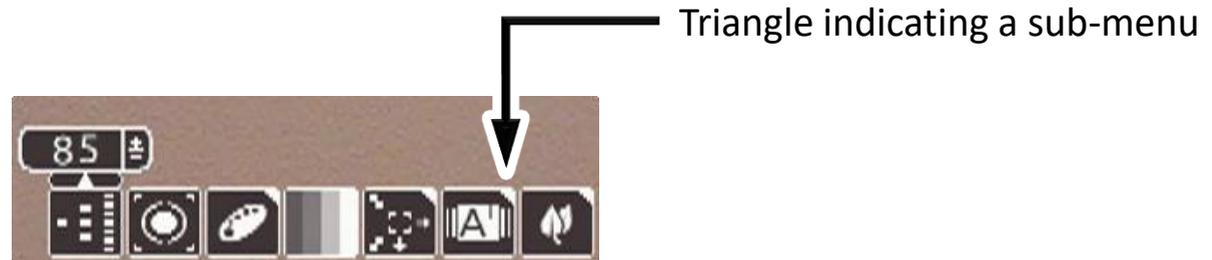
Pressing the Down or Minus keys will to decrease value.

Changing Values



Sub-Menus

Sub-menu icons are indicated by the top right corner of the main menu icon having a white triangle.



When these icons are selected the sub-menu appears above the icon.



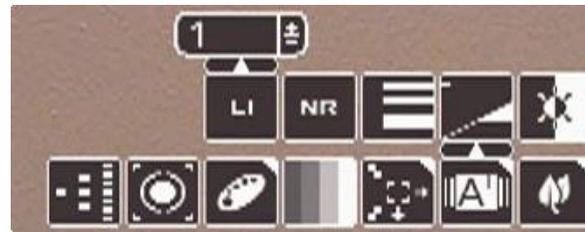
Sub-Menus

Sub-Menu



Sub-Menu Values

To enter the sub-menu press the Select key, the default sub-menu icon will be selected and a Value icon will appear above the selected icon showing the current setting.



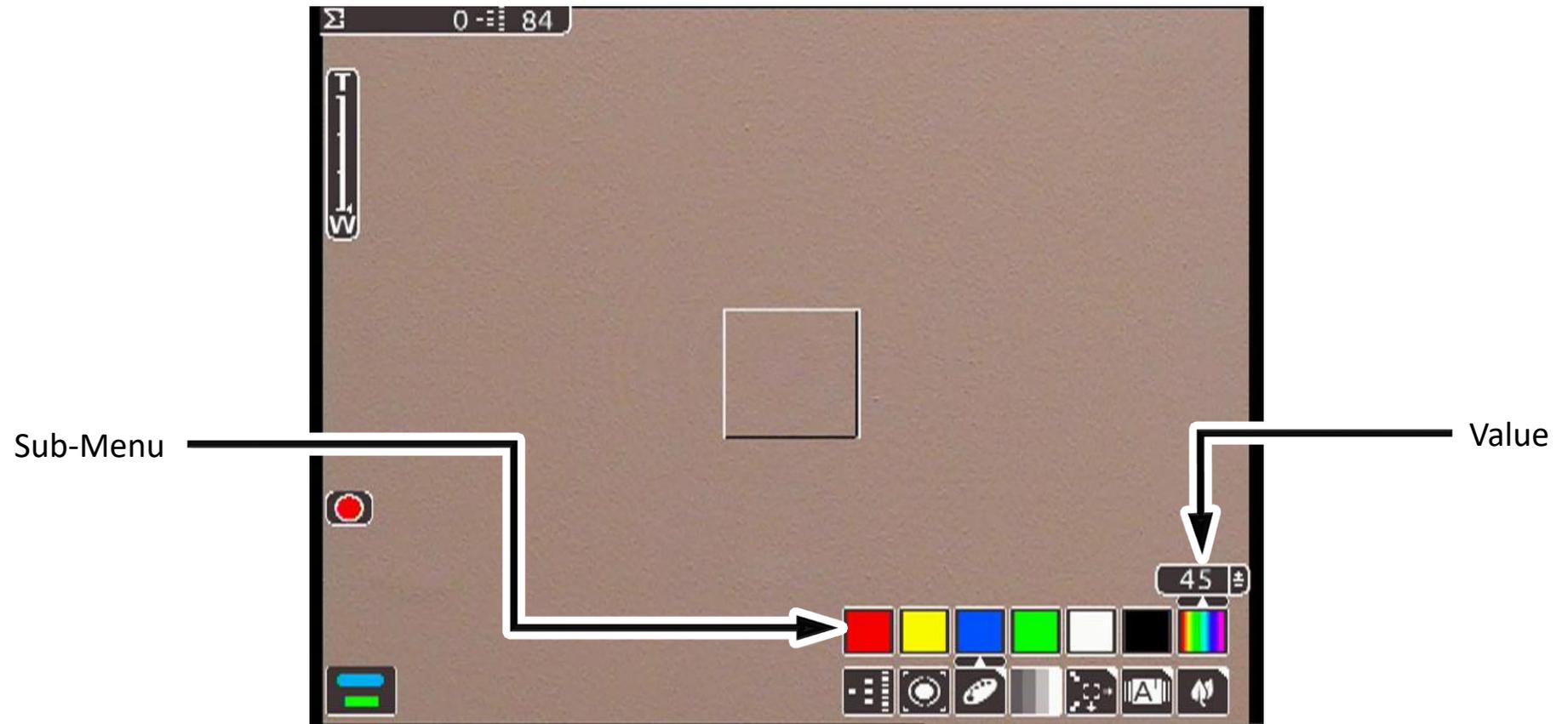
Use the Nav Left & Nav Right keys to navigate the sub-menu icons.

Use the Up & Down or Zoom in & out keys to change the values of the selected sub-menu icons.

Exit the Sub-menu by pressing the Menu key.

To exit the main menu press the Menu key.

Sub-Menu Values



UV Menu

Gain	Focus	Palette	Transparency	Background Priority	Sampler Size	Adv. Tools Sub Menu	Environment Sub Menu
				Long Integration			
				Noise Reduction			
				Edge thickness			
				Threshold			
				Solar blind Mode			
Free select hue							

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UV Gain

The UV gain is comparable to a visible camera exposure setting.

In Menu Mode:

The gain is adjusted by selecting the UV Gain icon and using the Up / Down or Zoom In / Out keys.

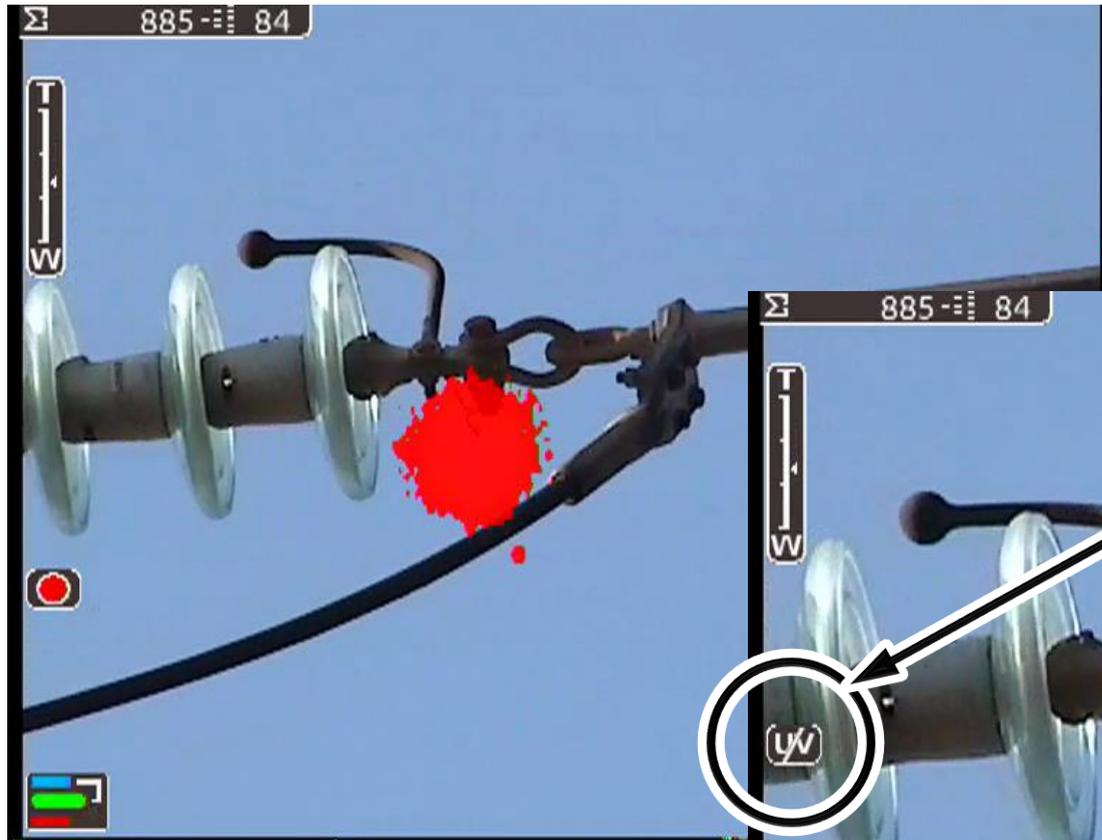
At low gain levels a “No UV” flag will indicate that the likelihood of detecting discharges is very low.

The UV overlay can be removed by pressing the Select key – the “No UV” flag will also be displayed.

In Interaction Mode:

If the UV channel is selected, the Gain can be set from 1 to 100 % using the Nav Left & Nav Right keys.

UV Gain



Gain On



No UV



UV Focus

In Menu Mode:

The focus icon value is set using the Up and Down keys or Zoom In / Out keys. The manual focus flag is shown.

To Match-focus, press the Select key.

Autofocus can only be set from Interaction Mode.

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UV Palette

The color used to indicate the discharge location should be set to contrast the background, else it could be missed.

6 preset colors have been assigned menu icons.



The rainbow icon can be used to set a user defined color.

Press the Select key to enter the UV palette sub-menu.

Use the Nav Left & Nav Right keys to navigate the preset colors, the desired color will be applied to the UV blobs.

Use the UP & Down keys or Zoom In / Out keys to change the color value of the rainbow icon.

UV Transparency



Once a discharge has been located it is necessary to see the physical source of the discharge.

Adjusting the UV transparency allows the operator to see the location of the blob and the physical cause of the discharge.

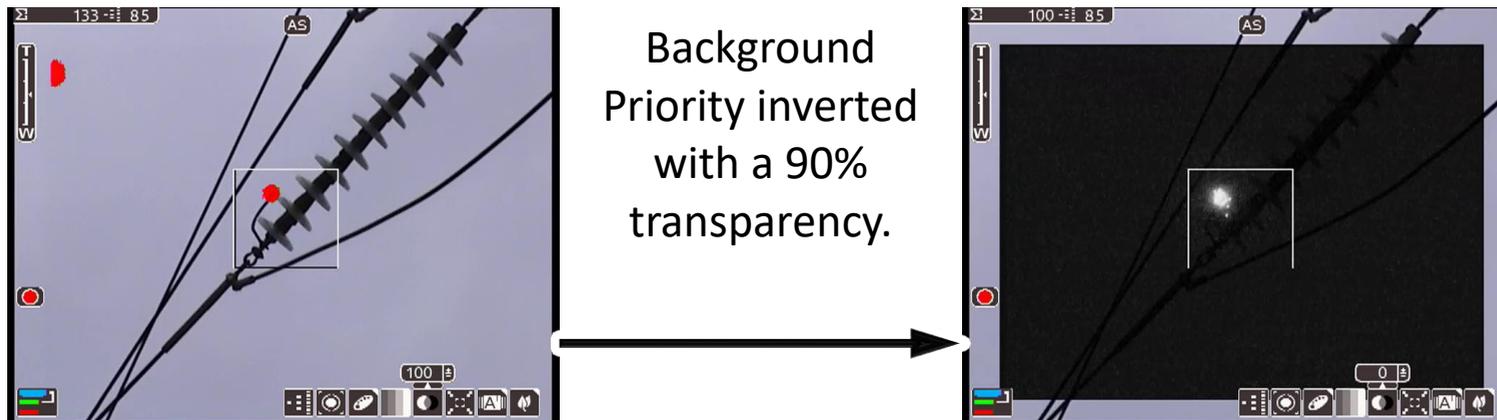
The transparency level can be set using the Up & Down keys or Zoom In / Out keys.

A value of 100% will give a totally solid UV blob. When the value is set to 0% the UV blob will be completely transparent, the UV blob color will be applied to the background in the area where the blob is located.



UV Background Priority

The UV Background Priority inverts the UV/Visible mixing. At 100% the visible background is given total priority, at 0% the UV is given total priority (no visible shown). The mixing can be modified with the UV transparency capping the minimum priority for the visible.



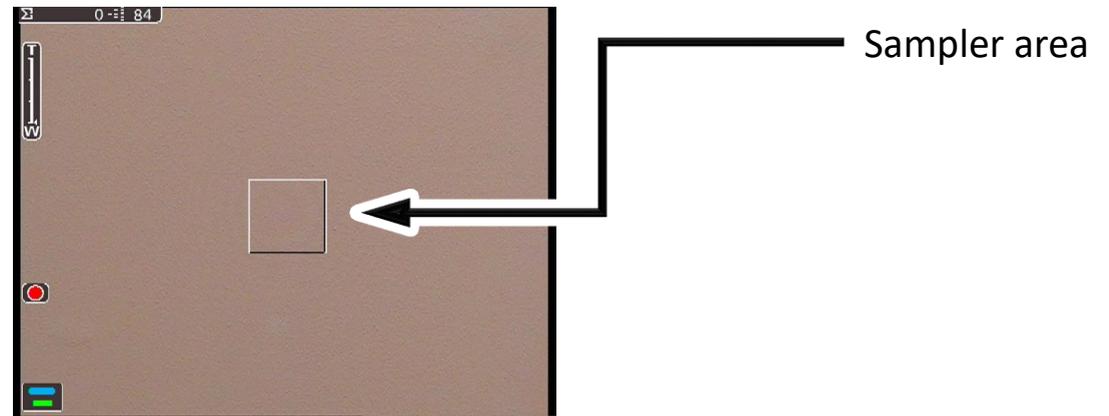
At zero % Background Priority the UV overlay color is automatically changed to white for optimal viewing. When increased from zero the previous color will be applied.

This function can be toggled between 100% and zero using the Select key.

UV Sampler



The count value displayed in the top left corner of the screen is an indication of the UV intensity inside the Sampler area.



To set the sampler size use the UP & Down keys or Zoom In / Out keys to increase its corner to corner distance from the center of the window.

To set the sampler to full screen & effectively hide it press the Select key. To show the sampler again, press the set key again. Pressing the Up or Down keys will also show the sampler.



UV Advanced Tools Sub Menu

There are a number of Advanced Tools available to optimize the UV image.



Long Integration (LI) sums n number of frames, up to 150. If n is 1 then there is no summation / no integration. LI is used to make low intensity signals more visible.



Noise Reduction (NR) removes sporadic noise. The range is 0 to 7. If it is set too high for the situation it may remove actual signal.



UV Edge Effect modifies the UV blob edges to make them more pronounced.



UV Threshold sets the intensity above which a blob in the UV channel is considered signal and not system noise.



Solar Blind (SB) Mode toggles the solar blind filter position between SB and Non-SB (NSB) position. In NSB the camera is more sensitive to UV.

Environmental Sub Menu



The environmental variables which affect the likelihood and intensity of discharges can be recorded here.



Distance is used to record the distance to the discharge source, this could be used to calculate the effective discharge intensity.



Humidity, can cause surface activity on hardware which may otherwise be corona free and contaminated hardware, the ideal inspection weather is dry.



Air Temperature affects the air density which has a direct link to the likelihood of corona discharge formation, it has a minor impact on the count adjustment.



Air Pressure affects the air density which has a direct link to the likelihood of corona discharge formation.



Wind Speed may cause discharge activity to fluctuate as ionized air is replaced faster with un-ionized air.

Visible Menu



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Playback

Playback is used to play back previous recordings.

Use the Select key to activate the recorded file browser – a tabbed screen showing media recorded on the SD card.

Use the Left & Right keys to select the required tab.

Use the Up & Down keys to select the video or image to playback.

UCF file playback is not possible on the camera.

Use the Select key to start the play back of the selected file.

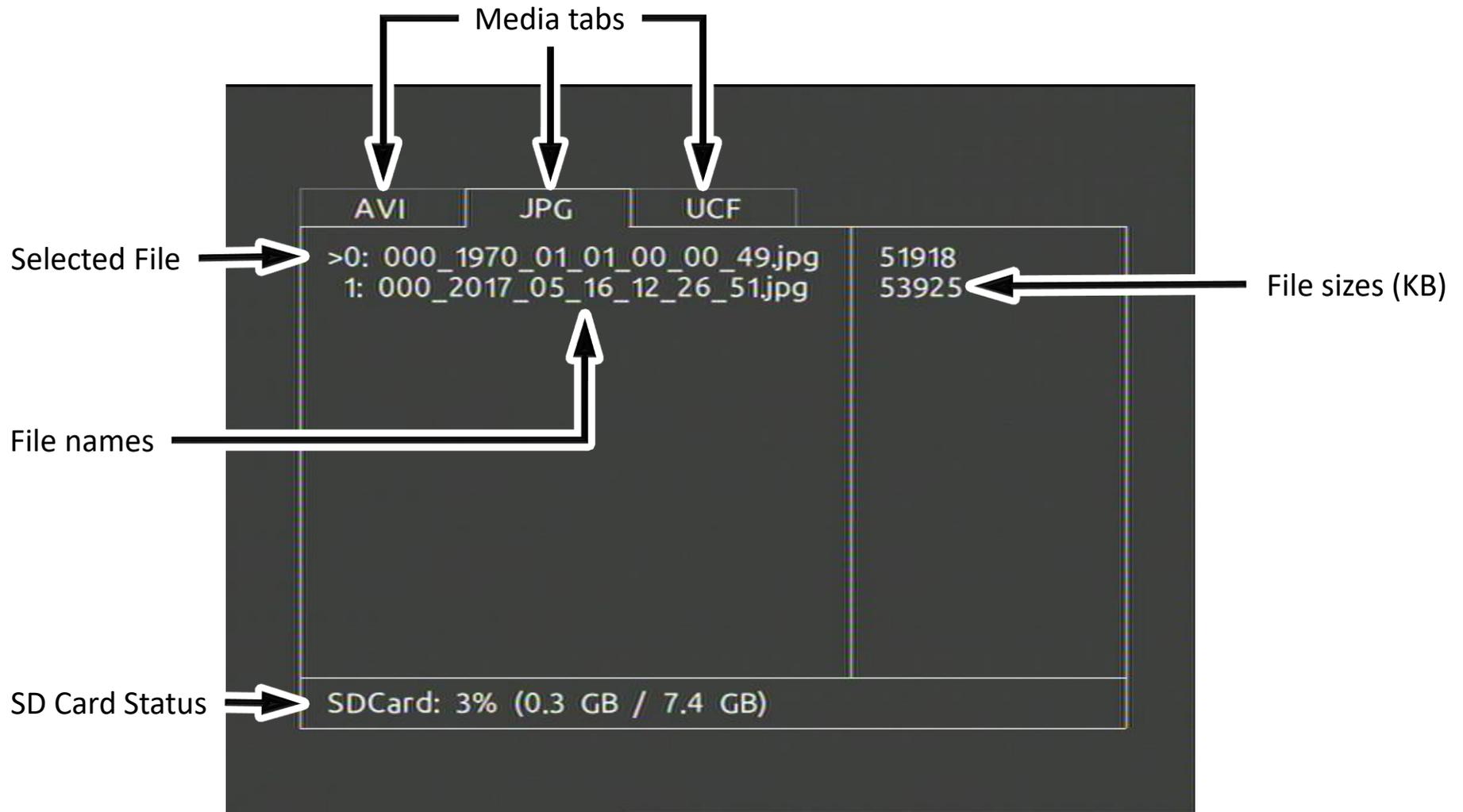
Note that large video files may take a couple of seconds to load.

During playback the Left and Right keys can be used to skip to the previous or next media entries.

Use the Menu key to exit a playback to the file browser view.

Use the Menu key to exit the browser view to immediate mode.

Playback





Visible Focus

In Menu Mode:

The focus is adjusted by selecting the icon and using the Up & Down keys or Zoom In / Out keys.

Press the Select key to re-engage auto focus.

In Immediate Mode:

The Focus can be set from Near to Infinity using the Focus Near and Focus Far keys.

- Alt-Focus Near sets the visible camera to auto focus, with the UV camera matching the visible camera focus position for a few seconds. This is called Quick Focus.
- Alt-Focus Far sets the visible camera to auto focus, with the UV camera continuously matching the visible camera focus position. This is called Slave Focus.

Visible Channel Exposure



In Menu Mode

The visible camera exposure level can be adjusted by selecting the icon and using the Up & Down keys or Zoom In / Out keys. Use the Select key to set it to Auto.

In Immediate Mode:

If the Visible channel is active then the Left and Right keys can be used to set the visible camera exposure.



Flashlight

In Menu Mode

Navigate to the flashlight icon.

Use the Up & Down keys or Zoom In / Out keys to change the flashlight intensity.

The minimum intensity is 10, maximum intensity is 100.

Press the Select key to activate & de-activate the flashlight.

Note that the flashlight will quickly drain the battery at max intensity.

In Interaction Mode:

Press the Alt key followed by the Laser/Light key to activate the Flashlight. The menu will appear allow for the intensity to be set.

Image Series Numbering (ISN)



The Image Series Number is a 3 digit precursor to the file name (“date and time”) of the recorded files. This number can be used to tag imagery of a single fault with the same precursor number.

This 3 digit number is also used by the CoroBASE reporting software to auto sort images into database entries.

In Menu Mode

Navigate to the ISN icon.

The ISN value can be set using the Up & Down keys or Zoom In / Out keys.

Imagery recorded after the value change will have the new value as its 3 digit precursor to the filename of the recording.

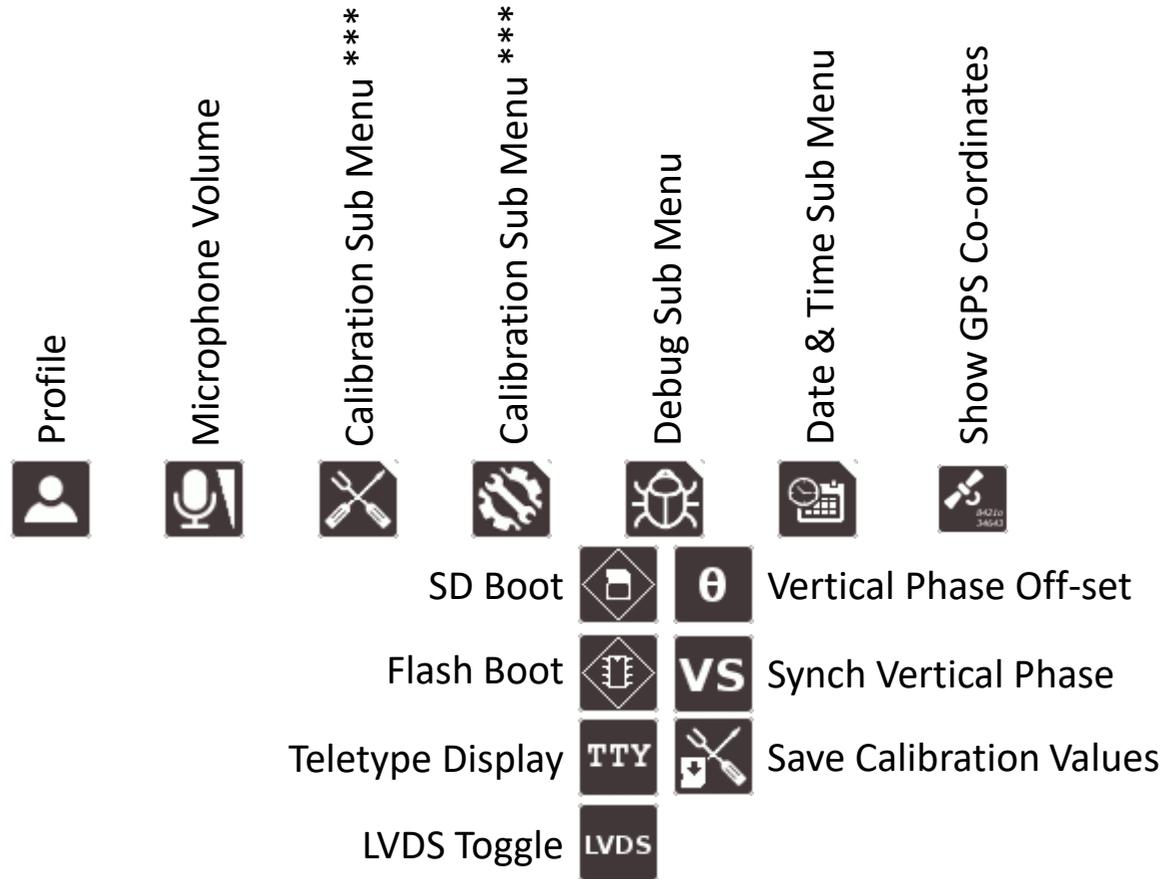


Force Low Light Mode

In **Low Light Mode** the visible camera sensitivity is increased by removing the visible cameras internal NIR filter, resulting in a monochrome image.

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Setup Menu



*** = Password required

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User Profile

The user can create and save 10 different profiles.

Select a profile number using the up/down keys or Zoom In / Out keys.

Press the Select key to activate that profile.

The user can change settings to his requirements.

Re-enter the setup menu and select the user profile number to which these changes have to be saved.

To save a profile long press the Select key.

To reset a profile to factory default, select profile 0, then save to the desired profile number.

Microphone Volume



Set the value of the recording volume 0-10 of the onboard microphone, which is recorded with video recordings – unless a headset is plugged in.

Press the set value to quickly Mute (value 0).



Calibration Sub Menu

These two sub-menus are password locked and only used by factory trained technicians.

Debug Sub Menu



The Debug sub menu is used by maintenance technicians.



Reboot DSP from SD card



Reboot DSP from Flash Memory



Display activity log terminal



Toggle IR Channel data connection.



Set vertical synch phase.



Toggle Vertical Synch



Save Calibration Settings to SD card.



Date & Time Sub Menu

The camera date and time can be set from this menu.



Set the Year using the Up & Down keys or Zoom In / Out keys.



Set the Month using the Up & Down keys or Zoom In / Out keys.



Set the Day using the Up & Down keys or Zoom In / Out keys.



Set the Hour using the Up & Down keys or Zoom In / Out keys.



Set the Minutes using the Up & Down keys or Zoom In / Out keys.

Display GPS



Set the option value to 1 to display the current GPS position on the video / image recorded and record it in the UCF format's meta data for use in CoroBASE.

When the value is set to 0 the GPS position is only recorded in the UCF format's meta data for use in CoroBASE.

The GPS can be read from the information screen at any time.

Key Guide

CoroCAM 7

VISIBLE MENU

PLAYBACK FOCUS EXPOSURE LOW LIGHT / NIGHT MODE FLASHLIGHT CONTROL IMAGE SERIES NUMBER OPTIONAL VISIBLE ENHANCEMENTS

UV MENU

LIV GAIN LIV FOCUS OVERLAY PALETTE TRANSPARENCY BACKGROUND PRIORITY SAMPLER SIZE ADVANCED TOOLS ENVIRONMENTAL SETTINGS

COOLING AREA: KEEP EXPOSED IN HIGH TEMPERATURE ENVIRONMENT

KEY FUNCTIONS:

	ZOOM		OUT IN		DECR INCR
	FOCUS		NEAR FAR		CHAN QUICK AUTO
	ALT		ALT FUNCTION		INFO
	LASER		LASER ON		LIGHT
	POWER		ON OFF		
	RECORD		VIDEO STOP		UCF
	RECORD		IMAGE STOP		UCF
	MENU		MAIN EXIT		SETUP
	LEFT RIGHT		DECR GAIN / EXPOSURE		INCR GAIN / EXPOSURE
	ENTER		CHANNEL: UV <> VISIBLE		
	INCR DECR		FOCUS FAR FOCUS NEAR		QUICK AUTO

IF FITTED; (REFER TO LABELING ON RIGHT SIDE OF CAMERA)

CoroCAM7 CORONA DETECTION SYSTEM

MANUFACTURED BY: UVIRCO TECHNOLOGIES (Pty) Ltd
41 DE HAVILLAND CRESCENT, UNIT B003, THE WOODS, PERSEQUOR TECHNOPARK, 0020, SOUTH AFRICA

DATE OF MANUFACTURE:
 2018 ■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6
 2019 ■ 7 ■ 8 ■ 9 ■ 10 ■ 11 ■ 12

DATE OF CALIBRATION: _____

MADE IN SOUTH AFRICA

DO NOT OPEN. WARRANTY VOID IF OPENED. NO USER SERVICEABLE PARTS INSIDE.

USE ONLY: Li-ion BATTERY F770 7.2V 4400 mAh. RISK OF EXPLOSION IF INCORRECT BATTERY IS USED.

12VDC 1,5A

CE

IEC 60529: IP54, IEC62368-1

COR700-3011V3 www.corocam.com www.uvirco.com

REAR CONNECTOR BAY

DC PWR LAN USB SD CARD

AUD VID

SIDE BAY

REMOTE

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<http://www.uvirco.com>
