



# **RED EPIC<sup>®</sup>**

## **OPERATION GUIDE**

### **BUILD V3.0**

### **EPIC-M & EPIC-X**



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# RED EPIC® OPERATION GUIDE

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### EPIC-M / EPIC-X

Version 3.0

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## DISCLAIMER

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## COMPLIANCE

### INDUSTRIAL CANADA EMISSION COMPLIANCE STATEMENTS

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT



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:

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

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

**NOTE: This device complies with Part 15 of the FCC Rules.**

Operations 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 undesirable interference.

**CAUTION: If the device is changed or modified without permission from RED, the user may void his or her authority to operate the equipment.**

## AUSTRALIA AND NEW ZEALAND STATEMENT

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to EN 55022:2006

## JAPAN STATEMENTS



This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス B 情報技術装置です。この装置は家庭環境で使用することを目的としていますが、ラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをしてください。

## EUROPEAN UNION COMPLIANCE STATEMENTS



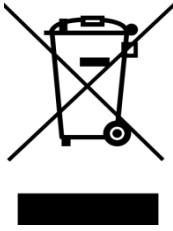
RED declares that the equipment described in this document is in conformance with the requirements of the European Council EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC, RoHS Directive 2002/95/EC and WEEE Directive 2002/96/EC.

This declaration is based upon compliance of the product to the following standards:

- EN 55022, Information Technology Equipment - Radio Disturbance Characteristics
- EN 55024, Information Technology Equipment - Immunity Characteristics
- EN 61000-3-2, Limits for harmonic current emissions
- EN 61000-3-3, Limits for harmonic current emissions
- EN 60950-1, Information Technology Equipment – Safety

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The Waste Electrical and Electronic Equipment (WEEE) mark applies only to countries within the European Union (EU) and Norway. This symbol on the product and accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For business users in the European Union, if you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

**Responsible party:**

Red Digital Cinema®

34 Parker

Irvine, CA 92618

USA

## BEFORE YOU START

Congratulations on your purchase of a RED DSMC® Digital Still and Motion Camera.

Please read the attached safety instructions, and only then unpack the camera body and any accessories. If there is any physical damage or missing components for either your camera body or any accessories, please file a support ticket at [www.RED.com/support](http://www.RED.com/support).



*RED EPIC Digital Still and Motion Camera*

## IMPORTANT SAFETY INSTRUCTIONS

### READ BEFORE USING YOUR CAMERA

- A. Heed all cautions and warnings in these instructions.
- B. Read these instructions before operating the camera and accessories.
- C. Follow these instructions while operating the camera and accessories.
- D. Keep these instructions with the camera and accessories at all times.
- E. DO NOT attempt to modify, dismantle or open your camera, lens or other accessory as doing so may expose you to electric shock and serious injury. There are no user-serviceable parts inside. Alteration or repairs made to the camera, lens or other accessory, except by a RED authorized service facility, will void the Limited Warranty. Users are not permitted to make design changes or otherwise modify the operation of the camera, lenses or other accessories, without the express written approval of RED DIGITAL CINEMA.
- F. Only use attachments/accessories specified by RED.
- G. Install camera and accessories in accordance with the manufacturer's instructions.
- H. Avoid imaging of laser beams as they may cause damage to the sensor.
- I. DO NOT use the camera or accessories near water. Avoid exposing your camera to moisture. The unit is not waterproof, so contact with water could cause permanent damage to the unit as well as electric

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shock and serious injury to the user. DO NOT use the camera in the rain or under other conditions with high moisture without appropriate protection, and immediately remove power source if camera or accessories are exposed to moisture.

**WARNING: To reduce the risk of fire or electric shock, do not expose the camera or accessories to rain or moisture.**

- J. DO NOT expose your camera to excessive vibration or impact (shock). Be careful not to drop your camera. Internal mechanisms may be damaged by severe shock. Mechanical alignment of optical elements may be affected by excessive vibration.
- K. **ELECTROMAGNETIC INTERFERENCE:** The use of devices using radio or other communication waves may result in the malfunction or interference with the unit and/or with audio and video signals.
- L. Clean only using a dry cloth. When cleaning your camera, remember that it is not waterproof and moisture can damage electronic circuitry. DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times. DO NOT use soaps, detergents, ammonia, alkaline cleaners, and abrasive cleaning compounds or solvents. These substances may damage lens coatings and electronic circuitry.
- M. Maintain sufficient ventilation - DO NOT block any ventilation openings or obstruct cooling fan airflow.

**CAUTION: Proper camera ventilation requires a minimum 1/2" (1,25cm) clearance between the camera ventilation openings and external surfaces. Verify that objects that can block the fan intake and exhaust ports do not impede airflow. Failure to permit adequate airflow may result in overheating of the camera, degraded operation and in extreme situations, damage to the camera.**

- N. DO NOT operate or store near any heat sources such as radiators, heat registers, stoves, or any other apparatus that produce heat. Store in a protected, level and ventilated place. Avoid exposure to temperature extremes, damp, severe vibration, strong magnetic fields, direct sunlight or local heat sources during storage. Remove any batteries from the camera before storage. Recommended storage and usage temperatures for your camera, lenses and other accessories are:
  - a. Operating range: 0°C to +40°C (32°F to 104°F)
  - o Storage range: -20°C to +50°C (-4°F to 122°F)

If there are any performance issues with your camera or accessories when operating within this temperature range, please file a support ticket on [www.RED.com/support](http://www.RED.com/support).

- O. The Side Handle, Side SSD Module, Rear Modules and Lens Mount are **NOT HOT SWAPPABLE** – meaning you cannot remove or install them while the camera is powered on. Before installing or removing any of these accessories, you MUST power down the camera. Failure to do so may result in damage to the accessory and / or camera brain that will not be covered under warranty.
- P. Do not bypass the third prong of the grounding-type plug on the power cord of the AC Power Adapter. A grounding-type plug has two blades and a third “grounding” prong. The third prong is provided for your safety. A grounding-type plug shall be connected to an outlet with a protective earthen connection. If the grounding-type plug does not fit into your outlet, do not attempt to modify the plug or outlet, consult a qualified electrician.
- Q. Protect all power cords from being pinched, walked on or driven over by a vehicle. Replace any power cords suspected of sustaining damage due to crushing or other forms physical damage.

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**CAUTION:** The power cord plug for the AC Power Adapter is used as the power disconnect. To disconnect all power from the AC Power Adapter, unplug the power cord plug from the wall outlet. During use, the power cord plug should remain easily accessible at all times.

R. Lithium Ion batteries may be subject to special handling requirements pursuant to federal and local laws. Please refer to specific shipping instructions included with your battery regarding proper transport of your battery. Do not handle your battery if it is damaged or leaking. Disposal of batteries must be in accordance with local environmental regulations. For example, California law requires that all rechargeable batteries must be recycled by an authorized recycle center. Storing batteries fully charged or in high temperature, conditions may permanently reduce the life of the battery. Available battery capacity may also be temporarily lessened after storage in low temperature conditions.

**WARNING:** Do not expose the battery to excessive heat.

**WARNING:** Danger of explosion if an incorrect battery is charged with the RED Charger or is used to power the camera and accessories. Replace only with the same or equivalent type battery.

**CAUTION:** Refer all service and repair to qualified RED service personnel. To reduce the risk of electric shock, and damage to the camera or accessories, DO NOT attempt to perform any servicing other than any procedures that are recommended in the operating instructions.

## THEORY OF OPERATION

The RED family of Digital Still and Motion Cameras (DSMC) provide high performance digital imaging over a wide range of frame rates and optical formats including Super 35mm / APS-H. The RED DSMC camera is supplied as standard with a PL mount, and may be configured with mounts and 19 mm rods to accommodate most cinematography lenses, matte boxes and follow focus systems. Adaptors for 15mm offset studio and 15mm lightweight rods are also available.

In addition to compatibility with the majority of existing PL mount cinematography lenses; a select range of Super 35mm PL mount prime and zoom lenses are available from RED.

Other lens mounts, including the DSMC Canon mount are available, permitting the use of Canon EF and EF-S photographic lenses. The Canon mount can report lens iris, focus and zoom data when mated to an appropriate lens. In addition, iris and manual or auto-focus settings may be controlled from the camera.

Lens mounts may be exchanged in the field, however it is highly recommended that this be performed in a dust-free environment, as the optical path will be exposed to the elements during this process.

A B4 mount to PL mount adaptor is also available to permit use of 2/3" HD broadcast lenses on the RED DSMC camera. The optical coverage it provides is approximately equivalent to 16mm, hence the maximum recording resolution operating with a B4 mount 2/3" lens is 2K (2048 x 1152 pixels) progressive scan.

## MYSTERIUM X® SENSOR

The MYSTERIUM X sensor has been specifically designed for use with the RED DSMC camera, and provides variable frame rate imaging at up to 120fps at 5K resolution, and up to 240 fps at 2K resolution.

Native color balance for the MYSTERIUM X sensor is 5,000 KELVIN, but it may be electronically compensated for any color temperature in the range 1,700 to 10,000 KELVIN. White balance preset values include Tungsten (3200K) and Daylight (5600K) light sources. The camera may also calculate a color neutralizing White Balance value on demand by imaging on a standard white or 18% grey card.

The MYSTERIUM X sensor includes high precision analog to digital conversion, capable of delivering up to 13.5 stops of dynamic range with daylight light sources over a camera sensitivity rating of 320-800 ISO. In HDR mode, dynamic range can be extended to approximately 18 stops.

## IMAGE PROCESSING

The digital image received from the sensor is formatted as a pixel defect corrected (but in all other aspects unprocessed) 12-bit, 14-bit or 16-bit per pixel RAW data frame. When operating in STILL mode, each image received from the sensor is treated as a unique FRAME; however when operating in MOVIE mode, successive images received from the sensor are collected together into a CLIP. In all other regards, a frame of information gathered in STILL mode or MOVIE mode is identical.

Each RAW frame or sequence of RAW frames in a clip is compressed using proprietary wavelet based REDCODE® RAW compression, then stored to a digital media Magazine such as REDMAG™ 1.8" SSD.

When recorded, the RAW data is independent of any RGB domain color processing such as ISO, White Balance or other RGB color space adjustments made by the camera operator. These parameters are saved with the RAW data as reference METADATA; i.e. color is not burned into the recorded RAW data.

This recording technique permits RGB color processing choices to be deferred to post production or to be adjusted in the field to help a director visualize alternative color treatments, without affecting the recorded RAW data's image quality or dynamic range.

The camera's monitoring path converts RAW sensor data to a white balanced 12-bit depth 2048 x 1080 pixel RGB 4:4:4 video signal. This signal may be modified using ISO, White Balance or other RGB color space adjustments as desired by the operator, and is then scaled and gamma corrected to provide VIEWFINDER, HD-SDI and HDMI monitor outputs at 10-bit depth in 4:2:2 YCC or 8-bit depth in 4:4:4 RGB.

Frame guides and other camera data may be added as desired by the user to one or more of the outputs.

**NOTE: The supplied REDCINE-X® PRO application software can create and export .RMD "color look" files which may then be imported as camera monitor path color processing PRESETS. This information is stored as reference metadata, so that this color processing choice can be the default value used in Post Production. Refer to SECONDARY MENUS > PRESETS for details how to import and apply .RMD file metadata.**

## HDRX™

HDRx is an option for extending dynamic range up to 6 stops over the base Dynamic Range offered by the camera. When enabled HDRx simultaneously shoots two images of identical resolution and frame rate - a normally exposed primary track (A-track), and an underexposed secondary track (X-track) whose exposure value reflects the additional stops of highlight protection desired.

i.e. if you select an HDR value of +2 and your primary track exposure is 1/48th sec, the secondary track exposure will be 2 stops under, or 1/192 sec. The ISO and Aperture remain the same for both exposures.

During acquisition and recording, the two tracks are "motion-conjoined", meaning there is no gap in time between the two exposures. This is very important to note because if they were traditional alternating exposures, there would be a time gap between the two tracks that would show up as an undesirable motion artifact. Both tracks (A & X) are stored in a single .R3D® file.

Since there are two exposures in HDRx mode, the camera is recording double the amount of frames each second. For example, when shooting at 24fps, the camera is recording two 24fps tracks, which is the data rate equivalent of 48fps; however after combining the A and X tracks in postproduction you will see only one 24fps blended image sequence.

HDRx provides multiple options for exploitation in postproduction.

- Blend the two tracks in post tools like REDCINE-X, Storm or any other application that supports the SDK to create Magic Motion™. This blending of the two tracks comes with a slider so you can decide just how much of each track you want to use. A preview window shows you the combined result of your selection, or you can view each track individually.
- Combine the two tracks using MNMB (More Normal Motion Blur). MNMB is designed to emulate the motion of a traditional camera with full motion blur. This is a tool created by The Foundry that uses a new motion estimation algorithm designed specifically for HDRx. The shorter exposure (sharper image) is blended to match the motion blur of the normal exposure. Again, a preview window shows the combined result of your selection, or you can view each track individually.
- Use the X-track data for motion tracking, then combine the X-track with the A-track, or just motion stabilize the A-track using the motion analysis data extracted from the X-track.

- Exporting to EXR file format will give you a multi-view EXR with both exposures (like a stereo EXR).

**NOTE: If you ignore the X-track data, you will have a standard exposure with up to 13.5 stops of dynamic range just as if you had not enabled HDRx. For this reason, we encourage the A-track exposure to be "normal" as it provides the most options. If you are tempted to shoot "over-under", you are then fully committed to using HDRx and your postproduction options are reduced.**

**NOTE: When recording in HDRx mode the camera records twice as many frames per second so the maximum frame rate or minimum REDCODE ratio, and the maximum record time on your media will be cut in half.**

## MAGIC MOTION™

Shooting at 24fps and with an 180 degree (1/48th) shutter on a film or digital camera may create an optical illusion we are familiar with, however it is not really the way the eye sees motion. To understand this, ask someone to stand in front of you and swing their arm over their head from one side to the other. What you would observe in the recording is a constant motion blur until the arm stopped. What your eye sees though is both motion blur AND a sharper reference to the arm and hand all along the motion path. "Magic Motion" provides such a combination of motion blur (A-track) and a sharper reference (X-track), with the bonus of extreme dynamic range not available with any other motion capture camera system.

## AUDIO RECORDING

The RED DSMC camera can record up to two discreet channels of microphone level uncompressed 24-bit, 48 KHz audio (four channels of microphone level or line level audio inputs when equipped with a PRO I/O Module), that are synchronized with video and timecode to a REDMAG 1.8" SSD digital media Magazine.

Input signals are routed via a high quality pre-amplifier and soft clip analog limiter in order to achieve the desired audio reference / recording level and maximize dynamic range.

To assist with audio reference level setup, the camera provides a color-coded Audio Level Meter in the Graphical User Interface. Meter range is -36dBu to +20dBu (-56dBFS to 0dBFS) with audio input type, reference level and audio input clipping indicators.

Audio monitor output options include a 2-channel headphone output on the camera Brain and 2-channel line level analog outputs from the optional PRO I/O Module, plus 2-channel and 4-channel 24-bit 48KHz uncompressed digital audio embedded in the HD-SDI and HDMI outputs.

## MICROPHONE LEVEL ANALOG INPUTS

The recording level of a Microphone input is affected by the sensitivity of the microphone and the Gain setting of the camera's pre-amplifier. Available pre-amplifier range is +8dB to +62dB, with a default value of +10dB. The camera operator should choose a Gain value that aligns the input signal to the 0dBu reference line drawn on the camera's Audio Level Meter (or the 0VU reference line if operating at that level).

This setting provides up to 30dB of input signal headroom above reference 0dBu level before clipping (up to 26dB above 0VU reference level) and maximizes the signal to noise ratio of the 24-bit digital recording.

## LINE LEVEL ANALOG INPUTS

The recording level of a Line input is affected only by the signal provided by the field production sound mixer or other external line level source. The sound mixer operator should choose a mixer output level that aligns a reference tone signal to the 0dBu (-20dBFS) reference mark drawn on the camera's Audio Level Meter, or if using 0VU as reference level, a mixer output level that aligns a reference tone signal to the 0VU (-16dBFS) reference mark.

This setting provides up to 24dB of input signal headroom above reference 0dBu level before clipping (up to 20dB above 0VU reference level) and maximizes the signal to noise ratio of the 24-bit digital recording.

## VIDEO MONITORING OUTPUTS

In its default configuration, the RED DSMC camera can simultaneously support one VIEWFINDER output (suitable for use by a BOMB EVF®, or RED LCD) plus one PROGRAM output and one PREVIEW output (suitable for use by HDMI or HD-SDI monitors). The various monitor outputs can support a set of overlay graphics including camera GUI, timecode, clip name and framing guides; the specific overlay graphics for each type of output is user configurable.

The default VIEWFINDER output is the EVF / LCD connector located on the front face of the Side SSD Module. If neither of these is connected, the VIEWFINDER output can be transferred to either the HDMI output or the HD-SDI output of the camera Brain.

### BOMB EVF

A 1280 x 784 pixel progressive scan color display providing the equivalent of viewing a 17" reference monitor from a distance of about 3ft (1m). Display includes Surround View™ look around area, frame guides and safe action / title, zebra and false color exposure overlays, operation status and setup menus.

### RED LCD

A 800 x 480 pixel progressive scan color display supporting a touchscreen overlay. Display includes Surround View™ look around area, frame guides and safe action / title, zebra and false color exposure overlays, operation status and setup menus.

### HD-SDI

A 720p or 1080p progressive scan output suitable for monitoring or recording to an external VTR or DDR device. May be configured for 10-bit LIN (VIDEO) or 10-bit LOG (FILM) encoded data.

### HDMI

A 720p or 1080p progressive scan output suitable for monitoring via a PC monitor or most HDTV displays.

# RED EPIC® OPERATION GUIDE



*Example of HDMI Monitor Output in MENU mode.*

## RED LCD / BOMB EVF®

The optional RED LCD and BOMB EVF are specialized video monitors that provide the user with a variety of tools to assist framing, focus and exposure, including:

- Surround View™, which is an additional look around area, visible outside of the recorded image.
- Frame Guides, showing common film presentation and television aspects such as 2.40:1 and 16:9.
- Focus, aided by high display resolution, 1:1 Focus Check function and False Color overlay.
- Exposure, aided by dual Zebras, False Color overlay, RAW “Traffic Lights” and RGB histogram.
- System information including current frame rate, ISO rating, shutter speed, color temperature, record resolution, record quality, clip name, timecode value and the remaining battery and media capacity.

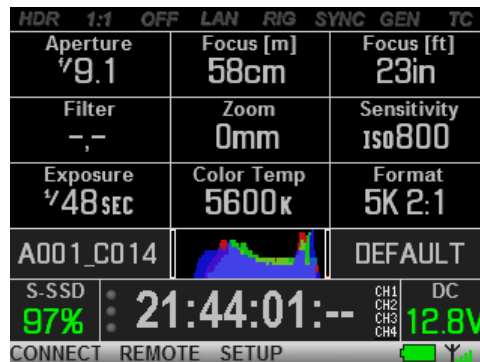
For applications where use of an attached RED EVF or RED LCD is not desired – for example when working on a crane – the VIEWFINDER / MENU output can be transferred to the HD-SDI or HDMI outputs, supporting remote camera monitoring up to 200 ft away.

# RED EPIC® OPERATION GUIDE

## REDMOTE®

REDMOTE is a camera control unit for RED's family of DSMC cameras that attaches to the rear of the camera Brain or rearmost expansion module. REDMOTE may also be detached from the camera or rearmost module and provide wireless remote control of the camera over proprietary REDlink™ protocol.

Whether attached or operating via wireless, REDMOTE supports all controls necessary to operate the camera, including Record Start / Stop, Shutter Speed, White Balance, ISO and programmable User Keys. A color LCD displays critical camera parameters, including media and battery capacity, timecode and clip name, lens data and exposure information..



*REDMOTE LCD display*

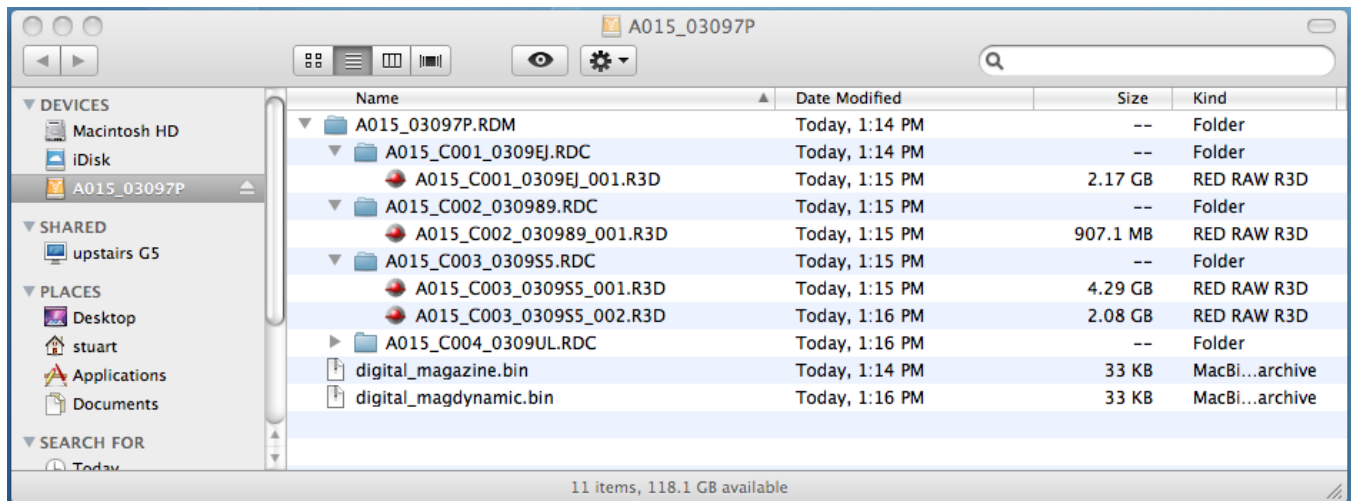
REDMOTE includes a rechargeable Li-Ion battery, which automatically re-charges when attached to the camera or rearmost module. It may also be re-charged by connecting to a USB 2.0 based power source such as a laptop PC or cell phone charger. Under typical operating conditions, REDMOTE should operate for up to 8 hours without requiring a re-charge and support a wireless communication range of approximately 50 ft.

## DIGITAL MAGAZINE (MEDIA)

REDCODE RAW compressed MOVIE clips and STILL images; time code, multi-channel audio and metadata may be recorded to **REDMAG 1.8" SSD** solid-state digital media Magazine of 64GB, 128GB or 256GB capacity.

Each MOVIE clip is recorded with a unique name in a Clip folder with the extension .RDC. This folder contains all appropriate information describing the clip, including one or more REDCODE RAW.R3D files and all color grading metadata and other system level metadata such as lens and location information. Refer to CLIP NAMING CONVENTIONS.

The individual Clip folders are placed into a Magazine folder (i.e. root directory) on the digital media. This Magazine folder has the extension .RDM. As this folder contains all the recorded Clips; copying all clips recorded on the SSD to other media may be performed by a drag and drop operation on the .RDM folder.



*Typical Magazine Folder and clip structure*

For additional information about digital magazines, refer to APPENDIX B: MANAGING DIGITAL MEDIA.

## METADATA

RED's family of DSMC cameras record extensive Metadata, which is data that describes all the characteristics of the picture and sound signals in every frame of the recording. This includes camera setup information, project and RGB color management information, Clip Name, Time Code, Date and GMT, lens and shutter speed / angle parameters, audio configuration, plus any externally provided metadata.

## CLIP NAMING CONVENTIONS

When you press RECORD, the camera automatically creates a unique name for the CLIP being recorded to the REDMAG 1.8" SSD media. The format of this name is:

Camera Letter + Reel Number + Month + Day

e.g. A001\_C002\_0502\*\*.RDC

Where: A = camera A, 001 = reel 001, C002 = clip 002, and 0502 = May 02, and the digits \* \* are two random characters generated by the camera to prevent any possibility of duplicate names being created.

So a three Clip sequence of Clip Folders within a Magazine Folder on Camera A would look like this:

A001\_C001\_0502\*\*.RDC

A001\_C002\_0502\*\*.RDC

A001\_C003\_0502\*\*.RDC

# RED EPIC® OPERATION GUIDE

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## MULTI CAMERA SHOTS

The scheme provides flexibility to uniquely identify Clips from different cameras on a multi-camera shoot. For example three cameras, slated as camera A, camera B, and camera C respectively, can generate these easily recognizable clips on their respective digital media Magazines.

A001\_C001\_0502\*\*.RDC                      B001\_C001\_0502\*\*.RDC                      C001\_C001\_0502\*\*.RDC

## 3D (STEREO) CAMERA SHOTS

The scheme also allows unique identification of Clips from left and right eye cameras on a stereo shoot. For example two cameras, both slated as Camera S, can generate these easily recognizable clips on their respective digital media Magazines.

S001\_L001\_0502\*\*.RDC                      S001\_R001\_0502\*\*.RDC

For more information refer to APPENDIX F: 3D SETUP / OPERATION > CLIP NAMING CONVENTIONS.

## SMPTE TIMECODE

Time Code (TC) is a SMPTE timecode track that synchronizes to the camera's high precision internal clock, or if operated in Jam Sync mode, references to an externally supplied SMPTE master timecode signal. TC is a sequential code that is continuous from frame to frame, but is discontinuous from clip to clip.

Edge Code (EC) is a SMPTE timecode track that always starts at 1.00.00.00 on the first frame recorded to the digital media. It is a sequential code that is continuous from frame to frame and also continuous from clip to clip. EC is equivalent to RUN RECORD commonly found on broadcast cameras.

Irrespective of the timecode mode selected, once recording starts the camera's timecode counter will update at the same instantaneous frame rate as the recording. This ensures that a valid SMPTE timecode value is created for every frame in the clip, eliminating any timecode count jumps that could affect playback or editing.

If operating in Jam Sync mode referenced to an external timecode source, the clip's master time reference point is the first frame of the recorded clip.

**NOTE: When in Loop Record mode, Edge Code will also become discontinuous from clip to clip, because frames copied into the cache memory are discarded. This may lead to editing difficulties with postproduction applications that assume continuous timecode.**

## POWER CONSUMPTION

The camera draws approximately 60 watts when recording in 4K resolution, 24fps MOVIE mode. The camera is cooled by convection from the camera body assisted by a fan contained in a sealed air duct.

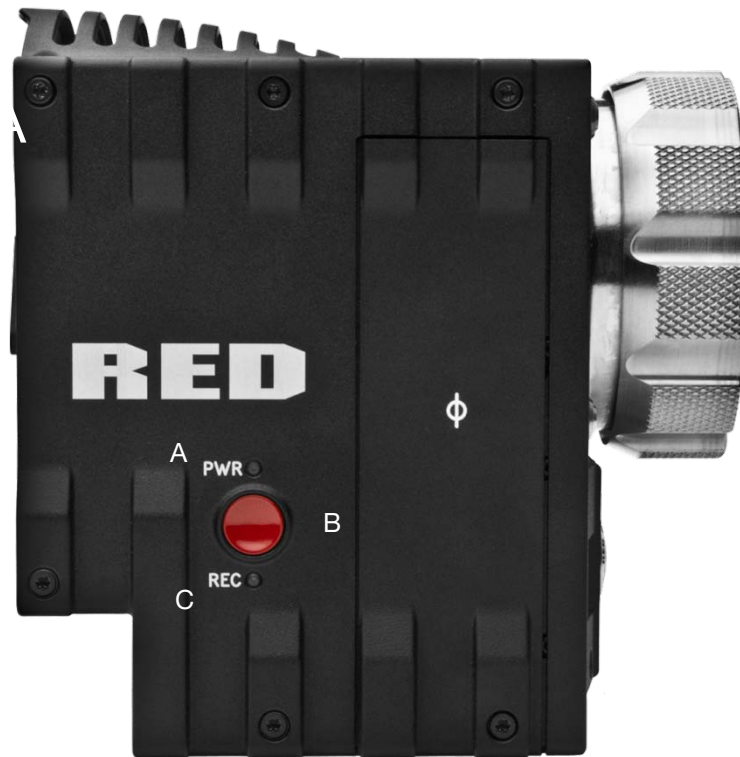
Under typical operating conditions, a REDVOLT® battery will run the camera and accessories for about 30 minutes and a REDVOLT® XL battery will run the camera and accessories for about 90 minutes.

# RED EPIC® OPERATION GUIDE

## CAMERA OPERATIONAL CONTROLS

This section describes the available operational controls on the RED DSMC camera Brain, Side SSD Module, Side Handle and REDMOTE accessories.

### BRAIN



<b>A</b>	Power Status LED
<b>B</b>	Power / Record Button
<b>C</b>	Record Status LED

*Power / Record Button / Status LEDs*

- **Power / Record Button:** Powers camera Up / Down and initiates Record Stop / Start
- **Power Status LED:** Indicates Power status:
  - LED Red = Power Present, Camera OFF
  - LED Yellow = Power present, Camera Booting
  - LED Green = Power present, Camera ON
  - LED Green Blinking = Power present. Running on Battery
  - LED Yellow Blinking = Power present. Battery below 10%

# RED EPIC<sup>®</sup> OPERATION GUIDE

- LED Red Blinking = Power present. Battery Below 5%
- **Record Status LED:** Indicates record status:
  - LED Off = No Media present.
  - LED Green = Ready to Record
  - LED Red Constant = Recording
  - LED Red Slow Blink = Recording, 25% Media Left
  - LED Red Fast Blink = Recording, 5% Media Left
  - LED Yellow = Finalizing
- **Both LEDs:** Indicates camera status:
  - Both LEDs Green Blink = firmware update in Progress

## SIDE SSD MODULE



<b>A</b>	SSD Slot
<b>B</b>	User Key 1
<b>C</b>	User Key 2
<b>D</b>	Focus / Record Button
<b>E</b>	Media Indicator

*Side SSD Module Controls*

# RED EPIC® OPERATION GUIDE

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- **SSD Slot:** Slot for REDMAG 1.8" SSD digital media Magazine.
- **User Key 1:** Initiates user defined camera function. Undefined by Default.
- **User Key 2:** Initiates user defined camera function. Undefined by Default.
- **User Key 1 + User Key 2 :** Press both keys to Eject (unmount) REDMAG 1.8" SSD Magazine.
- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Media Indicator LED:** Indicates status of media:
  - LED Off = No Media
  - LED Green = Ready to Record
  - LED Red Constant = Recording
  - LED Red Slow Blink = Recording, 25% Media Left
  - LED Red Fast Blink = Recording, 5% Media Left
  - LED Yellow = Finalizing
  - LED Yellow Blinking = Media Access (Format etc...)

# RED EPIC® OPERATION GUIDE

## SIDE HANDLE

### TOP



<b>A</b>	Battery Release	<b>D</b>	LCD Menu Keys
<b>B</b>	Focus / Record Button	<b>E</b>	LCD Display
<b>C</b>	Adjustment Ring	<b>F</b>	LCD Backlight Button

#### *RED Side Handle Controls - Top*

- **Battery Door Release Button:** Releases Side Handle battery door to permit battery exchange.
- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Adjustment Ring:** Selects and adjusts camera parameter values. Similar to the scroll wheel on the navigation group.
- **LCD Menu Keys:** The specific functions for each key are defined by the LCD screen. Defaults are:  
1 – ISO                                      2 – F-Stop                                      3 – Shutter Speed                                      4 – White Balance
- **LCD Display:** Displays key camera parameter values.
- **LCD Backlight Button:** Enables LCD backlight.

# RED EPIC® OPERATION GUIDE

## FRONT



A	Stills / Movie Slider
---	-----------------------

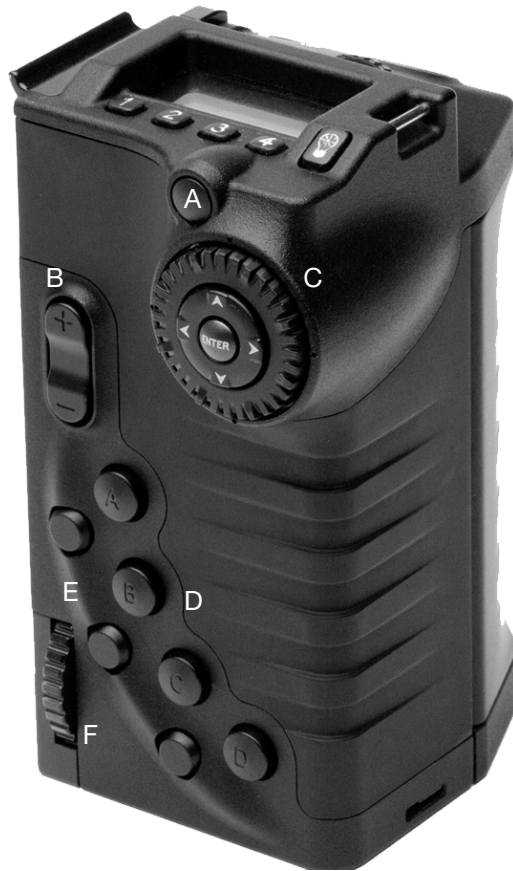
### *Side Handle Controls - Front*

- **Stills / Movie Slider:** Selects between STILLs and MOVIE modes of operation.

**NOTE:** This switch is not active at this time. Default camera operation is MOVIE

# RED EPIC® OPERATION GUIDE

## REAR



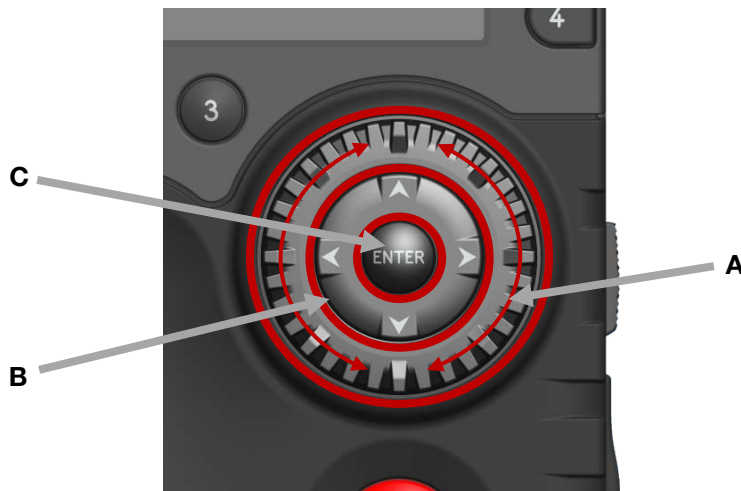
*RED Side Handle Controls - Rear*

<b>A</b>	MENU Button	<b>D</b>	User Keys A-D
<b>B</b>	Rocker Switch	<b>E</b>	System Keys 1- 3
<b>C</b>	Navigation Group	<b>F</b>	Thumbwheel Lock

- **Menu Button:** Press to access / camera setup menus.
- **Rocker Switch:** Increases or decreases selected value based on parameter selected in USER KEYS.

# RED EPIC<sup>®</sup> OPERATION GUIDE

- **Navigation Group:** Allows navigation through camera menus, selection of camera parameter for adjustment, and adjustment of selected camera parameter.



*Side Handle Navigation Group*

<b>A</b>	Scroll Wheel	<b>B</b>	Direction Keys	<b>C</b>	Enter Button
----------	--------------	----------	----------------	----------	--------------

- **Scroll Wheel:** Selects and adjusts camera parameter value.
  - **Direction Keys:** Navigates camera menus and may select parameter for adjustment.
  - **Enter Button:** Confirms selected parameter value adjustment.
- **User Keys:** User Function Keys A-D. The specific function of these keys may be programmed by the user. Default settings for User Function Keys A-D are as follow:
    - User Key A – Toggles Focus Assist indicator
    - User Key B – Performs White Balance calculation.
    - User Key C – Toggles False Color > 1:1 Magnify
    - User Key D – Toggles False Color > Exposure Check
  - **System Keys:** Function is defined by System Firmware.
    - Upper: Toggles False Color > Exposure Check
    - Center: Not currently defined
    - Lower: Ejects (unmounts) the currently selected Media

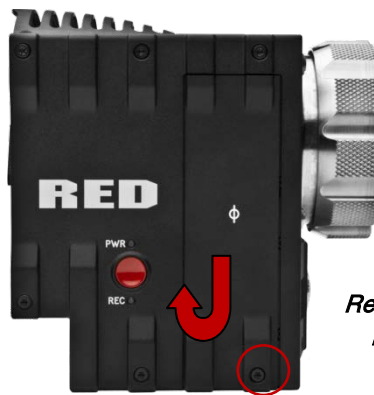
# RED EPIC<sup>®</sup> OPERATION GUIDE

## INSTALLATION / REMOVAL

**WARNING: THE SIDE HANDLE IS NOT HOT SWAPPABLE - MEANING YOU CANNOT REMOVE OR INSTALL WHILE THE CAMERA IS POWERED ON. BEFORE INSTALLING OR REMOVING THE SIDE HANDLE, YOU MUST POWER DOWN THE CAMERA. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE SIDE HANDLE AND / OR CAMERA BRAIN THAT IS NOT COVERED BY WARRANTY.**

To install the side handle:

1. Power down the camera if necessary.
2. Remove the brain side plate (if installed) by removing the single screw located at the bottom.
3. Rotate upwards to disengage lip at top of side plate from camera brain.



*Remove screw and rotate side plate upwards to remove.*

4. Insert the lip at the top of the side handle into the area where the lip from the side plate was installed.

*Insert lip into top of camera brain.*

*Rotate thumbscrew upwards until tight.*

*Press side handle flush against camera brain.*

5. Rotate side handle down flush along side of camera brain.
6. Rotate thumbscrew upwards until tight. Ensure side handle is secure to camera brain. You may have to apply steady pressure to get the screw started.

# RED EPIC® OPERATION GUIDE

To remove the side handle:

1. Power down the camera if necessary.
2. Rotate the thumbscrew downwards until detached from camera body.

*Disengage lip from top of camera brain.*

*Rotate thumbscrew downwards until loose.*



*Rotate side handle upwards to remove.*

3. Rotate upwards and pull down to disengage lip at top of side handle from camera brain.
4. Remove side handle from camera.

## QUAD BATTERY MODULE



*Quad Battery Module – Shown with REDVOLT batteries Installed*

A	Battery Status LED	B	Battery Eject Button
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- **Battery Status LED:** Indicate current charge status of corresponding battery.
- **Battery Eject Button:** Ejects corresponding battery to permit battery exchange.

## INSTALLATION / REMOVAL

**WARNING: THE QUAD BATTERY MODULE IS NOT HOT SWAPPABLE - MEANING YOU CANNOT REMOVE OR INSTALL WHILE THE CAMERA IS POWERED ON. BEFORE INSTALLING OR REMOVING THE QUAD BATTERY MODULE, YOU MUST POWER DOWN THE CAMERA. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE QUAD BATTERY MODULE AND / OR CAMERA BRAIN THAT IS NOT COVERED BY WARRANTY.**

To install the Quad Battery Module to the camera, an Adaptor Plate must be purchased separately. The following procedure details installation of the Adaptor Plate and Quad Battery Module:

1. Power down the camera if necessary.
2. Remove the REDMOTE if necessary.

# RED EPIC<sup>®</sup> OPERATION GUIDE

3. Install the Adapter Plate.
  - a. Place the adapter plate over the v-mount on the rear of the camera brain.



- b. Using a T-20 Torx, lightly tighten the four screws. Do not overtighten.



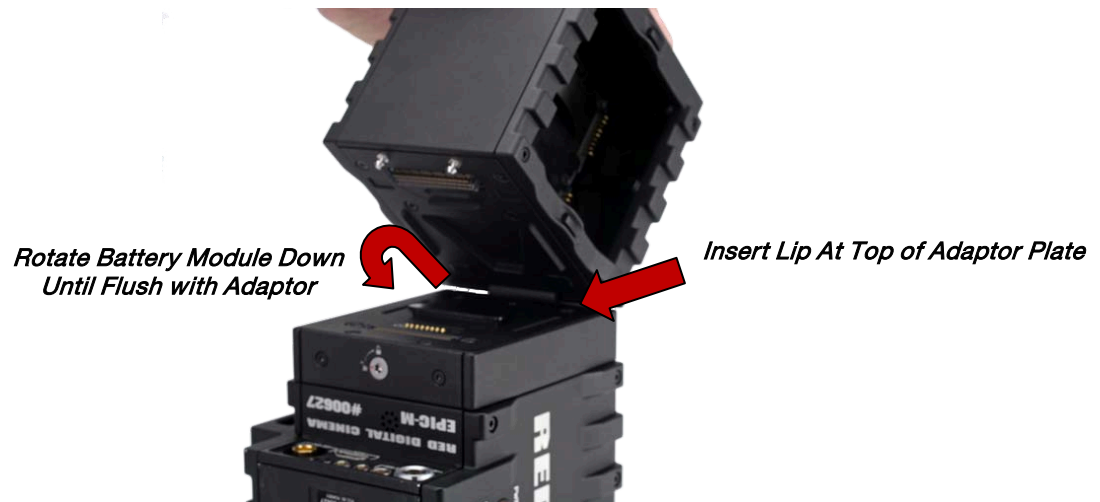
# RED EPIC® OPERATION GUIDE

- c. Tighten the screws again in a cross pattern until tight.



## 4. Install the Quad Battery Module

- a. Insert the lip at the top of the battery module into the recess at the top of the adaptor plate.

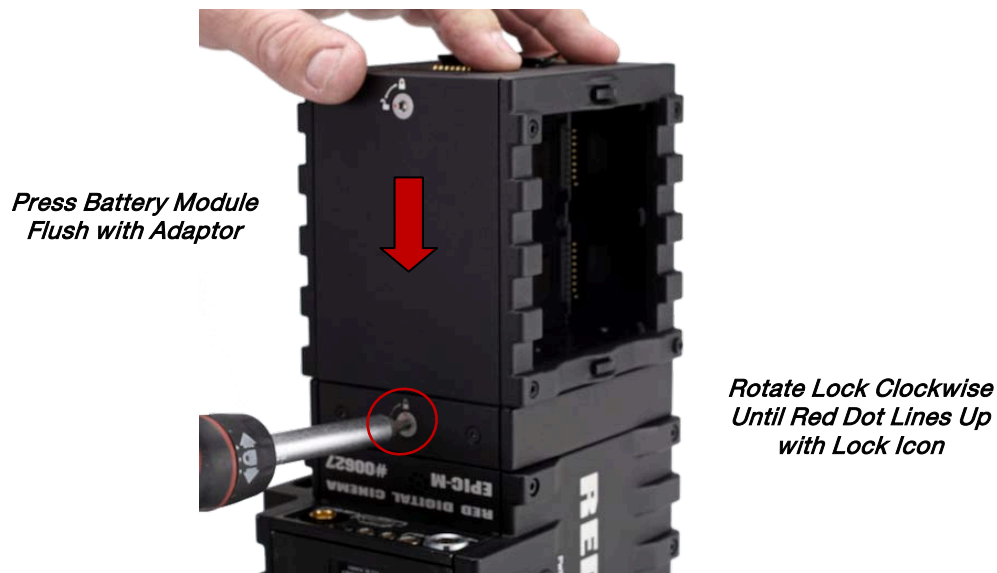


# RED EPIC<sup>®</sup> OPERATION GUIDE

- b. Rotate battery module down flush with the rear of the adaptor plate.



- c. While applying steady pressure to hold the battery module against the adaptor plate, use a T-20 Torx screwdriver to rotate the lock on the adaptor plate clockwise to secure the battery module.



- d. Installation is now complete.

To remove the Quad Battery Module and Adaptor Plate:

1. Power down the camera if necessary.
2. Use a T-20 Torx screwdriver to rotate the lock on the adaptor plate to the Unlock position.
3. Rotate the battery module upwards and down to disengage lip at top of battery module from adaptor plate.

# RED EPIC® OPERATION GUIDE

4. Remove battery module from adapter plate.
5. Use a T-20 to loosen the screws attaching the adaptor plate the camera brain.
6. Remove the adaptor plate from the camera brain.

## REDMOTE

This section describes the physical controls on the REDMOTE. For complete details on REDMOTE control, refer to APPENDIX E: REDMOTE OPERATION.

**IMPORTANT:** For your REDMOTE to operate with this camera build version, ensure your REDMOTE has been upgraded to the latest firmware. Refer to APPENDIX E: REDMOTE OPERATION > MAINTENANCE > UPGRADING REDMOTE FIRMWARE.



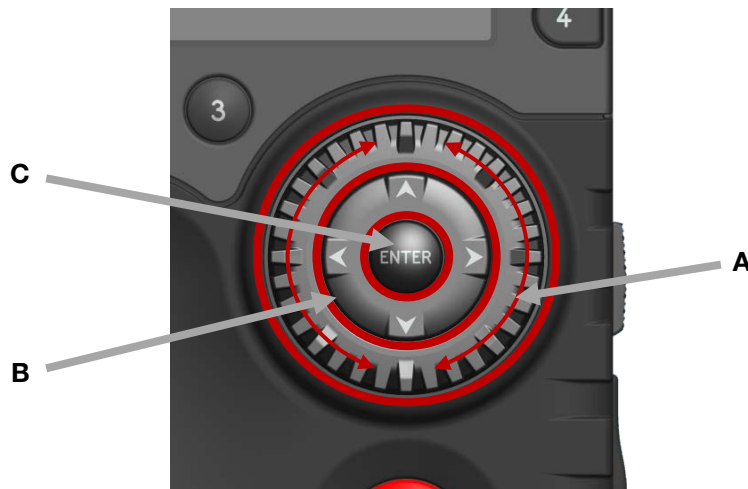
*REDMOTE Controls*

<b>A</b>	Still/Motion Slider	<b>F</b>	User Keys A-D	<b>K</b>	Soft Menu Keys 4-8
<b>B</b>	Release Button (L)	<b>G</b>	MENU Button	<b>L</b>	Power/Lock Slider
<b>C</b>	Record LED	<b>H</b>	Soft Menu Keys 1-3	<b>M</b>	Release Button (L)
<b>D</b>	Power LED	<b>I</b>	Navigation Group	<b>N</b>	USB Connector
<b>E</b>	Rocker Switch	<b>J</b>	Focus / Record Button		

- **Stills / Motion Slider:** Allows selection of STILLs or MOVIE operational modes.
- **Rocker Switch:** Provides continuous adjustment of parameter specified in USER KEYS menu.

# RED EPIC® OPERATION GUIDE

- **User Keys:** Press to initiate camera functions as defined in USER KEY menu.  
Default settings for User Function Keys A-D are as follow:
  - User Key A – Toggles Focus Assist Indicator
  - User Key B – Toggles False Color > RAW Check
  - User Key C – Toggles False Color > 1:1 Magnify.
  - User Key D – Toggles False Color > Exposure Check
- **Menu Button:** Press to access / camera setup menus.
- **Soft Menu Keys 1-3:** Below the LCD are three (3) Soft Menu buttons 1-3 (H) whose functions are defined on the LCD screen. For complete information refer to APPENDIX E: REDMOTE OPERATION > OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 1-3.
- **Navigation Group:** Allows navigation through camera menus, selection of camera parameter and adjustment of selected camera parameter.



*REDMOTE Navigation Group*

<b>A</b>	Scroll Wheel	<b>B</b>	Direction Keys	<b>C</b>	Enter Button
----------	--------------	----------	----------------	----------	--------------

- **Scroll Wheel:** Selects and adjusts selected camera parameter value.
- **Direction Keys:** Navigates camera menus and may select parameter for adjustment.
- **Enter Button:** Confirms selected parameter value adjustment.
- **Focus / Record Button:** Touch for Auto Focus, fully depress to Start or Stop Record.
- **Soft Menu Keys 4-8:** To the right of the LCD are five Soft Menu buttons 4-8. These are pages displaying camera settings. For complete information refer to APPENDIX E: REDMOTE OPERATION > OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 4-8.
- **Power / Lock Slider:** Slide and hold down for two seconds to power up / down REDMOTE and or camera. Slide up to lock keys.

# RED EPIC® OPERATION GUIDE

## BOMB EVF



*BOMB EVF*

<b>A</b>	Focus Ring	<b>B/C</b>	Brightness Control	<b>D</b>	EVF Tally Light
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- **Focus Ring:** Adjusts optimal subject focus for your eye. Available diopter range is +2.0 to -5.0.
- **EVF User Key (B):** Increases EVF display brightness.
- **EVF User Key (C):** Decreases EVF display brightness.

**NOTE:** The specific function of EVF user keys (B/C) may be programmed by the user.

## TOUCHSCREEN LCD



*RED Touchscreen LCD*

<b>A</b>	Backlight Adjust	<b>B</b>	LCD User Key C	<b>C</b>	LCD User Key D
----------	------------------	----------	----------------	----------	----------------

- **Backlight Adjust:** Adjusts LCD backlight intensity. Upper button +, Lower button -
- **LCD User Key C:** Press to execute user defined function. Default: Toggles False Color > 1:1 Magnify.
- **LCD User Key D:** Press to execute user defined function. Default: Toggles False Color > Exposure.

**NOTE:** The specific function of keys C and D may be programmed by the user.

**NOTE:** The touchscreen LCD also allows navigation of camera menus and selection and adjustment of camera parameters by directly touching icons on the screen. Gestures supported include:

- **Tap:** Tap on an icon to bring up a quick adjustment display.
- **Hold:** Touch and hold on an icon to bring up an advanced interface display.
- **Slide:** Touch and slide on an icon to increment a value.
- **Pinch:** Touch with two fingers, then open or close to magnify or normalize the video image.

# RED EPIC<sup>®</sup> OPERATION GUIDE

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## BASIC OPERATION

This section describes basic operation, starting from power up, Viewfinder layout and Menu navigation.

**WARNING: THE SIDE HANDLE, SIDE SSD MODULE, REAR MODULES AND LENS MOUNT ARE NOT HOT SWAPPABLE – MEANING YOU CANNOT REMOVE OR INSTALL THEM WHILE THE CAMERA IS POWERED ON. BEFORE INSTALLING OR REMOVING ANY OF THESE ACCESSORIES, YOU MUST POWER DOWN THE CAMERA. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE ACCESSORY AND / OR CAMERA BRAIN THAT WILL NOT BE COVERED UNDER WARRANTY.**

Power draw is prioritized as follows when multiple power sources are available to the camera.

1. DC (Voltage) or Brick (%)
2. Battery Module batteries
3. Side Handle battery

## POWER SOURCES

### SIDE HANDLE

The optional Side Handle accepts one REDVOLT.



*Side Handle Battery Compartment*

# RED EPIC® OPERATION GUIDE

## QUAD BATTERY MODULE

The optional QUAD BATTERY MODULE accepts up to four REDVOLT or up to two REDVOLT XL batteries, which can power the camera and typical accessories.



*Quad Battery Module*

## REDVOLT AND REDVOLT XL



*REDVOLT and REDVOLT XL*

**Note:** When multiple batteries are installed in the Quad Battery Module, the power management circuit will select the lowest charged battery to supply power to the camera. On depletion, a battery may be ejected from the Quad Battery Module for re-charging, and a new charged battery may be inserted in its place. i.e. batteries may be hot swapped, there is no need for the operator to power down the camera to replace a REDVOLT battery when using the Quad Battery Module.

# RED EPIC® OPERATION GUIDE

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## BACKPACK QUICKPLATE

The optional BACKPACK QUICKPLATE attaches directly to the back of the DSMC BACKPACK to provide a compact REDBRICK configuration for EPIC or SCARLET-X.

**Note: DSMC BACKPACK is required for use of the BACKPACK QUICKPLATE**



*BACKPACK QUICKPLATE*



*REDBRICK*

# RED EPIC® OPERATION GUIDE

## AC POWER ADAPTOR - (DSMC)



AC POWER ADAPTOR - (DSMC)

When powering from the Module it is called in the lower UI as Rear Module (RM Bx) Bay number on lower UI, and identified as Rear 1-4 in the POWER status menu.



In use, an LED on the Quad Battery Module will flash to show the battery currently powering the camera.

Current battery LED indicates status as follow:

- LED Off = No Battery
- LED Constant Green = Battery Not used but Charged
- LED Green Blinking = Battery Used (100% - 11%)
- LED Yellow Blinking = Battery (10% - 6%)
- LED Red Blinking = Battery (5%- 1%)
- LED Constant Red = Battery Discharged

Remaining batteries will have a steady LED on module.

When current battery reaches 4% charge, the battery module will automatically switch over another battery, by default the LOWEST charge capacity battery of the remaining batteries installed in the Module.

# RED EPIC® OPERATION GUIDE

Battery location and status are displayed in the lower UI. In this case RM B1 (Rear Module, Bay 1).

Battery location and status are also displayed on REDMOTE. In this case RM B3 (Rear Module, Bay 3).

HDR	1:1	OFF	LAN	RIG	SYNC	GEN	TC
Aperture	-, -		Focus [m]		Zoom		
Sensitivity	ISO800		Exposure		Color Temp		
Format	5K 2:1		Redcode		Sensor FPS		
A003_C017				DEFAULT			
S-SSD	99%		15:04:22:--		RM B3		22%
CONNECT REMOTE SETUP							

The POWER menu also shows all installed batteries and their state of charge.

HDR	Focus	Exposure	Presets	Media	Settings	Power
Brain: 93.1%						
Side Handle: 48%						
Rear 1: 98%						
Rear 2: 98%						
Rear 3: --						
Rear 4: --						
Shutdown						
A001_C008						
5K 2:1	23 976	RC 8:1	29/41C	HDR	TC	RM
			E:0	OFF	GEN	LAN
			F:67%	1:1	SYNC	RIG
			S-SSD		DC	CH1
			72%		15.0V	CH2
						CH3
						CH4

## EXTERNAL DC POWER

RED DSMC Cameras accept input voltages between 11.5V - 17V D.C and can draw a maximum current of 12 Amps.

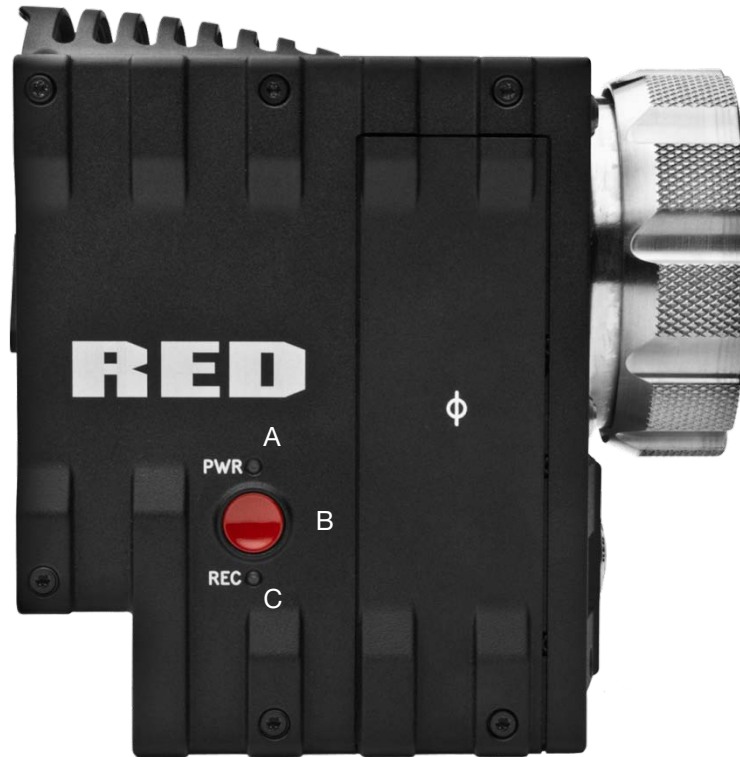
- An appropriate 150W supply with DC output rated at 15V 10A such as AC Power Adapter P/N 740-0019 available from RED DIGITAL CINEMA.
- RED Charger. For RED Charger you must use 2B-to-1B Power Adapter Cable P/N 790-0138.
- RED BRICK® 140Wh batteries may be used with Backpack Quickplate, RED Quickplate, Battery Belt Clip, or RED Cradle via 2B-to-1B Power Adapter Cable P/N 790-0138.
- 4-pin XLR DC power sources may be used with the camera via adaptor cable P/N 790-0164.

# RED EPIC® OPERATION GUIDE

## POWER UP

Locate the camera's Power / Record button on the right face of the Brain.

**NOTE:** This button also serves as a Record Start / Stop button once the camera is powered up.



<b>A</b>	Power Status LED
<b>B</b>	Power / Record Button
<b>C</b>	Media Status LED

### *Power / Record Button / Status LEDs*

When an appropriate power source is connected to the Brain, the Power Status LED will illuminate Red. If it is illuminated, depress and then release the Power / Record button. The Power Status LED will initially go out and within 5 seconds illuminate Orange to confirm the camera is powering up, then it will illuminate Green, confirming the camera is powered up and ready to use.

If a formatted REDMAG 1.8" SSD is attached to the Brain, once powered up the Media Status LED will illuminate Green. If this LED is not illuminated, verify a formatted REDMAG 1.8" SSD is inserted into the Side SSD Module and / or format the SSD if it has not previously been formatted on the camera.

**NOTE:** Once powered up, if the Power Status LED illuminates Red, it indicates low remaining battery capacity and a battery exchange or switch over to external DC power is recommended.

## POWER DOWN

The camera can be powered down in two ways:

1. Using REDMOTE or Side Handle Menu controls, or via Touch Screen LCD icons. Refer to SECONDARY MENUS > POWER.
2. Depress and continue to hold the Power / Record button in its fully depressed position for a minimum of 5 seconds. When the button is released, INITIATING CAMERA SHUTDOWN will display and camera will power down.

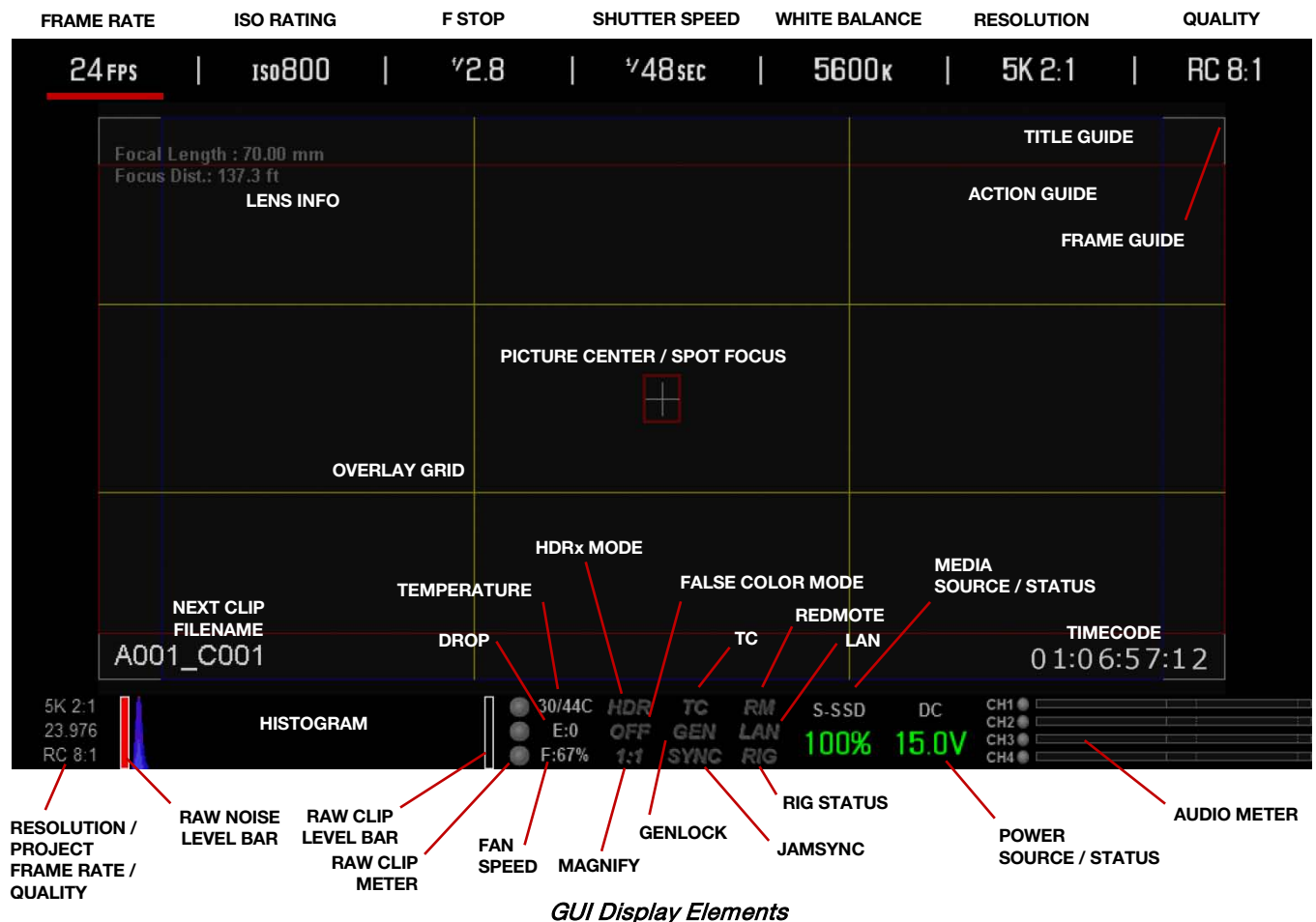
After Power Down, the Power Status LED will illuminate Red, if an appropriate power source is available.

# RED EPIC® OPERATION GUIDE

## GRAPHICAL USER INTERFACE AND NAVIGATION

### RED LCD/TOUCHSCREEN LCD, BOMB EVF, EXTERNAL MONITORS

The following is a general description of the structure of the camera's Graphical User Interface (GUI) which overlays the video monitor signal on the Viewfinder output(s) of the camera.





The display elements include:

- **Frame Rate:** Current frame capture rate
- **Resolution Record Resolution**
- **ISO Rating:** Camera sensitivity
- **Quality:** REDCODE setting
- **F Stop:** Functional when optional mount and lens are installed
- **Lens Info:** Lens information when using specific Canon or Cooke lenses.
- **Shutter Speed:** Exposure Time (or Degrees)
- **Cursors:** Reference cursors – Safe Action / Safe Title, Picture Center, Grid Overlay
- **White Balance:** Color Temp

# RED EPIC® OPERATION GUIDE

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- **Frame Guide:** Record or Projection area
- **Next Clip Filename:** Filename of the clip that will be shot next
- **Project Frame Rate:** Current project TIME BASE
- **Noise Level Bar:** Relative number of RAW pixels in noise
- **Histogram:** RGB Histogram.
- **Clip Level Bar:** Relative number of RAW pixels near clip
- **Clip Meter:** RGB sensor RAW clipping status
- **Temperature:** Displays camera sensor and core temperature in that order (xx/xxC)
- **Drop:** Indicates if any frames were dropped during recording of the clip
- **Fan Speed:** Displays fan speed in %
- **HDR Mode:** Displays HDRx mode status
- **False Color Mode:** Displays false color overlay mode
- **Magnify:** Tallies 1:1 if magnify is selected
- **TC:** Indicates presence of valid SMPTE timecode signal
- **Genlock:** Indicates presence of valid Genlock signal / sensor sync to genlock
- **Jam Sync:** Timecode Jam Sync status / time code jam
- **RM:** Indicates communication to REDMOTE
- **LAN:** Indicates communication via Ethernet connection
- **RIG:** Indicates 3D rig metadata is present
- **Media Status:** Media location and remaining media capacity in %
- **Power:** Indicates D.C supply voltage or % of remaining battery capacity Including current supply voltage
- **Audio Meter:** Audio input selection and levels
- **Timecode:** Current **timecode** value
- **Menu ICON** : In the upper Right corner on the touchscreen LCD - Opens the Secondary Menu
- **Playback ICON** : In the upper Left corner on the touchscreen LCD - Accesses the Playback Function

# RED EPIC® OPERATION GUIDE

The GUI is broken down into the following three main sections: the Upper Status Row, the Live Action Area, and the Lower Status Row. On VIEWFINDER output(s), all three sections are visible, on PREVIEW outputs only the Live Action Area and associated graphic overlays are visible. On PROGRAM outputs, none of the graphic overlays are visible, i.e. a PROGRAM output is defined to be a CLEAN FEED output.

## UPPER STATUS ROW



Provides immediate feedback on the most critical image composition parameter settings, including (from Left to Right):

- Playback Access (Touchscreen)
- Current frame capture rate
- ISO Rating
- Shutter Speed (or Shutter Angle)
- White Balance
- Record Resolution
- Record Quality
- Secondary Menus Access (Touchscreen)

Whichever parameter is underlined with a red bar may be immediately adjusted by pressing ENTER in the Navigation Group of the Side Handle or REDMOTE, then using the Scroll Wheel to change the value of that parameter. To confirm the parameter change press ENTER a second time.

**NOTE: Shutter angle is displayed in Relative mode by default, as indicated by Yellow text.**

If the red bar is not on the parameter you wish to change, first use the Scroll Wheel to position the red bar under that parameter, then press ENTER, adjust with the Scroll Wheel and press ENTER a second time to confirm the value change.

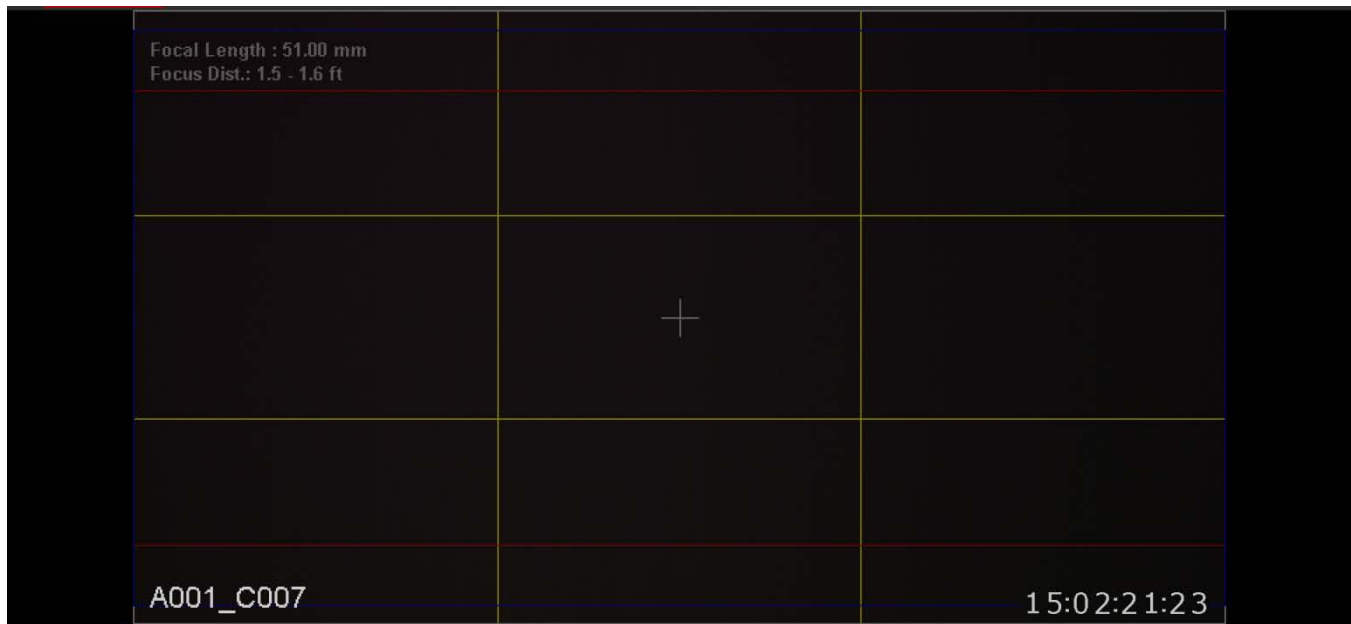


In the above GUI example, the Scroll Wheel has been used to move the red cursor to the Shutter Speed parameter; and the ENTER key has been pressed. This reveals the Parameter Adjust Window. Adjust the value using the Scroll Wheel and then press ENTER to confirm the value change, then close the sub-menu.

# RED EPIC® OPERATION GUIDE

## LIVE ACTION AREA

Contains the recorded image area plus Surround View™ look around area, plus overlays for Frame Guide, Safe Action / Safe Title and the current Clip Name and Timecode values. Each overlay may be color coded in one of 5 colors to maximize the contrast between the guide(s) and scene being captured.



## LOWER STATUS ROW



The Lower Status Row provides feedback on key systems level camera values, including:

- Clip Settings
- Exposure (Histogram)
- Temperature, Power and Sync
- Media Status
- Power Status
- Audio Levels

## ICON BEHAVIOR

### TC

- TC Gray - No analog time code is currently detected.
- TC Red - Analog time code is being detected, but the use of it is not enabled.
- TC Green - Analog time code is being used to jam the time of day time code. TC will revert to gray if the signal is no longer detected.

### GEN

- GEN Gray - No genlock signal is currently detected.

# RED EPIC® OPERATION GUIDE

- GEN Green - A genlock signal compatible with the current project and monitor rates has been locked to.

## SYNC

- SYNC Gray - The sensor sync mode is not Genlock.
- SYNC Red - The sensor sync mode is Genlock, but it is not locked to any genlock signal.
- SYNC Green - A genlock signal compatible with the current project and monitor rates has been locked to and the sensor timing is also locked to it.

## POWER STATUS

If powering camera through DC power, the current voltage will be displayed.



If using a REDBRICK or similar external battery to power the camera through DC IN, power status displays the current supply voltage available from the battery. Supply voltage decreases as battery is discharged, the displayed text is color coded as follows:

- Green = 12.0 V and up
- Yellow = 11.9 – 11.8 V
- Red = 11.7 – 11.6 V

**NOTE: The camera will automatically power down if supply voltage drops to 11.5 Volts.**

If using a REDVOLT battery in the Side Handle or Battery Module to power the camera, power status displays the location of the power source (example: SH: Side Handle; RM: Rear Module) and reports the % of remaining battery capacity and the displayed text is color coded as follows:

- Green = 99% - 11%
- Yellow = 10% - 6 %
- Red = 5% - 0%



If using a RED BRICK battery connected to DC IN, power status displays BRICK and reports the % of remaining battery capacity and the displayed text is color coded as follows:

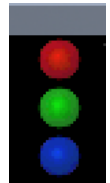
- Green = 99% - 11%
- Yellow = 10% - 6 %
- Red = 5% - 0%



# RED EPIC<sup>®</sup> OPERATION GUIDE

## RAW CLIP METER

The RAW Clip meter looks a traffic light style meter and indicates if either of the Red, Blue or Green channels of the RAW sensor data are clipping. This meter is unaffected by White Balance, ISO, VIEW or LOOK settings and therefore represents a true measurement of the exposure levels of the sensor at all times.



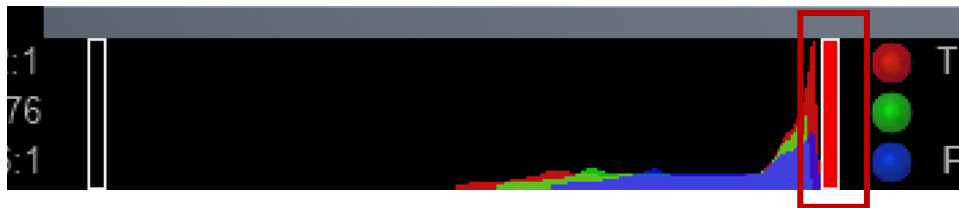
## RAW NOISE LEVEL BAR

The RAW noise level bar displays the amount of pixels in the image that are in noise. For example, if the bar is about 1/8 of the total height, this would indicate approximately 1/8 of the total pixels in the image are at an exposure level at risk of displaying noise when pushed at higher ISO or FLUT values in postproduction.



## RAW CLIP LEVEL BAR

The RAW clip level bar displays the amount of pixels in the image that are clipping. For example, if the bar is about 1/4 of the total height, this would indicate approximately 1/8 of the total pixels in the image are at an exposure level at risk of clipping and may not be recoverable by lowering ISO or FLUT values in postproduction.



# RED EPIC® OPERATION GUIDE

## SIDE HANDLE

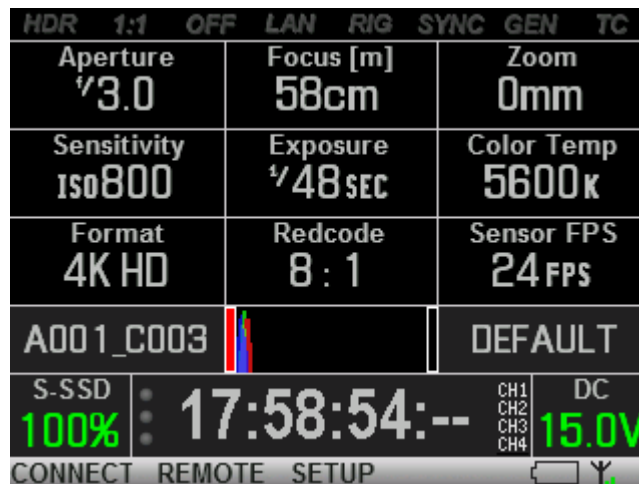


As you navigate and adjust settings on the camera (main menu settings only), they will be reflected on the Side Handle LCD display.

The display elements include:

- **Power:** Camera power status (DC Shown)
- **Frame Rate:** Image capture rate
- **Resolution** Recording Resolution
- **Quality:** REDCODE setting
- **ISO Rating:** Camera sensitivity
- **Shutter Speed:** Exposure Time (or Degrees)
- **White Balance:** Color Temp

## REDMOTE



The display elements include:

- **Camera ID:** Displays camera ID (DEFAULT shown)
- **Wireless Status:** Displays signal strength when connected wirelessly
- **Battery Indicator:** Displays battery life or charge status (shown) of REDMOTE
- **Resolution** Recording Resolution
- **Quality:** REDCODE setting
- **Frame Rate:** Image capture rate
- **ISO Rating:** Camera sensitivity

# RED EPIC® OPERATION GUIDE

- **Frame Rate:** Current frame capture rate
- **Shutter Speed:** Exposure Time (or Degrees)
- **White Balance:** Color Temp
- **Resolution** Record Resolution
- **Quality:** REDCODE setting
- **Clip Filename:** Filename of the clip that will be shot
- **Project Frame Rate:** Current project TIME BASE
- **Clip Meter:** RGB sensor RAW clipping status
- **HDR Mode:** Displays HDRx mode status
- **False Color Mode:** Displays false color overlay mode
- **Magnify:** Tallies 1:1 if magnify is selected
- **TC:** Indicates presence of valid SMPTE timecode signal
- **Gen:** Indicates presence of valid Genlock signal
- **Sync:** Timecode Jam Sync status
- **RIG:** Indicates 3D rig metadata is present
- **LAN:** Indicates communication via Ethernet connection
- **Media Status:** Media location and remaining media capacity in %
- **Power:** Indicates D.C supply voltage or % of remaining battery capacity Including current supply voltage
- **Audio Meter:** Audio input selection and levels
- **Timecode:** Current timecode value
- **Histogram:** Displays histogram

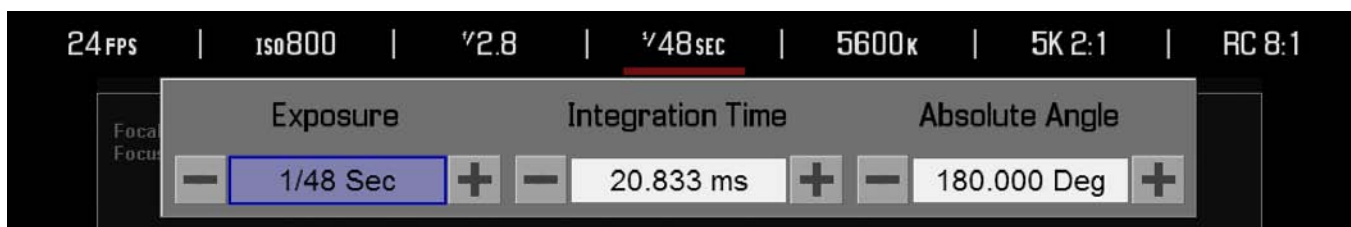
## NAVIGATING MENUS

The primary method to navigate Menus is via the Scroll Wheel on the REDMOTE or Side Handle. Rotate clockwise to move right, counter clockwise to move left. However, the Left and Right direction Navigation Keys (REDMOTE or Side Handle) or Adjustment Ring (Side Handle) may also be used for this purpose.

The Up and Down direction Navigation Keys provide additional navigation functions when pressed:

**UP** Selects Advanced Settings menu.

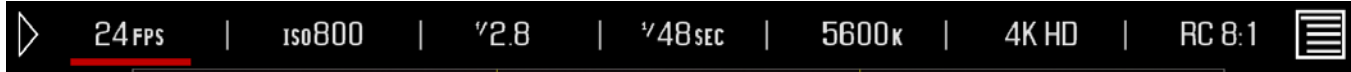
**DOWN** Selects standard Settings menu.




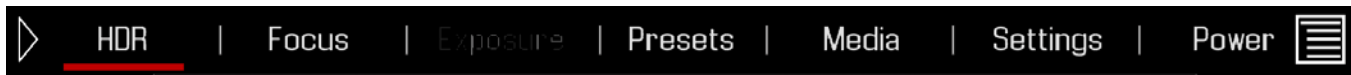
As an example, position the Cursor under the Shutter Speed (24FPS) icon and press the UP Direction Key to access advanced adjustment values for Shutter Speed.

## USING TOUCHSCREEN LCD

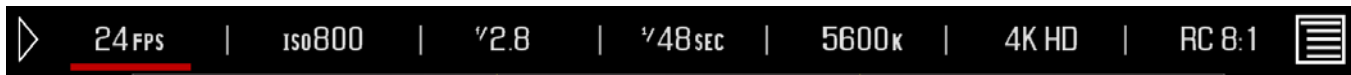
If operating a Touchscreen LCD, camera menu navigation may be made through finger gestures.



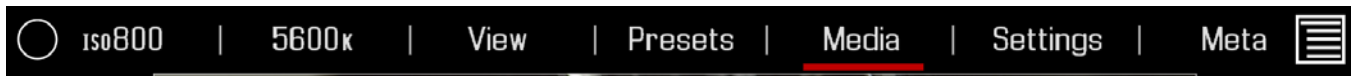
- To adjust a parameter value, simply touch it, and then swipe the finger left / right to adjust its value.
- To access an advanced parameter settings display, press and hold down on the parameter icon.
- Touch anywhere outside the overlay windows to enter the value changes and to hide the sub-menus.
- To enter the Secondary Menu, touch the MENU icon. 



- To return to the Main Menu, touch the MENU icon again.
- To access the Playback function, touch the arrow.



- To exit the Playback function, touch the circle.



## SHORTCUTS

Along the lower status row, menu items can be accessed by simply touching that section of the screen.



**NOTE:** The upper menu options do not change when you select the below items. You are taken directly inside of that menu item.

- Touching Clip Settings at the lower Left corner of the LCD will display the System Status screen. Refer to SECONDARY MENU > SETTINGS > MAINTENANCE > SYSTEM STATUS for complete information.
- Touching the RGB Histogram will bring up the False Color overlay menu. Refer to SECONDARY MENU > SETTINGS > DISPLAY > FALSE COLOR for complete information.
- Touching System Status in the lower Center of the screen will bring up the Settings menu. Refer to SECONDARY MENU > SETTINGS for complete information.
- Touching Media Status indicator will bring up the Media menu. Refer to SECONDARY MENU > MEDIA for complete information.
- Touching Power Status indicator will bring up the Power menu. Refer to SECONDARY MENU > POWER for complete information.


# RED EPIC® OPERATION GUIDE

- Touching the Audio Meter will display the Audio Input menu. Refer to SECONDARY MENUS > SETTINGS > AUDIO/VIDEO for complete information.

## POWER DOWN

**NOTE:** Camera will automatically power down if supply voltage drops to 11.5 Volts.

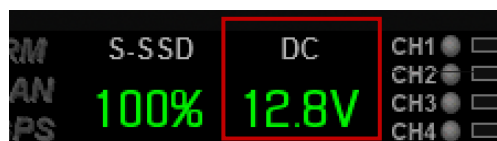
## POWER MENU

1. Select the MENU icon  in the right corner of the Upper Status Bar to reveal the Secondary Menus.
2. Select POWER.
3. Select SHUTDOWN.
4. The camera will immediately power down.



## USING POWER STATUS DISPLAY



1. Select the POWER status located between the audio channels and media remaining indicator, to reveal the same menu illustrated above.

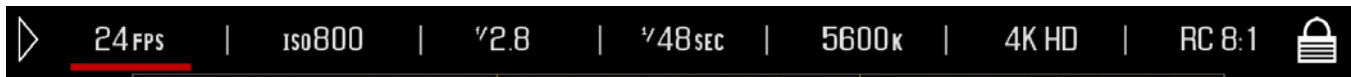


2. Select SHUTDOWN.
3. The camera will immediately power down.



## LOCK / UNLOCK TOUCHSCREEN OPERATION

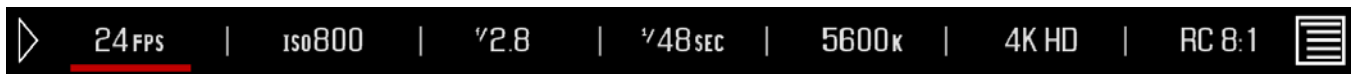
### LOCK

To lock out the touchscreen operation, touch and hold the MENU icon  until the LOCK icon  displays; indicating the touchscreen has been locked out. When locked, the main menu will be displayed.



### UNLOCK

To unlock out the touchscreen and allow normal operation, touch and hold the LOCK icon  until the MENU icon  displays; indicating the touchscreen has been unlocked.



## FIRST TIME USE – SETTING UP YOUR RED EPIC

### 1. ATTACH POWER SOURCE

If a REDVOLT battery is installed in the Side Handle and DC power is connect through the DC IN connector, the DC IN power supply has priority and will power the camera instead of the battery.

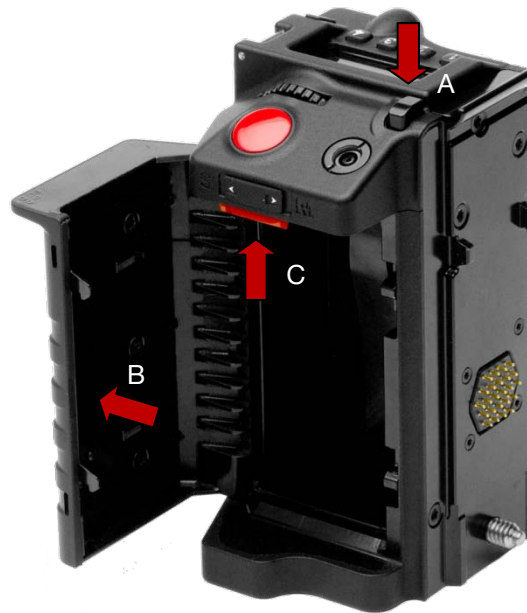
#### BATTERY

Connect a RED battery to the camera in one of the following ways:

#### SIDE HANDLE

Attach a Side Handle and insert a REDVOLT battery.

#### INSTALL



1. Press the battery door release button (A).
2. Open battery door (B).
3. Press upwards on retainer (C).
4. Insert a REDVOLT battery until it is fully seated and retainer (C) clicks into place.
5. Close battery door.

## REMOVE

1. Press the battery door release button (A).
2. Open battery door (B).
3. Press upwards on retainer (C) to release battery.
4. Remove battery from side handle.

## QUAD BATTERY MODULE

Attach a Quad Battery Module and insert one or more REDVOLT batteries.

## INSTALL

Insert battery into desired location and press until a click is heard and battery is seated.

## REMOVE



1. Press the battery eject button (A) for desired battery.
2. When battery pops out, remove battery from battery module (B).

## RED BRICK

Attach to the camera using a V-Plate and 2B-to-1B Power Adapter Cable P/N 790-0138 to the DC IN connector.

## DC POWER

Connect a DC power source to the camera in one of the following ways:

- Plug the RED AC Power Adapter into AC power, and the LEMO connector to the DC IN connector.
- Plug the RED CHARGER into AC power, and the LEMO connector to the DC IN connector via 2B-to-1B Power Adapter Cable P/N 790-0138.
- Plug a 12V XLR based power source into the DC IN connector via adaptor cable P/N 790-0164.

**NOTE: The maximum sustainable power load of the DSMC AC Power Adapter is 150W (15V@10A). The output of the adapter is over current protected, and will shut down if an excess load condition occurs. If the output trips for any reason, remove any external loads from the camera, such as lights, motors etc, turn off the Adapter and repeat the above procedure.**

## 2. POWER UP

Locate the camera's Power ON / OFF button on the right face of the Brain. If the Power Status LED is illuminated Red, depress and then release the Power / Record button. If not illuminated, check your battery charge status or external power source cable connection. Once powered up the Power Status LED will illuminate Green, confirming the camera is ready to use.

## 3. PREPARING TO RECORD

Before each days recording, the camera should be prepared as follows:

- Physically set-up camera as desired.
- Verify camera is using the latest firmware version at [www.RED.com/support](http://www.RED.com/support) and if appropriate, upgrade the camera firmware. Refer to APPENDIX A: UPGRADING CAMERA FIRMWARE.
- Insert a blank (or previously used but erasable) REDMAG 1.8" SSD and format it.
- Perform a BLACK SHADING CALIBRATION of the Sensor.
- Check your PROJECT SETTINGS (Time Base, Record Resolution, Record Quality, etc.).
- Frame, focus and record.

## CONNECT AND FORMAT MEDIA

Identify a REDMAG 1.8" 64GB, 128GB or 256GB SSD that has not previously been recorded to, or is not a camera master and may therefore be erased and re-used. Aligned the RED logo of the SSD to the outside, and then push the SSD firmly, but without excessive force, into the slot in the Side SSD Module.

# RED EPIC® OPERATION GUIDE

**NOTE: When fully inserted, the SSD media protrudes slightly from the SSD slot as indicated above.**

When SSD media is inserted into the camera, the camera will recognize if the media is unformatted:

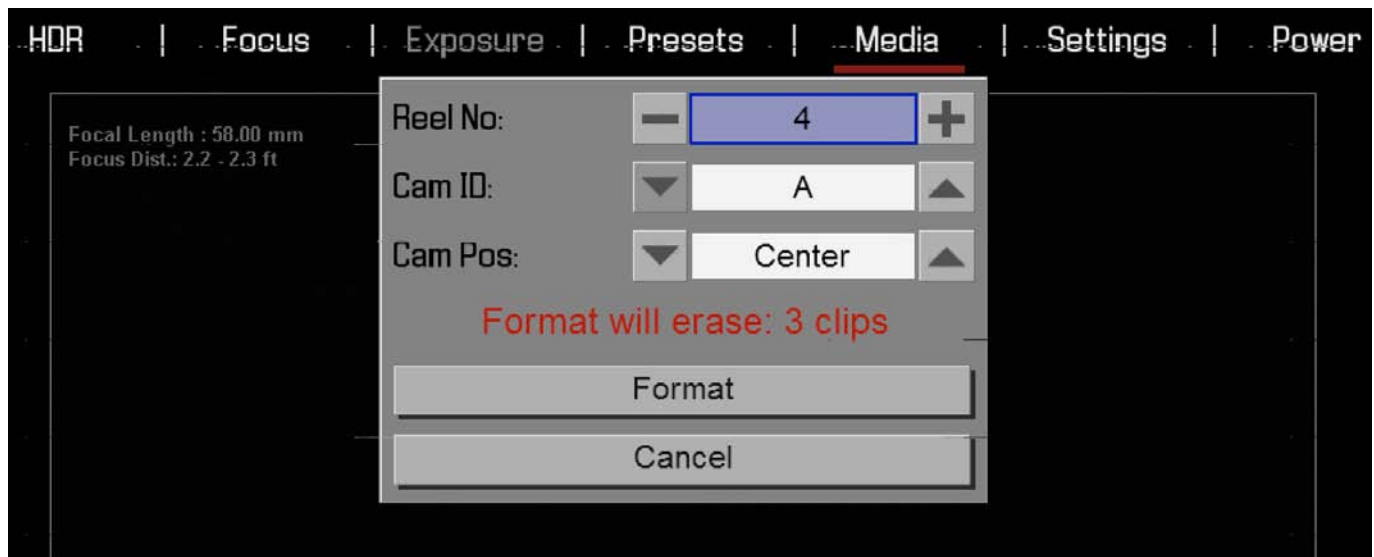
- On LCD, EVF and external monitors, in the media section of the GUI, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").
- On REDMOTE, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").
- On the Side Handle, NA will be displayed (same as if no media is present).

To format the media select SECONDARY MENUS > MEDIA > FORMAT MEDIA.



When FORMAT is selected, a SLATE dialog box will appear allowing you to add Camera Identity and 3D Position properties when formatting. When desired options are set, select FORMAT.

**NOTE: If any clips will be erased on the attached media, you will be informed of the number.**



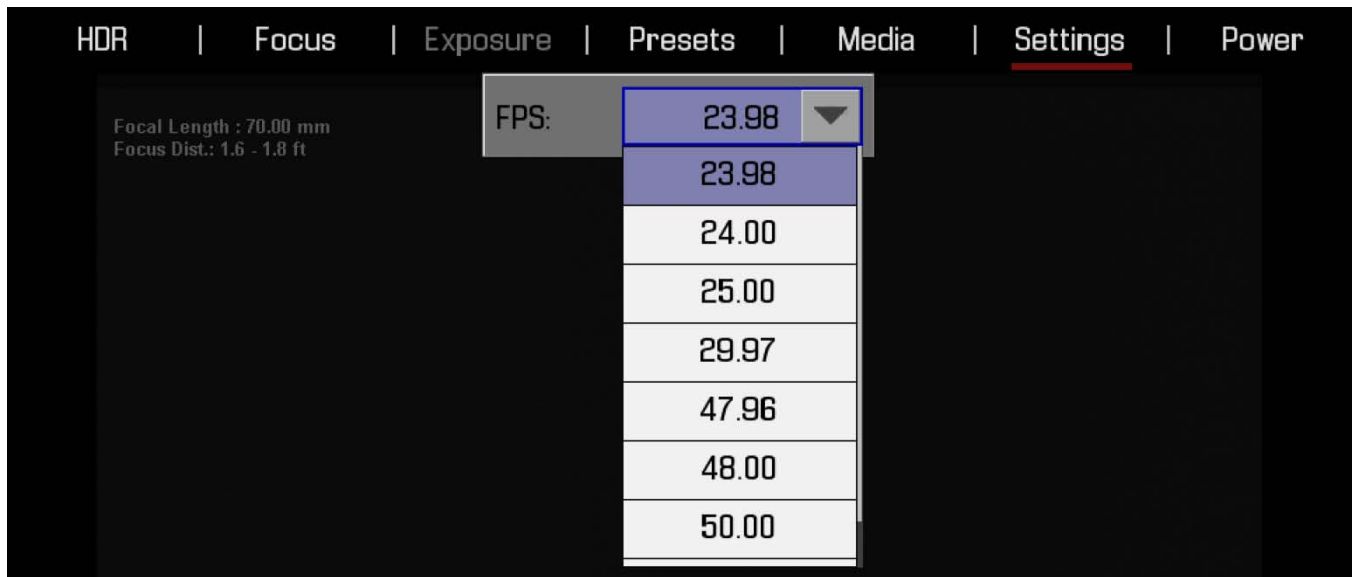
## PERFORM A BLACK SHADING CALIBRATION

Refer to SECONDARY MENUS > SETTINGS > MAINTENANCE > CALIBRATION for complete details for performing a Black Shading Calibration.

## ADJUST PROJECT SETTINGS

### TIME BASE

To adjust the project TIME BASE, press the MENU button on the Side Handle or REDMOTE. Then use the Scroll Wheel or Direction Keys to navigate to SETTINGS > PROJECT > TIME BASE and press ENTER. Adjust to the desired value using the Scroll Wheel and press ENTER once more to confirm.



If using a Touch Screen, select SECONDARY MENU > SETTINGS > PROJECT > TIME BASE. Adjust by sliding your finger up / down or tapping on the desired value, and then press anywhere else on the touch screen to confirm.

The following TIME BASES are currently available:

- 23.98 fps
- 24.00 fps
- 25.00 fps
- 29.97 fps
- 47.96 fps
- 48.00 fps
- 50.00 fps
- 59.94 fps

**NOTE: A project can only support one Time Base as this defines the frame count to be used for time code and as the clip playback and editing frame rate. It is also the primary frame rate for acquisition, but variable speed (over-crank and under-crank) recordings can be made above and below this base frame rate using the VARISPEED menu.**

## RECORD RESOLUTION



To adjust Record Resolution, navigate the Cursor to the RESOLUTION icon in the Upper Status Row and press the Navigation Group ENTER key. Adjust to the desired value using the Scroll Wheel and press ENTER a second time to confirm.

If using a Touch Screen, press the RESOLUTION ICON, adjust RESOLUTION by sliding your finger left / right, or tap on the desired resolution, and then press anywhere else on the touch screen to confirm.

The following Recording Resolutions are currently available:

- 5K
- 5K ANA
- 3K
- 5K 2:1
- 4K
- 2K
- 5K WS
- 4K HD
- 2K WS

## RECORD QUALITY (REDCODE)



To adjust Record Quality, navigate the Cursor to the QUALITY (RC) icon using the Navigation Group Scroll Wheel, then press the ENTER key. Adjust to the desired value using the Scroll Wheel and then press ENTER to confirm. Available REDCODE compression options are RC 3:1 through RC 18:1.

If using a Touch Screen, press the QUALITY icon, adjust the REDCODE value by sliding your finger left / right or tap on the desired value, and then press anywhere else on the touch screen to confirm.

Default value for REDCODE is 8:1.

## CAMERA ID (SLATE)

If operating on a multi-camera production, enter a different Camera ID for each camera; otherwise skip this step; the camera is ready to shoot.

The Camera ID is set when the media is formatted. Refer to **ADVANCED MENU > MEDIA** for details.

## 4. RECORDING

Ensure a formatted REDMAG 1.8" SSD is inserted in the camera's Side SSD Module, then fully depress any one of the RECORD buttons located on the Brain, Side SSD Module, Side Handle or REDMOTE.

# RED EPIC® OPERATION GUIDE

Fully depress again to stop recording. The camera will automatically create a unique and sequential file name for each clip recorded on the SSD based on the Camera's I.D set in the MEDIA menu.

REDCODE RAW data recordings store the Color Temperature and Exposure (ISO) and any RGB color processing values you use in the monitor path as metadata. This metadata is used in REDCINE-X or other postproduction software as initial white balance, exposure and color correction points however, you are free to change these values at any time when you process the RAW footage.

Time Code and Edge Code values used by the camera are Non Drop Frame (NDF); Drop Frame (DF) is not supported. Audio is captured uncompressed at 24-bit resolution, 48KHz sample rate per channel.

Digital media such as REDMAG 1.8" SSDs are very robust, but should be treated with equal care as exposed film or a videotape master. We recommend storing digital media that contains your footage in a secure location and backing up the data to a digital archival media, such as data tape or hard disk drive.

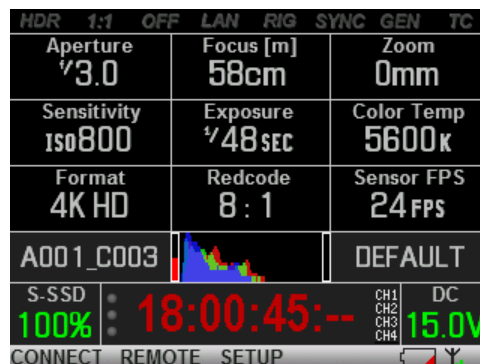
## RECORD INDICATOR

When recording, the RED DSMC camera provides a variety of record indications (tallies):

- Timecode, normally displayed in white colored text, will be displayed in red colored text.
- A small Red dot will appear in the top right corner of the VIEWFINDER output(s).



- The REC LED on the right side of the camera Brain will illuminate Red.
- REDMOTE upper LED will illuminate Red, and the Timecode will turn Red.



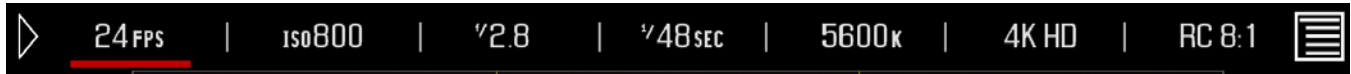
- If using a BOMB-EVF, the LED on the front will illuminate Red if Tally is enabled

# RED EPIC® OPERATION GUIDE

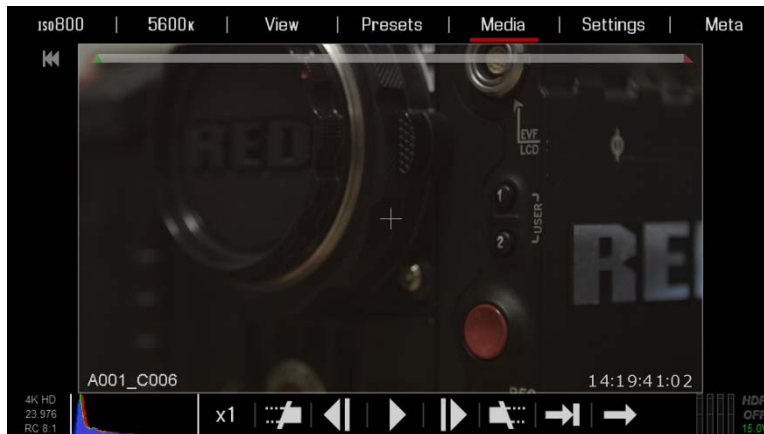
- SMPTE-RP188 timecode VITC-2 HANC metadata record flag will be enabled on HD-SDI outputs.
- If enabled in the USER KEYS menu, the GPO trigger output in the CNTL connector will pulse.

## 5. PLAYBACK

Playback is available on the RED DSMC Camera by going to SECONDARY MENU > SETTINGS > PLAYBACK or by touching the Playback arrow icon in the upper Left corner of the GUI.




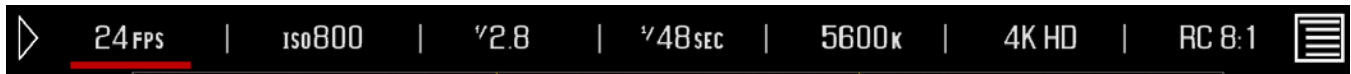
The Playback function will display.



For complete details, go to SECONDARY MENU > SETTINGS > PLAYBACK.

## MENU CONTROLS

Displayed in the Upper Display Group of the VIEWFINDER output(s), are FRAMERATE (FPS), EXPOSURE (ISO),  $f$  (F/Stop), WHITE BALANCE, RESOLUTION, and QUALITY (REDCODE). These parameters are adjustable directly through this screen. When using the touchscreen, directly to the right of these parameters is the MENU icon  which when pressed will take you to the secondary camera set up menus.



## ADJUSTMENTS

### BASIC SETTING ADJUSTMENTS

#### SIDE HANDLE / REDMOTE

- The MENU button can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.
- Navigate to the desired setting using the NAVIGATION GROUP direction keys and press ENTER.
- Use the Scroll Wheel or Adjustment Ring to increase or decrease the parameter value.
- When the desired value has been selected, press ENTER to set.

#### BASIC ADJUSTMENTS USING SIDE HANDLE ONLY

Although not recommended, the Side Handle can be used stand alone to make basic adjustments to FPS, ISO, Shutter Speed, Resolution and REDCODE located on the Main Menu screen. Use the Navigation Group to make these adjustments while watching the cursor placement under the desired setting on the side handle LCD. When desired setting is selected, press the Enter button to access, then use the Scroll Wheel, Directional Pad or Adjustment Ring to make changes. When done, press the Enter button again to set the changed parameter. The MENU button can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.

#### TOUCHSCREEN

- The MENU ICON can be used to ENTER the secondary menus, as well as CANCEL inside lists and for navigating back up menus.
- Touch the desired parameter for adjustment.
- Slide your finger across the screen to scroll through the available parameter values.
- When desired the parameter value has been selected, touch anywhere in the screen area to set.

- To close an alpha numeric keypad when entering information directly, tap anywhere on the screen outside the keypad.

## ADVANCED SETTING MENUS

At this time, only FRAMERATE, F-STOP, SHUTTER SPEED and WHITE BALANCE on the MAIN MENU have advanced settings and

## SIDE HANDLE / REDMOTE

1. Navigate to the desired setting using the NAVIGATION GROUP direction keys and then press the UP directional key.
2. Use the direction keys to navigate to the desired parameter adjustment field and press ENTER to confirm.
3. Use the Scroll Wheel to adjust the selected parameter value.
4. When desired selection is made, press the MENU button to set.

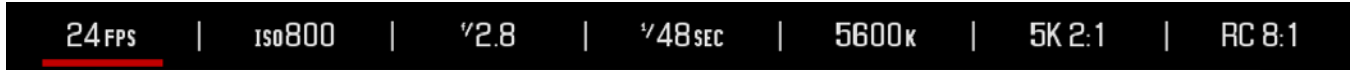
## TOUCHSCREEN

1. Press and hold the desired parameter to gain access to advanced setting adjustments.
2. Press the field - a keypad type menu may appear to allow adjustments.
3. Press the desired parameter settings to adjust.
4. When desired selection is made, press anywhere in the screen area to set and exit the advanced settings submenu.

# RED EPIC® OPERATION GUIDE

## MAIN MENU

Available options under the MAIN MENU are FRAMERATE (FPS), ISO (SENSATIVITY), F STOP, 1/SEC (EXPOSURE), WHITE BALANCE, RESOLUTION, and QUALITY (REDCODE).



## FPS

Used to select an image capture frame rate that differs from the Project's TIME BASE frame rate.

Ranges are as follows:

- 1 sec – 300 fps (2K 2.4:1)
- 1 sec – 120 fps (4K HD)
- 1 sec – 96 fps (5K ANA)
- 1 sec – 120 fps (5K 2.4:1)
- 1 sec – 96 fps (5K FF)
- 1 sec – 96 fps (5K 2:1)

Default is 24 fps (or the selected Project TIME BASE frame rate if not 23.98 or 24.00 fps). 1 sec translates to 1 second per frame.

Available frame rate is dependent on Resolution and REDCODE settings. Refer to RECODE > REDCODE OPTIONS FOR VARIOUS FRAME RATES table.

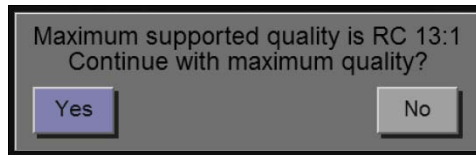
## VARISPEED

When a frame rate other than the current TIME BASE has been selected, the FPS text will turn Yellow and VARISPEED will be shown where the Audio Meter is normally displayed at the lower right of the display.



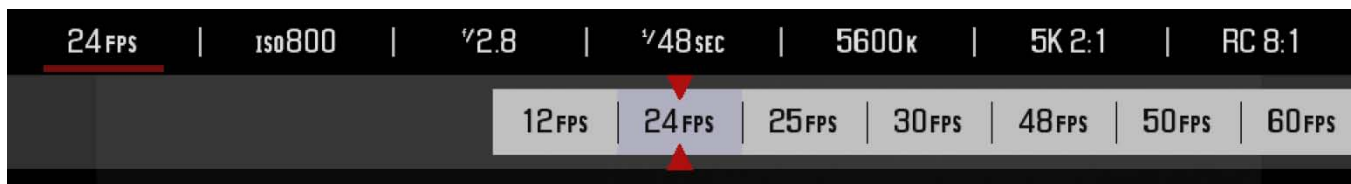
# RED EPIC® OPERATION GUIDE

If you press record with a frame rate set too high for the selected record quality, you will be prompted to allow the camera to change the REDCODE setting to the maximum quality that enables that frame rate. REDMOTE will also display this message.

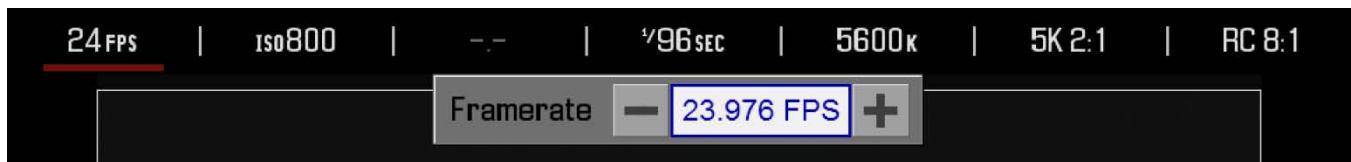


## BASIC SETTINGS

Provides quick selection of the most common VARISPEED frame rates.



## ADVANCED SETTINGS



When selected a numerical keypad will appear allowing the desired VARISPEED Framerate to be entered in 1 fps increments. Maximum frame rate is a function of RECORD RESOLUTION and REDCODE settings. Granularity is 0.001 FPS.



On Touchscreen systems, a Keypad is available for direct numeric entry of the VARISPEED FPS value. Touch the value bounded by the + and - labels to bring up, press outside the keypad to confirm the value.

## ISO (SENSITIVITY)

Adjusts the camera's ISO rating. The sensitivity value is adjustable in 1/3rd stop increments. When the ISO rating is adjusted, the camera logs the change as metadata and the monitor path reacts accordingly. Higher ISO values lead to brighter images in the monitor path, and vice versa.



Range is ISO 250 – 12800

Default is ISO 800

## F STOP

Aperture controls the depth of field of the subject imaged by the camera, and in combination with the shutter speed / angle setting controls the amount of light falling on the sensor. i.e. exposure. Increasing the F stop to a higher number reduces exposure as well as increases the depth of field, decreasing the F stop to a lower number increases the exposure and decreases the depth of field. You can choose either 1/3 or 1/4 stops.



## RED DSMC Ti PL Mount Installed

When a lens equipped with Cooke's S4/i system is attached to the DSMC Ti PL Mount, the camera will display the current aperture (F stop) of the attached lens. This is for information only and on-camera adjustment is NOT available, manual adjustment only as indicated by being Grayed out.



## DSMC Canon Mount Installed

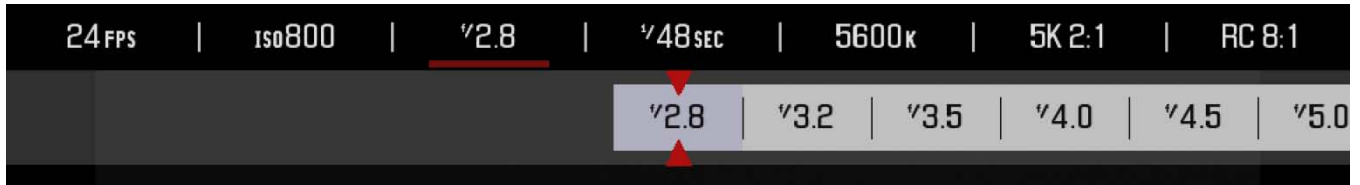
This menu will appear when a DSMC Canon Mount is installed and a Canon EF or EF-S Lens or equivalent is attached (a Non-Canon EF or EF-S Lens may not function as smoothly or accurately). Adjusts the aperture (F stop) of the attached lens.

The attached lens for the example shown is a Canon EF 24-70mm.

# RED EPIC® OPERATION GUIDE

## BASIC SETTINGS

Allows adjustment of the aperture (F stop) of the attached lens. The range will vary depending on the attached lens.



## ADVANCED SETTINGS

When selected, the advanced settings menu allows fine control over the f-stop value under APERTURE and focal distance under FOCUS.



## APERTURE (F STOP)

Provides the ability to enter the F stop value directly.

Range depends on attached lens.

Default depends on attached lens.

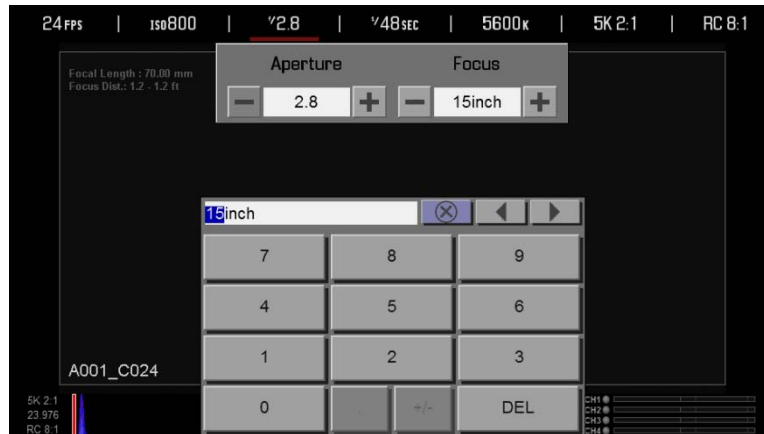


## FOCUS

Provides the ability to enter the focal distance directly.

Range depends on attached lens.

Default depends on attached lens.



## EXPOSURE

### BASIC SETTINGS

Adjusts the exposure of each frame captured by the MYSTERIUM X sensor. Shutter speed presets are provided for all common speeds (and shutter angles) for 24 / 25 fps and 50 / 60 fps project frame rates.



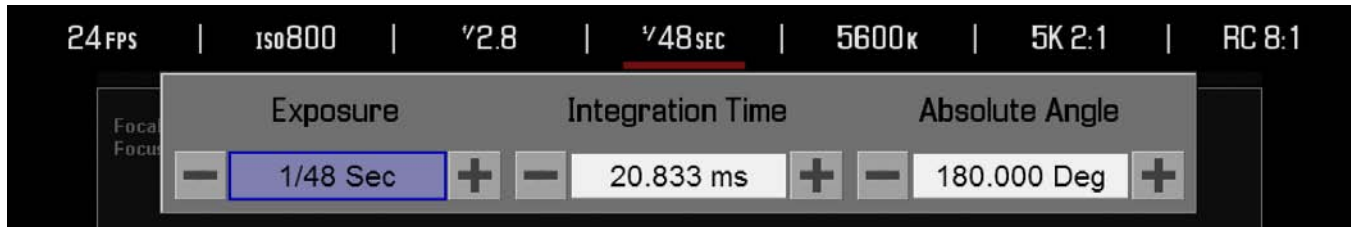
Decreasing Shutter Speed increases the amount of time over which light falls on the sensor, increasing exposure and motion blur on any objects moving within the frame. Increasing Shutter Speed shortens the amount of time over which light falls on the sensor, decreasing exposure and motion blur on objects moving within the frame.

Range is 1/24<sup>th</sup> sec – 1/8000<sup>th</sup> sec - Slowest available speed is 1 second per frame / frame rate, so for 24 fps it is 1/24<sup>th</sup> sec.

Default is 1/48<sup>th</sup> Sec.

## ADVANCED SETTINGS

When selected, the advanced settings menu allows fine control over the Exposure value, and permits entry in any of the three following common units – EXPOSURE (Shutter Speed), INTEGRATION TIME or ABSOLUTE ANGLE (Shutter Angle).

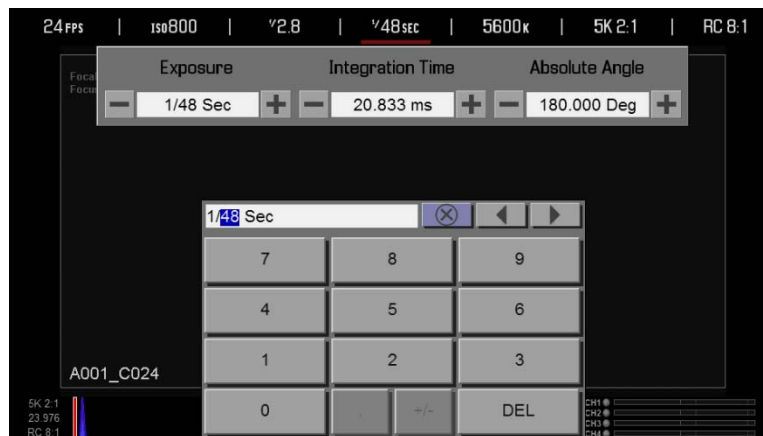


## EXPOSURE (SPEED)

Provides the ability to enter the Exposure value as a Shutter Speed (1/xx sec).

Range is 2 – 1/8000<sup>th</sup> Sec - Slowest available speed is 1/frame rate, so for 24 fps it is 1/24<sup>th</sup> Sec.

Default is 1/48<sup>th</sup> Sec.

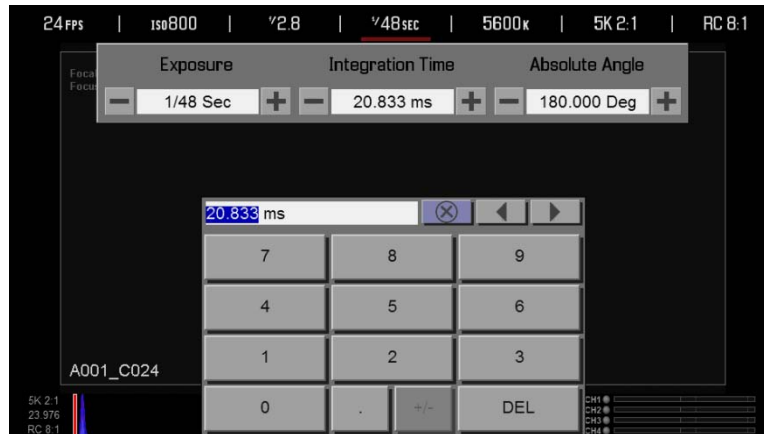


## INTEGRATION TIME

Provides the ability to enter the Exposure value as a Shutter Integration Time (xx milliseconds).

Range is 0.125 to 41.708 mS (milliseconds)

Default is 20.833 MS

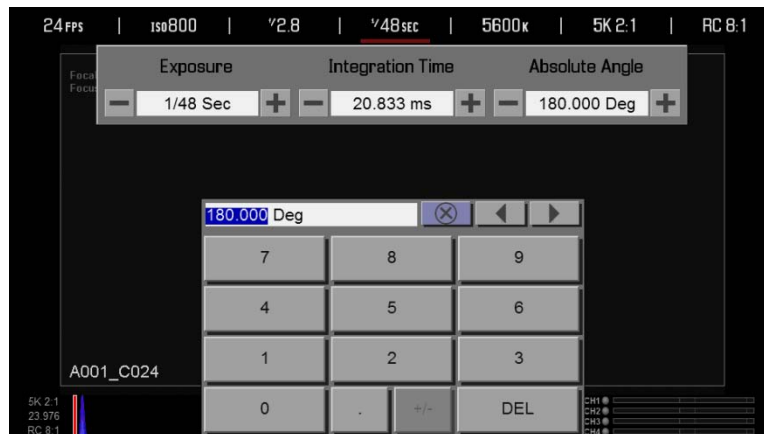


## ABSOLUTE ANGLE

Provides the ability to enter the Exposure value as a Shutter Angle (xx Degrees).

Range is 1.000 to 360.000 Degrees

Default is 180.0 Degrees



As you adjust any of these three parameters, the camera will automatically calculate the equivalent value in the other units, but as a quick reference here are some common Speeds and Angles.

# RED EPIC® OPERATION GUIDE

To Convert Shutter Speed to Angle Equivalent:

Equivalent Degrees = (Shutter Speed x Frame Rate x 360)

E.g. =  $(1/48 \times 24 \times 360) = (8640/48) = 180$

SHUTTER	DEGREES	SHUTTER	DEGREES
1/32	270	1/120	72
1/48	180	1/192	45
1/50	172.8	1/348	22.5
1/60	144	1/696	11
1/96	90	1/1000	8.6

Equivalent Shutter =  $1 / (\text{Frame Rate} \times 360 / \text{Angle})$

E.g. =  $1 / (24 \times 360/180) = 1 / (8640/180) = 1/48$

DEGREES	SHUTTER	DEGREES	SHUTTER
270	1/32	72	1/120
180	1/48	45	1/192
172.8	1/50	22.5	1/348
144	1/60	11	1/696
90	1/96	8.6	1/1000

## WHITE BALANCE

### BASIC SETTINGS

Allows you to manually set Color Temperature in the range from 1,700 to 100,000 KELVIN.



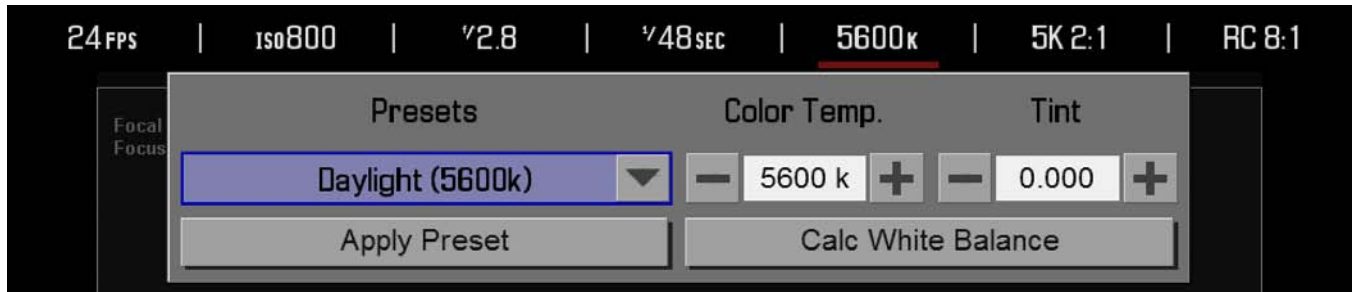
Range is 1,700 K to 10,000 K.

Default is 5600K.

# RED EPIC® OPERATION GUIDE

## ADVANCED SETTINGS

When selected, allows additional adjustment of the White Balance. Available options are PRESET, COLOR TEMP, TINT, and CALCULATE WHITE BALANCE. Press APPLY PRESET for settings to take effect.



## PRESET

Available preset options are:

### SHADE

Preset to 9,000K

### CLOUDY

Preset to 7,500K

### DAYLIGHT

Preset to 5,600K

### FLASH

Preset to 5,500K

### FLOURESCENT

Preset to 4,500K

### TUNGSTEN

Preset to 3,200K

### INCANDECENT

Preset to 2,800K

## COLOR TEMP

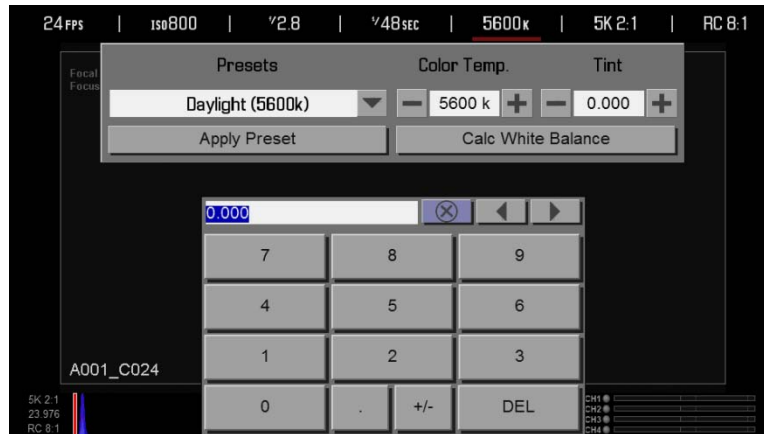
Allows you to manually set Color Temperature in the range from 1,700 to 100,000 KELVIN. Default is 5600K.



## TINT

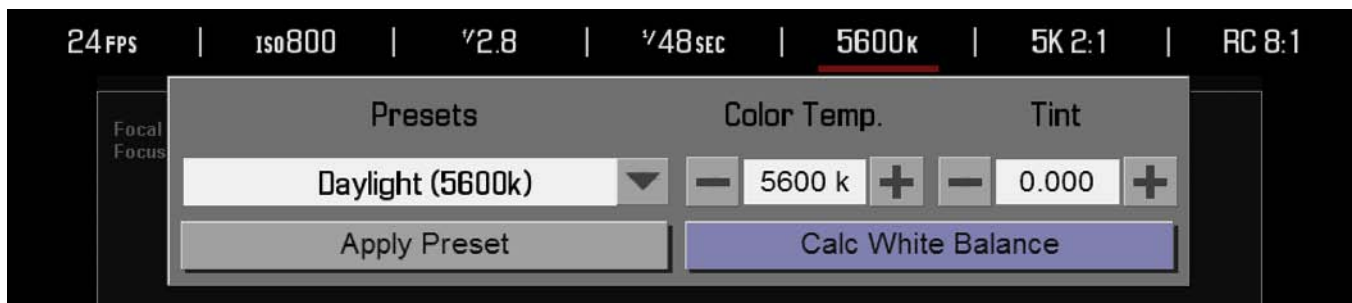
Color Temperature calculations assume a pure light source that may not be true in the specific scene the camera is imaging. To compensate for any residual colorcast, the TINT parameter can adjust the RGB color balance with a compensating Magenta - Green color component. Default is 0.000. When selected, a secondary keypad will appear allowing you to enter the desired Tint value directly.

NOTE: Selecting Calc White Balance calculates a new Tint value. This is maintained if the Color Temp is adjusted via the Color Temp parameter. If you select ANY presets, Tint will be reset to zero, which is the default value.



## CALC WHITE BALANCE

The Calc White Balance function analyzes the central 25% of the image visible in the monitor to calculate a Color Temperature that will render a white object as white.



To use Calc White Balance function, place a White or Gray object under the ambient light, select the Calc White Balance function and then press the Calc White Balance function box. Calc White Balance is also assigned to a User Key on the REDMOTE and Side Handle as a factory default setting.

# RED EPIC® OPERATION GUIDE

## RESOLUTION

Allows adjustment of resolution.



Default is 5K 2:1

The following Resolution options are available:

- 5K
- 5K 2:1
- 5K WS
- 5K ANA
- 4K
- 4K HD
- 3K
- 2K
- 2K WS

Current RED EPIC resolutions listed below with their respective size (in pixels). For a visual reference, see APPENDIX L: RESOLUTION CHART.

RESOLUTION	X (WIDTH)	Y (HEIGHT)
5K	5120	2700
5K 2:1	5120	2560
5K WS	---	---
5K ANA	3296	2700
4K	4096	2160
4K HD	3840	2160
3K	3072	1620
2K	2048	1080
2K WS	---	---

## REDCODE

Allows adjustment of REDCODE settings.



Range is 3:1 to 18:1


Default is 8:1

## REDCODE OPTIONS FOR VARIOUS FRAME RATES

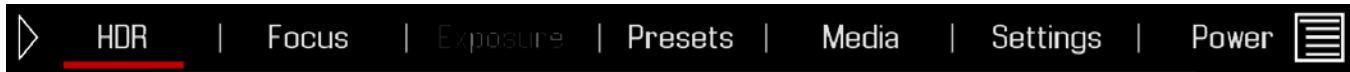
Minimum frame rate is 1 sec per frame; maximum frame rate is a function of REDCODE setting, and record resolution:

FPS	24	25	30	48	50	60	72	75	90	96	100	120	150	175	210	250	288	300
<b>5K FF</b>	RC 3:1	RC 4:1	RC 4:1	RC 6:1	RC 7:1	RC 8:1	RC 9:1	RC 10:1	RC 12:1	RC 12:1	-	-	-	-	-	-	-	-
<b>5K 2:1</b>	RC 3:1	RC 3:1	RC 4:1	RC 6:1	RC 6:1	RC 8:1	RC 9:1	RC 9:1	RC 11:1	RC 12:1	-	-	-	-	-	-	-	-
<b>5k ANA</b>	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 5:1	RC 5:1	RC 6:1	RC 7:1	RC 8:1	RC 8:1	-	-	-	-	-	-	-	-
<b>5K 2.4:1</b>	RC 3:1	RC 3:1	RC 3:1	RC 5:1	RC 5:1	RC 6:1	RC 8:1	RC 8:1	RC 9:1	RC 10:1	RC 10:1	RC 12:1	-	-	-	-	-	-
<b>4K HD</b>	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 4:1	RC 5:1	RC 6:1	RC 6:1	RC 7:1	RC 8:1	RC 8:1	RC 10:1	-	-	-	-	-	-
<b>2K 2.4:1</b>	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 3:1	RC 4:1	RC 5:1	RC 6:1	RC 7:1

## SECONDARY MENUS

Press the Menu button on the REDMOTE / Side Handle or touch the MENU icon  on the LCD to access the Secondary Menu.

Available options in this menu screen are HDR, FOCUS, PRESETS, MEDIA, SETTINGS, and POWER. EXPOSURE is not implemented at this time.



## HDR MENU

Available options are HDR OFF, HDRx and STOPS.

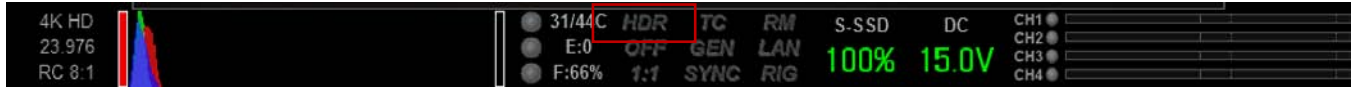
**NOTE: HDR mode cannot be modified when in Magnify 1:1 mode.**



# RED EPIC® OPERATION GUIDE

## HDR ON / OFF

By default, HDRx is OFF (HDR button is illuminated Blue). In the Lower Status Group of the Viewfinder screen, the HDR text is Gray, indicating HDRx is inactive.

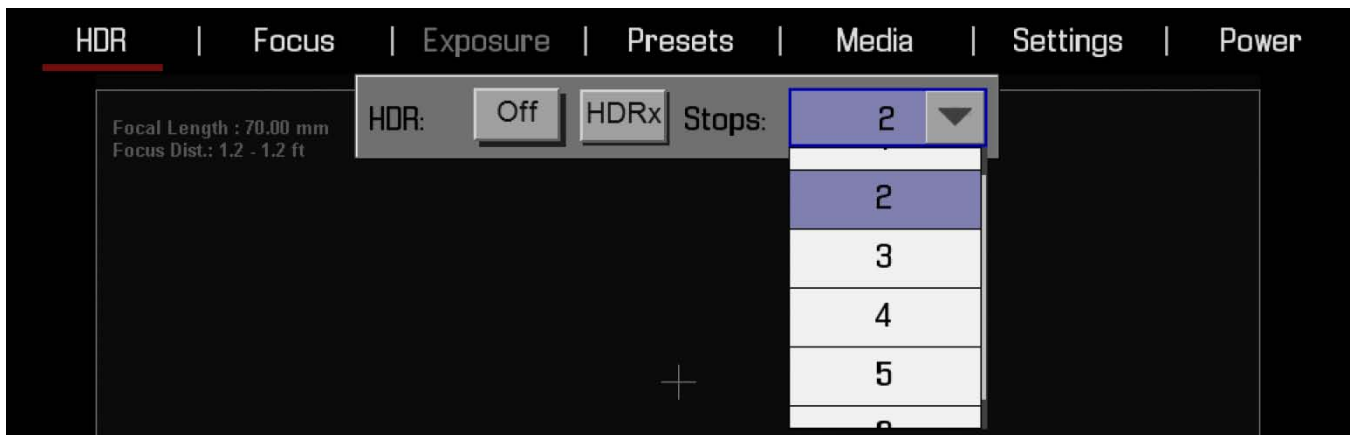


To turn HDRx on, navigate to the HDRx button using the Nav Group and press ENTER, or from the touchscreen directly touch the HDRx button. In the Lower Status Group of the Viewfinder screen, the HDR text will turn White, indicating HDRx is active.



## STOPS

To adjust the STOPS parameter, select the Stops box and use the UP / DOWN arrows to adjust.



Range is 1 to 6.

Default is 2.

## FOCUS MENU

The Focus Menu is used to enable and select Focus parameters including MODE and ZONES.



## MODE

### MANUAL FOCUS

To adjust the MODE parameter, select the Menu box and use the UP / DOWN arrows to adjust. Available options are MANUAL and CONFIRM. Default is MANUAL.

### MANUAL

When selected all focus operations are manual.

### CONFIRM

Enables the Center or Spot focus square for use with manual focus. This mode provides additional focus assistance to the photographer using RED, YELLOW, and GREEN color changes to the focus spot window. Inadequate subject illumination and/or contrast may interfere with normal Focus Confirm operation.

For best results with Focus Confirm, operators should 'rock' the focus ring -- focusing through the point of optimum focusing and back again in decreasing amplitude -- as when 'zeroing-in' for precision manual focus.



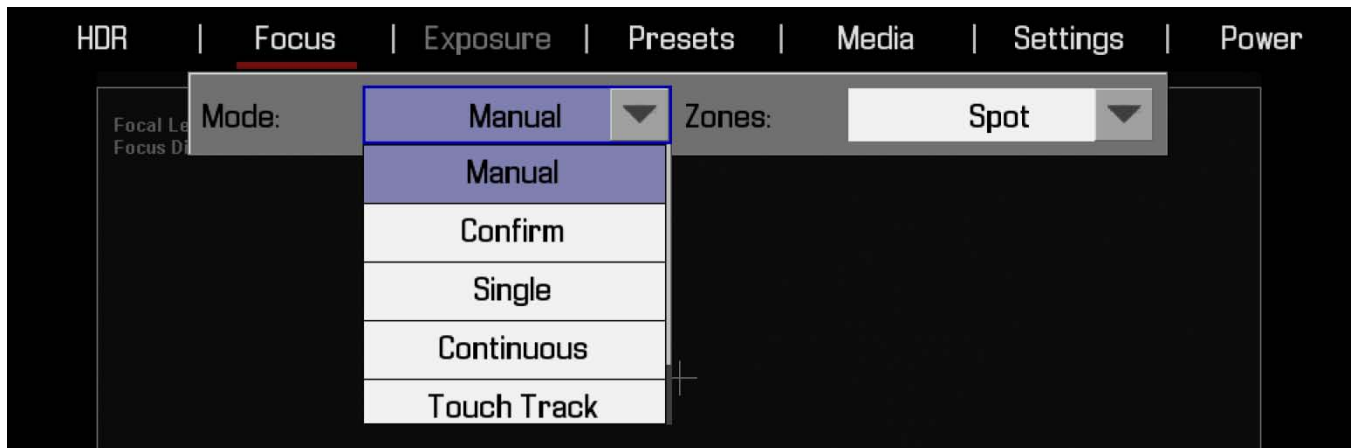
### AUTO FOCUS

**NOTE: The following menu will ONLY appear if a DSMC Canon Mount is installed with a Canon or Sigma lens attached.**

With a DSMC Canon Mount installed and a supported lens attached, available options become MANUAL, CONFIRM, SINGLE, CONTINUOUS, TOUCH TRACK, and RACK. Default is MANUAL.

All settings except MANUAL places a single square (Center) or a single rectangle (Spot) on the screen (depending on the ZONES selection) that indicate where the image is in focus.

Pressing the designated button for spot focus (REDMOTE / Side Handle button A default) will cycle you through each Focus Mode option in order as you press the button repeatedly.



Performance of Auto Focus may be reduced under the following conditions:

- The subject is dark or distant.
- There is inadequate contrast between the subject and background.
- The scene has reflective highlights.
- The subject is backlit.
- There is inadequate surface contrast/detail inside the window.

**NOTE: Edge Mode can be used for additional assistance in these conditions. Refer to SETTINGS MENU > DISPLAY > TOOLS > EDGE.**

## MANUAL

When selected all focus operations are manual.

## CONFIRM

Enables the Center or Spot focus square for use with manual focus. This mode provides additional focus assistance to the photographer using RED, YELLOW, and GREEN color changes to the focus spot window. Inadequate subject illumination and/or contrast may interfere with normal Focus Confirm operation.

For best results with Focus Confirm, operators should 'rock' the focus ring -- focusing through the point of optimum focusing and back again in decreasing amplitude -- as when 'zeroing-in' for precision manual focus.

## SINGLE

A Focus / Record Button half-press performs single-shot AF. Optimized for rapid focus even under low-contrast conditions. Works with both Center and Spot Zones.

## CONTINUOUS

Once engaged with half-press, will attempt to keep objects in AF window in focus. Works best with good lighting and contrast. Works with both Center and Spot Zones.

## TOUCH TRACK

Dynamically updating positionable AF using touchscreen. Works with Spot Zone only. Keep AF Spot on subject while moving across frame, will continuously focus on spot.

## RACK

For quickly selecting two focus points and executing rack focus between them. Focus points are selected using the Touchscreen. Shutter half-press executes rack movement. Works with Spot Zone only.

Rack mode remembers the last Center or Spot position and focus setting as the first rack point. A second rack point needs to be defined by moving the spot window to the desired second location. If the spot window is not moved, a shutter half-press will only cause the lens to execute a single AF adjustment on the original Spot. On the other hand, when two rack points have already been defined, the rack point can be updated by moving the spot to a new location. This will replace the rack point that is not in focus at that moment.

## DSMC CANON MOUNT ELECTRONICALLY SUPPORTED LENSES

Canon EF 100-400mm f/4.5-5.6L IS  
Canon EF 100mm f/2.0 USM  
Canon EF 100mm f/2.8L Macro IS USM  
Canon EF 135mm f/2.0L  
Canon EF 135mm f/2.8 Soft Focus  
Canon EF 14mm f/2.8L II USM  
Canon EF 15mm f/2.8 Fisheye  
Canon EF 16-35mm f/2.8L II  
Canon EF 17-40mm f/4L  
Canon EF 180mm f/3.5L Macro  
Canon EF 200mm f/2.0L IS  
Canon EF 200mm f/2.8L II  
Canon EF 20mm f/2.8 USM  
Canon EF 24mm f/1.4L II  
Canon EF 24-105mm f/4L IS  
Canon EF 24-70mm f/2.8L  
Canon EF 24mm f/2.8  
Canon EF 28-300mm f/3.5-5.6L IS  
Canon EF 28mm f/1.8 USM  
Canon EF 28mm f/2.8  
Canon EF 300mm f/2.8L IS  
Canon EF 300mm f/4L IS  
Canon EF 35mm f/1.4L  
Canon EF 35mm f/2  
Canon EF 400mm f/2.8L IS  
Canon EF 400mm f/4.0 DO IS  
Canon EF 400mm f/5.6L  
Canon EF 500mm f/4L IS  
Canon EF 50mm f/1.2L  
Canon EF 50mm f/1.4 USM  
Canon EF 50mm f/2.5 Compact Macro  
Canon EF 600mm f/4L IS  
Canon EF 70-200mm f/2.8L IS  
Canon EF 70-200mm f/2.8L IS II USM  
Canon EF 70-200mm f/4L

Canon EF 70-300mm f/4-5.6 IS USM  
Canon EF 70-300mm f/4.5-5.6 DO IS USM  
Canon EF 800mm f/5.6L IS  
Canon EF 85mm f/1.2L II  
Canon EF 85mm f/1.8 USM  
Canon EF-S 10-22mm f/3.5-4.5 USM  
Canon EF-S 17-55mm f/2.8 IS USM  
Canon EF-S 18-200mm f/3.5-5.6 IS  
Canon EF-S 60mm f/2.8 Macro USM  
Sigma 10-20mm f/3.5 EX DC HSM  
Sigma 20mm f/1.8 EX DG ASP RF  
Sigma 24-70mm f/2.8 IF EX DG HSM  
Sigma 50mm f/1.4 EX DG HSM  
Sigma 70-200mm f/2.8 EX DG APO Macro HSM II  
Sigma 85mm f/1.4 EX DG HSM  
Sigma APO 50-150mm f/2.8 II EX DC APO HSM  
Zeiss Distagon T\* 18mm f/3.5  
Zeiss Distagon T\* 21mm f/2.8  
Zeiss Distagon T\* 25mm f/2  
Zeiss Distagon T\* 28mm f/2  
Zeiss Distagon T\* 35mm f/2  
Zeiss Planar 50mm f/1.4 ZE  
Zeiss Makro-Planar 50mm f/2  
Zeiss Planar T\* 85mm f/1.4  
Zeiss Makro-Planar 100mm f/2  
Zeiss Distagon T\* 18mm f/3.5  
Zeiss Distagon T\* 21mm f/2.8  
Zeiss Distagon T\* 25mm f/2  
Zeiss Distagon T\* 28mm f/2  
Zeiss Distagon T\* 35mm f/2  
Zeiss Planar 50mm f/1.4 ZE  
Zeiss Makro-Planar 50mm f/2  
Zeiss Planar T\* 85mm f/1.4  
Zeiss Makro-Planar 100mm f/2

## ZONES

Available options are CENTER and SPOT. Default is CENTER. This control allows selection of the boxes used to indicate objects in/out of focus.



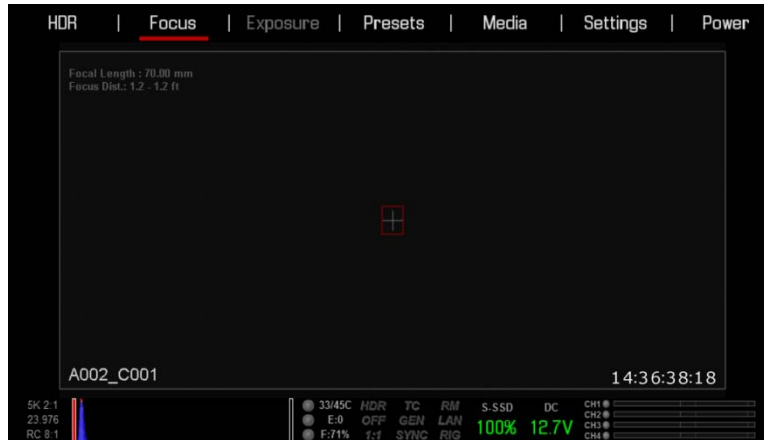
## CENTER

Provides a large, square target for focus. When objects located in the circle are in focus, the square will be Yellow or Green. When objects located in the square are out of focus, the square will be Red.



## SPOT

Provides a small, square target for precise focus (similar to Center focus, only smaller). When objects located in the square are in focus, the square will be Yellow or Green. When objects located in the square are out of focus, the square will be Red.



## SPOT FOCUS INDICATOR

### Moving

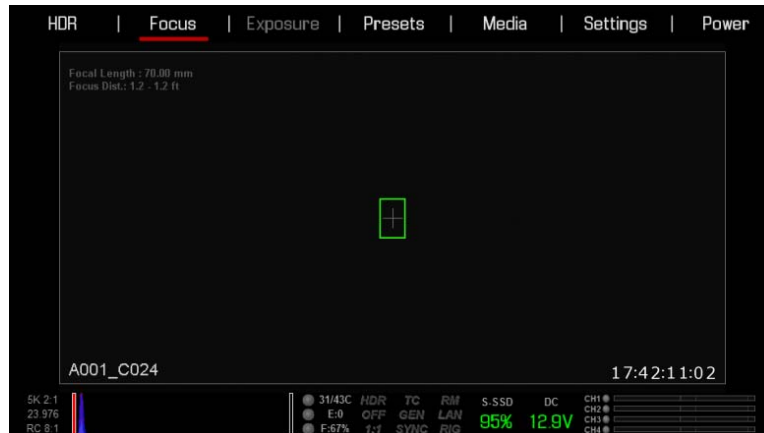
The spot focus square can be moved around the screen.

### Touchscreen

Tap on the spot focus square directly on the touchscreen and drag to the location you wish to relocate the spot focus circle.

## Side Handle / REDMOTE

1. Navigate to the focus menu.
2. Press the down arrow on the Navigation Group.
3. The spot focus square line weight will increase and the Red cursor under FOCUS will dim slightly.



4. Press the ENTER button.
5. Use the directional arrows to move the Spot Focus square to the desired location.



6. To exit:
  - Press the ENTER button, the spot focus square line weight will increase, then press the UP arrow to go back to the FOCUS menu.
  - Press the MENU button.

## Resizing

The spot focus square can be resized using the Navigational Wheel or the Touchscreen.

### Touchscreen

Tap two times on the square directly on the touchscreen to increase size. You can increase the size 3 times. After that, when you double-tap the spot focus square, it will decrease in size.

## LENS INFORMATION DISPLAY

### RED DSMC TI PL MOUNT + LENS

When a RED DSMC Ti PL Mount is installed and a Lens equipped with Cooke's S4/i system (or equivalent) is attached, the Focal Length and Focal Distance is displayed on the LCD, EVF and external monitors.



The focal length and focal distance values and range will vary depending on the attached lens. When the focal length or focal distance of the lens is manipulated, the current values are displayed.

### DSMC CANON MOUNT + LENS

When a DSMC Canon Mount is installed, and a Canon EF or EF-S Lens or equivalent is attached, the Focal Length and Focal Distance is displayed on the LCD, EVF and external monitors. When AF is set to Manual or Confirm mode, the focus distance displays as a pair of Near - Far distances. When it is in AF mode, a single estimated Focus distance is displayed.



The focal length and focal distance values and range will vary depending on the attached lens. When the focal length of the lens is manipulated, the current value is displayed under Focal Length. The Focal Distance can be changed under MAIN MENU > -.- (F-STOP) > ADVANCED SETTINGS.

## EXPOSURE MENU

Not implemented at this time.

## PRESETS MENU

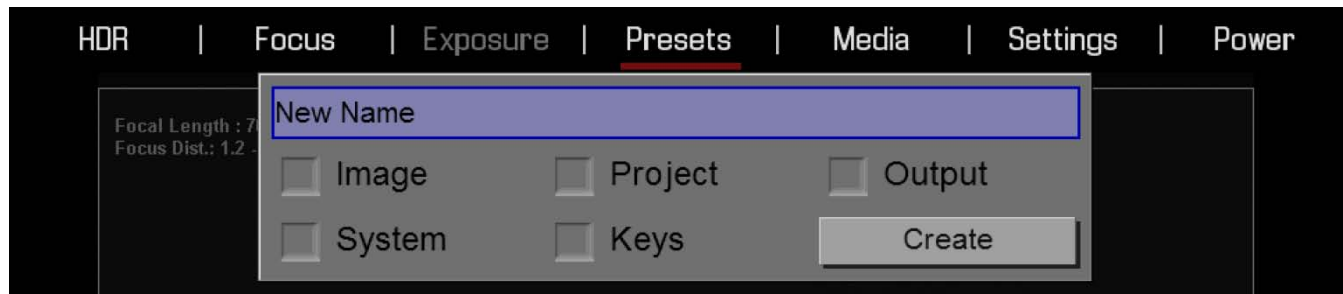
Presets are stored inside the camera. They can be imported / exported to the SSD. The Presets menu is used to create, save and import presets. Available options are APPLY, CREATE, IMPORT/EXPORT and DELETE.



If presets are available, they will be accessible by using the arrow keys in the Preset name field.

## CREATE PRESET

When selected allows you to create your own preset and decide which information will be stored with that preset.



After Preset name is entered and Preset information is highlighted, select CREATE to create your preset and will be taken back to the Preset Main Menu – your new preset shown.

## PRESET NAME

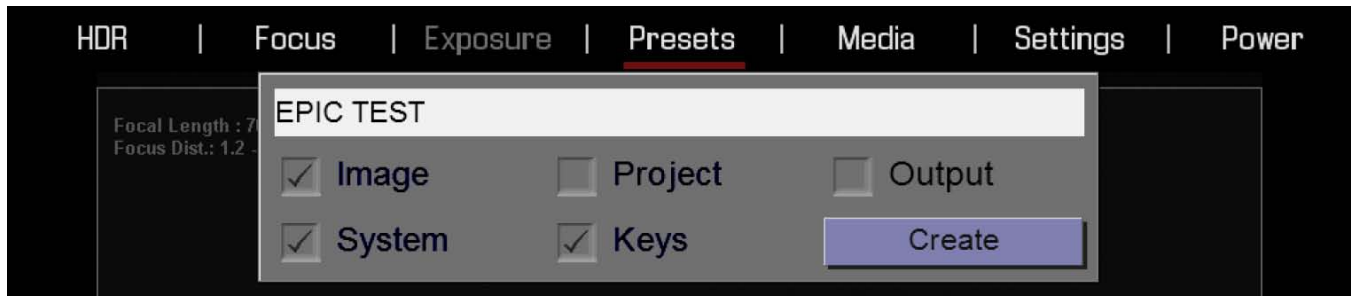
Press the Enter button on the New Name field, a keyboard will appear allowing you to enter the desired preset name.



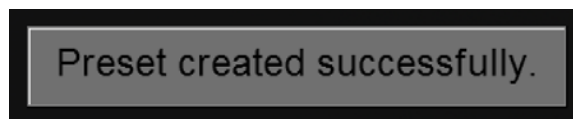
Use the arrow keys and Enter button, enter the desired name. When finished, press the Menu button to close the keyboard.

## PRESET INFORMATION

Use the arrow keys and Enter button to select the information you want to be stored for your preset. Available options are IMAGE, SYSTEM, PROJECT, KEYS, and/or OUTPUT.




When creating a new preset successfully completed, "Preset Created Successfully" will appear and the preset will be listed. REDMOTE will also display this message.



You can then select APPLY to apply the preset to the camera.



When successfully completed, “Preset Applied Successfully” will appear. REDMOTE will also display this message.



Preset applied successfully.

## EXPORT / IMPORT PRESET

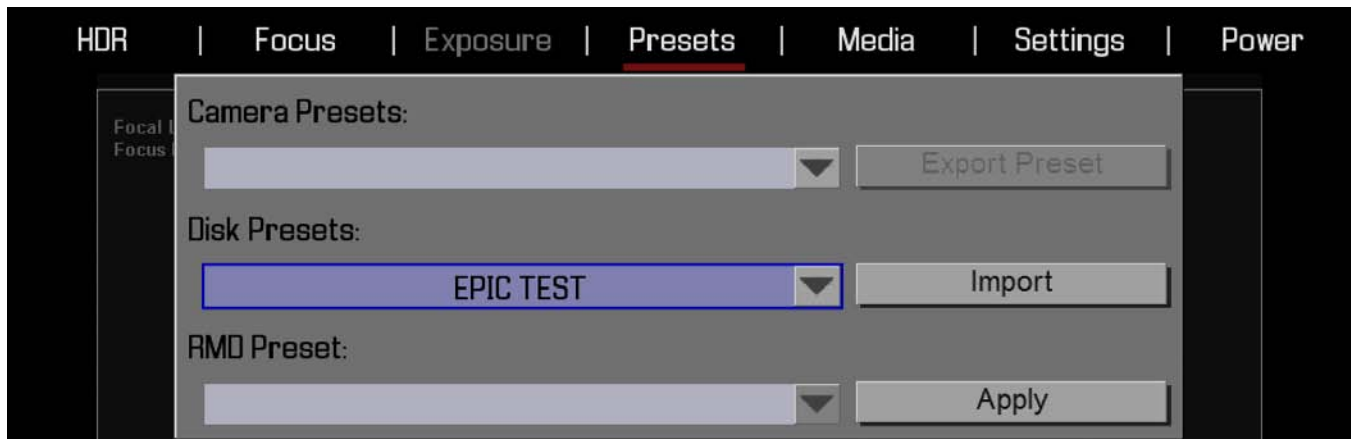
When selected you will be able to export presets from the camera to external memory (1.8” SSD), import presets from the external memory (1.8” SSD) to the camera, or apply available RMD presets.

**NOTE: Exported presets will be located in a folder labeled “Presets” on the CF or 1.8” SSD. This is also the location to place any presets for importing.**

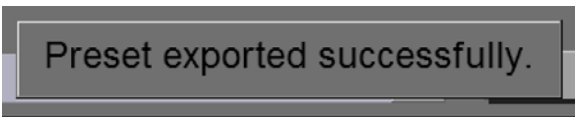
## CAMERA PRESETS

When EXPORT PRESET is selected, this will export the CAMERA PRESETS from the camera to the external memory (1.8” SSD). Once a preset is exported, it will appear as a selection in the DISK PRESETS field.

**NOTE: If external memory is not connected, the Export Preset function cannot be performed.**



When successfully completed, “Preset Exported Successfully” will appear. REDMOTE will also display this message.



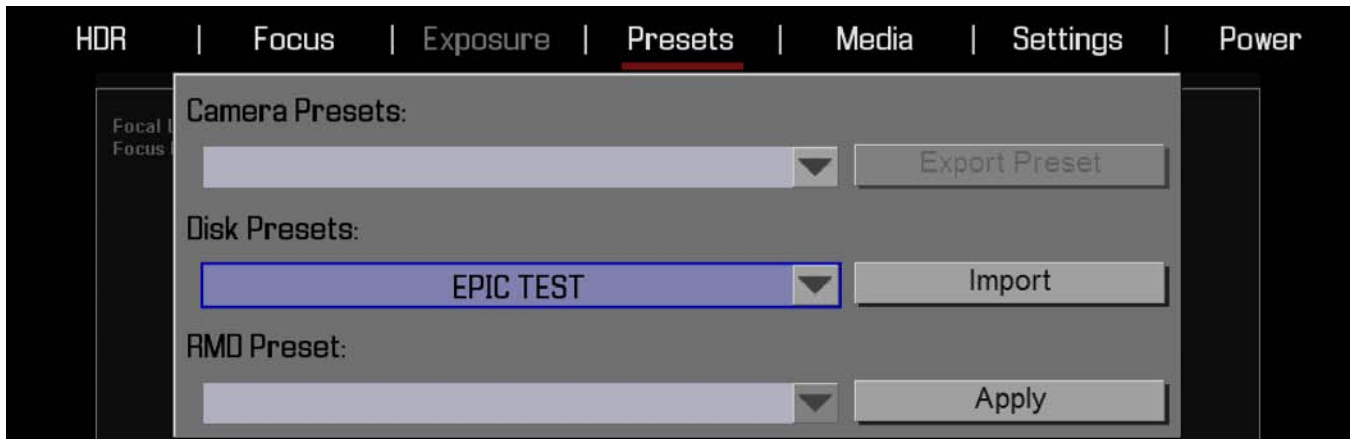
Preset exported successfully.

## DISK PRESETS

When IMPORT is selected, the selected preset will import from external media (1.8” SSD) to the camera. Once imported the preset will be listed under CAMERA PRESETS.

# RED EPIC® OPERATION GUIDE

**NOTE:** If no media is connected or no presets are saved to the media, this selection will remain Grayed out (until a preset is exported of course).



You will then be asked if you want to apply the imported preset.



If **No** is selected, the preset will be imported and listed in the available Camera Presets.

If **Yes** is selected, "Preset Applied Successfully" will appear when successfully completed. The preset will be listed in the available Camera Presets.

Preset applied successfully.

If the preset could not be applied, "Preset Could Not Be Applied" will appear to inform you. Try to set again.

Preset could not be applied.

## RMD PRESETS

If an RMD file exported from REDCINE-X or REDCINE-X PRO is on the SSD it can be imported from the SSD to the camera. When APPLY is selected, the RMD file is transferred to active system memory.

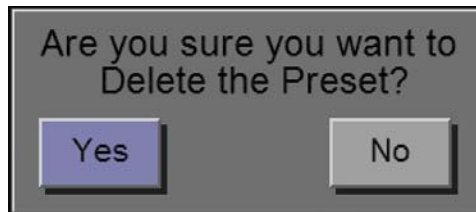
## DELETE PRESET

When selected will delete the selected preset from the camera. It will not delete the selected preset from the external media (1.8" SSD).



**IMPORTANT:** You will not be warned of the deletion nor asked to confirm this deletion. Be sure to save your preset to the external media (1.8" SSD) for later use before deleting the preset from the camera. Once you have deleted the preset, you will either need to create a new one or import and existing one from external media.

You will be asked to confirm if you want to delete the preset. REDMOTE will also display this message allowing you to respond.



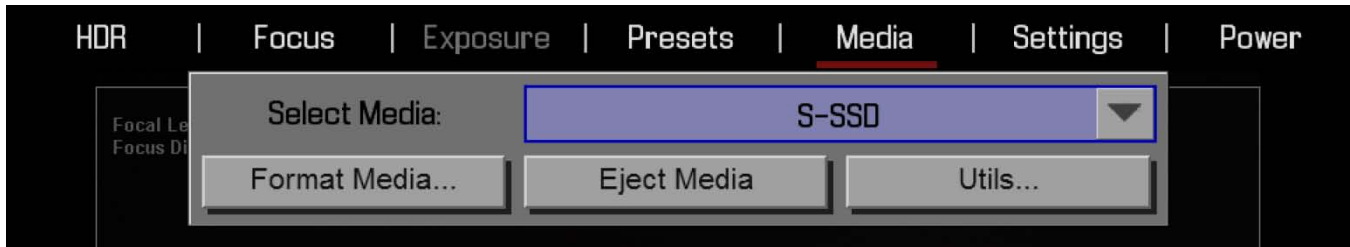
When successfully completed, "Preset Deleted Successfully" will appear. REDMOTE will also display this message.



## MEDIA MENU

The Media Menu is used to format media (SSD) prior to use on the camera as well as to Eject (unmount) the media prior to removal from the camera. Available options when selected are SELECT MEDIA, FORMAT MEDIA, EJECT MEDIA, and UTILITIES.

**IMPORTANT: Media MUST be ejected from the camera before removal to prevent corruption and/or loss of data on media.**

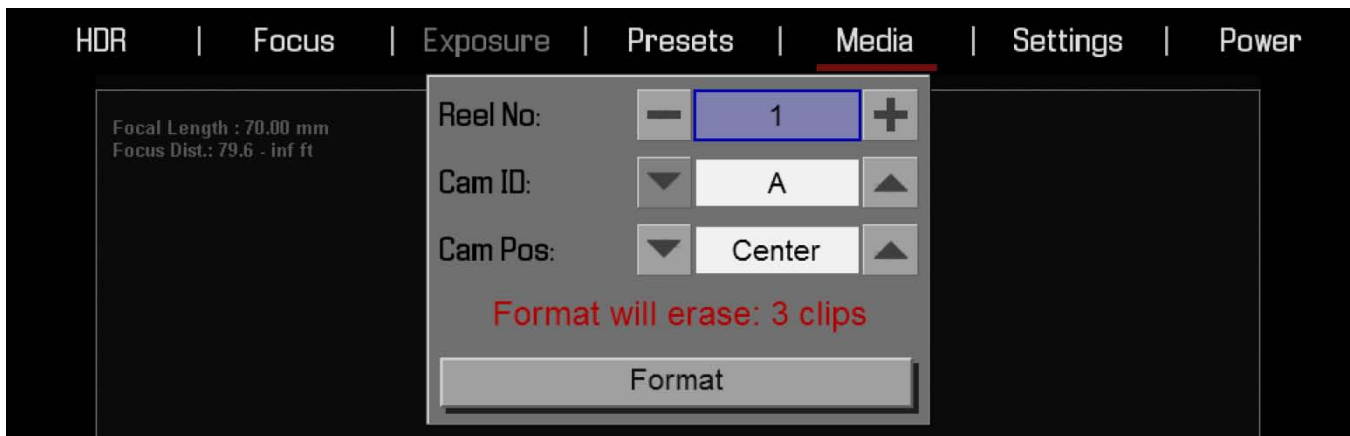


## SELECT MEDIA

Allows you to select the Media location to be used by the camera. Default is the Side SSD (S-SSD) Module.

## FORMAT MEDIA

When selected, a new dialog box will appear allowing you to add properties to the media highlighted in the Current Media box when formatting. Available options are REEL NO, CAM ID, CAM POS, and FORMAT to format the media with the values entered.



**NOTE: If clips are present on the media, you will be informed of how many clips will be erased when you format the media.**

## REEL NO.

When selected a keypad will appear allowing you to enter a value between 1 and 999.

## CAMERA ID (SLATE)

Identifies the camera with a letter A through Z. Default is A.

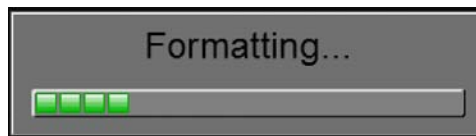
## CAMERA POS (POSITION)

Identifies the camera position as Right, Left or Center. Default is Center.

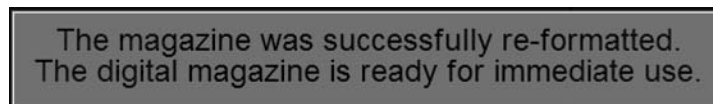
## FORMAT

When selected, formats the media and adds the selected properties.

- During formatting, the camera will display “Formatting” with a Green status bar. REDMOTE will also display this message.



- When formatting is complete, camera will display “The magazine was successfully re-formatted. The digital magazine is ready for immediate use. REDMOTE will also display this message.

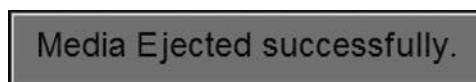


## EJECT MEDIA

When selected will Eject (unmount) the media highlighted in the Select Media box.



When ejected, camera will display “Media Ejected Successfully”. REDMOTE will also display this message.



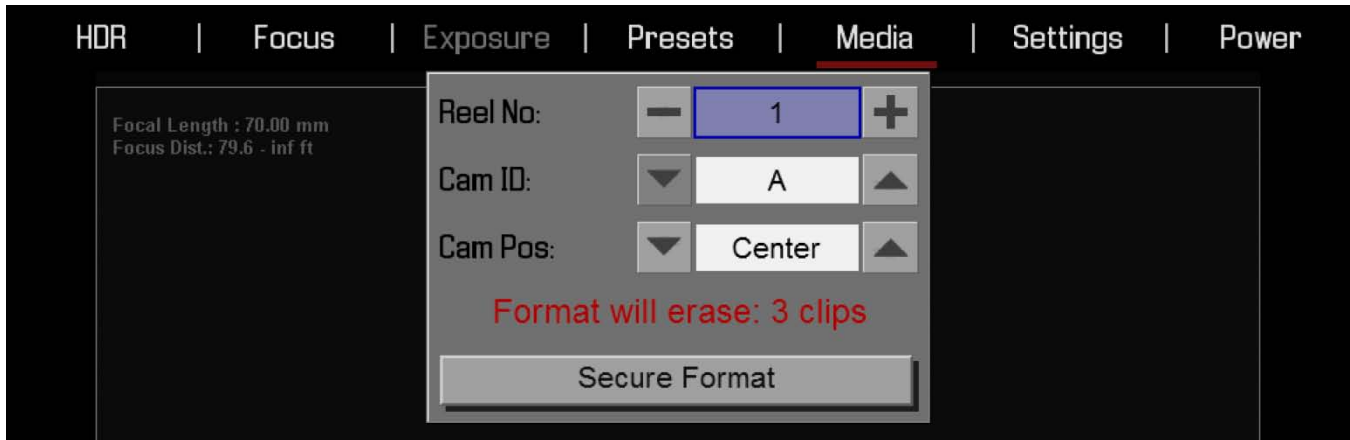
## UTILITIES

Options are SECURE FORMAT.



## SECURE FORMAT

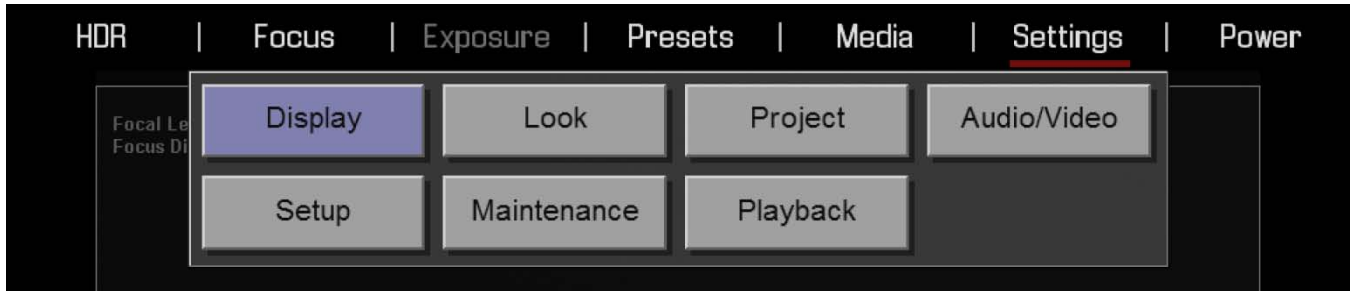
Secure Format is a low-level format that rebuilds the SSD file system. It should only be used if the performance of the SSD is in question.



**NOTE:** If clips are present on the media, you will be informed of how many clips will be erased when you secure format the media.

## SETTINGS MENU

This section describes the various secondary controls available to configure the camera. Menu options are DISPLAY, LOOK, SENSOR, PROJECT, MODES, AUDIO/VIDEO, SETUP, MAINTENANCE, and PLAYBACK.



## DISPLAY

Available options are TOOLS, ZEBRA, OVERLAY, MODES, FRAME GUIDE, AREA GUIDES, and MONITOR.



## TOOLS

The Tools menu permits the operator to adjust the GUI elements displayed on the Viewfinder output(s). Available options are OFF, EXPOSURE, FOCUS, VIDEO, EDGE, MAGNIFY, and RAW. The Dialog is available by either going to SETTINGS > DISPLAY > TOOLS or simply clicking on the histogram in the lower left.



## OFF

Turns off any of the display modes in the first line.

# RED EPIC® OPERATION GUIDE

## EXPOSURE

This will show areas of under exposure (Purple) or over exposure (Red) on top of a monochrome image. The color is based on RAW data so over/under exposure refers to data actually close to clipping in the sensor. When selected, the icon “E√” will be displayed in the Lower Status Group.



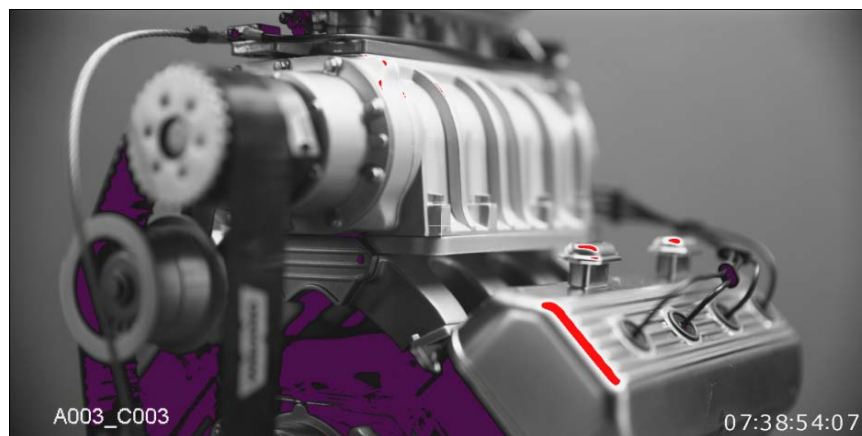
The EXPOSURE meter's color bands provide the following information:

PURPLE	Minimum Exposure
RED	Maximum Exposure

Between minimum and maximum exposure values, the image is displayed as a monochrome image.



In the image, Purple areas represent sensor exposure levels that are likely to be noisy if gained up in postproduction. Red areas represent sensor exposure levels that are at clipping.



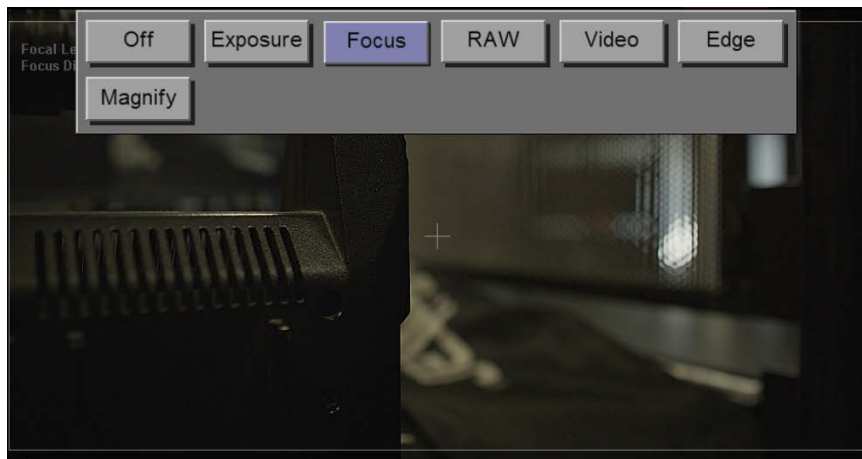
**NOTE:** As EXPOSURE meters sensor RAW information, it is not affected by any RGB domain adjustments - such as ISO rating, FLUT, White Balance, Video Gain or other LOOK information.

**NOTE:** Because the RAW data represents a wider color space than RGB, provided that the Red (clip) color is not present in EXPOSURE view, even if Red (clip) color is present in VIDEO view, the apparently clipped RGB highlights can be recovered in post production by adjustment of ISO, FLUT or changing the KNEE and WHITE values of the CURVE box.

# RED EPIC® OPERATION GUIDE

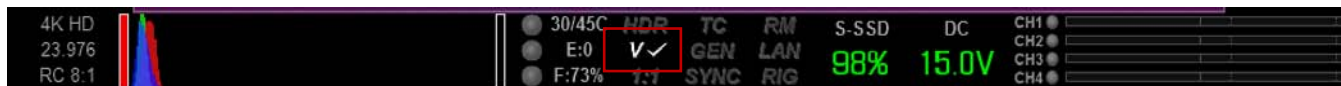
## FOCUS

This will emphasize edges in the image without changing brightness/image content so it is easier to judge if the image is in focus. By adjusting your lens zoom and focus you can see which objects are coming into and falling out of focus. When selected, the icon “F ✓” will be displayed in the Lower Status Group.



## VIDEO

VIDEO displays a multi-color color overlay that allows you to check the video level of the RGB monitor path (calibrated to the SMPTE test signal) and any outputs driven from that path - such as HD-SDI and HDMI. When selected, the icon “V ✓” will be displayed in the Lower Status Group.



Purple represents Super-Black, Dark Blue represents Black, Teal represents 3-stops under 18% Gray, Green represents 18% Gray, Pink represents Skin Tone, Straw represents White, and Yellow, Orange and RED represent various degrees of signal clipping in RGB space.

By adjusting ISO, FLUT and Shadow while looking at VIDEO check, the operator can ensure that Black, White and 18% Gray values conform to the desired levels on the HD-SDI and /or HDMI outputs.

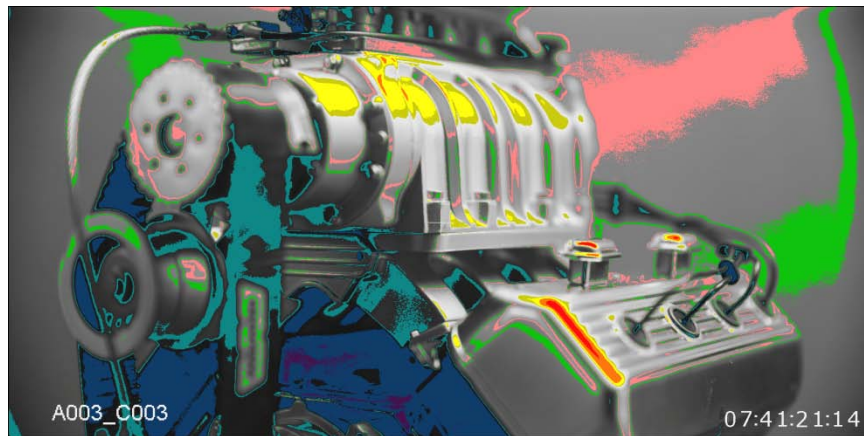
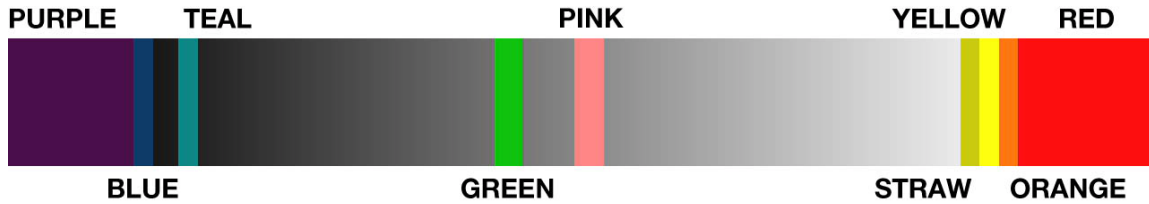
The VIDEO bands provide the following information:

<b>PURPLE</b>	Super Black (IRE 1-0)
<b>BLUE</b>	Black (IRE 1-3)
<b>TEAL</b>	Dark Gray (IRE 9-12)
<b>GREEN</b>	Typical Level for 18% Gray Card (IRE 44-47)
<b>PINK</b>	Typical level for Caucasian Skin (IRE 54-57)
<b>STRAW</b>	White (IRE 96-98)
<b>YELLOW</b>	Super White (IRE 101-104)

# RED EPIC® OPERATION GUIDE

ORANGE	Super White (IRE 105-107)
RED	Super White (IRE 108-109)

At all other values, the monochrome image displayed represents the luminance value of the ISO adjusted image.



## EDGE

EDGE displays a color overlay that outlines the edges of objects in an outline mode. By adjusting your lens zoom and focus you can pinpoint focus. When selected, the icon “F” will be displayed in the Lower Status Group.

**WARNING: This will potentially interfere with recordings done via HDMI/HD-SDI in "Clean" Mode!**



# RED EPIC® OPERATION GUIDE

## MAGNIFY

Magnify displays the central region of the sensor in 1:1 pixel resolution. When enabled, the 1:1 text in the Lower Status Group will change to Green. If in Magnify mode, when the Record button is pressed, the system will automatically exit this mode. When using a touchscreen you can also perform this function by pinching your fingers together and apart.

**NOTE: HDR mode cannot be modified when in Magnify 1:1 mode.**



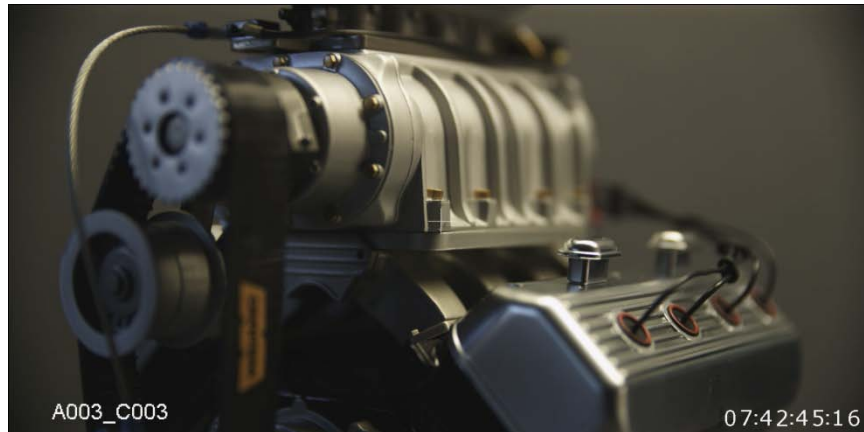
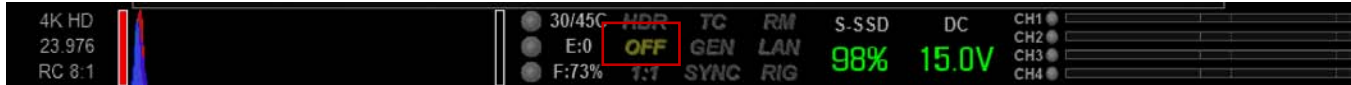
**NOTE: When in magnify mode, you will not be able to adjust frame rate or resolution. These options will be Grayed out.**



# RED EPIC® OPERATION GUIDE

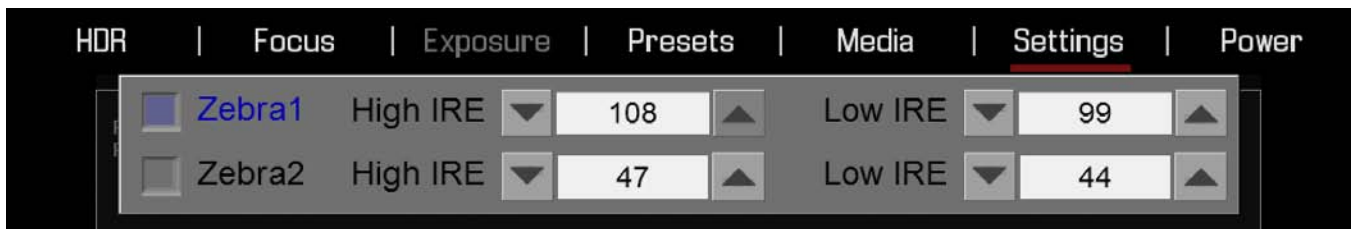
## RAW

RAW displays the image without any ISO correction. When selected, OFF will be highlighted in the Lower Status Group.



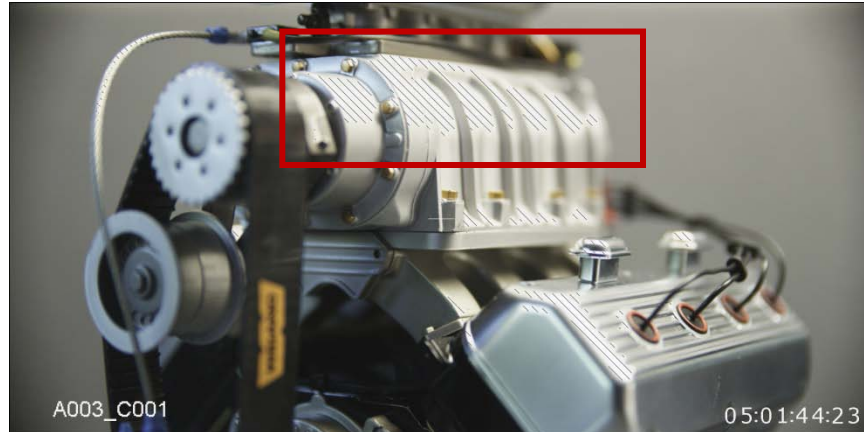
## ZEBRA

Zebra indicators enable and adjust the upper and lower values for two independent Zebra indicators. One zebra may be used for highlight exposure, and the other for mid tone or shadows. Zebras will be visible when in 1:1 zoom. **By default, Zebra 1 and 2 are disabled.**



## ZEBRA 1

To enable, select ZEBRA 1 check box. Areas of the image exposed within these ranges will be indicated by crosshatched overlays at - 45 degrees relative to vertical. Zebra 1 is shown in the image below.



### High IRE

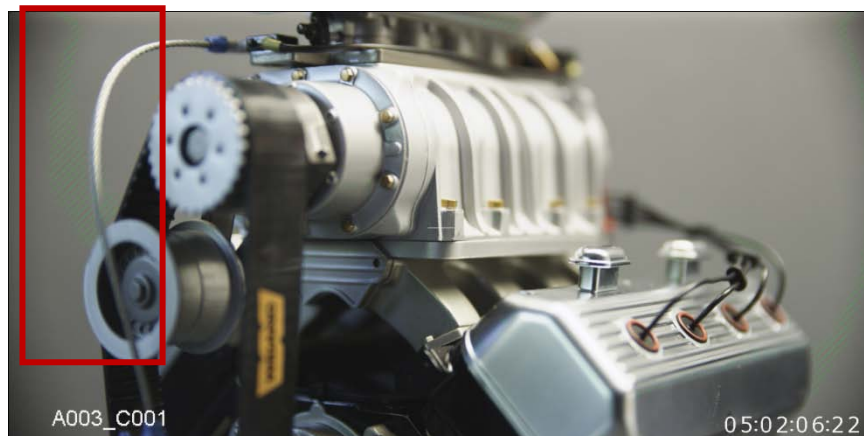
Change the desired setting between 93 and 109 (default is 108).

### Low IRE

Change the desired setting between 75 and 107 (default is 99).

## ZEBRA 2

To enable, select ZEBRA 2 check box. Areas of the image exposed within these ranges will be indicated by crosshatched overlays at + 45 degrees relative to vertical. Zebra 2 is shown in the image below.



### High IRE

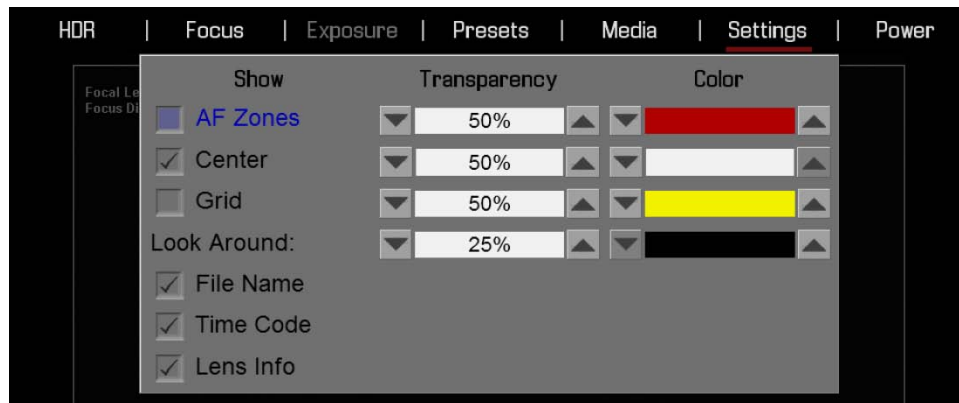
Change the desired setting between 1 and 99 (default is 47).

## Low IRE

Change the desired setting between 0 and 84 (default is 44).

## OVERLAY

Allows you to enable and color code graphic overlays visible the on the Viewfinder and Preview outputs.



## SHOW

Check the box adjacent to each overlay type to show. Overlays available are AF Zones, Center and Grid. Look Around is always enabled.

Check the boxes below Look Around are File Name, Time Code, and Lens Info. When selected will be displayed on the main screen. By default, all three are checked.

## Transparency

The transparency setting for AF Zones, AE Zone, Faces, Center, Grid and Look Around may be adjusted. Options are 0%, 25%, 50%, 75% and 100%.

## Color

The color setting for AF Zones, AE Zone, Faces, Center, Grid and Look Around may be adjusted. Options are White, Blue, Yellow, Green, Red, or Black. Select the color that provides maximum contrast with the scene you are shooting.

# RED EPIC® OPERATION GUIDE

## Grid

The Grid display is shown below. The grid may be used as a “rule of thirds” indicator.



## Look Around

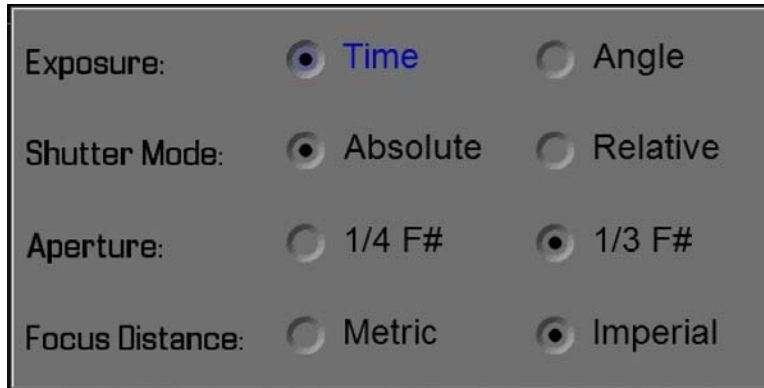
Highlights the look around area.



# RED EPIC® OPERATION GUIDE

## MODES

Available GUI display mode adjustments are Exposure, Shutter Mode, Aperture, and Focal Distance.



## EXPOSURE

Selects GUI display of Shutter Exposure on Main screen as Time (1/xx sec) or Angle (Degrees). Default is Time. Angle is shown below.



## SHUTTER

Enables one of two shutter timing (duration) modes: Absolute or Relative. Default selection is Absolute.

### Absolute

Shutter Speed is defined exclusively by the Shutter Speed setting.

**NOTE: When operating in Absolute mode, the shutter speed is reported in White text.**

### Relative

Shutter Speed is defined by the requested Shutter Speed divided by the ratio of the current capture fps to the Project TIME BASE fps.

**NOTE: When operating in Relative mode, the shutter speed is reported in Yellow text.**



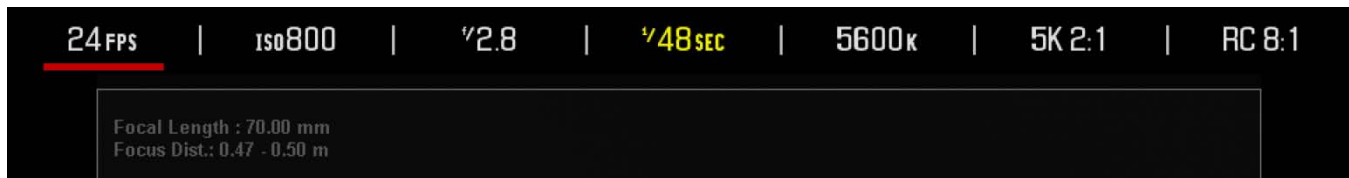
**NOTE: If the operator requests a shutter speed that is outside the capability of the camera, the camera will automatically limit them when a limiting parameter changes.**

## APERTURE

Selects GUI display of f/stop as 1/4 f Stop or 1/3 f Stop. Default is 1/3.

## FOCAL DISTANCE

Allows you to set the Lens Info to display in Metric or Imperial measurements. Default is Imperial.



## FRAME GUIDE

This sub-menu provides a selection of frame guides and safe action and safe title guides. User definable safe action and safe title guides may be saved as a USER PREFERENCE, thereby permitting the camera guides to be fully customized for any application. Available options are Size, Color and Transparency. Full is enabled by default.



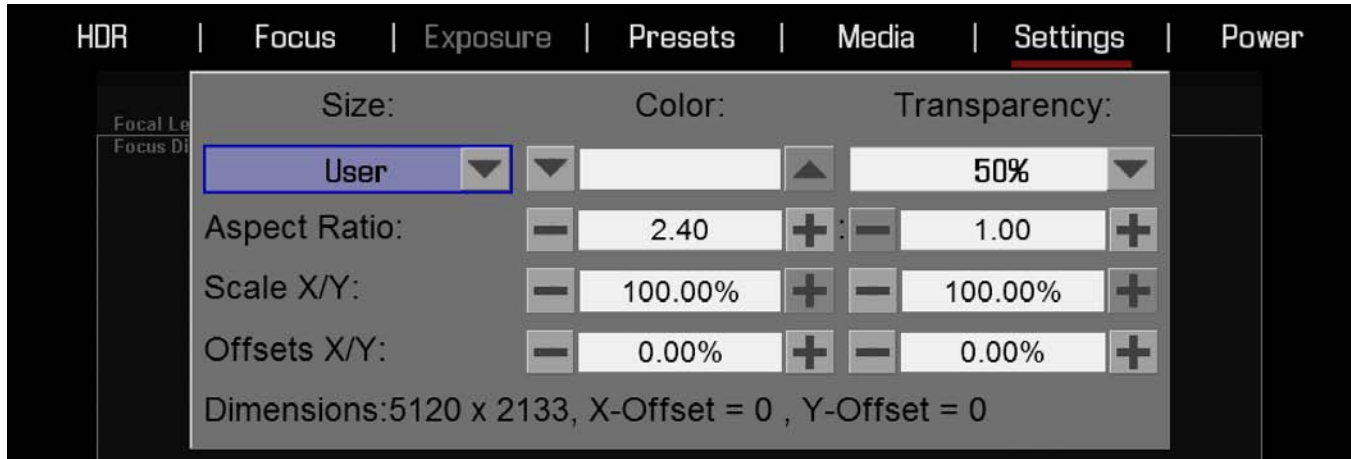
## SIZE

Available options are Off, Full, 4:3, 16:9, 1.85:1, 1.9:1, 2.4:1, or User.

# RED EPIC® OPERATION GUIDE

## User

Frame guides can be set to your own preferences through the User Settings. Available options are Aspect Ratio, Scale X/Y and Offsets X/Y. Note that the selected size will be displayed in the bottom of the Frame Guide box.



## COLOR

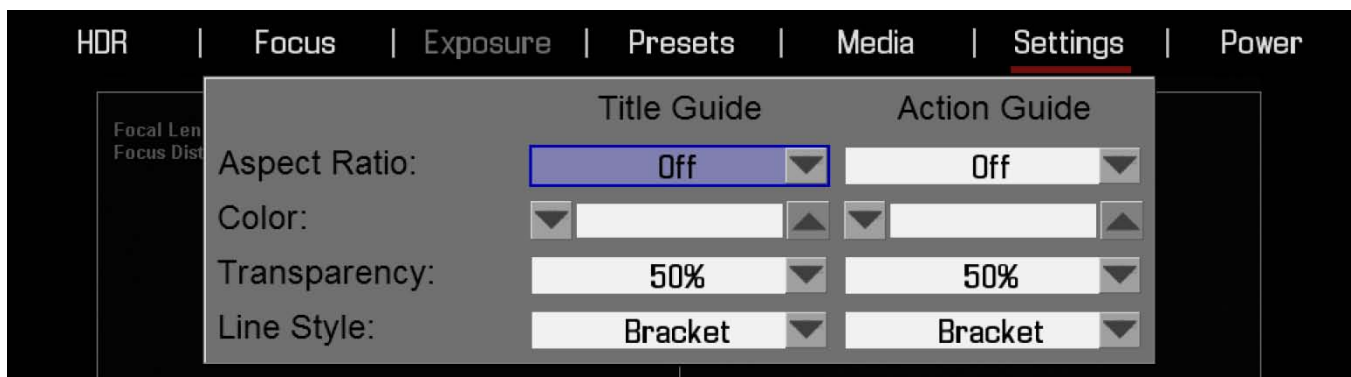
Sets the frame guideline color to White, Gray, Teal, Purple, Yellow, Green, Blue, Red, or Black. Select the color that provides maximum color contrast with the scene you are shooting. Default is White.

## TRANSPARANCY

Sets the frame guide transparency. Available options are 0%, 25%, 50%, 75% and 100%.

## AREA GUIDES

Area Guides displays Title Guides and Action Guides. Defaults are shown below.



Solid Line Style shown below.

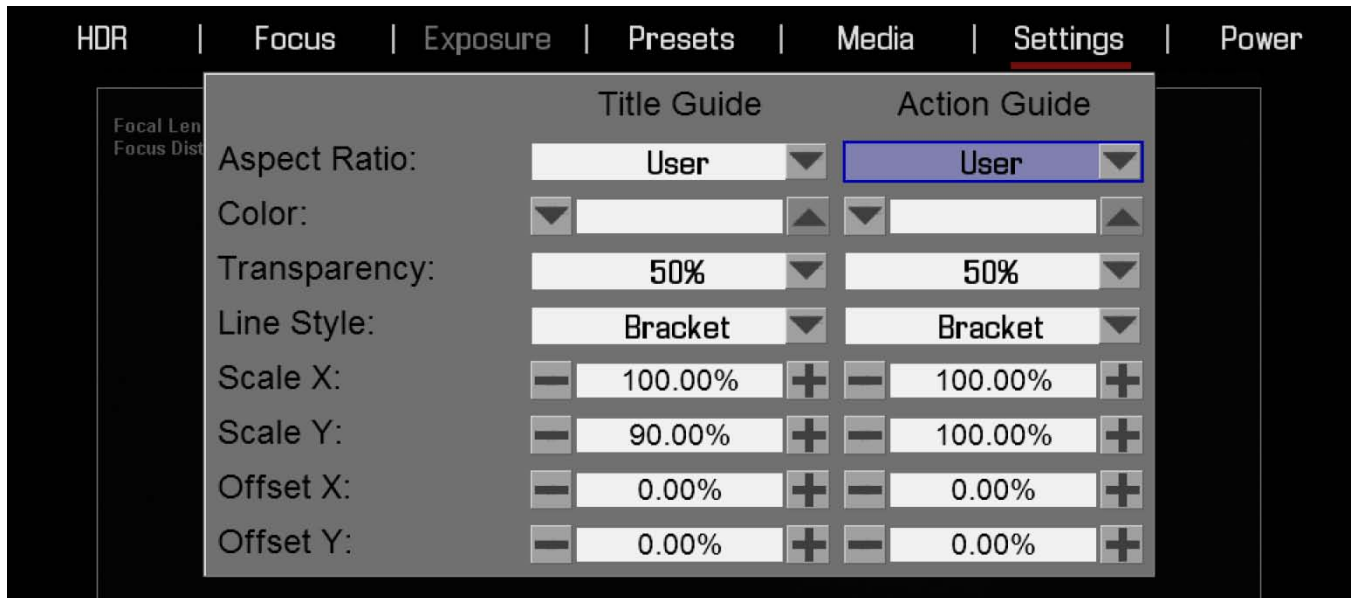


## ASPECT RATIO

For both Title Guide and Action Guide, available options are OFF, 16:9, 14:9, 4:3, 2.4:1, 1.85:1, and User. Default is OFF.

## User

Title Guide and Action Guide can be set to your own preferences through User Settings. Available options are Aspect Ratio and Scale. Bracket Line Style shown below.



## COLOR

Sets Title Guide and Action Guide line color to White, Blue, Yellow, Green, Red, or Black. Select the color that provides maximum color contrast with the scene you are shooting.

## TRANSPARENCY

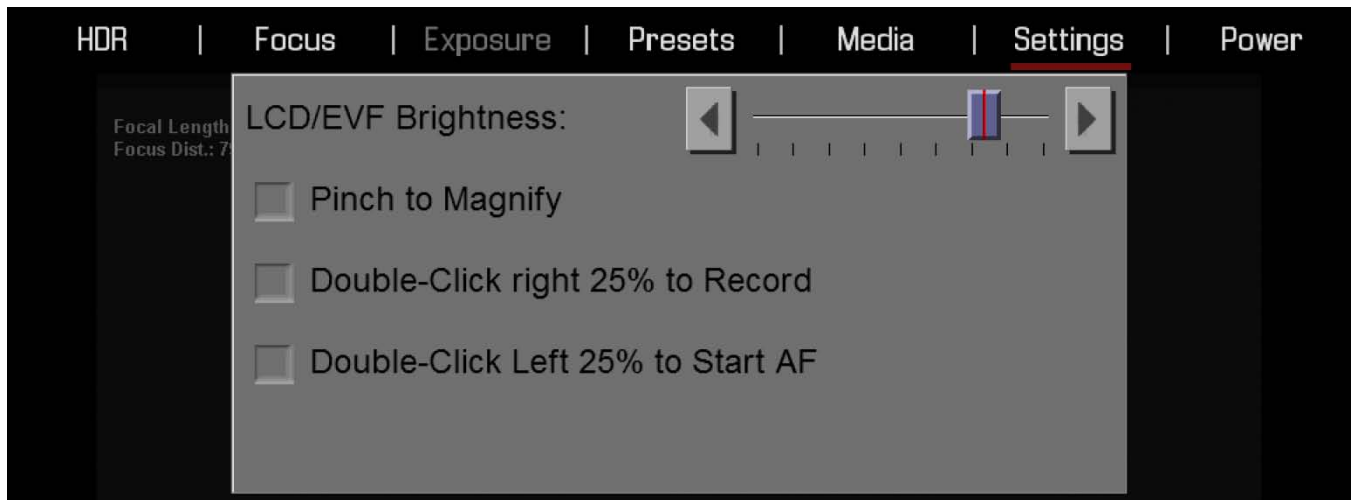
Sets Title Guide and Action Guide transparency. Options are 0%, 25%, 50%, 75% and 100%.

## LINE STYLE

Sets Title Guide and Action Guide line style. Options are Solid, Dashed and Bracket.

## MONITOR

Allows you to modify brightness of the LCD and EVF parameters through Brightness Control. Also allows options for the LCD touchscreen to be changed through Touch Gestures.



## BRIGHTNESS CONTROL

Slide to the right for a brighter display; slide to the left for a dimmer display.

## TOUCH GESTURES

These options apply ONLY to the Touchscreen LCD.

### Pinch to Magnify

When selected, allows you to use two fingers in a pinching motion on the screen to enable Focus Zoom. To zoom out to normal view, slide fingers apart.

## Double-Click Right 25% to Record

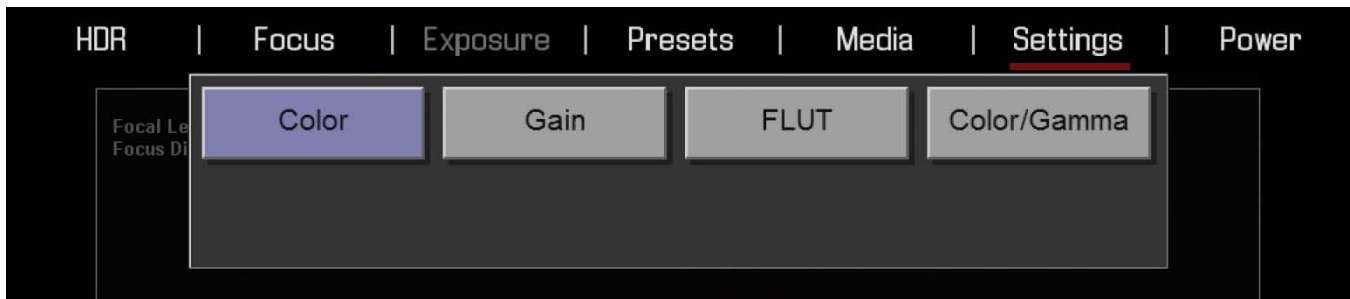
When selected, the right 25% of the screen can be double-tapped to start and double-tapped again to stop recording.

## Double-Click Left 25% to Start AF

When selected, the left 25% of the screen can be double-tapped to start the Auto focus (when DSMC Canon Mount and compatible lens are installed).

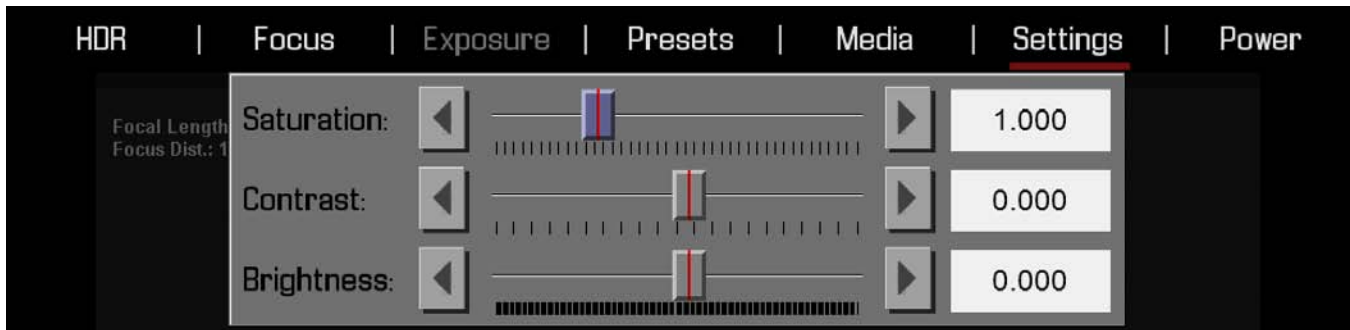
## LOOK

The LOOK menu permits adjustment of COLOR, GAIN, FLUT®, and CURVE metadata values. These parameters will affect the look of the monitor path, but do not affect the actual REDCODE RAW data being recorded.



## COLOR

The Color sub-menu permits adjustment of SATURATION, CONTRAST, and BRIGHTNESS.



## SATURATION

Adjusts color saturation. Range is 0.0 (monochrome) to +3.8 (super color). Default is 1.0.

## CONTRAST

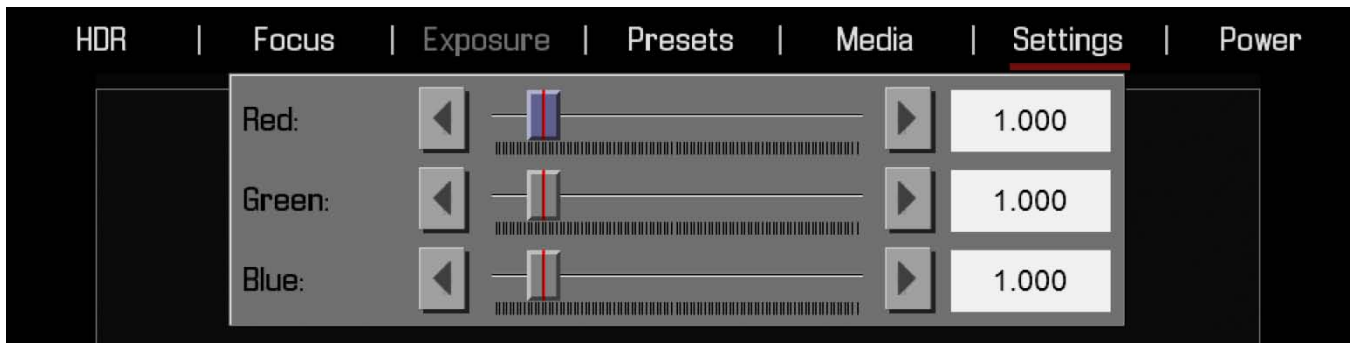
Adjusts the overall contrast of the image. Range is -1.0 (flat) to +1.0 (max contrast). Default is 0.0.

## BRIGHTNESS

Adjusts brightness without crushing highlights. Available range is – 10.0 to +10.0. Default is 0.0.

## GAIN

The GAIN sub-menu permits adjustment of RED GAIN, BLUE GAIN and GREEN GAIN.



## RED

Adjusts the gain of the RED channel only. Range is 0.0 (no Red) to 10.0. Default is 1.0.

## BLUE

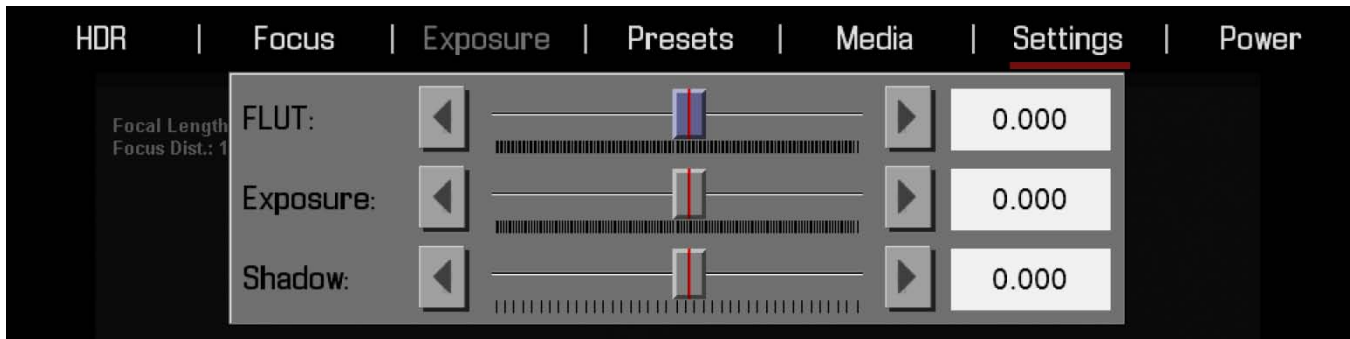
Adjusts the gain of the BLUE channel only. Range is 0.0 (no Blue) to 10.0. Default is 1.0.

## GREEN

Adjusts the gain of the GREEN channel only. Range is 0.0 (no Green) to 10.0. Default is 1.0.

## FLUT

The FLUT sub-menu permits adjustment of FLUT, EXPOSURE COMPENSATION and SHADOW.



## FLUT

FLUT (Floating Point Lookup Table) adjusts mid-range tone values. Range -8.0 to +8.0. Default is 0.0.

## EXPOSURE

Adjusts exposure compensation. Available exposure range is -7.0 to +7.0. Default is 0.0.

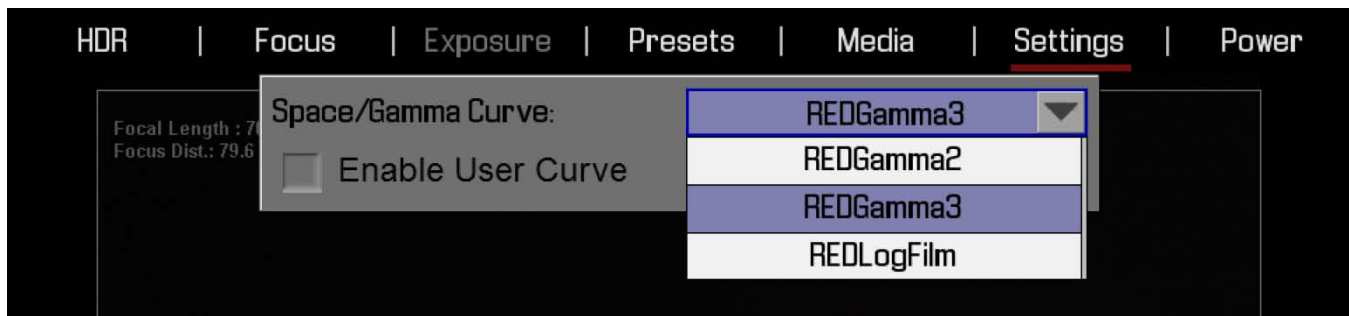
## SHADOW

Shadow adjusts the toe value of the FLUT or in other words, the tone near Black. Range is -2.0 to +2.0. Default is 0.0. Increasing the Shadow value raises the video level of near Blacks. Lowering the Shadow value crushes the video level of near Blacks.

## COLOR/GAMMA

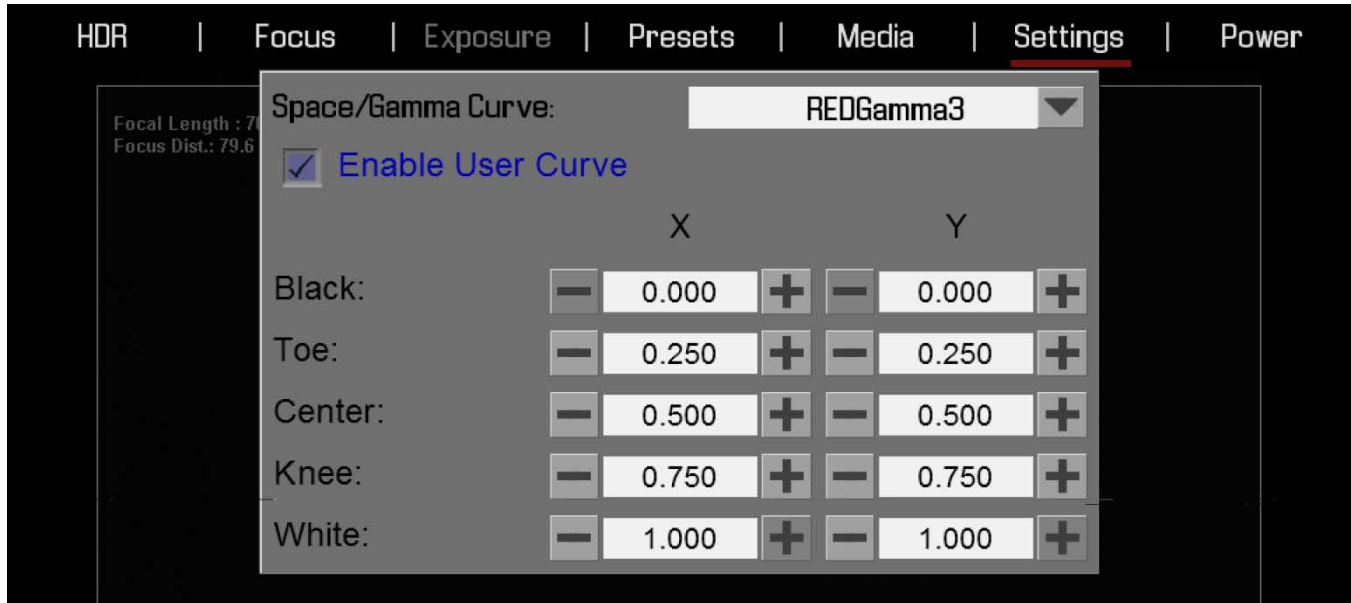
The COLOR/GAMMA sub-menu permits adjustment of the monitor output Color Space and Gamma curve.

Available options are REDGamma2, REDGamma3 and REDLogFilm. Default is REDGamma3.



## ENABLE USER CURVE

When checked will open more options allowing you to adjust the X and Y values for Black, Toe, Center, Knee, and White of the curve.



## PROJECT

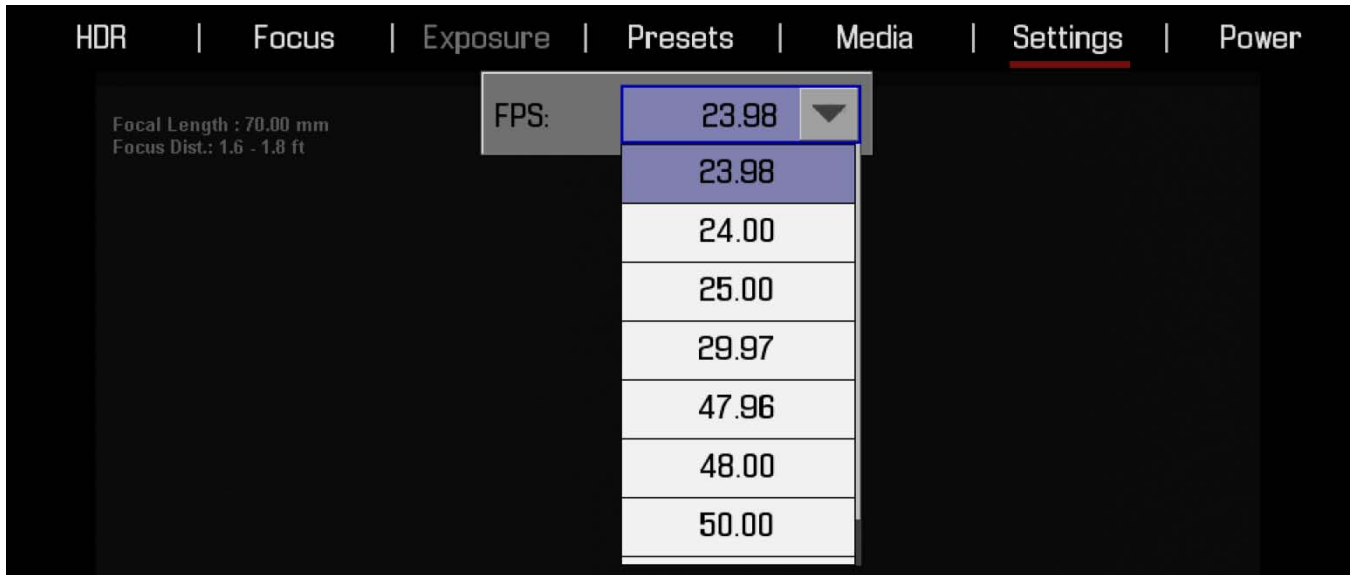
The project menu sets the operating parameters the camera will use for a given project. Options available are TIME BASE and TIME CODE.



## TIME BASE

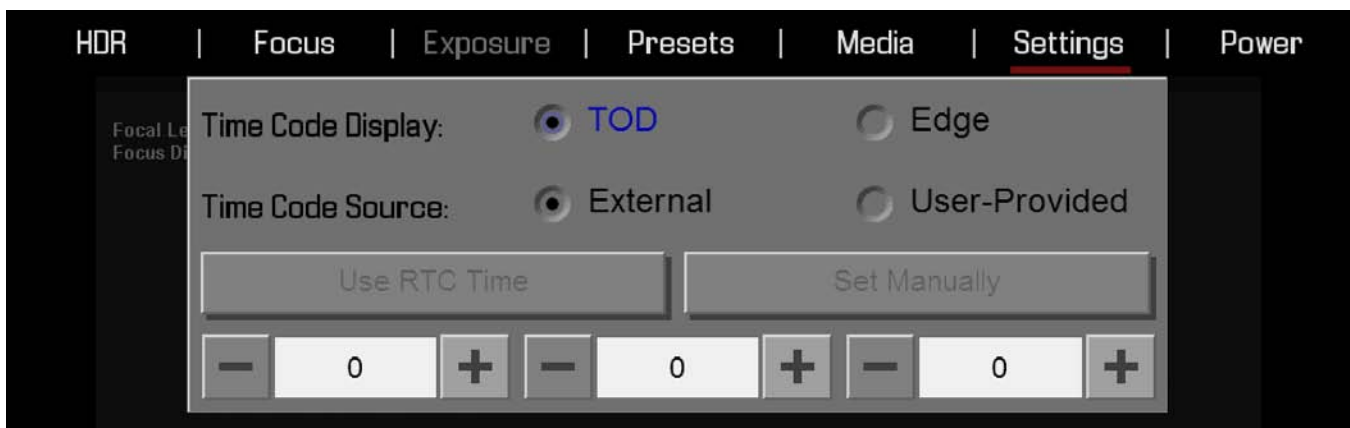
Sets the TIME BASE (fps) to be used for the project - the primary acquisition frame rate, time code count and playback & editing frame rate. Setting is displayed in the lower left corner of VIEWFINDER output(s).

Available options are 23.98, 24.00, 25.00, 29.97, 47.96, 48.00, 50.00, and 59.94. Default is 23.98.



## TIME CODE

Selects the TIME CODE source to be used. Options are EXTERNAL TC and INTERNAL USER-PROVIDED TC.

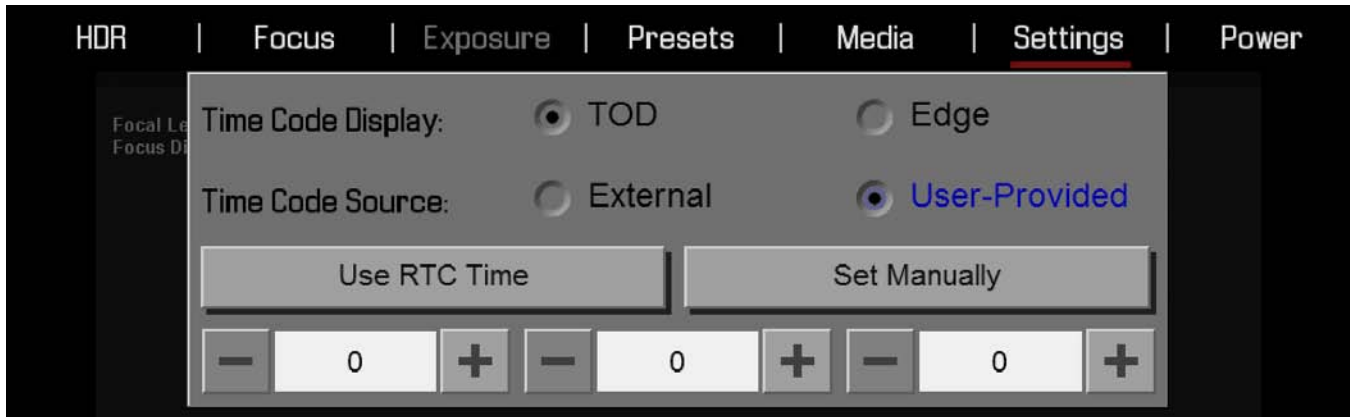


## TIME CODE DISPLAY

Allows you to choose between TOD and Edge display.

## TIME CODE SOURCE

Available options are EXTERNAL and USER-PROVIDED.



### User-Provided

The three numerical boxes below allow you to set hours, minutes and seconds (in that order).

### Use RTC Time

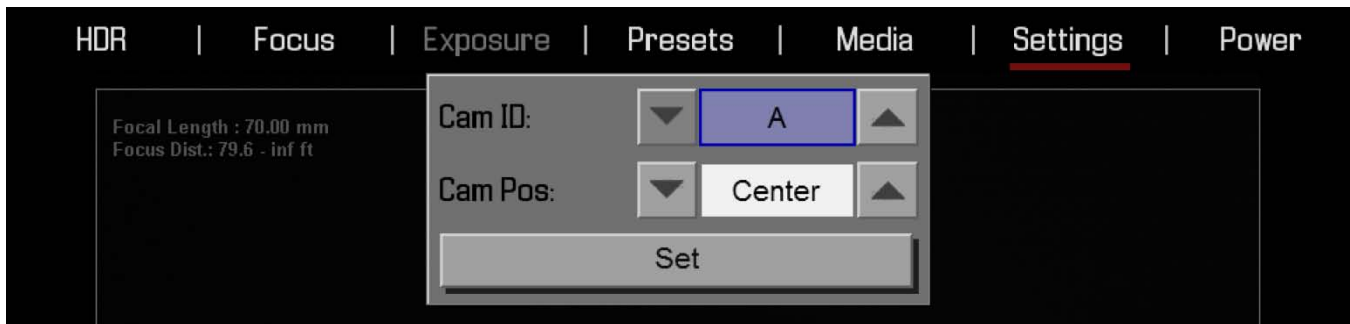
When selected the camera uses the camera's Real Time Clock as the timecode counter source (snapshot of the RTC.)

### Set Manually

When selected allows the user to define a custom value as the timecode counter seed.

## SLATE

When selected, a new dialog box will appear allowing you to add properties to the media highlighted in the Current Media box when formatting. Available options are CAM ID, CAM POS and SET to set the values entered.



## CAMERA ID (SLATE)

Identifies the camera with a letter A through Z. Default is A.

## CAMERA POS (POSITION)

Identifies the camera position as Right, Left or Center. Default is Center.

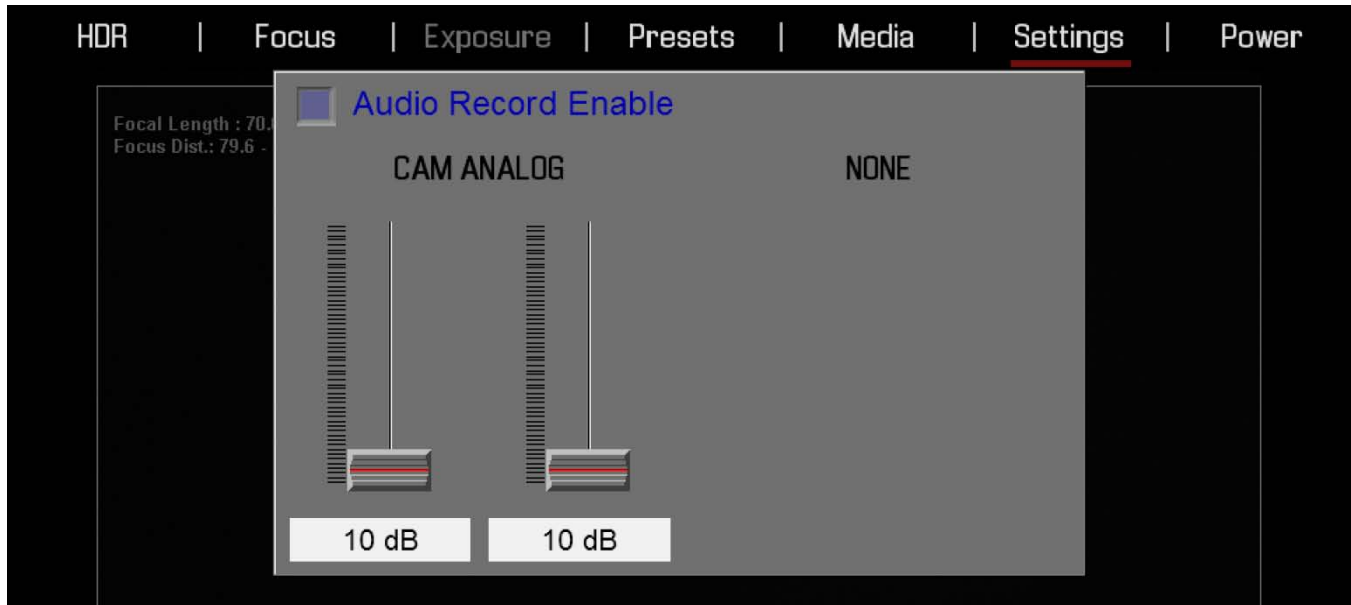
## AUDIO/VIDEO

Menu adjusts AUDIO INPUT, AUDIO OUTPUT, AUDIO CHANNELS, MONITOR CONTROL, and TEST SIGNALS.



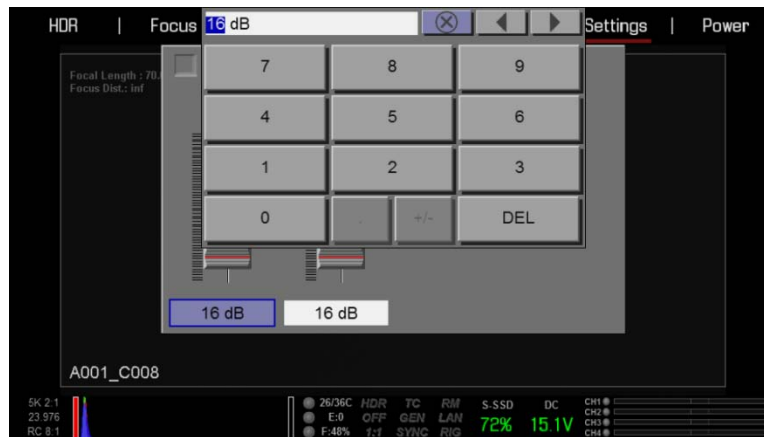
## AUDIO INPUT

Allows you to enable / disable and adjust levels for audio inputs (CAM ANALOG). Default is unchecked. Range 8 to 64 dB, default is 10 dB.



# RED EPIC® OPERATION GUIDE

You can also directly input your desired audio levels.



Audio channel level inputs are displayed in the lower section of the UI.

When audio is enabled and an audio jack is plugged in (detected by the camera), the circle next to CH1, CH2 etc... will be Green and the box around the signal will be highlighted.

When audio is enabled and an audio jack is not plugged in (not detected by the camera), the circle will be Red.

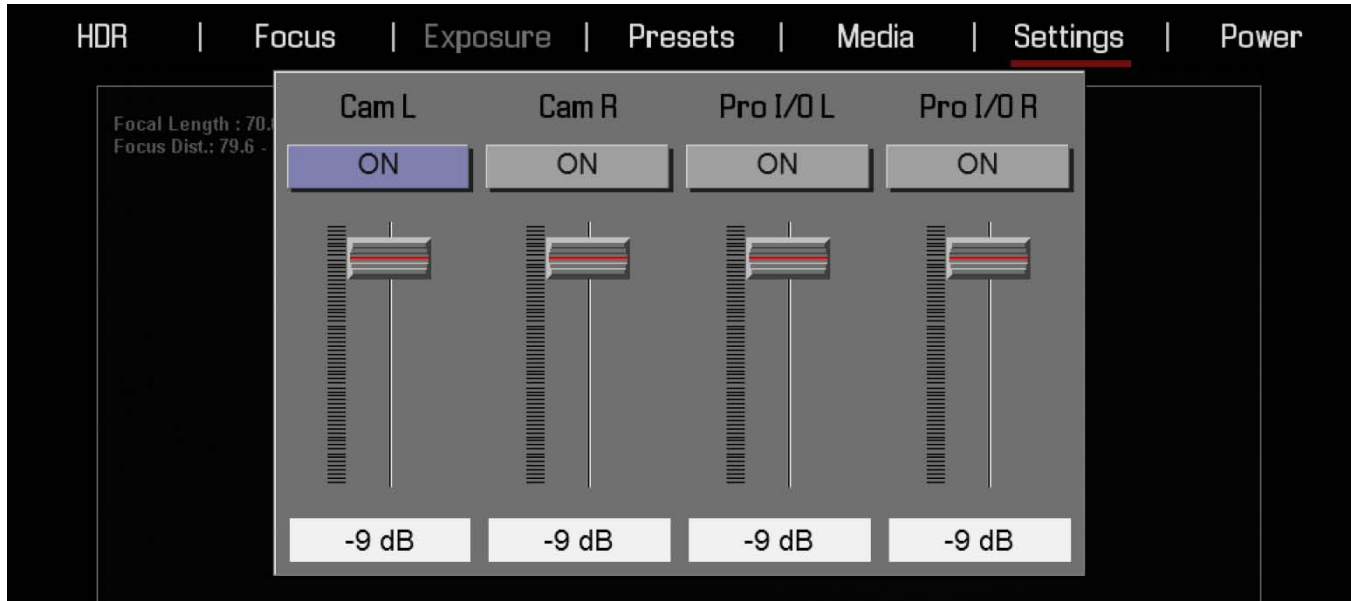


Also, when audio is disabled and an audio jack is plugged in, the circle will remain Gray but the box around the signal will be highlighted (jack is detected by the camera).



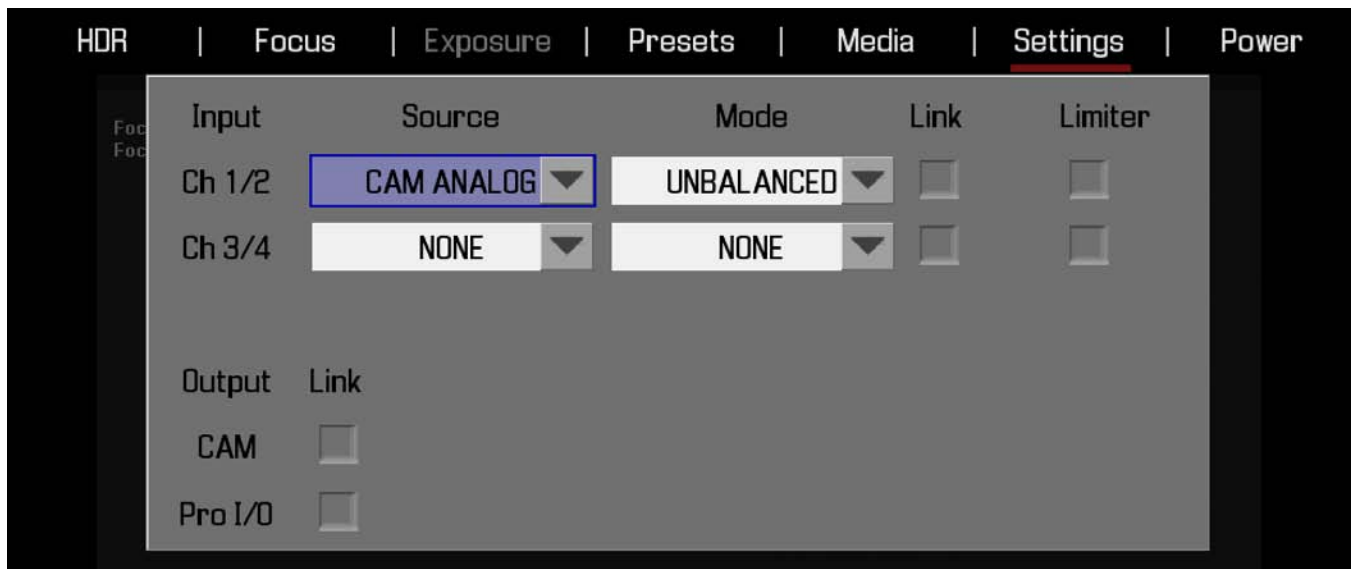
## AUDIO OUTPUT

Allows adjustment of audio output levels fed to the outputs. Available options for each channel are ON and MUTE. Default is ON at -9 dB.



## AUDIO CHANNELS

Allows selection of audio inputs and operational modes.



# RED EPIC® OPERATION GUIDE

## INPUT

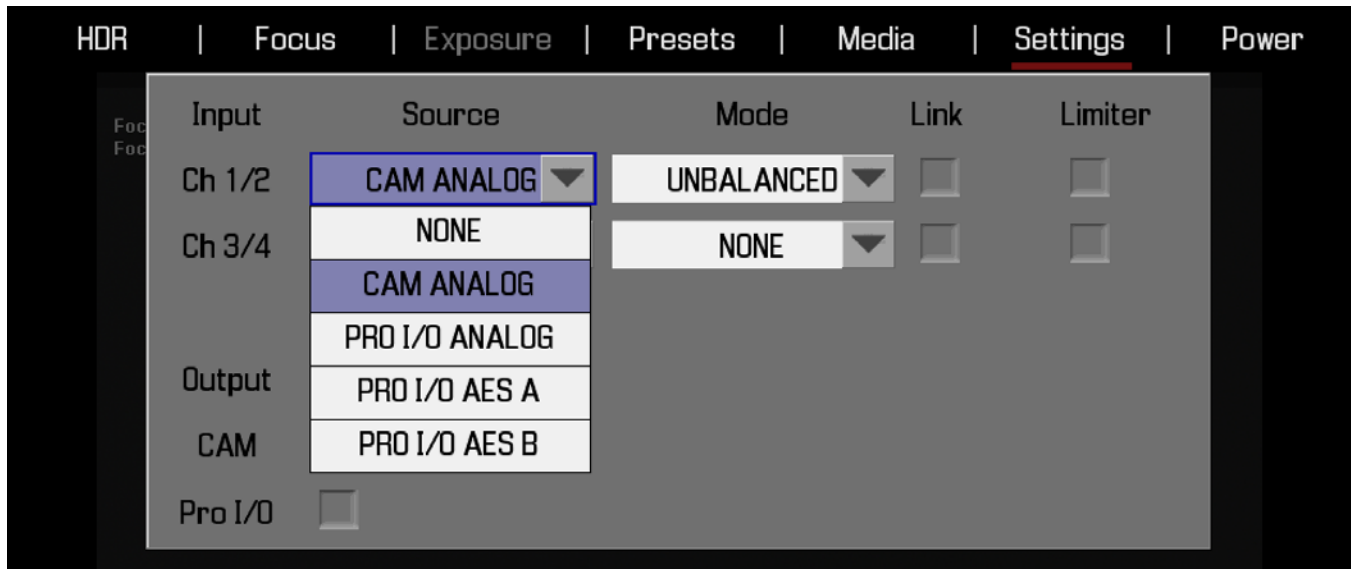
Available inputs are CH 1/2 and CH 3/4.

**NOTE:** For cameras not equipped with a PRO I/O module, options are CH 1/2.

### Source

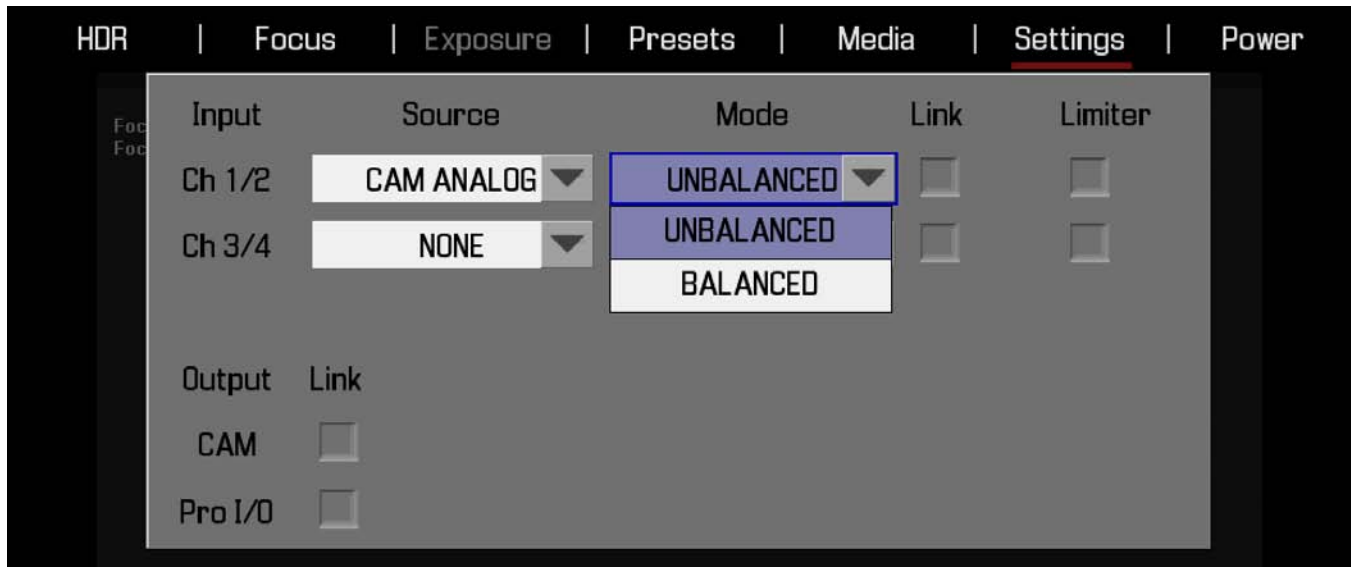
Available options are NONE, CAM ANALOG, PRO I/O ANALOG, PRO I/O AES A, and PRO I/O AES B.

**NOTE:** For cameras not equipped with a PRO I/O module, options are NONE or CAM ANALOG.



## Mode

Available options are UNBALANCED and BALANCED.



## Link

Enables linkage between Channel Gain controls.

## Limiter

Enables signal limiter circuit. Limiter enabled adds 10dB of headroom for Microphone level inputs, or 4dB for Line Level inputs.

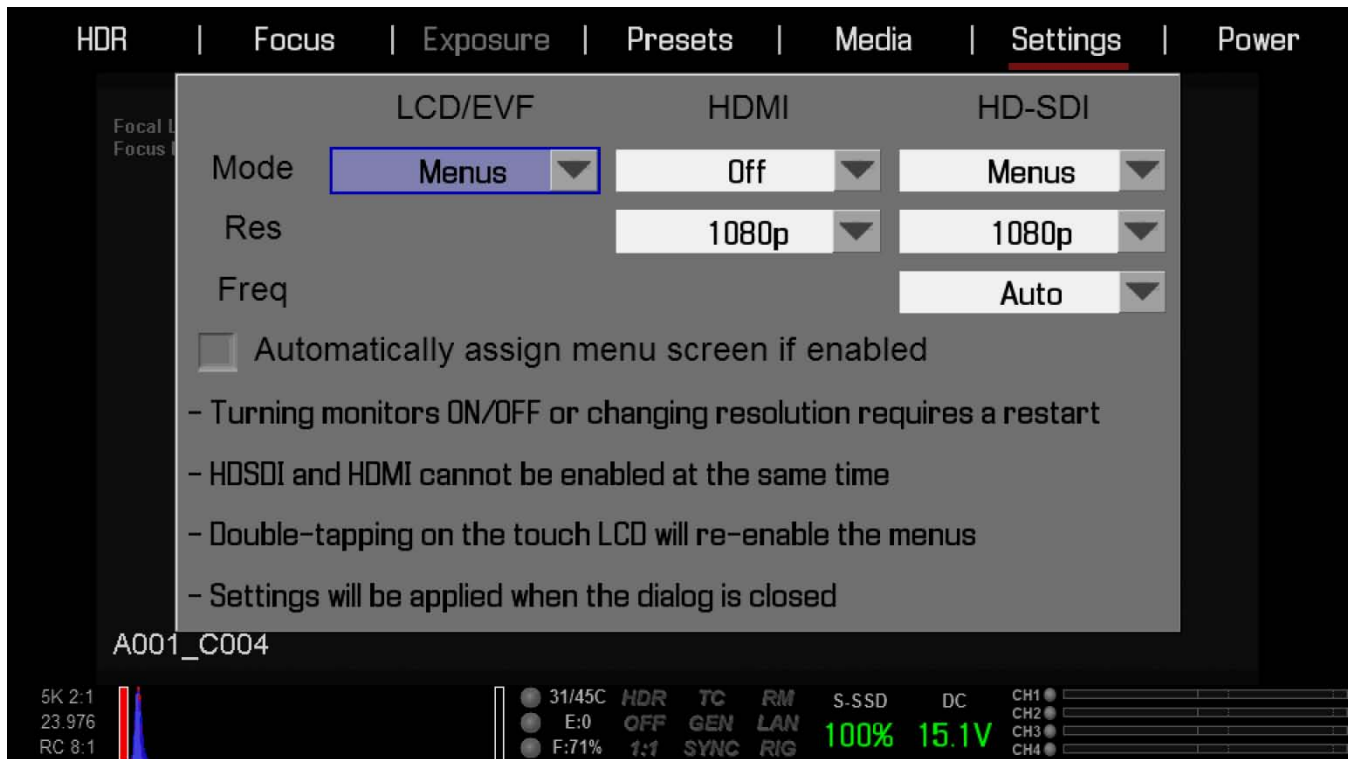
## OUTPUT

### Link

Enables linkage between Output Channel Attenuation controls.

## MONITOR CONTROL

This sub-menu allows the monitor outputs settings to be modified. For changes to take effect, the camera MUST be restarted.



## MODE

Allows you to choose the output for the LCD/EVF, HDMI and HD-SDI monitors.

## LCD/EVF

Options are MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

If anything other than MENUS is selected on the LCD (such as CLEAN), to return to displaying the MENUS, perform a double-tap on the LCD screen.

## HDMI

Options are OFF, MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

## RES

Allows you to choose the output resolution for HDMI monitors. Available options are AUTO, 720p and 1080p.

**NOTE: Some HDMI monitors may have trouble when "AUTO" is selected. In these cases, it is recommended to manually select the maximum monitor resolution provided.**

# RED EPIC® OPERATION GUIDE

## HD-SDI

Options are OFF, MENUS, PREVIEW, CLEAN, OVERLAY, 3D LEFT, and 3D RIGHT.

## RES

Allows you to choose the output resolution for HD-SDI monitors. Available options are AUTO, 720p and 1080p.

## FREQ

Allows you to choose the output frequency in Hertz (Hz) for HD-SDI monitors. Available options are AUTO, 23.976/24, 25, 29.976, 47.952/48, 50, and 59.94.

## AUTOMATICALLY ASSIGN MENU SCREEN IF ENABLED

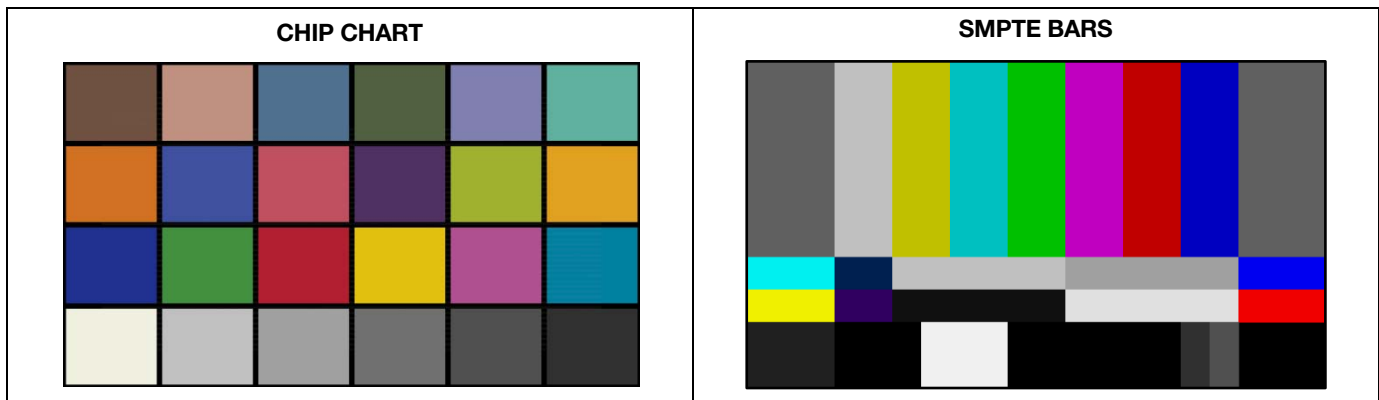
When checked will assign an attached external monitor to display the menus if none are selected.

## TEST SIGNALS

Permits the video monitor outputs to be replaced with a video test pattern. Available test patterns are CHIP CHART and SMPTE BARS.



To enable a desired test signal, select the desired test signal box. To exit the test signal, tap the touchscreen one time or press the Enter or Menu button on the Side Handle or REDMOTE.



**NOTE: RED DSMC test signals are not recordable, they are provided to help align external video monitors connected via the HD-SDI or HDMI outputs.**

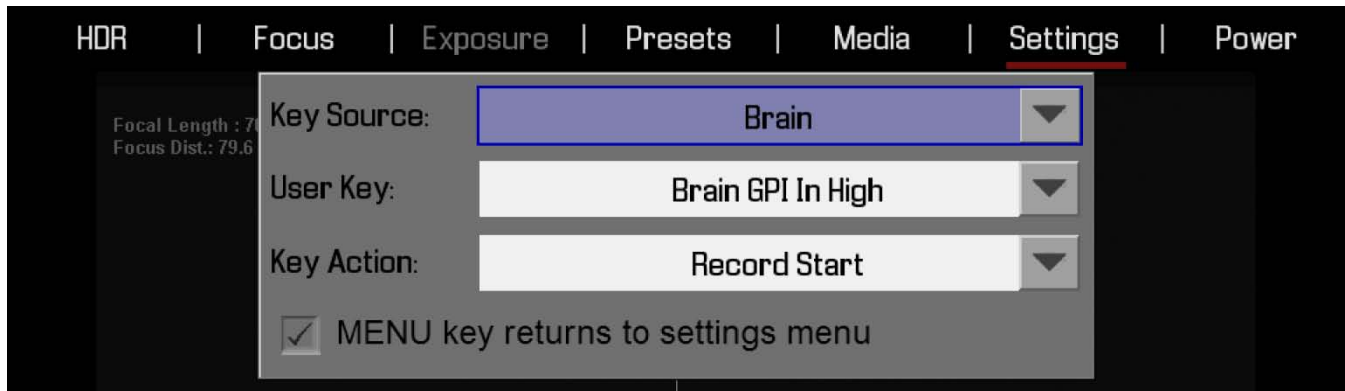
## SETUP

This menu permits a variety of system setup tasks to be accomplished. Options available are KEYS / SHORTCUTS, DATE / TIME, NETWORK, SERIAL, REMOTE, GPIO, and SYSTEM.



## KEYS / SHORTCUTS

Keys / Shortcuts display the USER KEY and KEY ACTION sub-menus. These options allow selected menus or functions to be mapped to specific User Keys on the camera body and accessories. User keys are also referred to as Soft Keys / Buttons.



## KEY SOURCE

Use this menu to select the device to program. Options at this time are:

- Brain
- Side Handle
- Bottom Handle
- Side SSD/CF
- LCD on Brain
- Lens
- LCD on Pro I/O
- EVF on Brain
- EVF on Pro I/O

## USER KEY

Use this menu to select and program the camera user keys (buttons).

**NOTE: To reset keys to default settings, go to RESTORE. A reboot of the camera is necessary to restore defaults.**

**NOTE: Multiple keys can be programmed to the same action.**

**WARNING: IT IS NOT ADVISABLE TO REMAP THE NAVIGATION KEYS (UP, DOWN, LEFT, RIGHT, SELECT (ENTER), OR MENU) ON THE SIDE HANDLE AS IT IS THEORETICALLY POSSIBLE TO GET INTO A SITUATION WHERE IT IS NOT POSSIBLE TO RESTORE THE FACTORY KEY PRESET ANYMORE IF NO TOUCH SCREEN IS ATTACHED TO THE SYSTEM.**

Default settings by device are listed below.

- “Down” indicates pressing of the key.
- “Side CF” refers to the Side SSD Module.
- “Brain LCD” refers to the EVF/LCD being plugged into the brain EVF/LCD connector.
- “Tele Level” refers to the +/- rocker switch.
- “North, South, East, West” refers to the Direction keys (Up, Down, Left, Right) on the Navigation Group.
- “Rotary Jog” refers to Scroll Wheel on the Navigation Group.
- “Rotary Front” refers to Adjustment Ring on Side Handle near LCD.

## Brain

- Brain GPI In High
- Brain Record Full Button Down
- Brain GPI In Low
- Record Start
- Toggle Record
- Record Stop

## Side Handle

- Side Handle User Key A Down
- Side Handle User Key B Down
- Side Handle User Key C Down
- Side Handle User Key D Down
- Side Handle Function 1 Key Down
- Side Handle Function 2 Key Down
- Side Handle Function 3 Key Down
- Side Handle Function 4 Key Down
- Side Handle Function 5 Key Down
- Side Handle Function 6 Key Down
- Side Handle Function 7 Key Down
- Side Handle Still Select
- Side Handle Movie Select
- Side Handle Record Half Button Down
- Side Handle Record Full Button Down
- Side Handle Tele Level +1
- Side Handle Tele Level +2
- Side Handle Tele Level +3
- Side Handle Tele Level +4
- Side Handle Tele Level -1
- Side Handle Tele Level -2
- Side Handle Tele Level -3
- Side Handle Tele Level -4
- Side Handle Tele Level 0
- Side Handle Backlight Key Down
- Side Handle Menu Key Down
- Side Handle North Key Down
- Side Handle South Key Down
- Side Handle West Key Down
- Side Handle East Key Down
- Toggle AF Mode
- WB Calc
- Toggle Magnify
- Exposure Check
- Activate ISO
- Activate Aperture
- Activate Shutter
- Activate WB
- Exposure Check
- Toggle REDCODE
- Eject Media
- Set focus mode for still
- Set focus mode for movie
- HALF Press Request
- Toggle Record
- Zoom In Speed 1
- Zoom In Speed 2
- Zoom In Speed 3
- Zoom In Speed 4
- Zoom Out Speed 1
- Zoom Out Speed 2
- Zoom Out Speed 3
- Zoom Out Speed 4
- Zoom Stop
- Toggle SH Backlight
- Menu Toggle
- Menu Up
- Menu Down
- Menu Right
- Menu Left

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- Side Handle Center Key Down
- Side Handle Rotary Front CCW
- Side Handle Rotary Jog CW
- Side Handle Rotary Front CW
- Side Handle Rotary Jog CCW

Menu Select  
Rotary Next Value  
Rotary Next Value  
Rotary Previous Value  
Rotary Previous Value

## Bottom Handle

- Bottom Handle Record Half Button Down
- Bottom Handle Record Full Button Down
- Bottom Handle Tele Level +1
- Bottom Handle Tele Level +2
- Bottom Handle Tele Level +3
- Bottom Handle Tele Level +4
- Bottom Handle Tele Level -1
- Bottom Handle Tele Level -2
- Bottom Handle Tele Level -3
- Bottom Handle Tele Level -4
- Bottom Handle Rotary CW
- Bottom Handle Rotary CCW

HALF Press Request  
Toggle Record  
Zoom In Speed 1  
Zoom In Speed 2  
Zoom In Speed 3  
Zoom In Speed 4  
Zoom Out Speed 1  
Zoom Out Speed 2  
Zoom Out Speed 3  
Zoom Out Speed 4  
Rotary Previous Value  
Rotary Next Value

## Side CF (SSD)

- Side CF Function 3 Button Down (press 1 and 2 together)
- Side CF Record Full Button Down

Eject Media  
Toggle Record

## REDMOTE

- REDMOTE User Key A Down
- REDMOTE User Key B Down
- REDMOTE User Key C Down
- REDMOTE User Key D Down
- REDMOTE Function 1 Key Down
- REDMOTE Function 2 Key Down
- REDMOTE Function 3 Key Down
- REDMOTE Record Half Button Down
- REDMOTE Record Full Button Down
- REDMOTE Tele Level +1
- REDMOTE Tele Level +2
- REDMOTE Tele Level +3
- REDMOTE Tele Level +4
- REDMOTE Tele Level -1
- REDMOTE Tele Level -2
- REDMOTE Tele Level -3
- REDMOTE Tele Level -4
- REDMOTE Tele Level 0
- REDMOTE Menu Key Down
- REDMOTE North Key Down
- REDMOTE South Key Down
- REDMOTE East Key Down
- REDMOTE West Key Down
- REDMOTE Center Key Down
- REDMOTE Rotary CW
- REDMOTE Rotary CCW

Toggle AF Mode  
RAW Check  
Toggle Magnify  
Exposure Check  
Open ISO List  
Open Shutter Speed List  
Open Color Temp List  
HALF Press Request  
Toggle Record  
Zoom In Speed 1  
Zoom In Speed 2  
Zoom In Speed 3  
Zoom In Speed 4  
Zoom Out Speed 1  
Zoom Out Speed 2  
Zoom Out Speed 3  
Zoom Out Speed 4  
Zoom Stop  
Menu Toggle  
Menu Up  
Menu Down  
Menu Right  
Menu Left  
Menu Select  
Rotary Next Value  
Rotary Previous Value

## LCD

- LCD Function 1 Button Down
- LCD Function 2 Button Down
- LCD Arrow Up Button Down
- LCD Arrow Down Button Down

Toggle Magnify  
Exposure Check  
Brain LCD Br. Up  
Brain LCD Br. Down

## EVF

- EVF Function 1 Button Down
- EVF Function 2 Button Down

Brain LCD Br. Up  
Brain LCD Br. Down

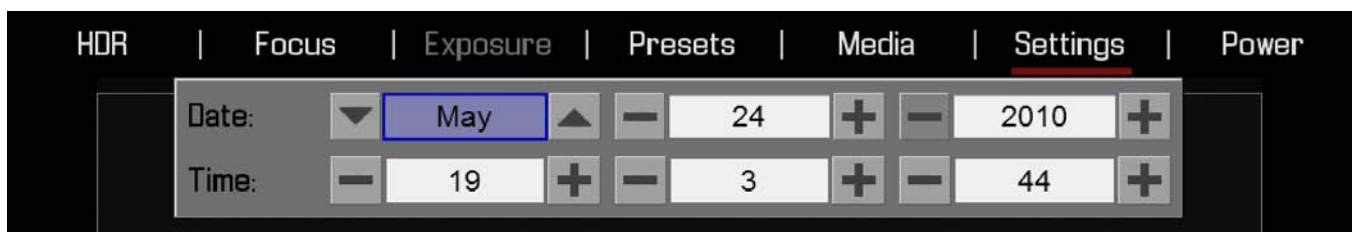
## KEY ACTION

When the desired User Key is selected, this setting allows the desired action for that User Key to be defined by the user. Available actions are as follow:

- Activate ISO
- Activate WB
- Activate Shutter
- Active Aperture
- Toggle Record
- Toggle Magnify
- WB Calc
- Menu Select
- Eject Media
- HALF press request
- Menu Left
- Menu Right
- Menu Toggle
- No Action
- Shutter Sync
- False Color
- Next Value
- Previous Value
- Shutdown
- No Action
- Toggle AF Mode
- Exposure Check
- Toggle REDCODE
- Zoom Stop
- Zoom In Speed 1
- Zoom In Speed 2
- Zoom In Speed 3
- Zoom In Speed 4
- Zoom Out Speed 1
- Zoom Out Speed 2
- Zoom Out Speed 3
- Zoom Out Speed 4
- Brain LCD Br. Up
- Brain LCD Br. Down
- Toggle ND Filter
- Open FPS List
- Open ISO List
- Open Aperture List
- Open Shutter Speed List
- Open Color Temp List
- Open AF AE
- Record Start
- Record Stop
- Toggle SH backlight
- Menu Up
- Menu Down
- Rotary Next Value
- Rotary Previous Value
- Set focus mode for still
- Set focus mode for movie
- RAW Check
- Toggle HDR Mode
- Toggle Display Mode
- Toggle Color Space
- Toggle Zebra 1 Mode
- Toggle Zebra 2 Mode
- Toggle Zebra 1/2 Mode
- Toggle Shutter Mode
- Toggle Shutter Angle Abs/Rel Mode
- Toggle TC Display Mode
- Toggle Lens Ring Mode
- Toggle Fan Mode
- One Shot AF
- Key Disabled

## DATE / TIME

This menu allows the user to reset the battery backed up internal clock of the camera. This time value is used as a timestamp on the .R3D files when recording to the RED MAG 1.8" SSD media.



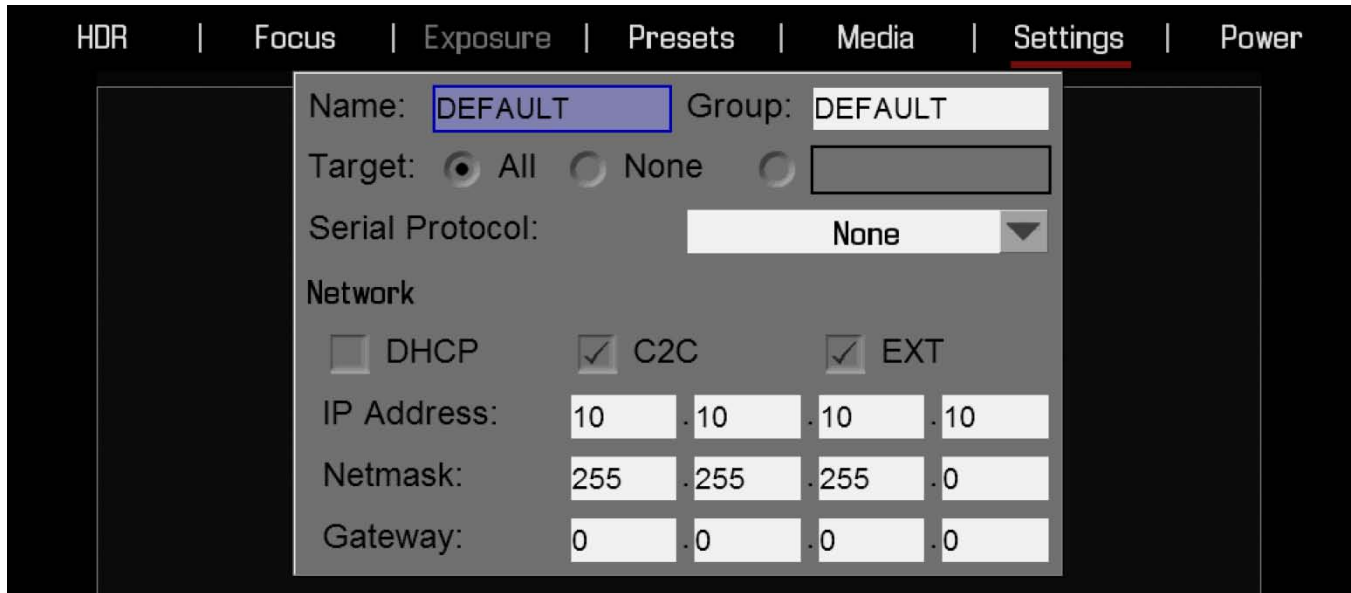
**NOTE: Enter time in 24-hour clock format. i.e. 2:35 pm should be entered as 14:35:00.**

## COMMUNICATION

Communication Menu allows you to set a unique identification for the camera (or a group of cameras) when operating in command and control communications network. Parameters are NAME, GROUP, TARGET, set a SERIAL PROTOCOL, ENABLE DHCP, C2C or EXT, IP ADDRESS, NETMASK and

# RED EPIC® OPERATION GUIDE

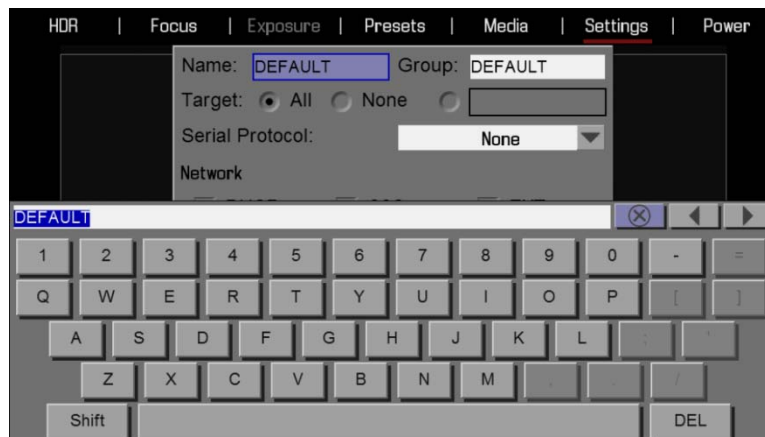
GATEWAY. Using the serial port or a direct Ethernet interconnect, two cameras, or one camera and one external device can be connected. If the camera is connected via Ethernet to a hub or router, multiple cameras and devices can communicate to each other.



## NAME

Allows the user to create a unique camera NAME that will be used in network communications, including wireless communications to REDMOTE. Each device in the network should have a unique NAME (such as "CAMERA\_A" or CTRL\_PAD") in order to uniquely address a command to a specific device. Note: the camera name field is limited to 8 characters, default name is DEFAULT.

When Name is selected the following keyboard will appear.



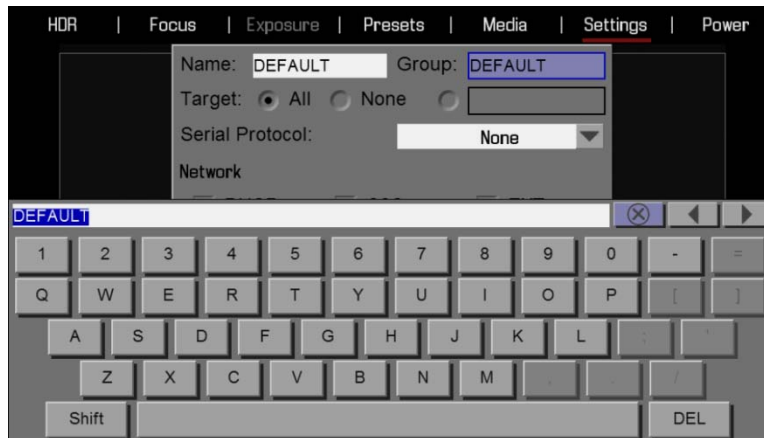
## GROUP

A camera can also be identified as a member of a GROUP of devices. (For example, a group "3DRIG\_A" could include two cameras "CAM\_A\_L" and "CAM\_A\_R"). The default group is named "DEFAULT".

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Group names (like camera Names) can be used to uniquely address commands to a specific group of networked cameras. Note: the group name is limited to 8 characters, default name is DEFAULT.

When Group is selected the following keyboard will appear.



## TARGET

Using TARGET the user can specify if this camera can send commands to ALL devices on the network, to NONE of the devices on the network (meaning the camera will only listen to messages and not originate messages) or to a specific TARGET device - which can either be the NAME of a specific camera or device or a name of a GROUP of cameras or devices.

This structure allows for a lot of flexibility. For example on a multi-rig 3D shoot the user can either send commands to an individual camera (e.g. Set CAM\_A\_L to 1/48th exposure), to a group of cameras (e.g. Set "3DRIG\_A" to 48 FPS), or to all cameras (e.g. Start Recording on all cameras). It is important to note that with the exception of the NONE setting, all command filtering is happening on the receiver side of the communication link.

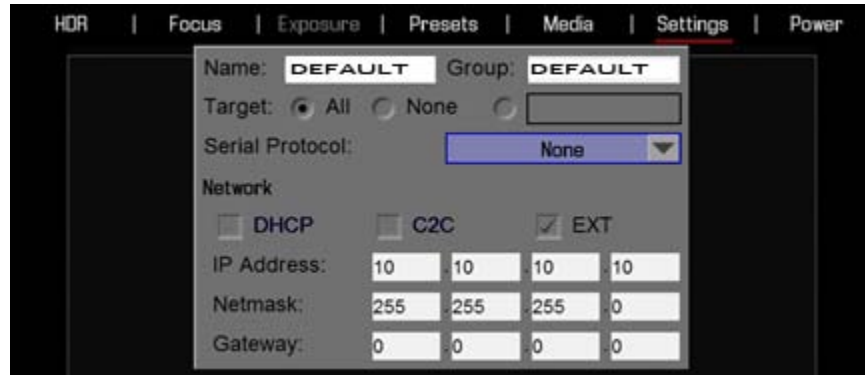
When selected a keyboard will appear.



## SERIAL PROTOCOL

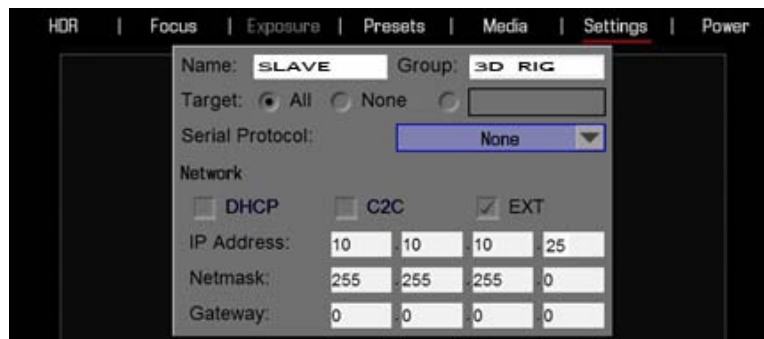
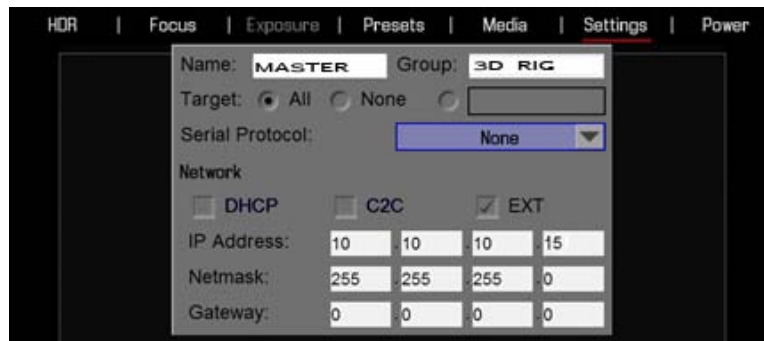
The camera can communicate to external devices via RS232 Serial Port and / or the Gigabit Ethernet Port.

This selection allows the user to specify the serial communications PROTOCOL. Available options are NONE, ELEMENT TECHNICA, 3ALITY SPC 7100 and 3ALITY SPC 7000. Default is NONE.



## NETWORK

If the Gigabit Ethernet port is used, additional settings are required. Each camera or device requires a unique IP ADDRESS. For simple camera-to-camera communication via Ethernet, both cameras need to be in the same sub-net. (use the same subNETMASK and GATEWAY addresses and the first three groups of the IP address need to be the same.



## **DHCP**

If a DHCP-server is available in the communications network the DHCP option can be checked and the camera will obtain an IP Address, Subnet Mask and Gateway address automatically from the DHCP - server.

## **C2C**

If the camera-to-camera (C2C) check box is checked, changes to the settings on this camera will be sent out via the network as UDP packets as a SET command (Which then sets the property on other cameras). SET commands sent to this camera will not be propagated.

## **EXT**

If the EXT check box is checked this camera can be controlled via TCP/IP from an external device.

## **IP Address**

Permits the user to adjust the camera's static IP address.

## **Netmask**

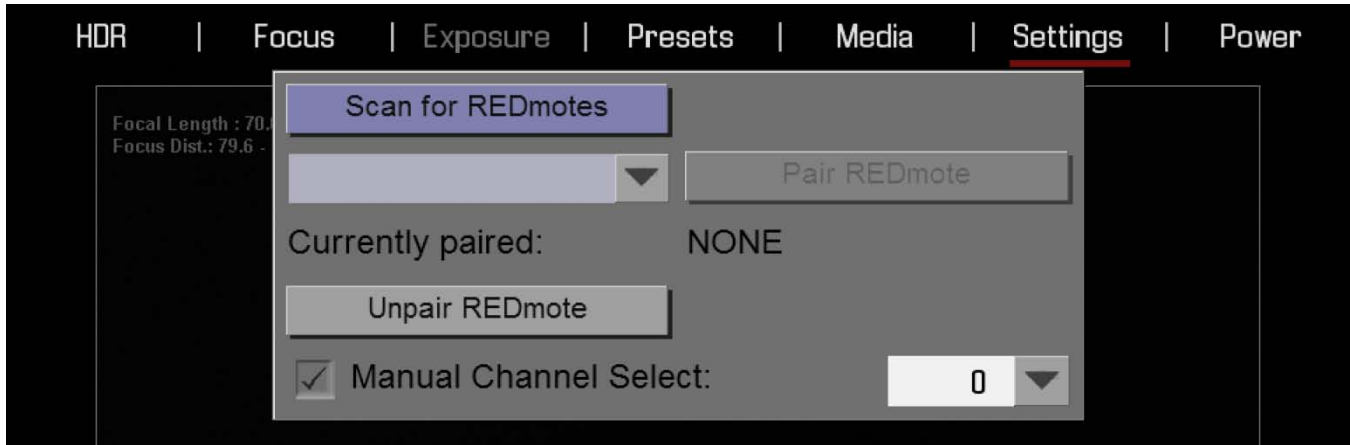
Permits the user to adjust the Subnet Mask address.

## **Gateway**

Permits the user to adjust the Gateway address.

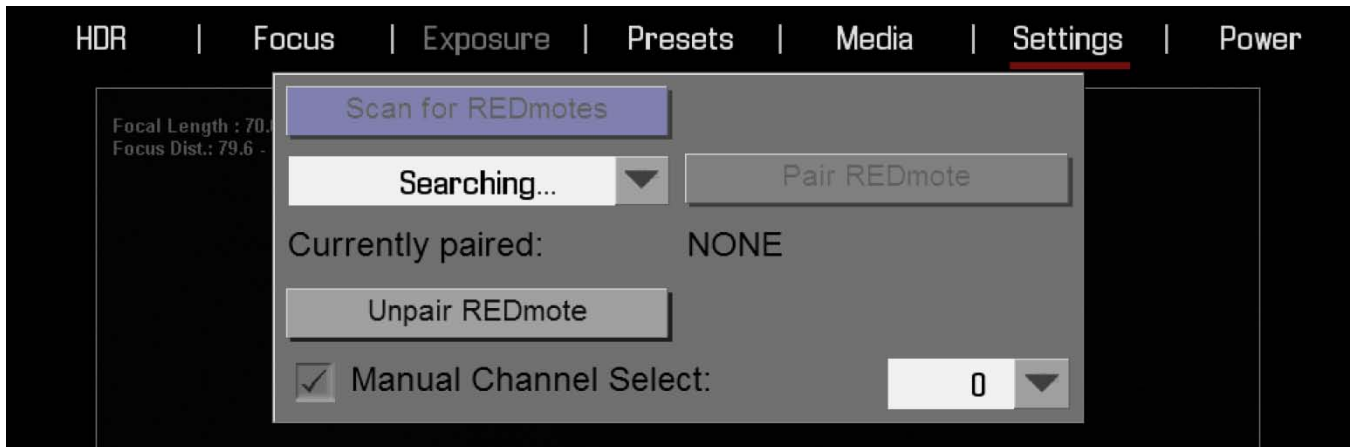
## REDMOTE

This function is used to pair the camera to a REDMOTE for wireless operation.

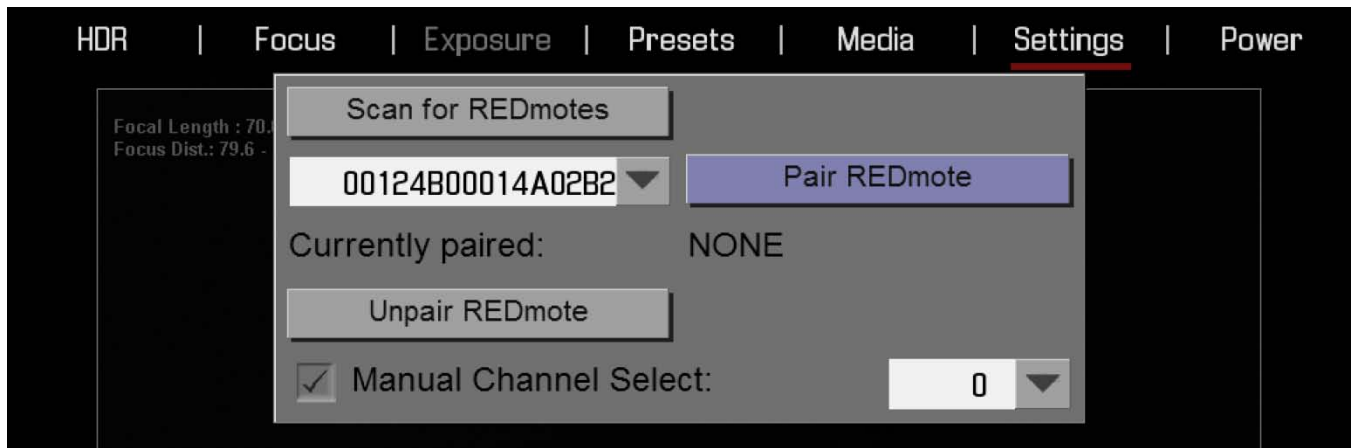


## SCAN FOR REDMOTES

When selected, the camera will look for an attached REDMOTE, plus any REDMOTES that are turned on with REDlink wireless enabled. Searching will display.



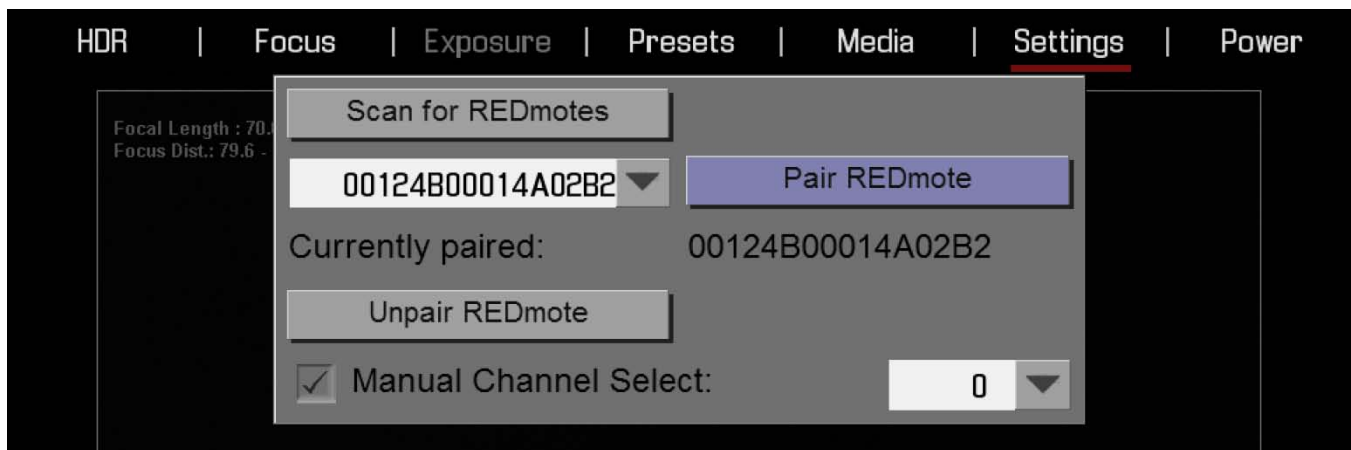
After scanning, recognized REDMOTES will be listed by their MAC address in the drop down menu.

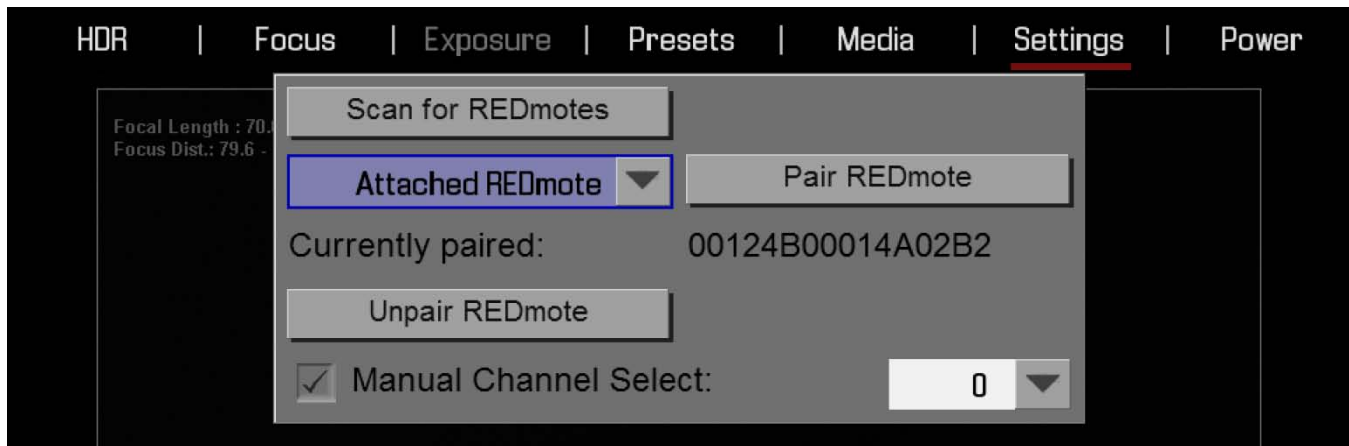


## PAIR REDMOTE

Select the desired REDMOTE that you want the camera to communicate with from the drop-down menu list and select Pair REDMOTE. This means the camera remembers the identity of the selected REDMOTE.

**Note: Only the REDMOTE that is paired to the camera may wirelessly control the camera, however a REDMOTE may control multiple cameras if each camera is paired with that REDMOTE.**





## CURRENTLY PAIRED

Displays the MAC address (identity) of the REDMOTE paired with the camera.

## UNPAIR REDMOTE

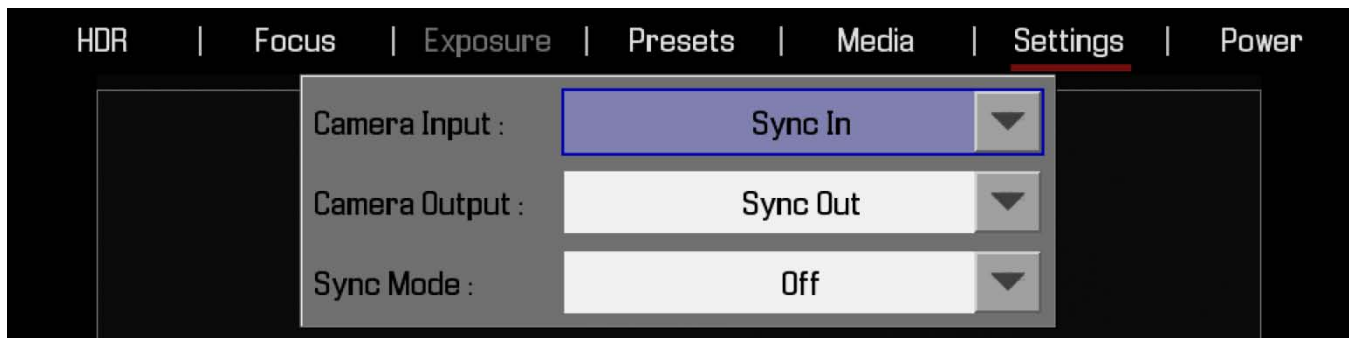
When selected will deselect the currently paired REDMOTE from the camera. Following this operation a different REDMOTE may be selected for pairing to the camera if desired.

## MANUAL CHANNEL SELECT

The Manual Channel Select option allows the user to change the communication channel for the REDLink wireless connection in the event of interference from other wireless devices. Auto (unchecked) will pick the "cleanest" channel automatically on each camera boot. Manual Channel Select is the default setting and for default uses Channel 0.

## GPIO

GPIO selects the GPIO preferences sub-menu.



## CAMERA INPUT

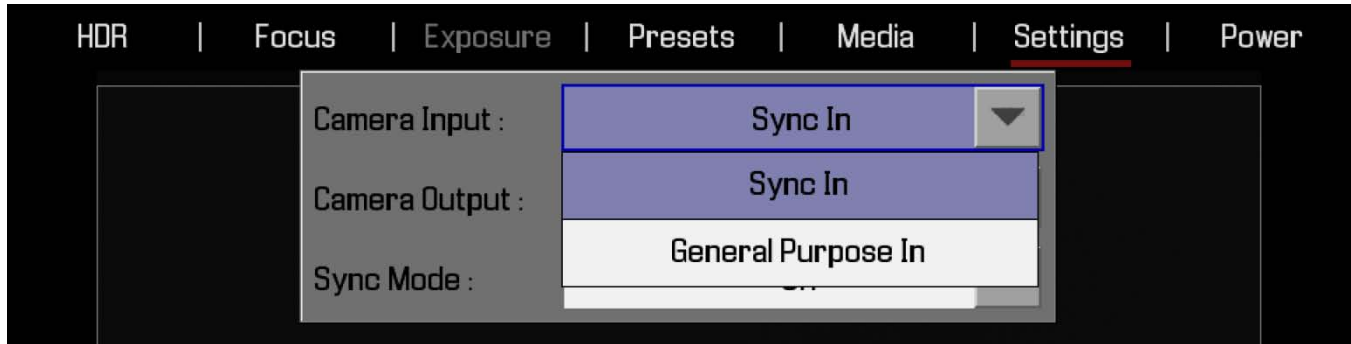
Permits the function of the SYNC IN / GPI pin in the SYNC connector to be defined as:

## Sync In

Accepts an Input Sync signal to control Shutter Start timing.

## General Purpose In

Accepts an Input Trigger signal to act as a General Purpose Input.



## CAMERA OUTPUT

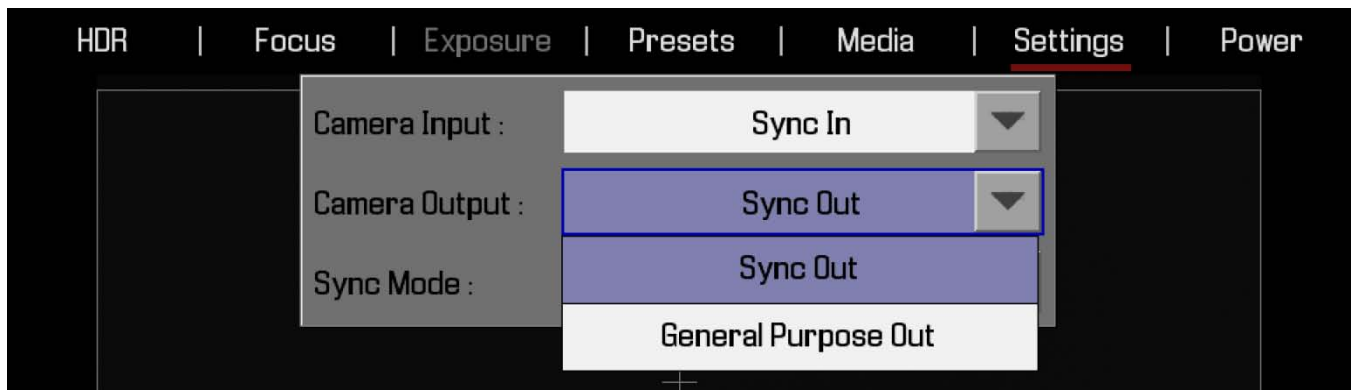
Permits the function of the SYNC OUT / GPO pin in the CNTL connector to be defined as:

## Sync Out

Provides an Output Sync signal to act as a Shutter Start tally.

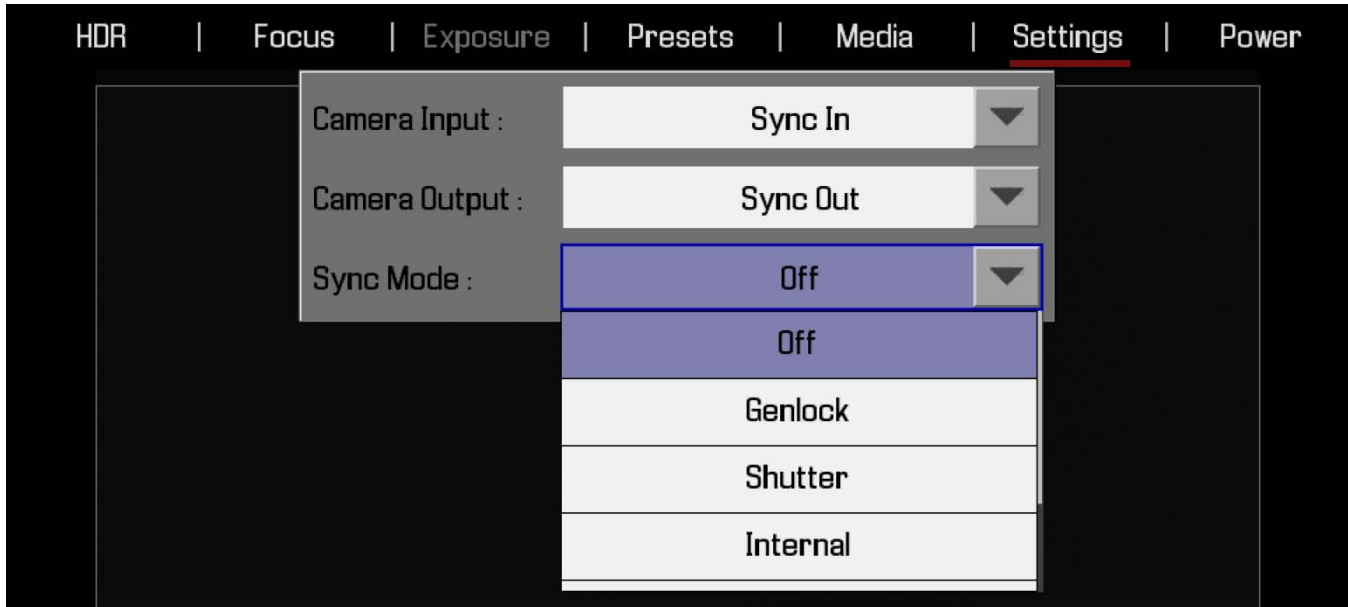
## General Purpose Out

Provides an Output Tally to act as a General Purpose Output tally signal.



## SYNC MODE

Allows the shutter timing (scan start) to be synced to an external signal.



Available options are OFF, GENLOCK, SHUTTER, INTERNAL, PROXY, and SLAVE. Default is Off.

**OFF** – Shutter start time is defined by internal camera timing.

**GENLOCK** – Shutter start time is slaved to an external RS170A tri-level sync signal .a.k.a “Genlock”.

**SHUTTER** – Shutter start time is slaved to an external Shutter Sync signal.

**INTERNAL** – Not implemented at this time.

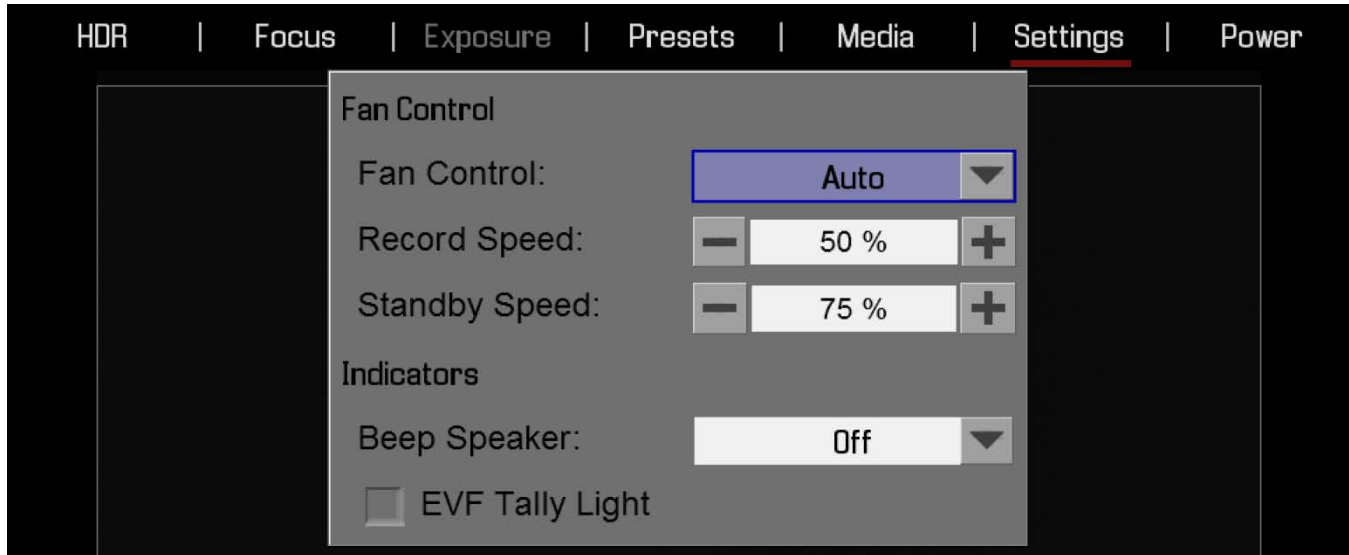
**PROXY** – Not implemented at this time.

**SLAVE** – Not implemented at this time.

**IMPORTANT:** If Sync > Genlock mode is selected, **DO NOT** set fps to higher than 72fps, and to a speed **NOT** a multiple of the project base rate and genlock input.

## SYSTEM

Available options are FAN CONTROL, RECORD SPEED and STANDBY SPEED as well as BEEP SPEAKER and EVF TALLY LIGHT.



## FAN CONTROL

Specifies cooling fan operation. Available options are AUTO and MANUAL. Manual will run the fan at the speeds specified in RECORD SPEED and STANDBY SPEED. Default setting is AUTO.

### Auto

This setting selects VARIABLE speed fan operation in standby based on the camera core temperature.

### Manual

This setting allows you to set a fixed fan speed to be used during Record and Standby modes.

### Record Speed

Sets a fixed fan speed to be used during Record. Range 25 – 100%. Default is 50%.

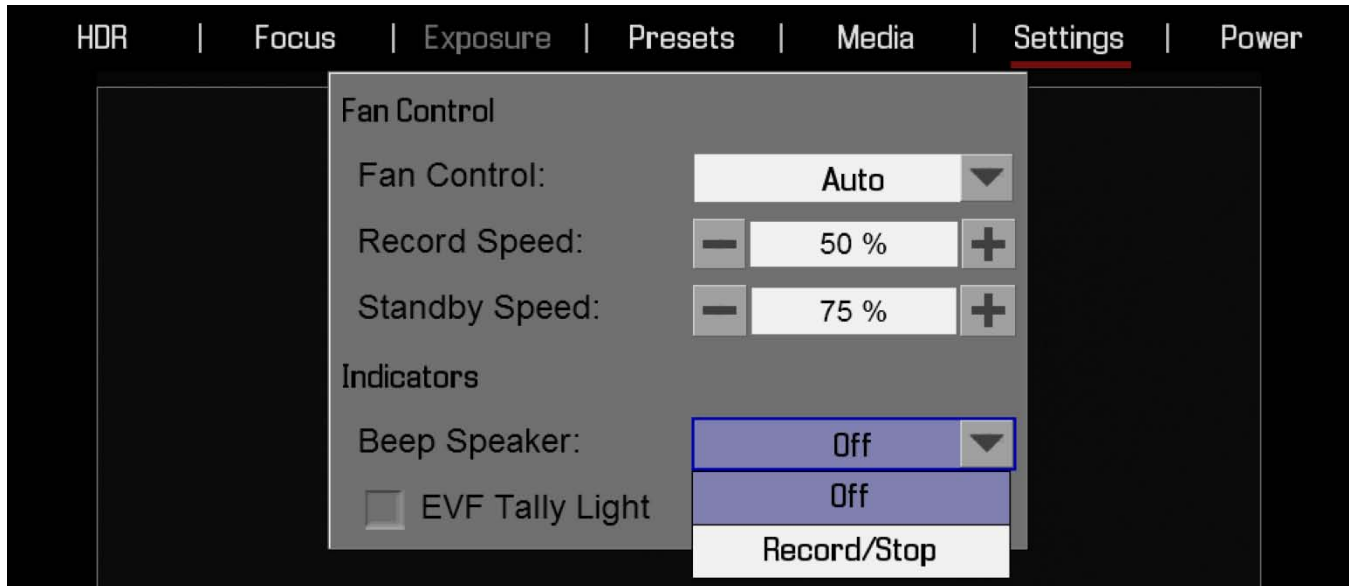
### Standby Speed

Sets a fixed fan speed to be used during Standby. Range 25 – 100%. Default is 75%.

## INDICATORS

### Beep Speaker

Available options are OFF and RECORD/STOP. When RECORD/STOP is selected, an audible beep will be heard when record is started and another when record is stopped.



### EVF Tally Light

When checked, enables the Record Tally Red LED on the front of the EVF.

## MAINTENANCE

The maintenance menu allows the user to check system status and information, save the camera diagnostic LOG to attached media, perform a software update, calibrate the sensor, perform a camera self test, and reset system settings to factory defaults.



# RED EPIC® OPERATION GUIDE

## SYSTEM STATUS

When selected the Viewfinder output(s) will display the System Status screen. This screen provides a summary of all operational settings currently applied to the camera.

HDR	Focus	Exposure	Presets	Media	<u>Settings</u>	Power
System Configuration						
Format	5K 2:1	ISO	800			
Timebase	23.976	Kelvin	5600			
REDCode	8:1	Tint	0.000			
Varispeed	23.976	Flut	0.000			
TC Track	---	Genlock	None			
TC JAM	OFF	Master/Slave	---			
Rig Metadata	---	Cam Name	A			
Sensor Sync	None	Cam Pos	Center			
Color Space	REDLogFilm	Calibration	37C,1/21Sec			

## SYSTEM INFO

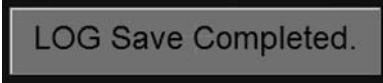
When selected the Viewfinder output(s) will display the camera Model, current firmware Version, installed and camera P.I.N.

HDR	Focus	Exposure	Presets	Media	<u>Settings</u>	Power
Focal Length : 70.00 mm Focus Dist.: 79.6 - inf ft		EPIC-M Version: 3.0.0 P.I.N.: 102-4C7-536 SVN revision: 44555 Hours of operation: 128.7				

## SAVE LOG

Select to write camera's .LOG file to the REDMAG 1.8" SSD. The .LOG file is a diagnostic tool that can assist RED with camera troubleshooting. After capture, upload the .LOG file to the RED customer service team contactable at [www.RED.com/support](http://www.RED.com/support).

After successfully writing the log file to media, viewfinder output(s) will display LOG SAVE COMPLETED. REDMOTE will also display this message.



LOG Save Completed.

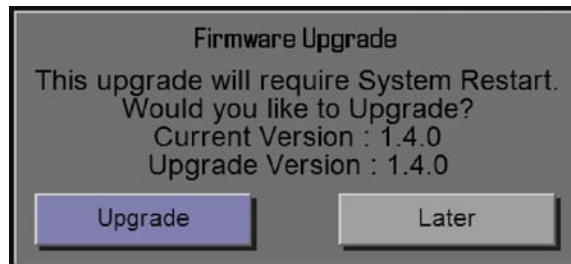
If media is not attached to the camera when attempting to perform a write log request, external monitors will display NO MEDIA ATTACHED.

**NOTE: Log files will be stored as \*.txt files in the 1.8" SSD root directory.**

## SW UPDATE

**NOTE: Firmware upgrade currently uses a force upgrade procedure as outlined in APPENDIX A: UPGRADING CAMERA FIRMWARE.**

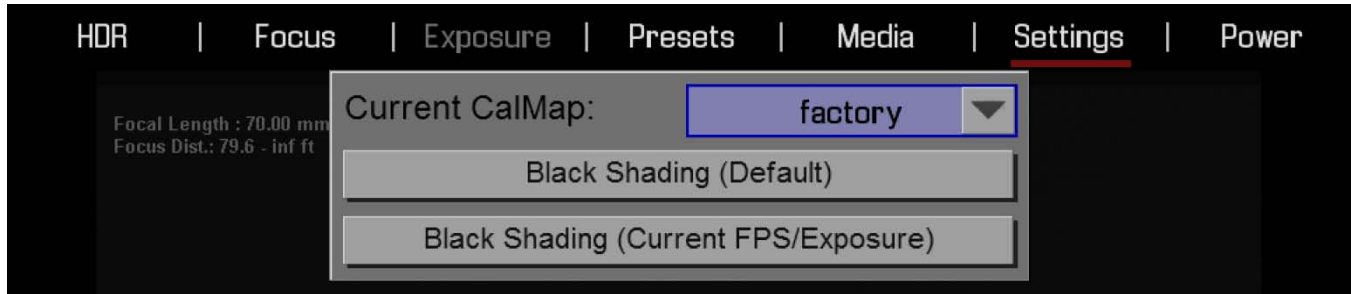
Update SW initiates a camera software (firmware) update. If a software update is on the attached media, you will be given the option to upgrade the camera (earlier firmware version shown for reference ONLY).



For complete, detailed procedure, go to APPENDIX A: UPDATING CAMERA FIRMWARE.

## CALIBRATION

Sensor calibration is a process where the camera generates a calibration map to correct for pixel defects and offsets based on current system and environmental settings. This allows you to perform a Black Shading calibration of the MYSTERIUM X sensor two (2) different ways; Default (at 24 FPS @ 1/48 SEC) or using your current FPS/Exposure settings.



To calibrate the sensor the image needs to be as dark as possible:

- At a minimum put a lens cap on the lens (WARNING: Not all lens-caps completely block IR. They are made to protect the lens, not necessarily to block light...)
- Preferably, take off the lens, and use the lens-mount cap provided by RED.
- If possible, use a dark room.
- Just closing the Iris is NOT sufficient.

Additionally a SSD needs to be inserted in the camera to store the raw images during calibration.

Calibration is required:

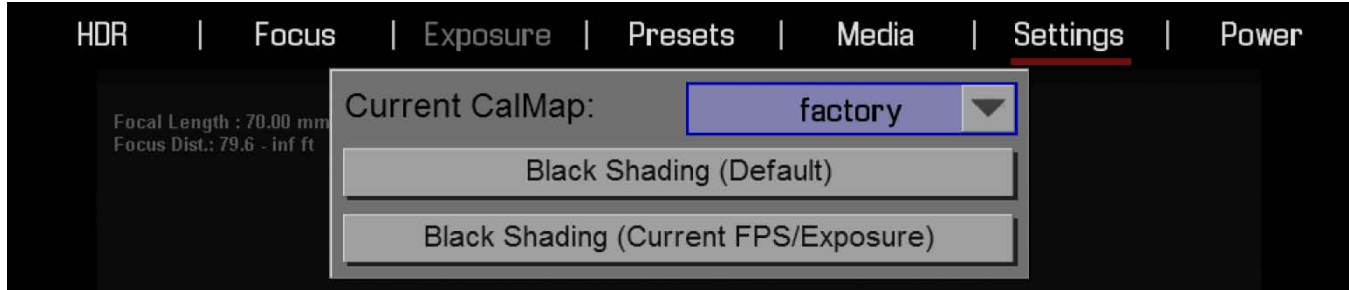
- If the temperature deviates significantly from the currently used calibration, it is recommended to recalibrate the sensor.
- If very long exposure (~longer than 1/24 Sec) is used it is recommended to recalibrate.

After Calibration with a lens cap on and ISO set to maximum, the sensor should show a uniform noise profile over the whole area without any falloffs on any side. You can check at which temperature/exposure time the currently used calibration was taken on under SETTINGS > MAINTENANCE > SYSTEM STATUS under Calibration.

Calibration maps will still be available after performing a system restore under SETTINGS > MAINTENANCE > RESTORE SYSTEM; however the factory calibration map will be reselected.

## CURRENT CALMAP

Calibration maps are stored in the camera. Due to the nature of the camera, different calibration maps are needed for different situations.



### Factory

This is the calibration map generated during production. This map is always present and selected as default on first use after performing a system restore under SETTINGS > MAINTENANCE > RESTORE SYSTEM.

### User HS

The user can select the CURRENT CALMAP. The dialog only shows the calmaps stored in memory (FACTORY and USER HS in this case).

### BLACK SHADING (DEFAULT)

This option uses fixed settings which are the same used for the factory calibration (around 23 Deg C).

### BLACK SHADING (CURRENT FPS/EXPOSURE SETTINGS)

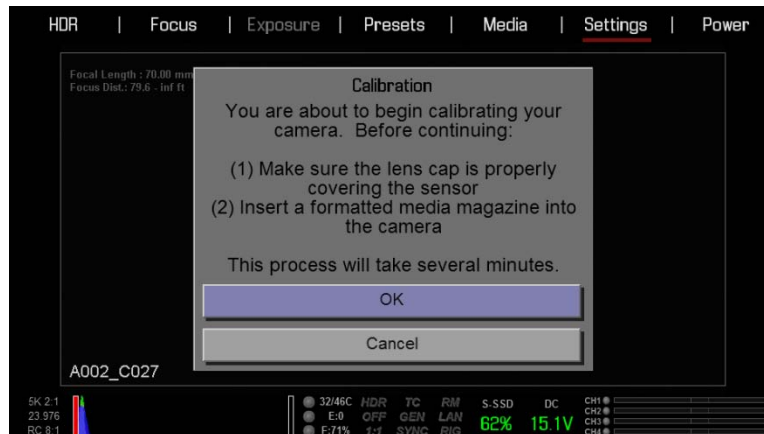
This option generates a calibration with the currently set frame rate/exposure. This can be used to generate a calibration for long exposures. After calibration (Which takes about 10 min), the new map is automatically selected.

## BLACK SHADING PROCEDURE

The calibration procedures are the same for both BLACK SHADING options.

The calibration procedures are the same for both Black Shading (24 FPS @ 1/48 SEC) and Black Shading (Current FPS/Exposure) options.

When selected, a screen will appear asking if you wish to proceed with Black Shading calibration. REDMOTE will also display the following messages.

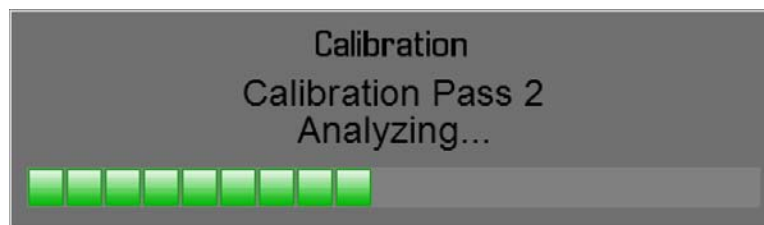


Black Shading calibration procedure:

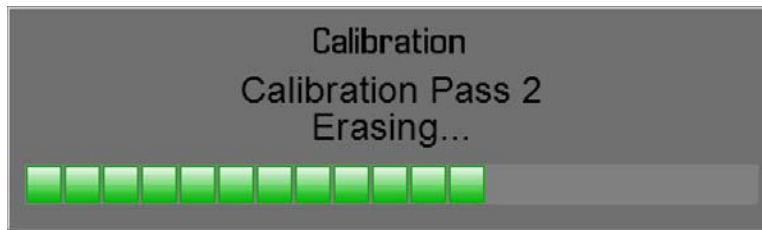
1. Ensure the sensor is NOT exposed to the calibration light source by installing the lens cap properly.
2. Ensure a properly formatted SSD is attached to the camera and properly formatted.
3. Select OK to perform the Black Shading calibration. The calibration will make 2 passes.
4. A status screen will show progress of the Capturing step. Second pass shown.



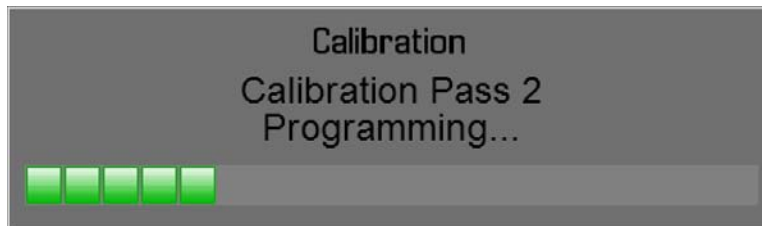
5. Once Capturing is complete, a status screen will show progress of the Analyzing step.



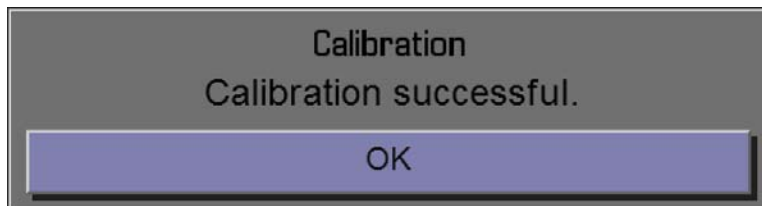
6. Once Analyzing is complete, a status screen will show progress of the Erasing step.



7. Once Erasing is complete, a status screen will show progress of the Programming step.



8. The camera will perform this procedure twice.
9. After Programming, CALIBRATION SUCCESSFUL will be displayed. Select OK to complete Black Shading calibration.



## SELF TEST

When selected allows you to perform a self-test for the sensor and LCD Touchscreen.



## ENABLE / DISABLE SENSOR TEST PATTERN

When selected enables / disables the sensor test pattern (White Screen). To turn on, select ENABLE SENSOR TEST PATTERN.

# RED EPIC® OPERATION GUIDE

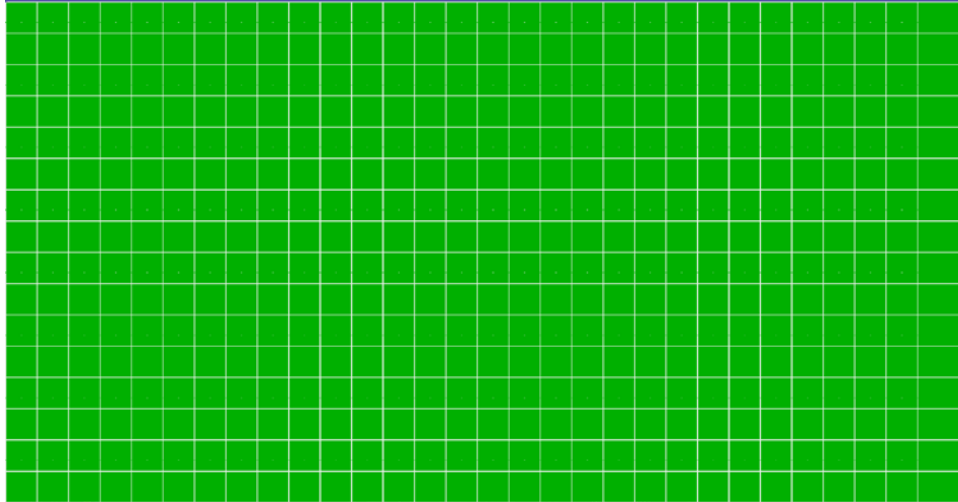


To turn off, select DISABLE SENSOR TEST PATTERN.

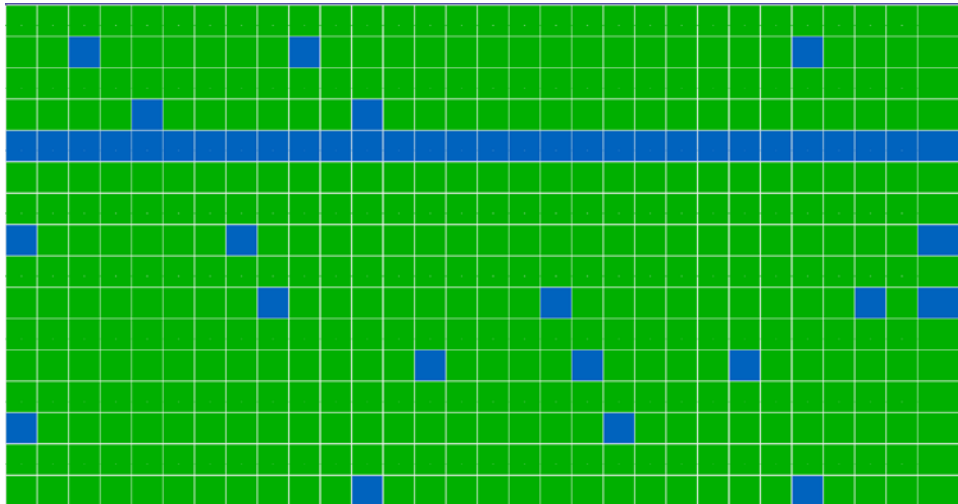


## TOUCHSCREEN

When selected allows you to perform a touchscreen self-test.



When the touchscreen self-test is on, you can verify all areas of the touch screen respond to touch. Simply touch each box using your finger. The touchscreen responds to the touch and the Green box turns Blue.



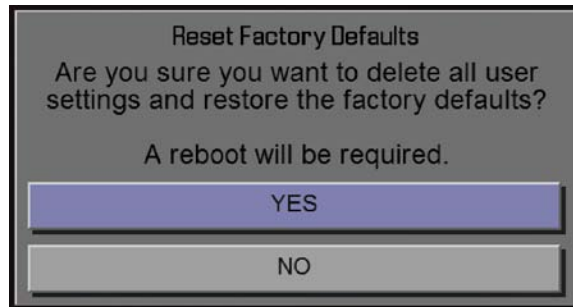
To exit the Touchscreen Self-Test:

- Place your finger on the touchscreen and hold it there until the main screen appears.
- Press the Enter or Menu button on the Side Handle or REDMOTE.

## RESTORE SYSTEM

Restore System permits ALL camera configuration and setup data to be reset to factory default values.

When selected, you will be asked to confirm if you want to delete all settings and restore the factory default settings. After settings are restored, “DEFAULT SETTINGS RESTORED, INITIALIZING RESTART...” Camera will automatically power down and will require you to manually power it up.

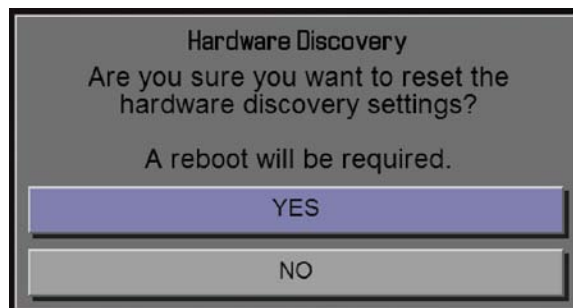


**NOTE: User key settings will be reset as well as any other changes from the cameras default settings. The REDMOTE will also require pairing to communicate wirelessly with the camera.**

## REDISCOVER

Rediscovered all hardware and caches the data for future boot cycles.

When selected, you will be asked to confirm if you want to reset all hardware discovery settings. After settings are reset, “RESET HARDWARE DISCOVERY SUCCESSFUL, INITIALIZING RESTART...” Camera will automatically power down and will require you to manually power it up.

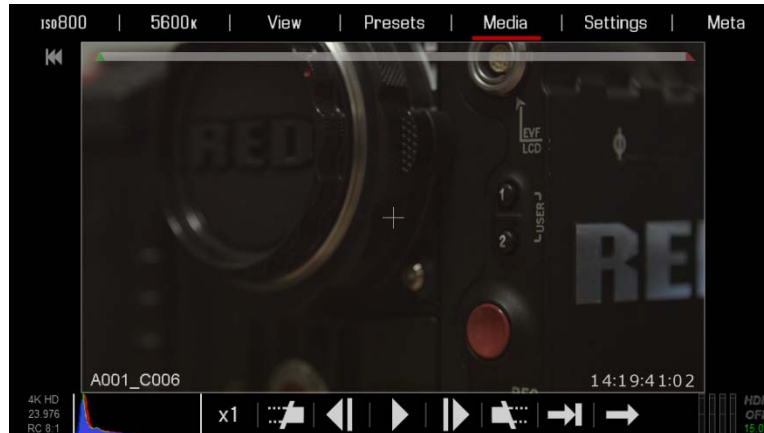


# RED EPIC® OPERATION GUIDE

## PLAYBACK

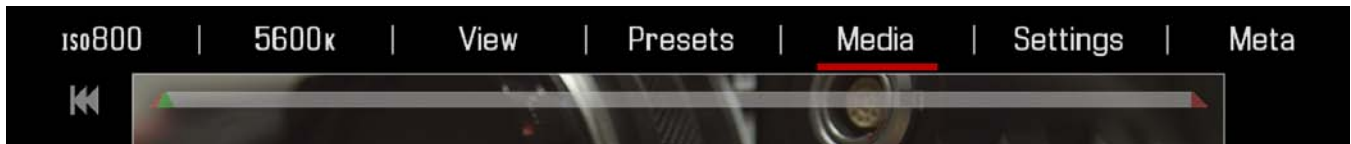
Playback allows you to view clips on media currently attached to the camera. It also allows you to change the look of the playback clips by changing settings available when in playback mode.

**NOTE: SCARLET-X™ menus shown, EPIC menus similar.**



## UPPER CONTROLS

From Left to Right are ISO, WHITE BALANCE, VIEW, PRESETS, MEDIA, SEETINGS, and META. Below the settings is the clip playback status bar.



## Exit Playback ICON (Touchscreen)

Select the O on the Left to exit Playback mode.

**NOTE: The Menu ICON on the Right does not respond to commands when in Playback mode.**



## ISO

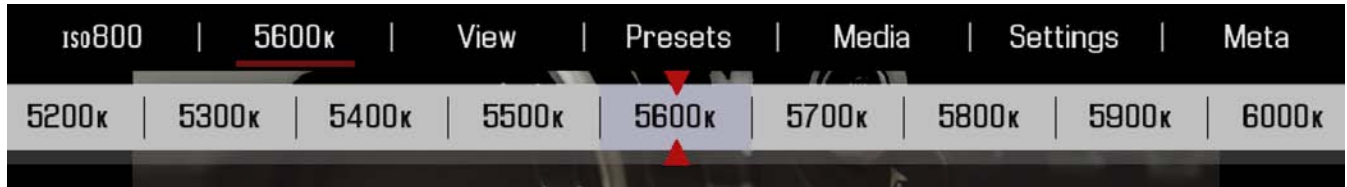
Allows you to change the ISO in the clip during playback.



# RED EPIC® OPERATION GUIDE

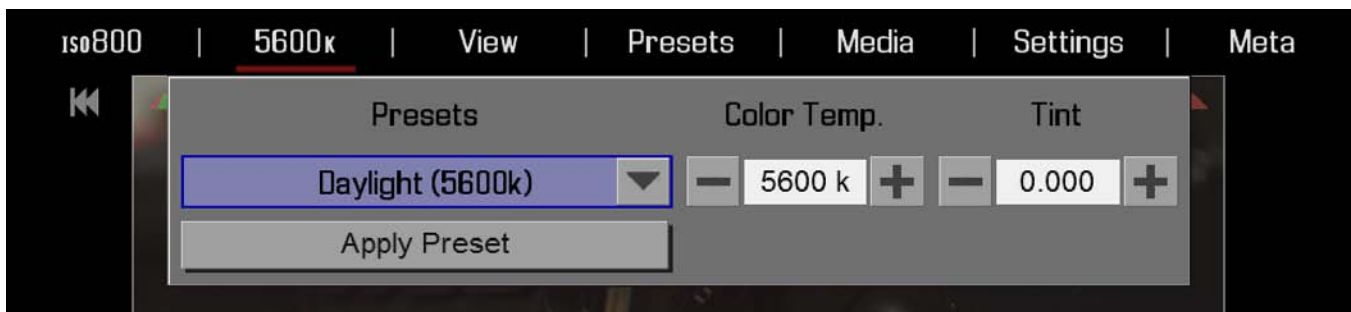
## WHITE BALANCE

Allows you to change the White Balance in the clip during playback.



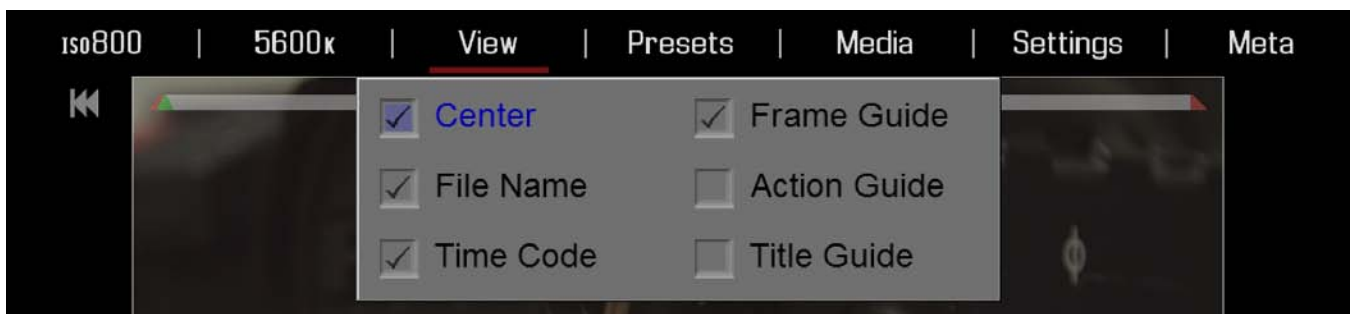
## Advanced Menu

Opens the advanced White Balance settings without the ability to Calculate.



## VIEW

Allows you to select the items to be displayed in the playback window. Available options are Center, File Name, Time Code, Frame Guide, Action Guide, and Title Guide.



# RED EPIC® OPERATION GUIDE

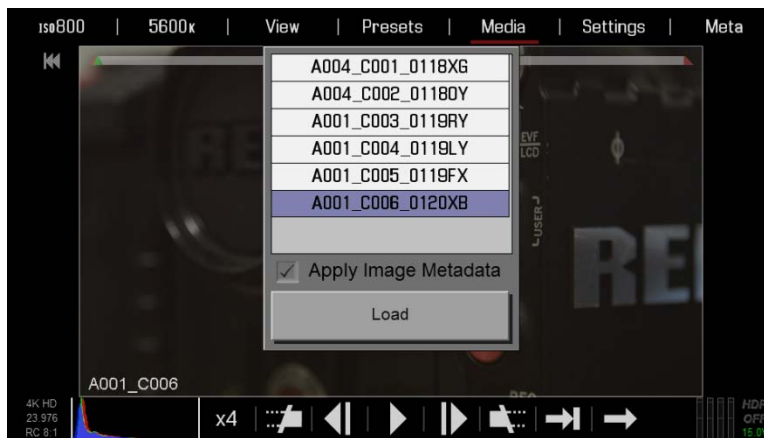
## PRESETS

Allows you to apply presets to the clip during playback.



## MEDIA

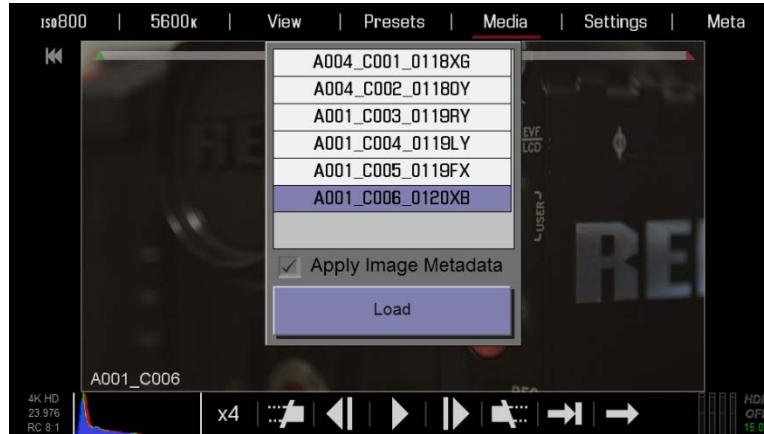
When selected will list all available clips on the attached media.



# RED EPIC® OPERATION GUIDE

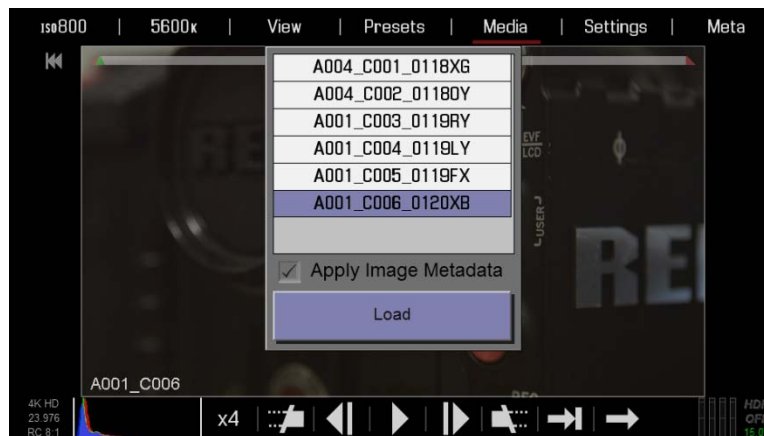
## Touchscreen

1. Double-Tap the desired clip to open in the playback window.
2. Load will also highlight. You can also select LOAD to load the clip in the player and allow playback.



## Side Handle / REDMOTE

1. Select the desired clip to playback and press the ENTER button.
2. Load will highlight. Select LOAD to load the clip in the player and allow playback.



# RED EPIC® OPERATION GUIDE

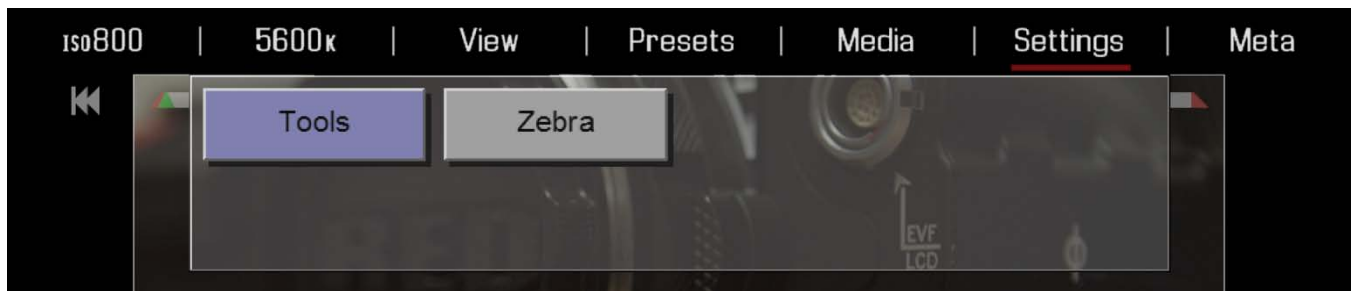
## SETTINGS

Available options are DISPLAY, LOOK and RECORD.



### Display

Available options under Display are TOOLS and ZEBRA.



### Tools

Allows you to toggle ON/OFF Exposure, Focus, Video, Edge, and RAW. Refer to SETTINGS MENU > DISPLAY > TOOLS for complete details about these options.



### Zebra

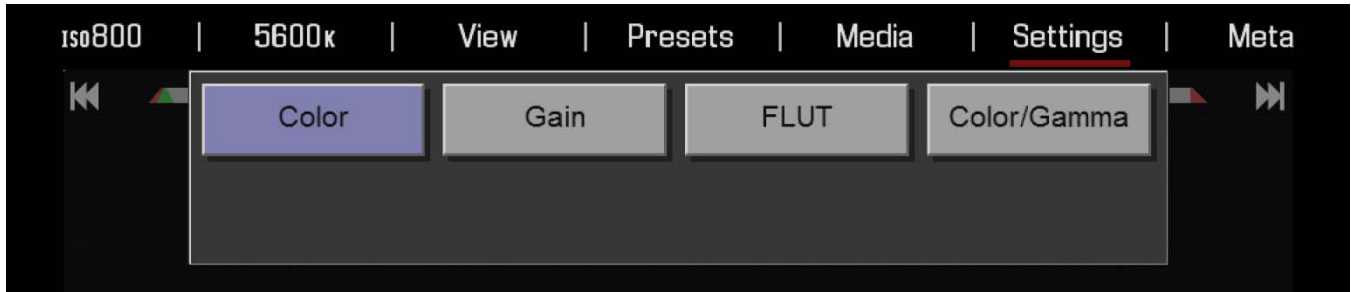
Allows you to toggle ON/OFF Zebras. Refer to SETTINGS MENU > DISPLAY > ZEBRA for complete details about these options.



# RED EPIC® OPERATION GUIDE

## Look

Allows you to adjust the Color, Gain, FUT, and Curve of the image during playback. Refer to SETTINGS MENU > DISPLAY > LOOK for complete details about these options.



## Record (Exit)

When selected will exit playback to the main menu.



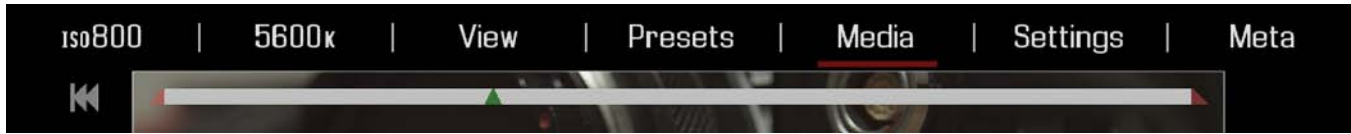
## META

Displays current clip META information.



## CLIP PLAYBACK STATUS BAR

Displays the progress of the clip during playback.

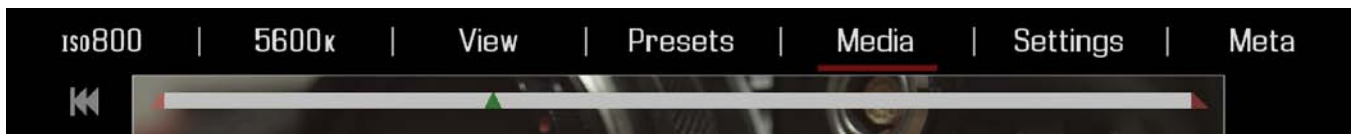


## Touchscreen

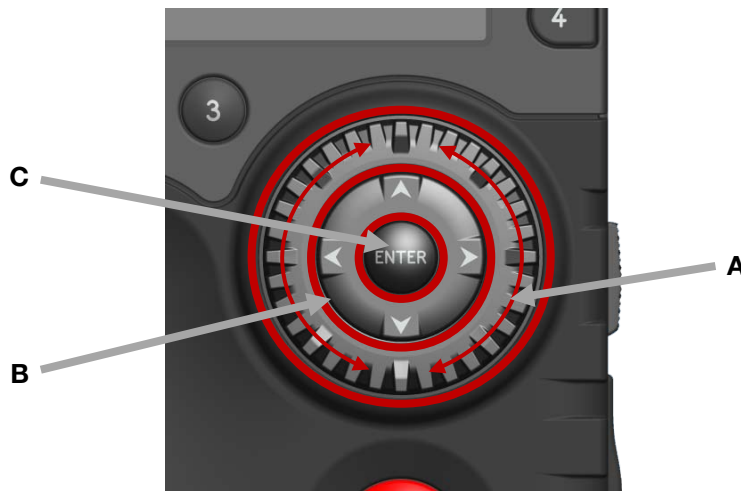
When using the touchscreen you can swipe your finger Left or Right to open and allow playback of the previous or next clip on the media.

## Side Handle / REDMOTE

When using the Side Handle or REDMOTE you can use the navigation group to highlight the clip playback status bar.



The navigation group will also allow you to perform the following actions to the clip:



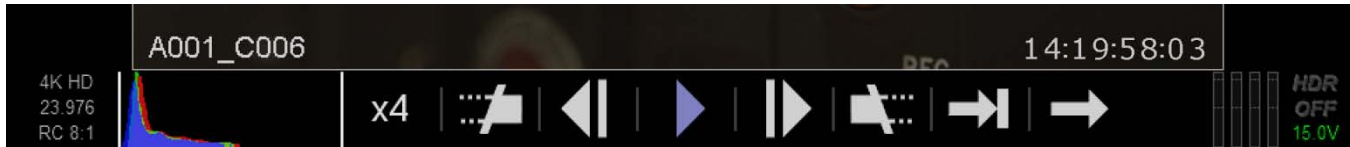
<b>A</b>	Scroll Wheel	<b>B</b>	Directional Pad	<b>C</b>	Enter Button
----------	--------------	----------	-----------------	----------	--------------

- **Scroll Wheel:** Rotating Clockwise or Counter-Clockwise will move through the clip on frame at a time forwards or backwards.
- **Directional Pad:** Pressing Left or Right to open and allow playback of the previous or next clip on the media.
- **ENTER Button:** Pressing the ENTER button controls Play / Pause of playback.

# RED EPIC® OPERATION GUIDE

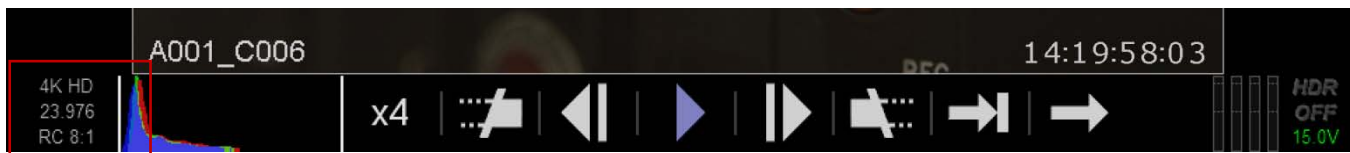
## LOWER CONTROLS

From Left to Right, PLAYBACK SPEED, IN POINT MARKER, FRAME-BY-FRAME REVERSE, PLAY/PAUSE, FRAME-BY-FRAME FORWARD, OUT POINT MARKER, PLAY ONCE/LOOP, and PLAYBACK DIRECTION



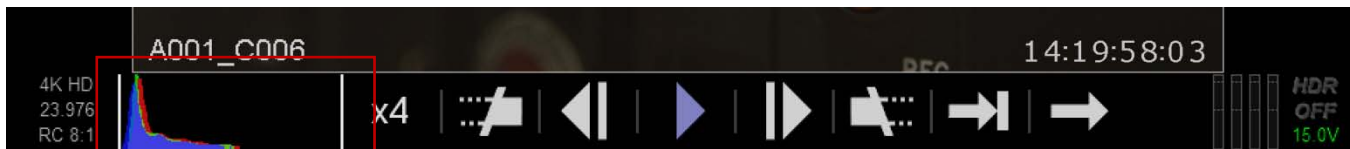
## RESOLUTION / PROJECT FRAMERATE / QUALITY

Display clip Resolution, Framerate and Quality (REDCODE). When using the touchscreen, touch the Resolution, Framerate and Quality (REDCODE) to display the METADATA for the clip.



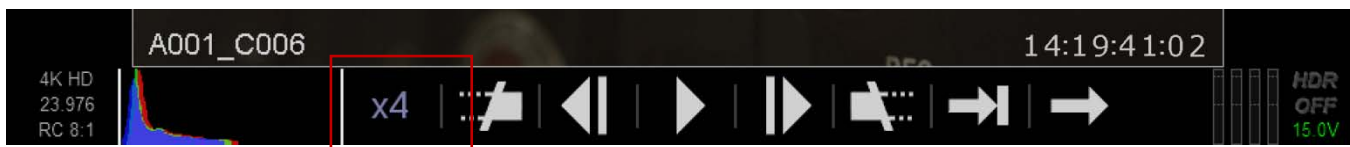
## HISTOGRAM

Displays the clip histogram. The histogram will change based on any changes made in the Upper Controls. When using the touchscreen, touch the histogram to display the TOOLS menu.



## PLAYBACK SPEED

Allows you to select x1, x2, x4, x8, or x16 playback speed.



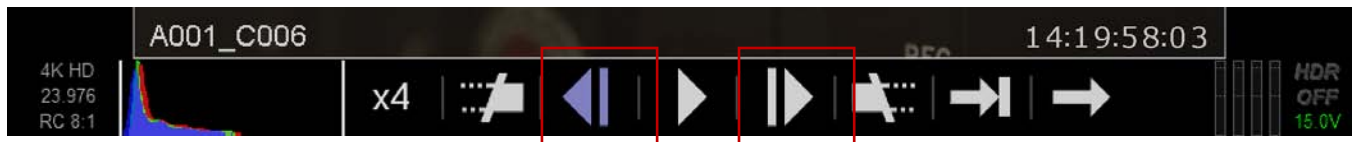
## IN / OUT POINT MARKER

Allows you to set In and Out Points during clip playback. This allows you to playback only a certain portion of the clip as desired. Helps when the clip is rather long and you want to focus on a particular segment. The In (Red) and Out (Green) points will be displayed in the Clip Playback Status Bar. You can use the navigation group to select the exact location of the In and Out Points if desired.



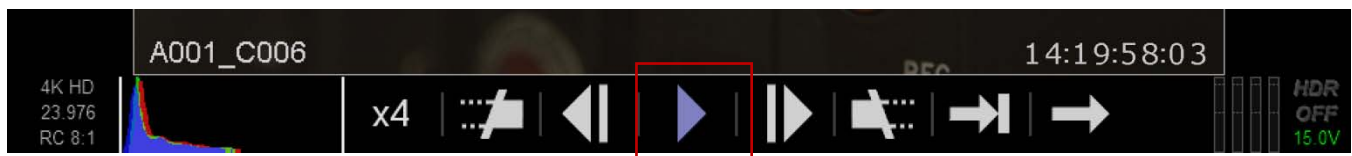
## FRAME-BY-FRAME REVERSE / FORWARD

Allows you to move through the clip frame-by-frame in the reverse direction.



## PLAY / PAUSE

Allows you to play and pause the clip.



## PLAY ONCE / LOOP

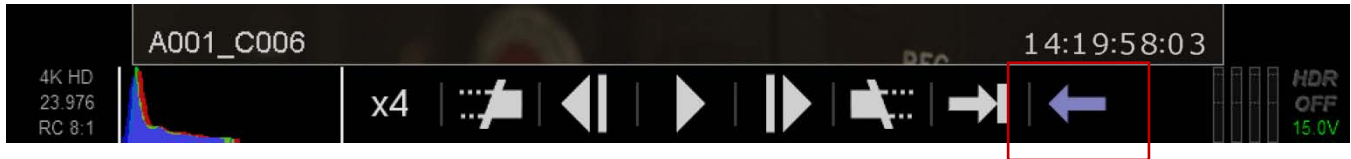
Allows you to choose to play the clip one time or to loop the clip in the player. Loop is shown below.



# RED EPIC® OPERATION GUIDE

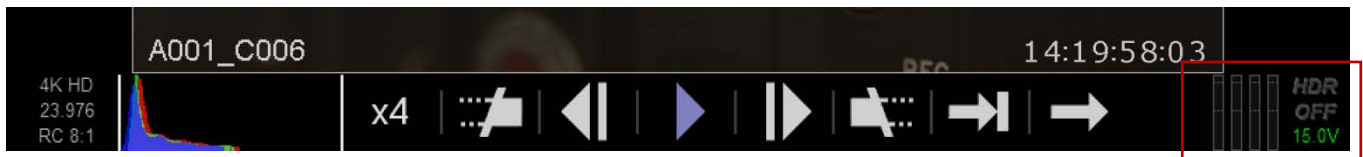
## PLAYBACK DIRECTION

Allows you to play the clip forward or backwards. Reverse playback is shown.



## ADDITIONAL CLIP/CAMERA INFORMATION

Will indicate if clip was recorded in HDRx and current camera power status as well as audio input signals.



## POWER

The power menu displays the current power status of all attached power sources as well as allows you to shutdown the camera.

## POWER STATUS

The power status is displayed for the BRAIN, SIDE HANDLE, REAR 1, REAR 2, REAR 3, and REAR 4.

Below is what is displayed when the camera is connected to DC power and a REDVOLT is installed into the side handle with REDVOLT batteries installed in the optional QUAD BATTERY MODULE.



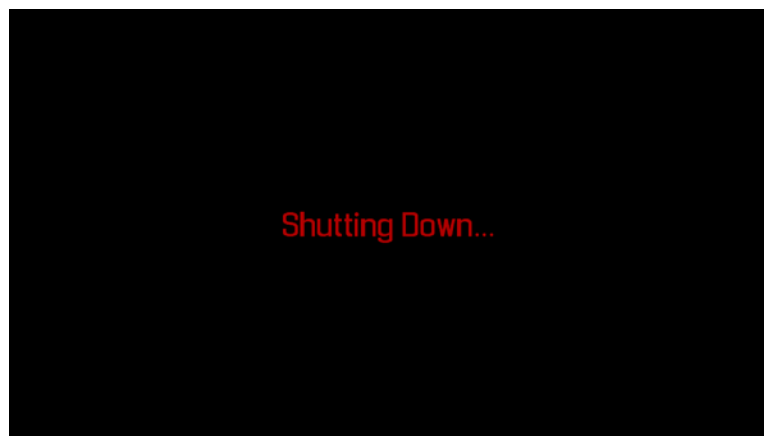
## SHUTDOWN

Power OFF controls are interlocked to prevent accidental powering down of the camera. For details on the different ways to power down your RED DSMC Camera, refer to BASIC OPERATION > POWER DOWN.

1. Enter the Secondary Menu using the touch screen, REDMOTE or Side Handle.
2. Select POWER.
3. Select SHUTDOWN.



4. The camera will immediately power down displaying SHUTTING DOWN.... If a REDMOTE is connected, the same message will display.



## APPENDIX A: UPGRADING CAMERA FIRMWARE

Your RED DSMC camera functionality may be upgraded by installing the latest firmware.

Camera firmware is identified by Version and SVN number, which will be displayed by the camera on the LCD display when SYSTEM INFO is selected. A higher number reflects a later release.

Make a habit of frequently visiting [www.RED.com/support](http://www.RED.com/support) to check for later versions of camera firmware, Operations Guide updates, and postproduction software.

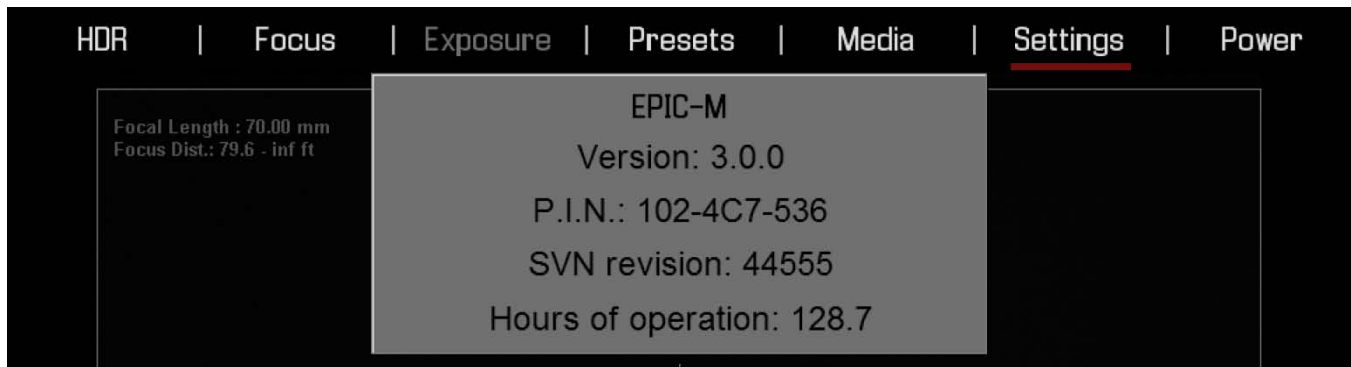
Your REDMOTE also requires a firmware upgrade. Go to APPENDIX E: REDMOTE OPERATION > MAINTENANCE > UPGRADING REDMOTE FIRMWARE.

### VERIFY CURRENT CAMERA FIRMWARE

With the camera ON, select SECONDARY MENUS > SETTINGS > MAINTENANCE > SYSTEM INFO.



The camera's P.I.N. number and current firmware version will be displayed.



### UPGRADE PROCEDURE

1. Download current firmware from <http://www.RED.com/support>.
2. Follow instructions in "Epic\_read\_me..." file.

## APPENDIX B: MANAGING DIGITAL MEDIA

### MEDIA

**REDMAG 1.8" SSD** is available with capacities of 64GB, 128GB or 256GB. Record duration is dependent on resolution, quality and frame rate, but a 64GB SSD will typically provide 24 minutes of 24fps 5K RAW recording.

On MAC computers with REDCINE-X PRO installed, RED Watchdog will mount the SSD as "READ-ONLY" by default and you cannot write the firmware to the SSD. RED Watchdog is identified by the RED Coin icon located on the Right side of the Menu Bar. Right-click on the icon to enter RED Watchdog settings and change to mount the drive as "READ-WRITE" to allow you to save the firmware to the SSD. Refer to REDCINE-X PRO OPERATION GUIDE for complete RED Watchdog instructions and details.

**IMPORTANT: After connecting REDMAG 1.8" SSD to the camera and BEFORE recording, you should format the media using the camera (even if formatting was previously performed on a computer). Go to ADANCED MENU > MEDIA > FORMAT to properly format media before recording.**

### FORMATTING MEDIA

Media must be formatted prior to using it for recording. Formatting is performed on camera, although media may be erased on a Macintosh OS X personal computer, allowing the camera to just add the necessary project profile and clip log data.

**NOTE: Media formatted on-camera will use a name and root volume in the format:**

Camera Letter + Reel Number + Month + Day + \*\* where \*\* is a two digit alphanumeric random number generated by the camera for each file e.g. A001\_0512A6.RDM

Clips recorded to the media follow similar naming conventions

A001\_C001\_0512A6\_001.RDC **and** A001\_C001\_0512A6\_H.mov etc.

**IMPORTANT: Media must always be un-mounted prior to removal or disconnection from the camera. This ensures power is removed from the digital media and any open data files are closed. Failure to do so may result in lost data or corrupted files. Refer to REMOVE MEDIA FROM CAMERA (UNMOUNT).**

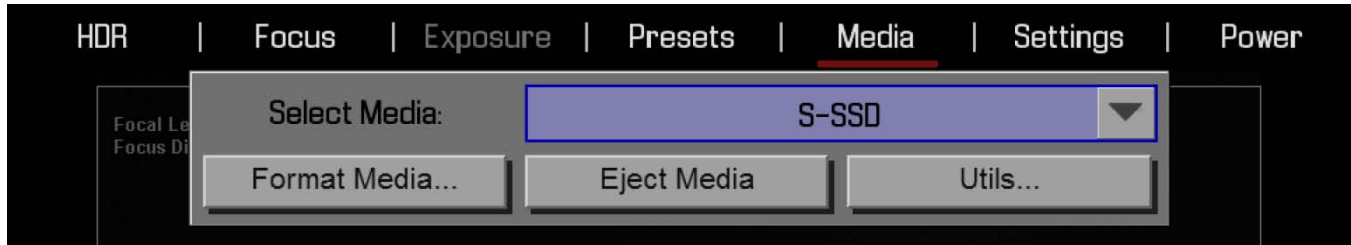
This procedure outlines the formatting of REDMAG 1.8" SSD media using the RED DSMC camera. Formatting the SSD media will take about 10 seconds.

1. Insert SSD into camera.
  - Insert the REDMAG 1.8" SSD with the RED logo facing outward (away from camera body). SSD firmly into its slot, but without using excessive force to prevent damage.
2. When SSD media is inserted into the camera, the camera will recognize if the media is unformatted:
  - On LCD, EVF and external monitors, in the media section of the GUI, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below "---").

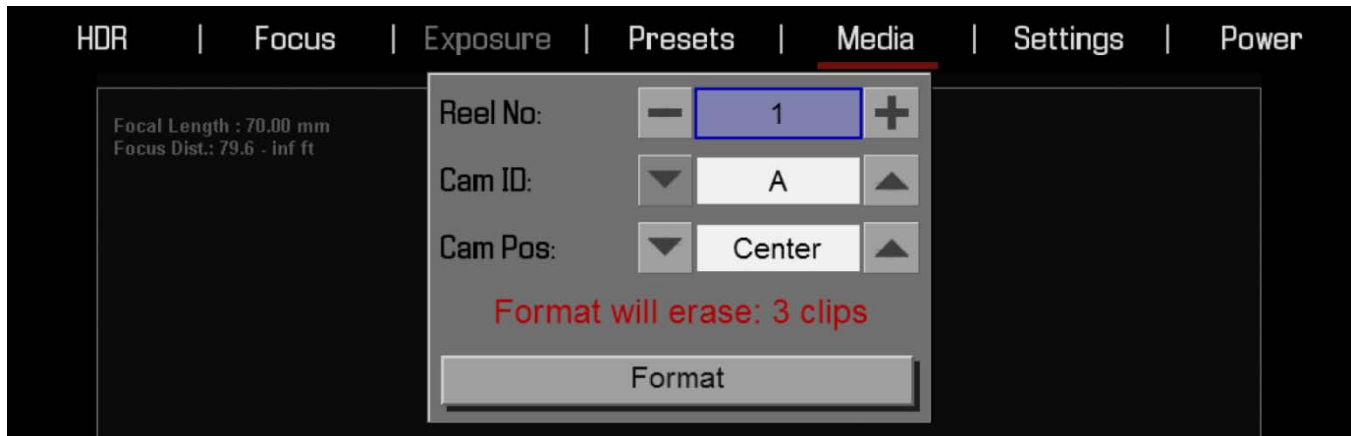
# RED EPIC® OPERATION GUIDE

- On REDMOTE, NONE will be displayed twice (as opposed to when no media is inserted, the GUI displays NONE with three dashes below “---”).
- On the Side Handle, NA will be displayed (same as if no media is present).

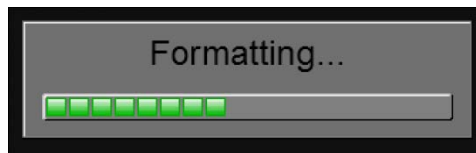
3. To format the media select SECONDARY MENUS > MEDIA > FORMAT MEDIA.



4. You will be prompted to set the media and select FORMAT.



- Viewfinder output(s) will display “FORMATTING”.



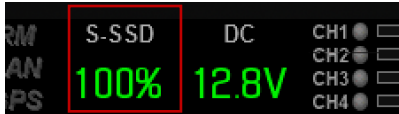
**NOTE: If when selecting FORMAT, the display indicates FORMAT FAILED, refer to MEDIA ERRORS.**

5. Once formatting is completed, the Viewfinder output(s) will display “THE MAGAZINE WAS SUCCESSFULLY FORMATTED THE DIGITAL MAGAZINE IS READY FOR IMMEDIATE USE”.

The magazine was successfully re-formatted.  
The digital magazine is ready for immediate use.

## MEDIA CAPACITY REMAINING STATUS

The Viewfinder output(s) will display the remaining media capacity in the MEDIA indicator (100% is shown).



At 10%, remaining capacity the media status will turn yellow, at 5% it will turn red. At 2%, remaining the camera will cease recording. This reserves a small amount of capacity for ancillary data to be written to the media.

**NOTE:** When media is full, the Side SSD LED will flash Red.

## EJECT MEDIA FROM CAMERA (UNMOUNT)

**IMPORTANT:** Media must always be Ejected (un-mounted) prior to removal or disconnection from the camera. This ensures power is removed from the digital media and any open data files are closed. Failure to do so may result in lost data or corrupted files.

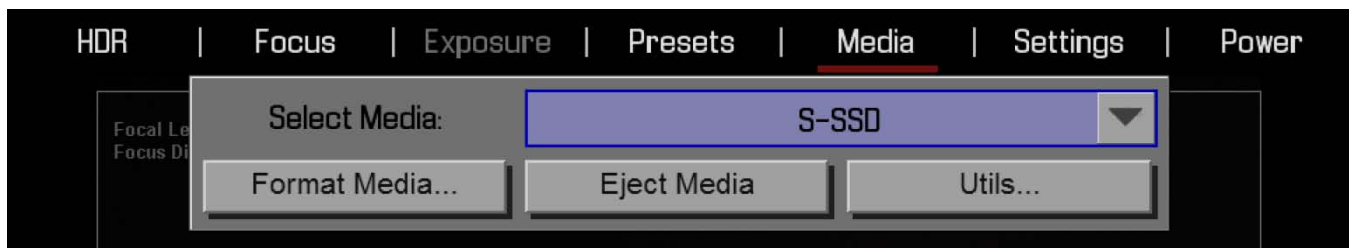
Removing an SSD without first un-mounting it will not physically damage the media, however it does increase the risk of file corruption, so it's good operational practice to un-mount the media if possible before removing or disconnecting.

**IMPORTANT:** Unmounting the digital media takes a few seconds, protects the integrity of your recorded data and helps clips mount instantly to your workstation once in postproduction, so it's a recommended habit to develop. If you do not un-mount the media the camera will offer a warning – your files may not be damaged, but you will have been warned!

**NOTE:** The camera will respond to physical removal of the media without un-mounting and display "MEDIA REMOVED PRIOR TO UNMOUNT – DATA INTEGRITY RISK".

## USING REDMOTE / TOUCHSCREEN LCD

1. Go to SECONDARY MENUS > MEDIA.



2. Select EJECT MEDIA.

3. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

Media Ejected successfully.

4. Media can now be removed from the camera.

## USING SIDE HANDLE

1. By default, the lower of the three (3) SYSTEM KEYS is set to Eject Media when pressed.



2. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

Media Ejected successfully.

3. Media can now be removed from the camera.

## USING SIDE SSD

1. Press both User Keys 1 and 2 at the same time to eject REDMAG 1.8” SSD Media.
2. When media is ejected, Viewfinder output(s) will display “MEDIA EJECTED SUCCESSFULLY“.

Media Ejected successfully.

3. Media can now be removed from the camera.

## COPYING MEDIA

For use when media is connected directly to your computer. When copying media, it is recommended that you drag the complete .RDM folder on the digital magazine to the archive storage media. This copies all the media and metadata files. You will not need to copy the log, magazine profile, or presets files, but if you do so, it will do no harm.

## ERASING MEDIA

**NOTE:** If the media was formatted using **SECURE FORMAT**, you cannot erase the media using an external source. Erasing of the media must be performed by formatting on the camera.

### MACINTOSH OS X

1. Connect the REDMAG 1.8" SSD via RED STATION REDMAG 1.8".
2. Open the Disk Utility.
3. Carefully choose the drive from the list on the left.
4. Select the Erase tab.
5. Choose MS-DOS (FAT) as the Volume Format. You can add a Name if desired, however the camera will overwrite this.

**IMPORTANT:** Before performing the next step, double-check that this is the correct SSD that you wish to erase **DATA FROM**.

6. Select Erase. When the pop up window appears click on the Erase button.
7. When the media is erased, drag its icon to the trashcan and physically disconnect it.
8. The media will need to be formatting by the camera before use. Refer to **FORMATTING MEDIA**.

### WINDOWS

1. Connect the REDMAG 1.8" SSD via RED STATION REDMAG 1.8".
2. Open Windows Explorer (go to my computer icon, right click and select EXPLORE).
3. Double-click on the drive you wish to erase files from.
4. Select all the files on the drive you wish to erase.

**IMPORTANT:** Before performing the next step, double-check that this is the correct SSD that you wish to erase **DATA FROM**.

5. Press the "DELETE" key on the keyboard, select FILE > DELETE or right-click on selected file and choose DELETE. When the pop up window appears click YES.
6. The media will need to be formatting by the camera before use. Refer to **FORMATTING MEDIA**.

## APPENDIX C: INPUT / OUTPUT CONNECTORS

### CAMERA BRAIN FRONT

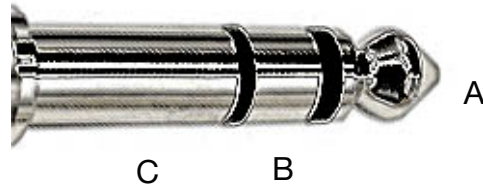


<b>A</b>	MIC-1 3.5mm Audio Jack	<b>B</b>	MIC-2 3.5mm Audio Jack
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*Camera Brain Connectors - Front*

## MIC-1, MIC-2 (MICROPHONE AUDIO)

Two 3.5mm phone jacks on the front of the brain support two independent channels of balanced or unbalanced microphone level analog audio inputs.



*Microphone Input Connector*

PIN	SIGNAL	DESCRIPTION	DIRECTION
A (TIP)	IN +	Mic Input (+48V Phantom Power)	In
B (RING)	IN -	Mic Input (+48V Phantom Power)	In
C (SLEEVE)	GND	Camera ground	--

Microphone Level analog audio input signals are routed via a high quality pre-amplifier and soft limiter, whose Gain may be controlled using the Input Level control to achieve the desired audio reference / recording level. Microphone inputs support +48V @ 10mA Phantom Power as a user selectable option.

To assist with reference level setup, the camera provides a color-coded Peak Level Meter in the Graphical User Interface, with witness marks that indicate 0dBu (-20dbFS) and 0Vu (- 16dBFS) levels.

Peak Level Meter range is -36dBu to +20dBu (-54dBFS to 0dBFS) and provides input clip indication.

**NOTE: In Version 3.x software, 48 V Phantom power is disabled.**

**NOTE: A pre-fabricated XLR to TRS interface cable, Part Number 790-0229, is available from RED Digital Cinema.**

## CAMERA BRAIN REAR



A	HD-SDI
B	Headphone
C	SYNC (Video Sync)
D	CTRL (RS232 Control)
E	GIG-E (Ethernet)
F	DC IN (Power Input)
G	HDMI

*Camera Brain Connectors - Rear*

## HD-SDI

A standard 75 Ohm BNC connector provides a broadcast specification high definition video output.

PIN	SIGNAL	DESCRIPTION	DIRECTION
Center	HD-SDI	SMPTE-292M HD-SDI	Out
Shield/Screen	GROUND	Camera ground	--

### *HD-SDI Output*

The HD-SDI output provides a 720p progressive scan video feed operating at 50.00 or 59.94 Hz or a 1080p 10-bit 4:2:2 progressive scan video feed operating at 23.98, 24.00, 25.00 or 29.97 Hz when in 1.5GHz HD-SDI mode, or a 1080p 10-bit 4:2:2 progressive scan video feed operating at a 50.00 or 59.94 Hz when in 3GHz HD-SDI mode.

The HD-SDI output may be specified as a PROGRAM output (clean feed video) or as a PREVIEW output (includes SurroundView™ look around, Clip Name, Timecode and Safe Action / Safe Title frame guides).

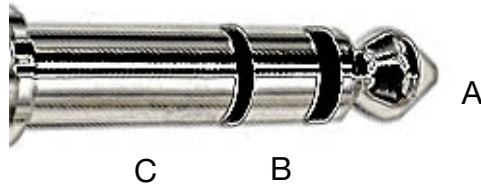
In addition to video, the HD-SDI output also provides two channels of embedded audio, Time of Day and Edge timecode, record Tally flag and Clip Name information as SMPTE RP-188 VITC2 HANC metadata.

**NOTE: Default setting is PROGRAM.**

**NOTE: HD-SDI video output is Progressive Scan; it does not support 1080i or 1080PsF modes.**

## HEADPHONE

A 3.5mm stereo jack provides two channels of adjustable level analog audio for monitor headphones.



*Headphone Output Connector*

PIN	SIGNAL	DESCRIPTION	DIRECTION
A (TIP)	LEFT	Left channel audio	Out
B (RING)	RIGHT	Right channel audio	Out
C (SLEEVE)	GND	Camera ground	--

The camera's four audio channels may be monitored in pairs: either 1L - 2R or 3L - 4 R or as a quad mix of 1+3L - 2+4R based on the MIX parameter. Default is 1L-2R.

Output volume may be adjusted as follows.

**Volume:** (master volume) Adjusts headphone volume equally for left and right outputs.

Range is -18dB to 0dB in 1dB steps. Default is -9dB.

**NOTE:** for maximum output signal quality, only use high impedance headphones.

**NOTE:** in Version 3.x software the above selection is not available, the output is set to 1L / 2R.

## SYNC (VIDEO SYNC)

A 4-pin LEMO connector supports shutter synchronization, GPI, timecode and genlock input signals.

The shutter Sync input signal acts as an immediate response hardware trigger to commence a scan. This is useful for motion control and other applications where the camera is driven by a master timing device. When using SYNC as the camera shutter timing reference, fine shutter start time timing (SHUTTER PHASE) is disabled; make any desired timing adjustments at the external SYNC generator.

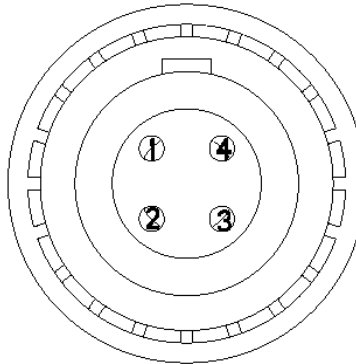
Alternatively, this input may be used as a GPI (General Purpose Input) trigger, whose function is programmed in the USER KEYS menu. Default function for the GPI trigger is Record Start / Stop.

The SMPTE timecode input provides a frame accurate time stamp for each frame of recorded video. External TC must be chosen in the Project > Timecode menu. When SMPTE timecode is detected it will align the internal TC value to the external TC signal at every :00 frame crossing of the external TC signal.

# RED EPIC® OPERATION GUIDE

The Video Genlock input may be used as a vertical interval reference signal for the sensor and HD-SDI outputs when precise synchronization is required between cameras, such as for 3D and live broadcasts.

**Note:** When GENLOCK is selected as the sensor shutter reference, shutter start timing (SHUTTER PHASE) may still be adjusted. HD-SDI monitor outputs will automatically sync to the external GENLOCK signal as soon as it is detected, there is no need to enable this function.



*View into camera SYNC (Video Sync) Interface connector*

*Mating Connector: FGG.00.304.CLAD27Z*

PIN	SIGNAL	DESCRIPTION
1	GROUND	Common Ground
2	SS/GPI	Shutter Sync / GPI Trigger Input
3	TIMECODE	SMPTE unbalanced timecode Input
4	GENLOCK	RS170A Tri-Level Sync Input

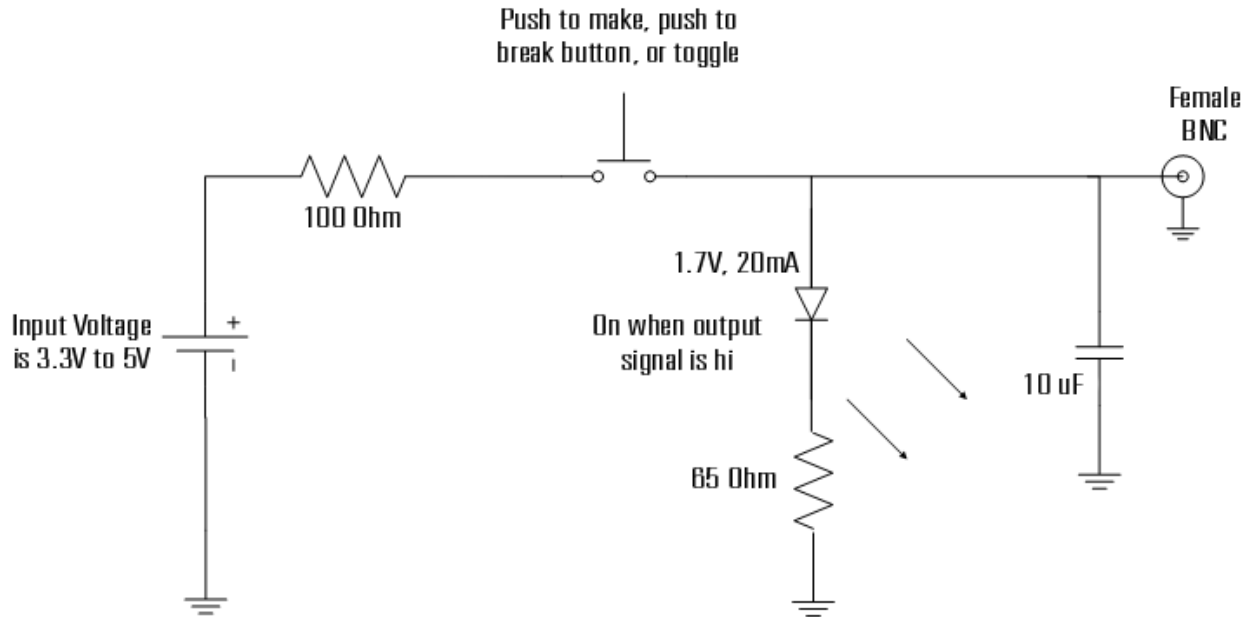
**NOTE:** The Camera Brain's Shutter Sync / GPI Trigger uses a 3.3 V Schmitt trigger (5 V tolerant), current supplied by the trigger source. Both edges of the input signal may be used as a trigger.

For example, when GPI trigger is used for Record Start / Stop.

- **Start Record:** On Ground to 3.3 V transition
- **During Record:** Hold at 3.3 V
- **Stop Record:** On 3.3 V to Ground transition
- **During Stop:** Hold at Ground

# RED EPIC® OPERATION GUIDE

## TRIGGER BUTTON CIRCUIT



Component values are approximate, use standard values

**NOTE: A pre-fabricated SYNC interface cable is available from RED Digital Cinema.**

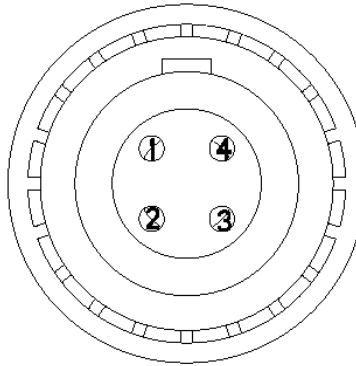
- P/N 790-0154 – Video Sync – Camera to 3 BNC – 3 ft. (1m)
- White BNC: Shutter Sync / GPI
- Yellow BNC: SMPTE Timecode
- Green BNC: RS170A Genlock

## CTRL (RS232 CONTROL)

A 4-pin LEMO connector supports RS232 remote control for 3D camera communication, and third party metadata ingest applications.

The shutter Sync Output signal acts as an immediate response hardware tally of a scan. This is useful for 3D or motion control applications where a slave camera or lighting device needs to be synchronized to a master camera.

Alternatively, this output pin may be used as a GPO (General Purpose Output) tally, whose function is programmed in the USER KEYS menu. Default function for the General Purpose Output is Record Tally.



*View into camera CTRL (RS232 Control) Interface connector*

*Mating Connector: LEMO FGG.00.304.CLAD27Z*

PIN	SIGNAL	DESCRIPTION
1	GROUND	Common Ground
2	232 RX	RS232 RX
3	SS/GPO	Shutter Sync / GPO Output
4	232 TX	RS232 TX

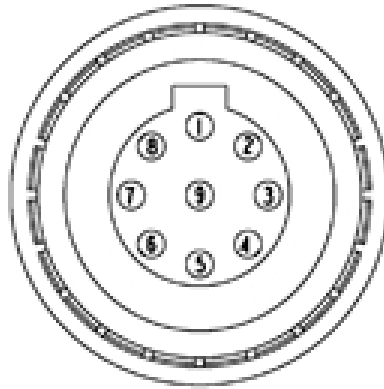
**NOTE:** When active, the GPO tally presents 3.3V @ 0.04 Amps maximum between pins 1 and 3. When used as Sync Out, the rising edge of the pulse indicates start of exposure. When used as a Tally, the rising edge of the pulse indicates start of record, falling edge represents end of record.

**NOTE:** A pre-fabricated CTRL interface cable is available from RED Digital Cinema.

- P/N 790-0152 – RS232 – Camera to DB-9 – 3 ft. (1m)
- DB-9 Pin 1: Shutter Sync / GPO
- DB-9 Pin 2: RS232 Tx
- DB-9 Pin 3: RS232 Rx
- DB-9 Pin 4: Ground

## GIG-E (ETHERNET)

A 9-pin LEMO connector provides a Gigabit Ethernet port for remote camera setup, master / slave camera communication and external metadata ingest.



*View into Ethernet Interface connector*

*Mating connector: FGG.0B.309.CLAD32Z*

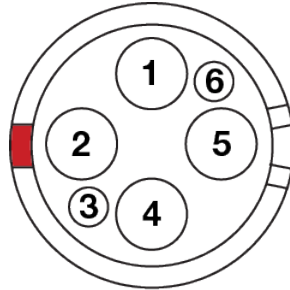
PIN	SIGNAL	DESCRIPTION	DIRECTION
1	B1_DC +	Data Pair C+	--
2	B1_DC -	Data Pair C-	--
3	B1_DD+	Data Pair D+	--
4	B1_DD -	Data Pair D-	--
5	B1_DA-	Data Pair A-	--
6	B1_DA+	Data Pair A+	--
7	B1_DB+	Data Pair B+	--
8	B1_DB-	Data Pair B-	--
9	-	Do Not Connect	--

**NOTE: Two pre-fabricated Ethernet interface cables are available from RED Digital Cinema.**

- P/N 790-0163 – Ethernet – Camera to Camera – 3 ft. (1m)
- P/N 790-0159 – Ethernet – Camera to RJ45 – 3 ft. (1m)

## DC IN (POWER INPUT)

The 6-pin LEMO connector accepts DC input power between +11.5 V and +17 V DC. Power conditioning provides protection against reverse-polarity connection, ESD, under and over voltage, and over current.



*View into camera DC IN Power Input connector*

*Mating Connector: LEMO FGJ.1B.306.CWLD72Z*

PIN	SIGNAL	DESCRIPTION
1	+VBATT	Power input, +11.5 to +17 V DC
2		
3	SCL-BATT	Serial Battery Bus Clock
4	GROUND	Power Return (Camera Ground)
5		
6	SCA-BATT	Serial Battery Bus Data

**WARNING:** It is very important that both pairs of +VBATT and GROUND pins are wired up. DO NOT fabricate power cables with just one each of +VBATT and GROUND pins wired, as this may cause damage to the camera's power supply; this is not covered by Warranty.

**NOTE:** Two pre-fabricated DC Power input cables are available from RED Digital Cinema.

- P/N 790-0138 – DC Power – REDBRICK® QUICKPLATE to Camera – 18 in. (0.5m)
- P/N 790-0164 – DC Power – XLR to Camera – 10 ft. (3m)

## HDMI OUT

The HDMI output supports an HDTV and PC monitor compatible 10-bit 4:2:2 progressive scan video signal (with embedded audio) at 720p and 1080p resolution.

The HDMI output may be specified as a PROGRAM output (clean feed video) or as a PREVIEW output (including SurroundView™ look around, Clip Name, Timecode and Safe Action / Safe Title frame guides).

In addition to video data, the HDMI output also provides 4 channels of embedded audio.

**NOTE: Default setting is PREVIEW.**

**NOTE: HDMI video output is Progressive Scan; it does not support 1080i or 1080PsF modes.**

## SIDE SSD MODULE



A	SSD Slot
B	VIEWFINDER (LCD/EVF)

*Side SSD Module*

The Side SSD Module mounts to the left side of the camera Brain. On the rear face of this module is a slot for inserting a REDMAG 1.8"SSD digital Magazine. Do not attempt to insert any other media type, or any foreign objects into this slot, as damage to the Side SSD Module and / or the camera Brain may occur.

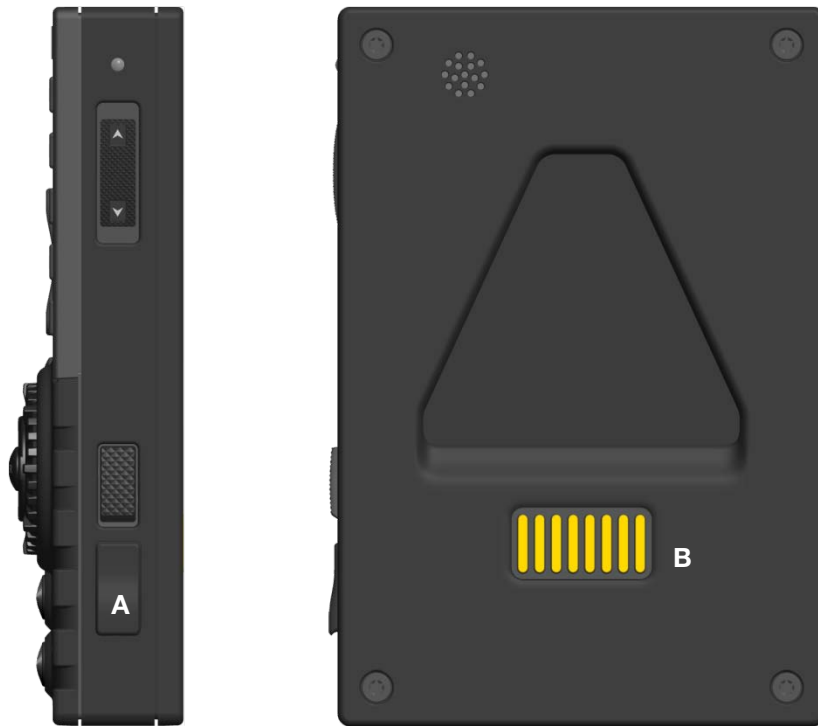
The VIEWFINDER output Module on the front face of the Side SSD Module provides digital video, communications and power interconnection between the camera and a RED EVF or RED LCD digital display. Due to the requirement for absolute data integrity this requires a custom cable manufactured by RED, the pin-out of this interface is not published.

**NOTE: Pre-fabricated EVF / LCD cables are available from RED Digital Cinema.**

- P/N 790-0157 – EVF / LCD Cable – Right Angle to Right Angle – 6 in. (0.15m)
- P/N 790-0153 – EVF / LCD Cable – Right Angle to Straight – 18 in. (0.5m)

## REDMOTE

This section describes the physical connectors on the REDMOTE.



<b>A</b>	Mini USB	<b>B</b>	Camera Interface
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### *REDMOTE Connections*

The REDMOTE interface connector allows communication between the REDMOTE and the camera Brain or any expansion module. Make sure these contacts are kept clean and free of any contaminants that may interfere with a reliable electrical contact.

## APPENDIX E: REDMOTE OPERATION

### CONTROL, CONNECTORS AND DISPLAY

This section describes the REDMOTE physical controls, connectors and color LCD display.

#### CONTROLS



*REDMOTE Controls*

<b>A</b>	Stills/Motion Switch	<b>F</b>	User Function Keys A-D	<b>K</b>	Menu Buttons 4-8
<b>B</b>	Release Latch - Left	<b>G</b>	MENU Button	<b>L</b>	Power/Lock Switch
<b>C</b>	Record Status LED	<b>H</b>	Menu Buttons 1-3	<b>M</b>	Release Latch – Right
<b>D</b>	Wireless Status LED	<b>I</b>	Navigation Group	<b>N</b>	USB External Power Port
<b>E</b>	Zoom Rocker Switch	<b>J</b>	Focus / Record Button		

#### STILL / MOTION SWITCH

The STILLS/MOTION toggle switch is used to switch between STILLS operation (DOWN) and MOTION operation (UP). When the toggle switch is set to the MOTION position, all camera settings and defaults are movie specific. When the toggle switch is set to the STILLS position, all camera settings and defaults are stills photography specific.

**Note: In Version 3.x software the STILLS/MOTION switch is disabled. Default mode is MOTION.**

## LEDS

There are two status LED indicators located above the rockers switch on the left side of the LCD display.

The upper LED is used to signal camera readiness and camera record status.

- Red – Camera Startup / Camera Recording.

The lower LED is used to signal camera readiness and REDMOTE communication status to the camera.

- Green – Camera Ready / REDMOTE connected.
- Blinking Green – Searching / Establishing communication

## ROCKER SWITCH

The function of the pressure sensitive ROCKER SWITCH may be assigned by the operator to one of a number of operational controls. Refer to SECONDARY MENU > SETTINGS > SETUP > KEYS / SHORTCUTS.

## USER FUNCTION KEYS

The function of each User Function Key may be assigned by the operator to one of a number of operational controls. Refer to SECONDARY MENU > SETTINGS > SETUP > KEYS / SHORTCUTS.

Default settings for User Function Keys A-D are as follows:

- User Key A – Toggles Auto Focus
- User Key B – Toggles View RAW
- User Key C – Toggles Focus Check (1:1 Magnify)
- User Key D – Toggles Sensor RAW Exposure Check

## MENU BUTTON

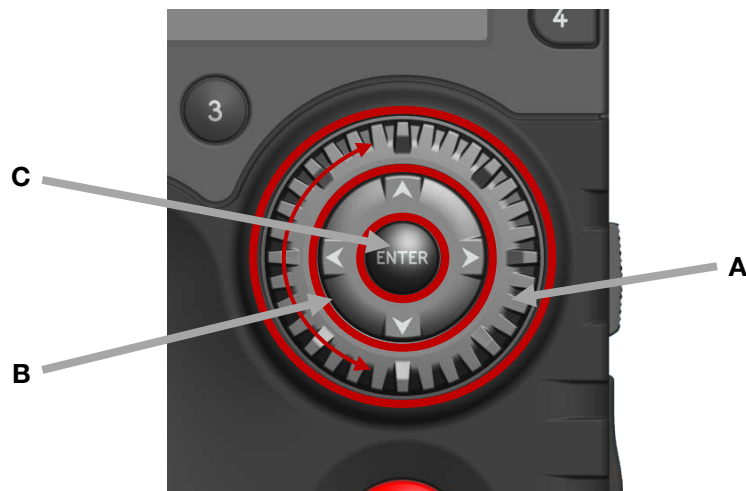
Below and to the left of the User Keys is the MENU button, press to switch between primary level and secondary level Camera menus. When in Camera menus or REDMOTE menus, press once to exit menus.

## SOFT MENU BUTTONS 1-3

Below the LCD are three Soft Menu Buttons, whose specific functions are indicated by the LCD screen. For complete information refer to OPERATION > REDMOTE MENU > SOFT MENU BUTTONS 1-3.

## NAVIGATION GROUP

The Navigation Group allows navigation of the camera menus and adjustment of selected parameters.



*REDMOTE Navigation Group*

<b>A</b>	Scroll Wheel	<b>B</b>	Direction Keys	<b>C</b>	Enter Button
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The Navigation Group has three separate operational capabilities.

## **SCROLL WHEEL**

The Scroll Wheel allows the operator to select and adjust the values of selected camera parameters.

## **DIRECTION KEYS**

The Direction Keys allows Left / Right / Up / Down navigation thru the camera menus to select a desired parameter for adjustment.

## **ENTER BUTTON**

The Enter button allows confirmation of a parameter adjustment or operational mode selection.

## **FOCUS AND RECORD BUTTON**

Below the Navigation Group is the focus and record button. A half press initiates Auto Focus; a full press initiates Stills capture or starts /stops a Movie recording.

When recording, the upper LED will illuminate Red and the Timecode readout on the REDMOTE LCD will also display in red colored text.

Note: In Version 3.x software the frame count of the Timecode is not displayed. This is normal and does not indicate an error.

## SOFT MENU BUTTONS 4-8

To the right of the LCD are five Soft Menu Buttons. These buttons select a variety of camera status pages. For complete information refer to OPERATION > REDMOTE MENUS > SOFT MENU BUTTONS 4-8.

Note: In Version 3.x software, Soft Menu Buttons 7 and 8 are undefined.

## POWER / KEY LOCK SWITCH

If the REDMOTE is powered OFF, moving and holding the switch in the down (POWER) direction for 2 seconds will power UP the REDMOTE and if the REDMOTE is powered ON, moving and holding the switch in the down (POWER) direction for 5 seconds will power DOWN the REDMOTE.

Moving the switch to the up (LOCK) position will lockout all REDMOTE buttons to prevent unintentional operation. When in the LOCK position, KEYS LOCKED will be displayed in red text above the SOFT MENU BUTTONS 1-3 on the REDMOTE LCD display.

## USB POWER PORT

The USB port may be used to charge the REDMOTE internal battery from a suitable USB power source. Refer to CHARGING / BATTERY LIFE > CHARGING USING USB CONNECTOR for complete information.

## OPERATION

### DOCKING AND UNDOCKING

This section describes how to physically dock / undock the REDMOTE to / from the camera Brain or the back of the rearmost expansion module.

### DOCKING

1. Place the female V-Mount of the REDMOTE over the male V-Mount of the camera Brain or rearmost module.

# RED EPIC<sup>®</sup> OPERATION GUIDE

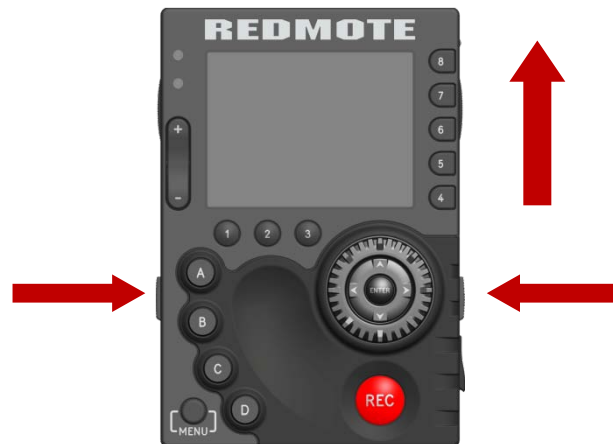


Note: For illustration only: rear surface of REDMOTE should face towards camera

2. Slide the REDMOTE down until a click is heard which indicates the REDMOTE is securely attached.

## UNDOCKING

1. Depress the two latch release buttons located on each side of the REDMOTE.
2. Slide the REDMOTE upward to release from the V-Mount of the camera Brain / rear most module.
3. Remove the REDMOTE.



## POWER UP / DOWN

Located on the upper right side of the REDMOTE is the Power / Key Lock Switch (refer to CONTROLS).

# RED EPIC® OPERATION GUIDE

## POWER UP

### CONNECTED TO CAMERA

If the REDMOTE is physically attached to a camera, when the camera is powered up the REDMOTE will automatically power up along with the camera.

### NOT CONNECTED TO CAMERA

To manually power up the REDMOTE, slide and hold the Power / Key Lock Switch in the down direction for 2 seconds, then release.

## POWER DOWN

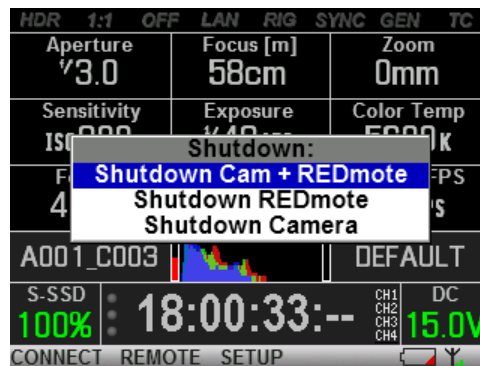
### USING CAMERA

When REDMOTE is connected to the camera and the camera is powered down, the REDMOTE will also power down. When disconnected from the camera, the REDMOTE will not power down with the camera.

### USING REDMOTE

To power down REDMOTE, slide and hold the Power / Key Lock Switch in the down direction for 5 seconds.

Or slide and hold the Power / Key Lock Switch in the down direction momentarily, then release. A screen will display with options to power down the REDMOTE, the Camera, or REDMOTE and Camera together. Select the desired option and press the ENTER key in the REDMOTE Navigation Group.

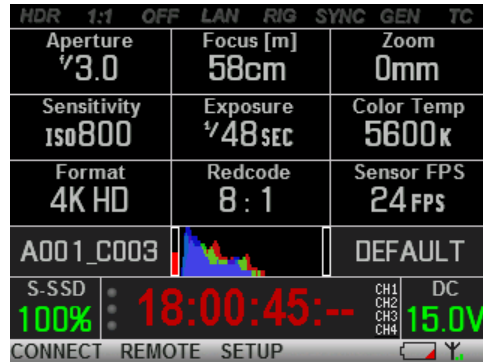


**NOTE: Wireless mode shown. When docked to camera, SHUTDOWN CAMERA is not displayed.**

# RED EPIC® OPERATION GUIDE

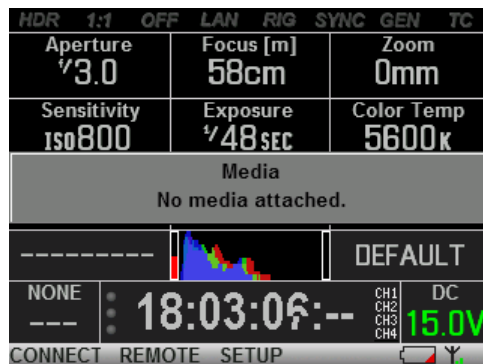
## RECORDING

- To record, press the Red REC (record) button. If media is connected and properly formatted, the upper LED will illuminate Red and the Timecode value displayed in the LCD will change to Red text.



To stop recording, press the REC button a second time. After recording to media is completed, the upper LED will go out and the Timecode value displayed in the LCD will change back to White text.

**Note:** If media is NOT connected when record is requested, the REDMOTE LCD and camera VIEWFINDER (MENUS) output will indicate “NO MEDIA ATTACHED”.



## ACCESSING CAMERA CONTROLS / SETTINGS

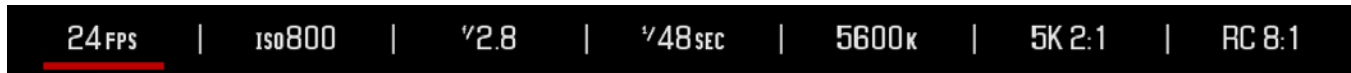
The Navigation Group is used to navigate through camera menus. Refer to CAMERA OPERATIONAL CONTROLS > REDMOTE > NAVIGATION GROUP. The camera settings and status are displayed on the REDMOTE LCD. Refer to BASIC OPERATION > GRAPHICAL USER INTERFACE AND NAVIGATION > REDMOTE.

# RED EPIC® OPERATION GUIDE

## CHANGING CAMERA SETTINGS

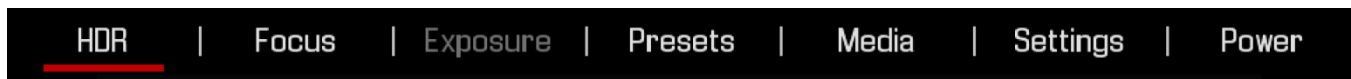
### USING CAMERA LCD / EXTERNAL MONITOR AS REFERENCE

To adjust a parameter value displayed on the camera's Upper Status Group, first note the red colored bar (located under 24fps in this example), indicating the currently active parameter for instant adjustment.



Use the NAVIGATION GROUP directional pad to move the cursor to a different parameter if desired, then press the ENTER key to select that parameter and use the Scroll Wheel to adjust that parameter's value. To confirm the change in parameter value and to exit the adjustment menu, press the ENTER button.

To access the camera's menus, press the MENU button at the lower left. The MENU displays on the EVF, LCD or external monitors if the LCD and/or EVF are not connected disconnected.



Use the NAV GROUP to make changes to the cameras settings. Use the scroll wheel and directional pad to move the cursor to navigate and make changes to the desired settings. When a desired setting change is made, press the ENTER button or the directional pad UP arrow to exit from that setting.

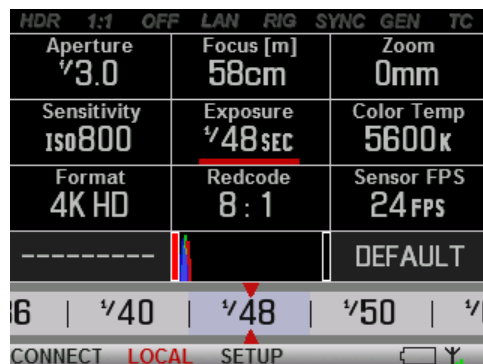
### Exiting Menus to Main Screen

To EXIT from the Secondary Menus and return to the main screen:

- Press the MENU button until the main screen is displayed.

### USING REDMOTE LCD STAND-ALONE

The LOCAL function of the REDMOTE allows you to adjust the camera settings from the REDMOTE while observing the parameters directly on the REDMOTE LCD as opposed to on the camera LCD or an external monitor. For complete details refer to REDMOTE MENUS > SOFT MENU BUTTONS 1-3 > 2 REMOTE > LOCAL.



## ADVANCED OPERATION: REDMOTE MENUS

### SOFT MENU BUTTONS 1-3

Located below the main LCD display are three Soft Menu Buttons, who access advanced function menus identified by text in the LCD directly above the corresponding button. These menus control wireless connection (CONNECT), camera or local menu (REMOTE/LOCAL) and system setup (SETUP).

### WIRELESS CONNECT: SOFT MENU BUTTON 1

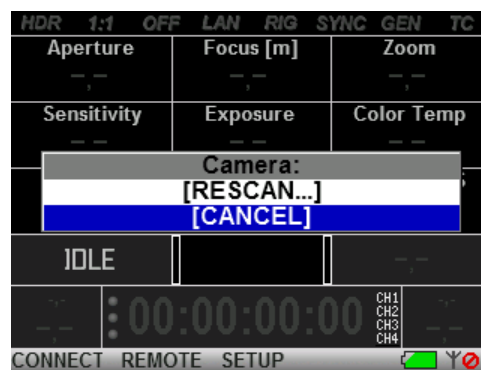
**Note:** This Button is hidden if REDMOTE is attached to the camera or rear-most camera module.

**Note:** If a REDMOTE has previously been successfully paired with a camera, and the REDMOTE has scanned the wireless network and found that camera, the following operation can be bypassed as the REDMOTE will auto scan and connect to that camera each time it is powered ON and undocked.

### CONNECT REDMOTE TO A PAIRED CAMERA

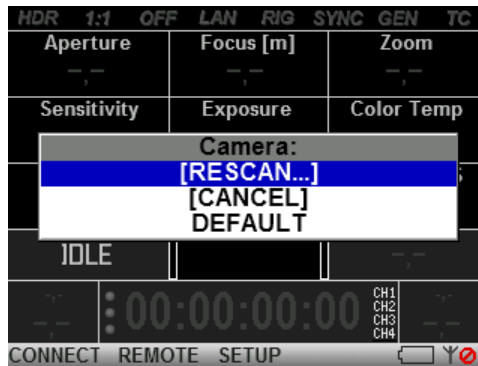
**NOTE:** The following procedure assumes the camera has already been paired and named **DEFAULT** under the camera's **SETTINGS > SETUP > REDMOTE** and **COMMUNICATION** menus.

1. Press **CONNECT** to initiate a scan by the REDMOTE for available paired cameras in wireless range.
2. If the REDMOTE fails to find a camera it has been paired with the following screen will be displayed. Select **RESCAN** and press the **ENTER** button in the Navigation Group to force a second scan for paired cameras in wireless range. A wireless scan typically takes 20-30 seconds.

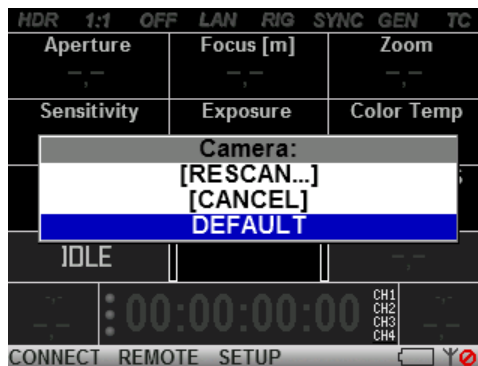


3. When REDMOTE finds a camera or cameras it has been paired with in wireless range, the name of the available camera or cameras will be displayed - for example a single camera named **DEFAULT**.

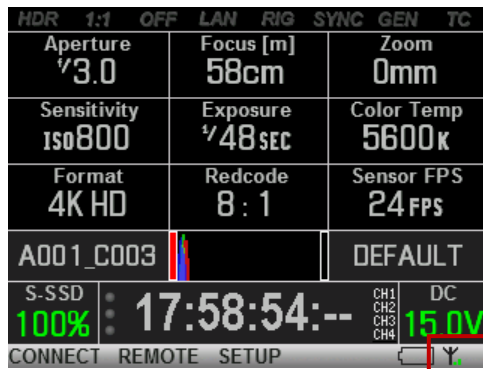
# RED EPIC® OPERATION GUIDE



4. Select the desired camera to connect to for REDMOTE wireless operation and press the ENTER button in the Navigation Group. The REDMOTE will connect to the selected camera.



5. Once connected, the REDMOTE will display the key operating parameters of the selected camera. The wireless signal strength will be shown in the lower Right corner of the REDMOTE screen.



The camera VIEWFINDER monitor output will confirm REDMOTE is wireless connection by displaying RM and a signal strength icon in Green on the Lower Status Group.

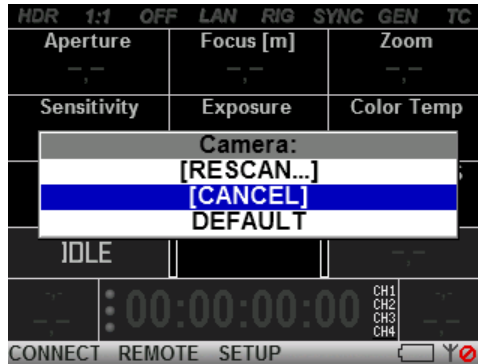


# RED EPIC® OPERATION GUIDE

**Note:** Once this procedure has occurred once, the REDMOTE will automatically search for the camera each time it is undocked, until the paired camera selection is changed.

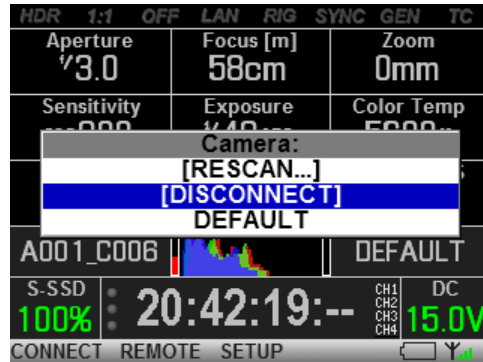
## CANCEL

If you wish to exit the CONNECT menu at any time press CANCEL.



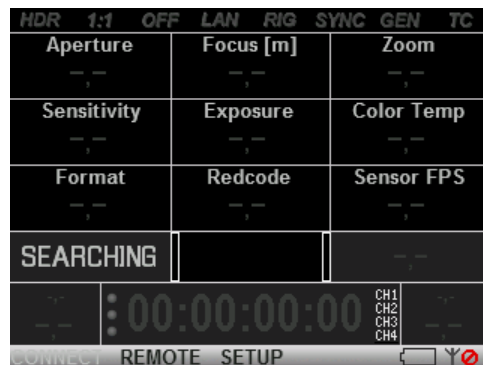
## DISCONNECT

To stop communicating wirelessly with the camera, select Soft Menu Button 1 Connect, then select DISCONNECT and press the ENTER key in the Navigation Group.



## RECONNECTING IF SIGNAL IS LOST

On loss of wireless communication REDMOTE will scan for the camera it was last paired with.



If the REDMOTE is unable to re-connect after 30 seconds, it will enter the manual SCAN menu, follow the procedure outlined about to scan and identify camera(s) that you wish to connect to.

# RED EPIC® OPERATION GUIDE

## OPERATING WITH MULTIPLE CAMERAS FROM A REDMOTE

To control more than one camera from a single REDMOTE, first pair the REDMOTE with each camera. After pairing REDMOTE to the desired cameras, press Soft Menu Button 1: CONNECT. Available cameras will be listed.

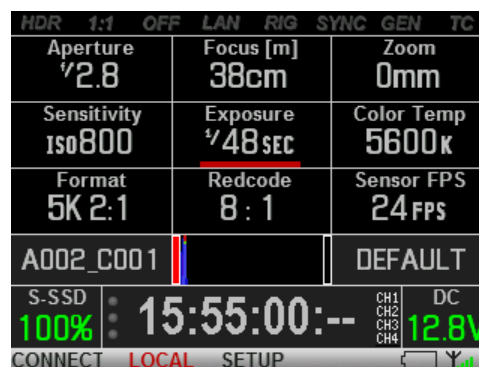


Select the camera you wish to control and press the ENTER button. When you want to switch to a different camera, press Soft Menu Button 1: CONNECT again to list available cameras and re-select.



## REDMOTE OR LOCAL MENUS: SOFT MENU BUTTON 2

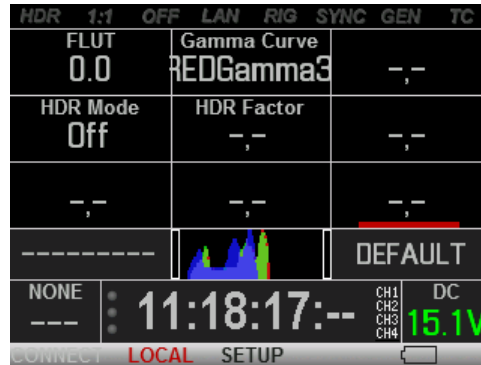
When selected allows the user to toggle the REDMOTE between REMOTE and LOCAL menus.



# RED EPIC® OPERATION GUIDE

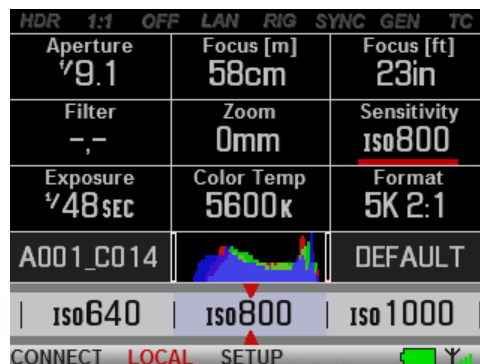
## REMOTE

Allows the user to adjust camera settings from REDMOTE, by navigating the camera menus appearing on the VIEWFINDER output of the camera, with summary data only appearing on the REDMOTE LCD



## LOCAL

Allows the user to adjust camera settings from REDMOTE, by navigating camera menus appearing on the REDMOTE LCD, with summary data only appearing on the VIEWFINDER output of the camera.



## CUSTOMIZING LOCAL MENUS.

When operating in LOCAL mode, REDMOTE provides the user the option to configure which parameters to display in each of the parameter status windows. You can assign the parameters to one of the 5 pages of information available under Soft Menu Buttons 4-8.

To customize parameters:

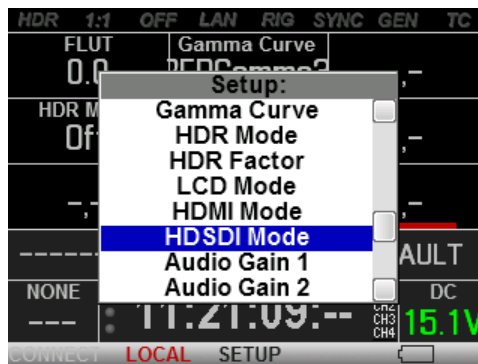
1. Ensure camera is ON and wirelessly connected to REDMOTE.
2. If Soft Menu Button 2 reports as REMOTE, press it once so it reports LOCAL.
3. Select the Soft Menu Button page you would like to set the parameter on from the right hand side of the LCD. Refer to SOFT MENU BUTTONS 4-8.
4. Use the directional arrows on the Navigational Control to move the Red cursor to the desired location within that page to place the parameter.
5. Now press SETUP: Soft Menu Button 3.

# RED EPIC® OPERATION GUIDE

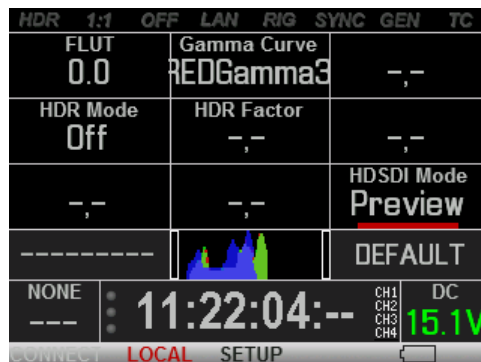
6. Select “Setup Slot” and press the ENTER button.



7. A new Setup window will appear displaying available parameters to display.



8. Select the desired parameter and press the ENTER button.

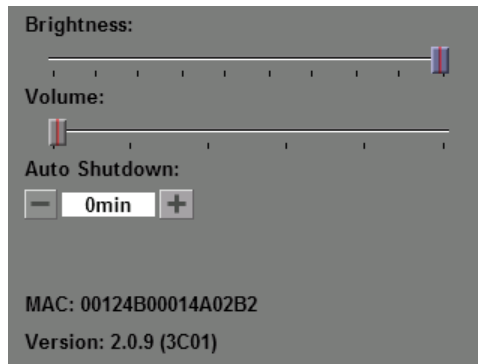


9. You may now control this parameter directly from the REDMOTE.

## REDMOTE SETUP: SOFT MENU BUTTON 3

When pressed SETUP provides the option of forcing the REDLINK wireless link ON or OFF and selecting the following REDMOTE Setup menu.

# RED EPIC® OPERATION GUIDE



Adjustable parameters include LCD screen brightness; beep speaker Volume and Auto Shutdown time. In the lower section of the display is the MAC address and the current firmware build of the REDMOTELITE

## Brightness

The BRIGHTNESS control adjusts the LCD backlight intensity. Set value to maximum for daylight visibility, set value lower for nighttime operation or for maximum battery run time when operating in wireless mode.

Default value is Maximum.

## Volume

The VOLUME control adjusts the loudness of the beep speaker. As you adjust this value the REDMOTELITE will beep the speaker to give an audible confirmation of the selected volume. Default value is Minimum.

## Auto Shutdown

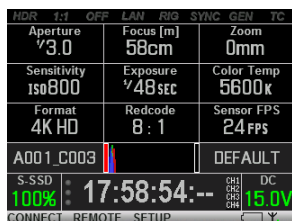
The AUTO SHUTDOWN control adjusts the amount of time a REDMOTELITE will continue to operate when in the wireless mode after no detected activity (i.e. no button presses are detected) before powering down.

Default value is OFF (REDMOTELITE will operate continuously until manually powered down.)

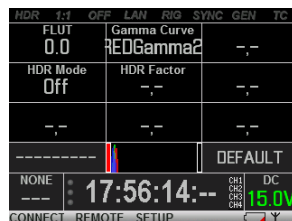
## DISPLAY LAYOUT: SOFT MENU BUTTONS 4-8

To the right of the LCD are five Soft Menu buttons 4-8. These buttons select between a variety of camera status page layouts.

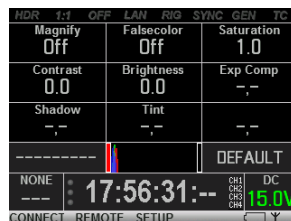
Note: In Version 3.x software, buttons 7 and 8 are undefined.



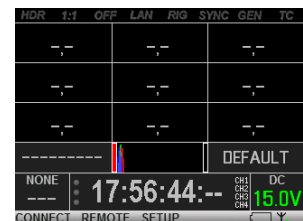
Menu Button 4



Menu Button 5



Menu Button 6



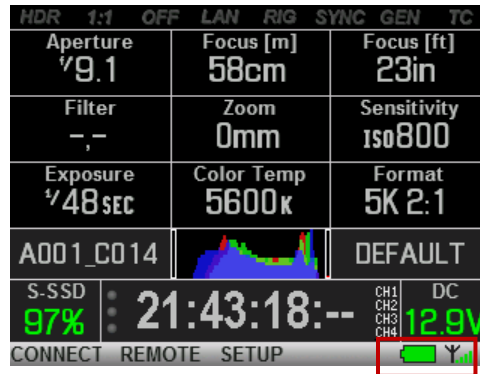
Menu Button 7 & 8

## MAINTENANCE

### INTERNAL BATTERY

#### CHARGE STATUS

An icon shows the charge status of the REDMOTE battery in the lower right corner of the LCD.



When REDMOTE is operating in wireless mode, the icon indicates current charge capacity. When satisfactory the icon is displayed in Green. When battery charge becomes marginal, the icon turns Yellow. When battery charge is critically low, and wireless communication is at risk of being lost the icon turns Red. The REDMOTE should be re-attached to the camera or rearmost module, or be attached to a suitable USB power source, to recharge the battery before re-attempting wireless operation.

When attached to the camera or rearmost camera module, or external USB power source, this icon will either display solid green, indicating fully charged, or blink, indicating the battery is being charged by the camera or external USB power source.

#### BATTERY LIFE

When using the REDMOTE in wireless configuration, the battery will last approximately 8 hours before charging is necessary.

**NOTE: When not using the REDMOTE, for maximum battery storage life, use the Power / Lock Switch to power down the REDMOTE completely by pressing down in the power off position and using the displayed menu to shut down the REDMOTE and/or the REDMOTE and camera. Refer to POWER UP / DOWN > POWER DOWN. If the Power / Lock Switch is pressed down in the power off position and held until the REDMOTE powers down, the battery storage life will be reduced greatly as there will be a slight power draw on the REDMOTE when shut down using this procedure.**

## CHARGING

### CHARGE TIME

A fully discharged REDMOTE battery will be fully charged in approximately 6 hours.

### USING CAMERA

While connected to the camera, the REDMOTE will automatically recharge its internal battery. Charge status is indicated by the Green Battery Icon at the top-right of the REDMOTE LCD display screen. A fully discharged REDMOTE battery will be re-charged in approximately 6 hours if connected to a powered camera or a USB based power source such as laptop P.C.

### USING USB CONNECTOR

The REDMOTE can be charged by connecting the RED Mini-USB-to-USB cable (790-0230) between REDMOTE and a computer or a cell phone charger.

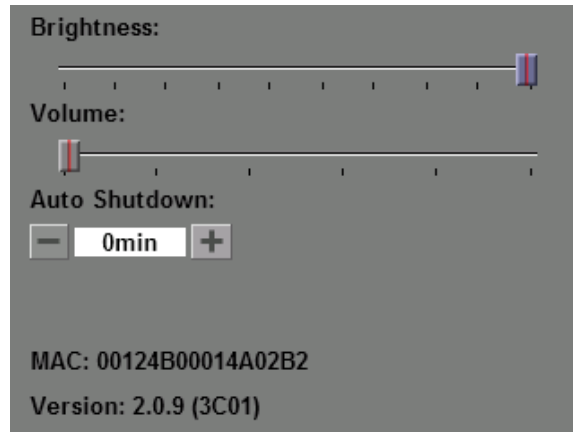
NOTE: The REDMOTE can be charged using the Mini-USB connector while connected and controlling a camera wirelessly.

**NOTE: If the computer / cable / hub do not provide enough voltage, the REDMOTE will not charge and show an "Error Charging" message.**

1. Connect the USB connector to any computer (computer must be ON to charge REDMOTE).
2. Connect the Mini-USB end to the REDMOTE USB Port located on the lower right side (under rubber protective cover).
3. If the REDMOTE is powered down (and paired camera is OFF), the REDMOTE will power UP, display STARTING UP, display SEARCHING (with flashing Green LED), then settle into IDLE mode.
4. Green battery indicator will blink, indicating REDMOTE is charging.
5. A fully discharged REDMOTE battery will be fully charged in approximately 6 hours.

## UPGRADING REDMOTE FIRMWARE

1. Verify the current REDMOTE firmware version by selecting SETUP > SETUP SYSTEM on the REDMOTE.



2. REDMOTE upgrade is complete. You can now reconnect to the camera.

## APPENDIX F: 3D SETUP / OPERATION

### OVERVIEW

The following information outlines basic procedures to connect two RED DSMC cameras together in a Master / Slave configuration for 3D operation, operation of cameras in Master / Slave configuration and clip naming conventions for clips recorded on those cameras. The MASTER camera will control only the METADATA parameters of both cameras. On the SLAVE camera, any other setting outside of these will need to be manually changed before recording.

### CAMERA SETUP

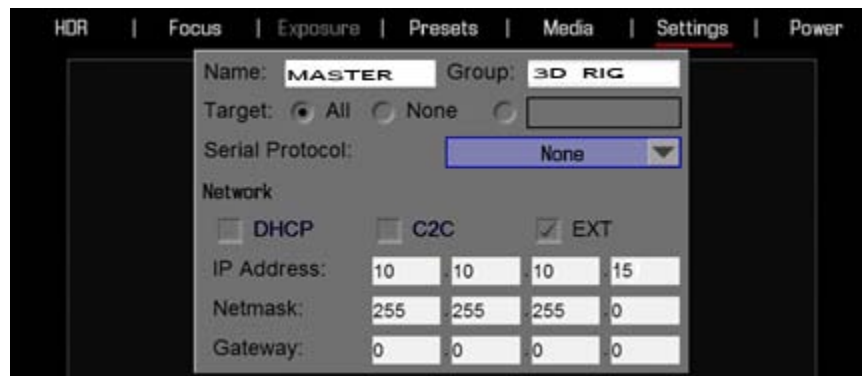
Select one camera to be designated as Master and a second to be designated as Slave.

**NOTE: Cameras can also be set up in a MASTER / MASTER and SLAVE / SLAVE configuration. To set as MASTER / MASTER select ALL under TARGET for both cameras. This will allow either camera to make METADATA changes and control record start/stop of both cameras. To set as SLAVE / SLAVE select NONE under TARGET for both cameras. This allows each camera to control it's own METADATA.**

### MASTER CAMERA

Perform the following steps on the Master camera:

1. Go to SECONDARY MENUS > SETTINGS > SETUP > COMMUNICATION > NAME and give the camera a unique NAME (CAM A, LEFT, etc...).



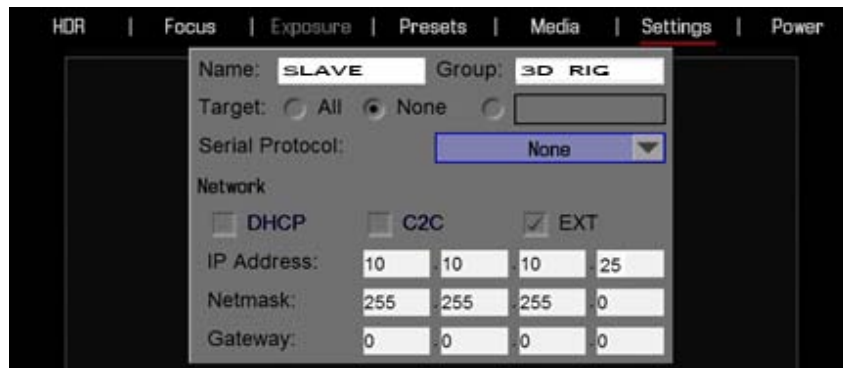
2. Under TARGET select ALL.
3. Give the camera a unique IP address.
4. Go to SLAVE CAMERA.

### SLAVE CAMERA

Perform the following steps on the Slave camera:

# RED EPIC® OPERATION GUIDE

1. Go to SECONDARY MENUS > SETTINGS > SETUP > COMMUNICATION > NAME and give the camera a unique NAME (CAM B, RIGHT, etc...).



2. Under TARGET select NONE.
3. Give the Slave camera a unique IP address different from the Master.

## CLIP NAMING CONVENTIONS

### REEL NO. / SLATE (CAMERA ID) / CAMERA POSITION

Before shooting in Master / Slave or Master / Master configuration for a Stereo / 3D production, make sure the Camera Slate (i.e. Reel No. and Cam ID) are set to the same value for both Master and Slave cameras. Then change the Cam Pos value from the system default of CENTER, to either LEFT or RIGHT to identify the "left eye" and "right eye" camera in the stereo pair.

The Reel No, Cam ID and Cam Pos can be set when formatting the media or after formatting by using the SET option. Refer to SECONDARY MENUS > MEDIA.



For example, if Master is set to LEFT and Slave is set to RIGHT and both Cam IDs are set to S, the first clip recorded by this stereo camera configuration will be:

- **Master:** S001\_L001\_0503B6.R3D

# RED EPIC® OPERATION GUIDE

- **Slave:** S001\_R001\_0503R7.R3D

Where 0503 represents 05 March, B6 and R7 are examples of camera generated wildcard characters.

**Note: If both Master and Slave cameras are accidentally left in default settings of CENTER and CAM A ID, the clips recorded on each camera will have the same file structure, with the exception of the camera generated wildcard characters which protect against exact file name duplication:**

- **Master:** A001\_C001\_0503B6.R3D

- **Slave:** A001\_C001\_0503R7.R3D

## CONNECTING CAMERAS

1. While still powered up, interconnect the cameras using a Master/Slave GIG-E Cable P/N 790-0163. Plug the cable into the GIG-E connector on the rear of each camera body..



2. Power down both cameras, then power back up. If properly connected, LAN will illuminate Green on the UI.
3. Connect a SYNC cable P/N 790-0154 to each camera and connect as to your 3<sup>rd</sup> party device.
  - Yellow BNC connector is for SMPTE unbalanced Timecode input.
  - Green BNC connector is for Tri-Level Sync (Genlock) input.
  - White BNC connector is a dual-purpose (Shutter SYNC input or GPI) input.
4. Go to SETTINGS > SETUP > GPIO/SYNC > SYNC MODE and select GENLOCK.

5. Verify the camera's project frame rate matches the Genlock and Timecode generator(s) framerate(s).
6. When properly connected and synchronized, TC, GEN and SYNC will illuminate Green on the UI.

## OPERATION

### CHANGING SETTINGS

When changes are made to the Master camera settings, the Slave camera setting will also change, but not in real-time. For example, when you change the Frame Rate on the Master camera, you will not see the change on the Slave camera until you set the Master camera at the new Frame Rate.

Also when making changes to the Secondary menu settings, the Slave camera will not display those changes unless it affects items displayed on the main screen (example: when HDRx is enabled on the Master camera, HDR will change to HDRx on the Slave camera).

### RECORDING

When the power/record button is pressed on the Master camera to start/stop recording, the Slave camera will also start/stop recording.

### POWER DOWN

When the Master camera is powered down using the Secondary Menu > Power, the Slave camera will also power down.

## APPENDIX G: EXPOSURE – USING FALSE COLOR AND ISO

**NOTE:** The following section uses a RED ONE camera display to illustrate exposure tools; however, the same principles apply to RED DSMC camera systems.

RED DSMC cameras provide several advanced exposure indication tools. In the following examples, we will show how these tools respond to a reference scene that is under-exposed, over-exposed and then correctly exposed. Each scene will have its unique characteristics so the “correct exposure” is a matter of judgment, balancing the desire to avoid clipping any highlights and also avoiding underexposure of elements in deep shadow – which may therefore be prone to noise when developed in post production.

The following reference scene includes highlight and shadow elements and was shot at ISO 800.

### UNDEREXPOSURE (~ 2 STOPS)



*ISO 800 - Monitor Output*

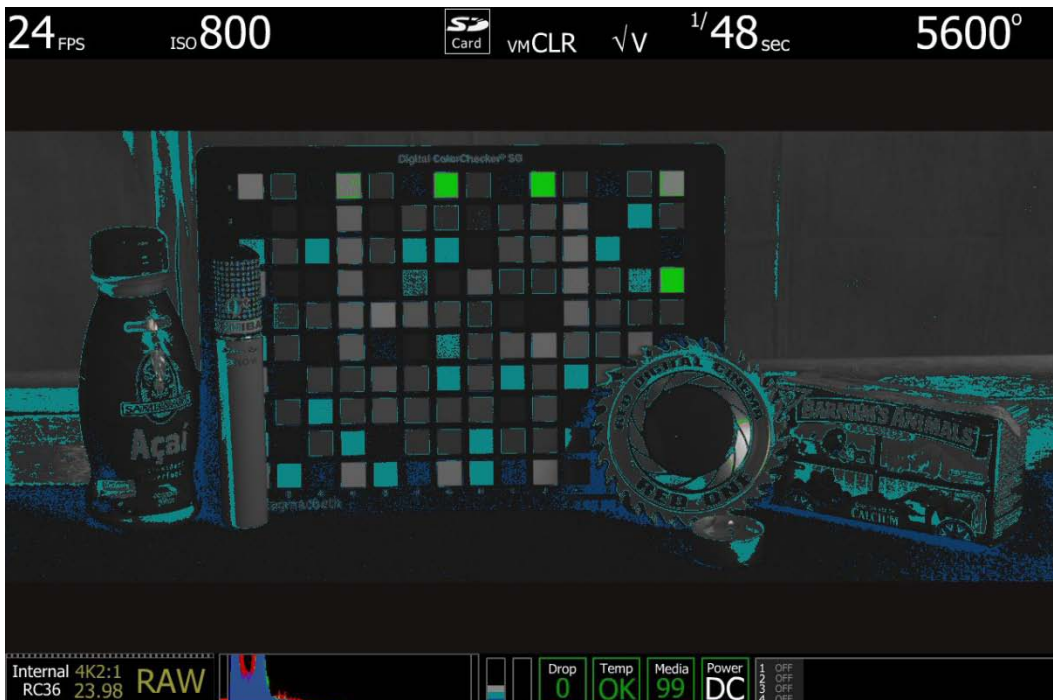
In the image above it is obvious the camera is under exposed. The initial clues are the monitor is very dark, and the histogram is justified to the left. Also note that red bar at the left edge of the histogram and the vertical color stack to the right of the histogram is only at grey. These indicators are saying a significant amount of the sensor's RAW data is “in the noise” and that the peak level of the sensor's RAW data is at a very low level – in fact less than halfway.

# RED EPIC® OPERATION GUIDE



*ISO 800 - False Color: Exposure*

Select False Color – Exposure: note the  $\checkmark$  E icon in the GUI when active. This mode allows us to visualize where in the image underexposure is taking place. These areas are indicated in purple. It is clear those areas are under the matchbox and coin, and between the bottle and cigar holder.



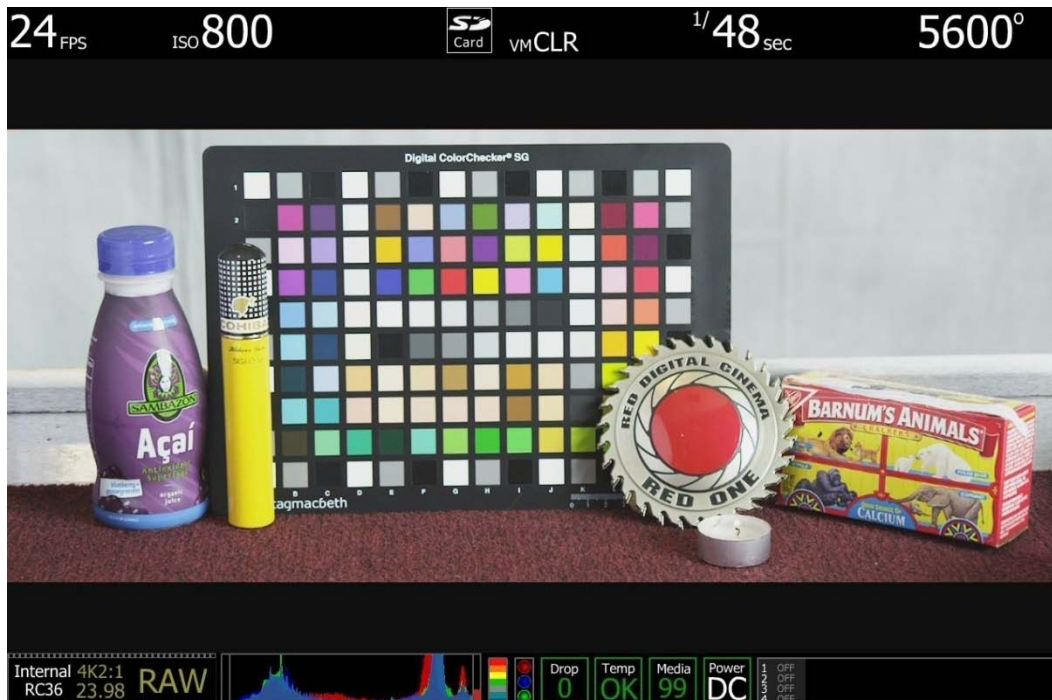
*ISO 800 - False Color: Video*

# RED EPIC® OPERATION GUIDE

Select False Color – Video: note the  $\sqrt{V}$  icon in the GUI when active. This mode allows us to check the RGB video levels of the scene. As the peak white chips on the test chart are showing up in green and the underexpose areas are showing up in dark blue, this says the monitor path video levels are only ranging between 44 IRE and 1 IRE.

Because the scene is under exposed, when the recorded .R3D file is color corrected in post-production, the scene’s highlight information will certainly not be clipped, however the shadow information will probably display with significant noise once pushed to an acceptable brightness.

## OVEREXPOSURE (~ 2 STOPS)



*ISO 800 - Monitor Output*

In the image above it is obvious the camera is over exposed. The monitor is very bright and the histogram is justified to the right. Note the red bar at the right edge of the histogram and the vertical color stack to the right of the histogram is showing red plus the three traffic lights to the right of that are all illuminated. These indicators are suggesting that a significant portion of the sensor’s RAW data is “at clip”, and this clipping is occurring on Red, Green and Blue channels.

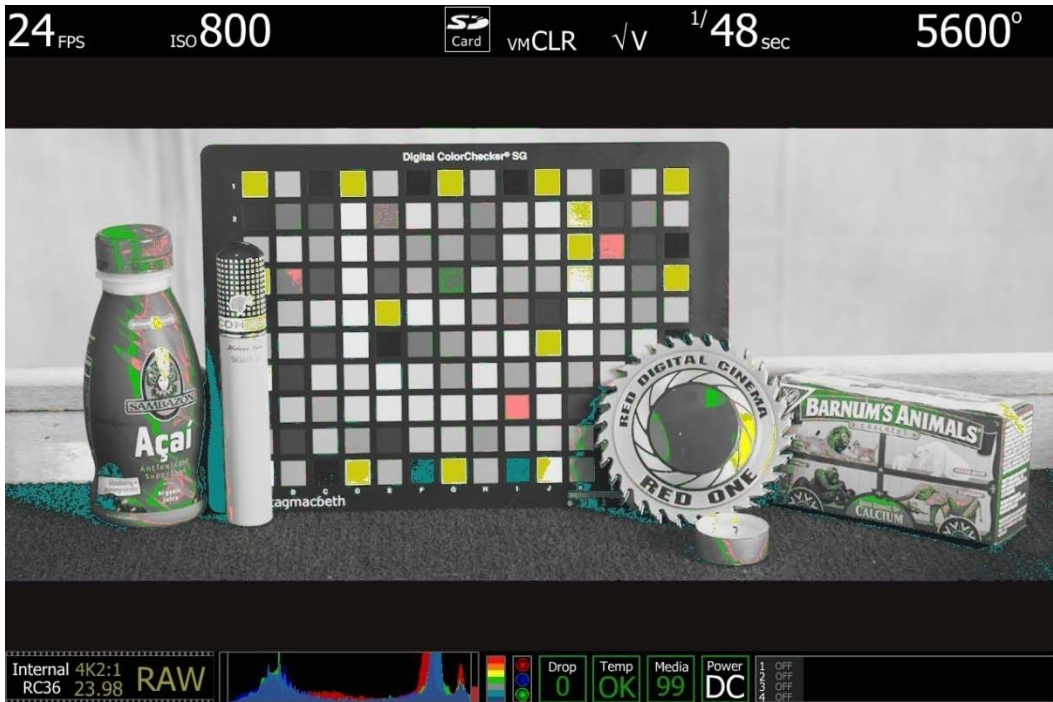
# RED EPIC® OPERATION GUIDE



*ISO 800 - False Color: Exposure*

Select False Color – Exposure: note the  $\sqrt{E}$  icon in the GUI when active. This mode allows us to visualize where in the image over exposure is taking place. These areas are indicated in red. It is clear those areas are on the highlight on coin, and at the top right edge of the color chip test chart.

# RED EPIC® OPERATION GUIDE

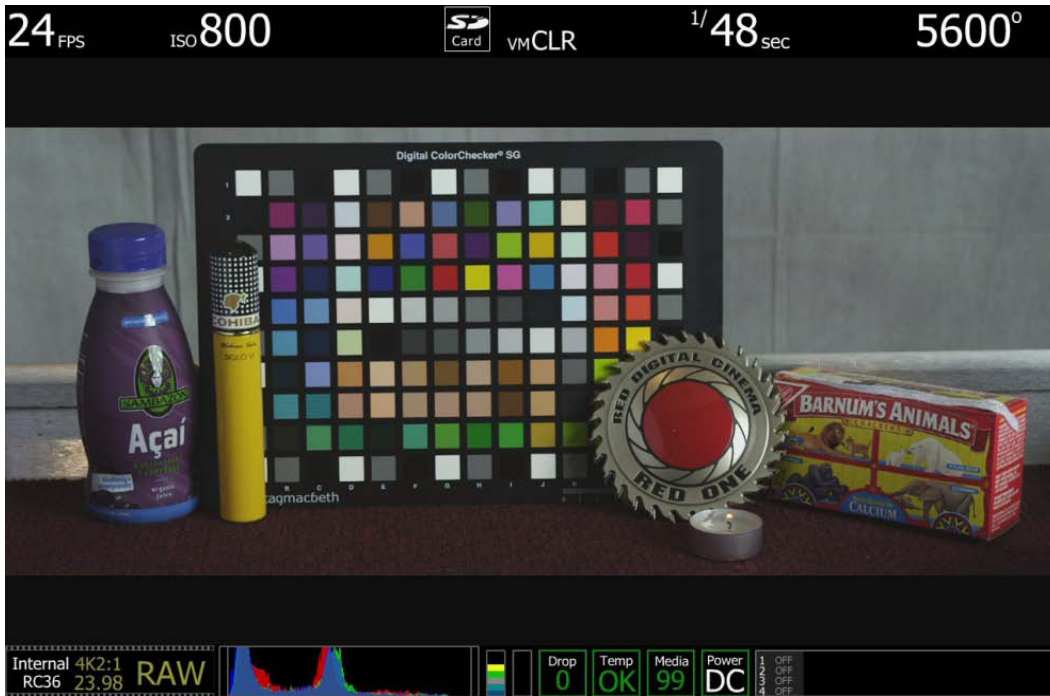


*ISO 800 - False Color: Video*

Select False Color – Video: note the  $\sqrt{V}$  icon in the GUI when active. This mode allows us to check the RGB video levels of the scene. As all the white chips on the test chart are Yellow, this suggests that a significant portion of the monitor path video is at the maximum legal 100 IRE value.

Because the scene is over exposed, when the recorded .R3D file is color corrected in post-production, the scene's highlight information will almost certainly be clipped, however the shadow information will probably display cleanly once pulled back down to an acceptable brightness.

## APPROPRIATE EXPOSURE



*ISO 800 - Monitor Output*

In this image, the camera is appropriately exposed for this scene. The monitor is neither very dark nor very bright and the histogram is spread evenly given that there are bright highlights on the coin we wish not to blow out. Note that there is no red bar on either the left or the right edges of the histogram and the vertical color stack to the right of the histogram is at yellow. These indicators suggest that there is no significant amount of the sensor's RAW data "in the noise" or "at clip", and that the peak level of the sensor's RAW data is about 2/3 stop below clipping.

# RED EPIC® OPERATION GUIDE



*ISO 800 - False Color: Exposure*

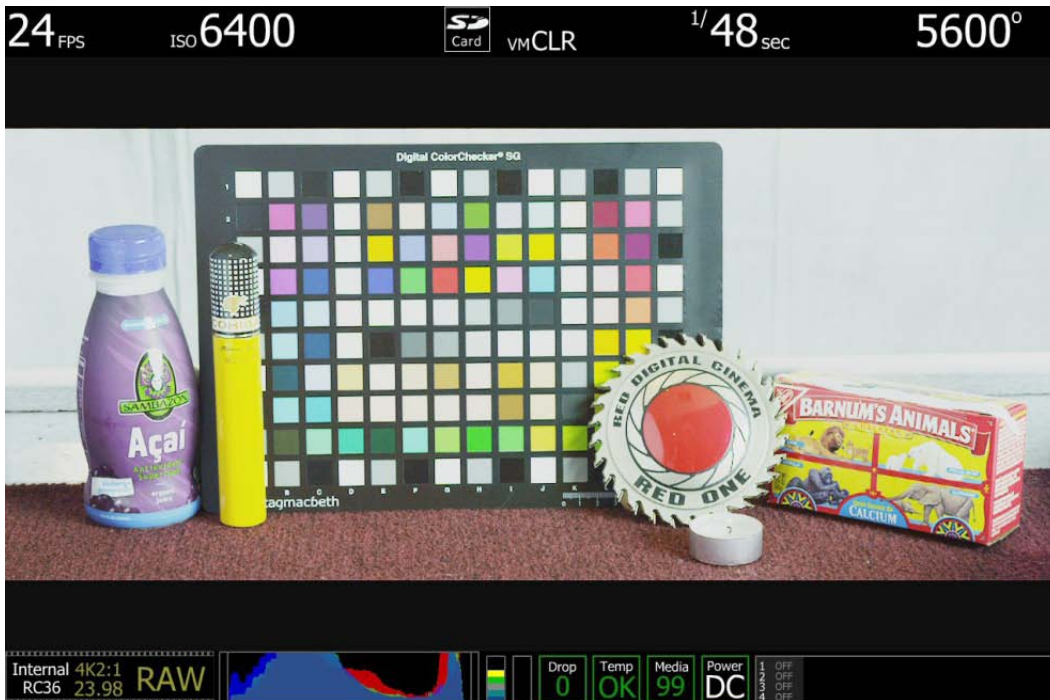
Select False Color – Exposure: note the  $\sqrt{E}$  icon in the GUI when active. This mode allows us to visualize where there is under exposure (purple) or over exposure (red) in the image. In this case, there is a very small area of purple under the cracker box, and just a suggestion of red on the highlight on the coin, which suggested that the sensor is appropriately exposed for this scene.



## ADJUSTING THE ISO RATING

In the following two examples, the image exposed at ISO 800 rating have had the ISO rating adjusted first to ISO 6400 and then to ISO 100.

**NOTE:** Although the image and Histogram both adjust to changes in the ISO rating, the sensor RAW meters do not change – they always indicate what is happening at the sensor level and hence where the image is truly in noise or at clipping.



*ISO 6400 - No Exposure Adjustment*



*ISO 100 - No Exposure Adjustment*

In these extreme examples, it is clear that the RGB domain images are respectively very bright and very dark. The histogram data reflects that, however you can also see that the sensor RAW meters are unchanged. The exposure at the sensor at this point in time is the same. If you choose to close the iris to reduce the brightness of the first image you will be reducing exposure at the sensor – this biases exposure in favor of protecting the scene highlight. Alternatively, if you choose to open the iris to increase the brightness of the image of the second image you will be increasing exposure at the sensor – this biases exposure in favor of minimizing noise in the scene shadows.

The technique is similar in principle to re-rating a film stock. With practice, the ISO rating can be used as a tool to assist ideal exposure based on the dynamic range identified within the scene.

## APPENDIX H: POST PRODUCTION

RED workflow is quite easy to understand, especially if you have experience with photographic RAW image processing, or shoot 16mm or 35mm film followed by a telecine transfer to video for non-linear video editing and on-line conform.

The RAW data captured by RED cameras has wide dynamic range and color space, so you can freely change the white balance, adjust exposure and alter highlight and shadow tonality in post-production.

The RED DSMC camera records RAW sensor data using wavelet based REDCODE RAW compression to REDMAG 1.8" SSD. The compressed RAW data is then transferred from the digital media to a Macintosh OSX or Windows XP workstation running REDCINE-X PRO postproduction software. These applications do not directly edit or conform the RAW data themselves, but prepare the RAW data for editing and conforming by RGB domain post-production software applications.

In film processing terms, REDCINE-X PRO act as an integrated film laboratory, telecine, and one light color corrector. It converts recorded REDCODE RAW data to RGB video, and provides basic one light image processing and color correction. Using REDCINE-X PRO, footage can also be cropped, resized, or repositioned.

REDCINE-X PRO can also encode 4K or 2K RAW footage into a variety of uncompressed RGB and compressed 4:2:2 video formats. For film out, multi-media or special effects applications, REDCINE-X PRO may export a sequence of 2K or 4K image files in TIFF, Open EXR, DPX, JPEG, or Photoshop PSD file formats.

Provided the appropriate QuickTime codecs are available on the host computer workstation, compressed video choices include ProRes, DNxHD, DV100 and M-JPEG QuickTime movies at 1080p or 720p resolution, providing compatibility with the majority of non-linear editing systems.

Depending on the QuickTime movie resolution, material may be taken directly to a broadcast delivery videotape format, or after the editorial decisions have been made, video can be conformed at full image resolution by replacing the lower resolution edit proxy with a high resolution 4K, 2K or 1080p image file.

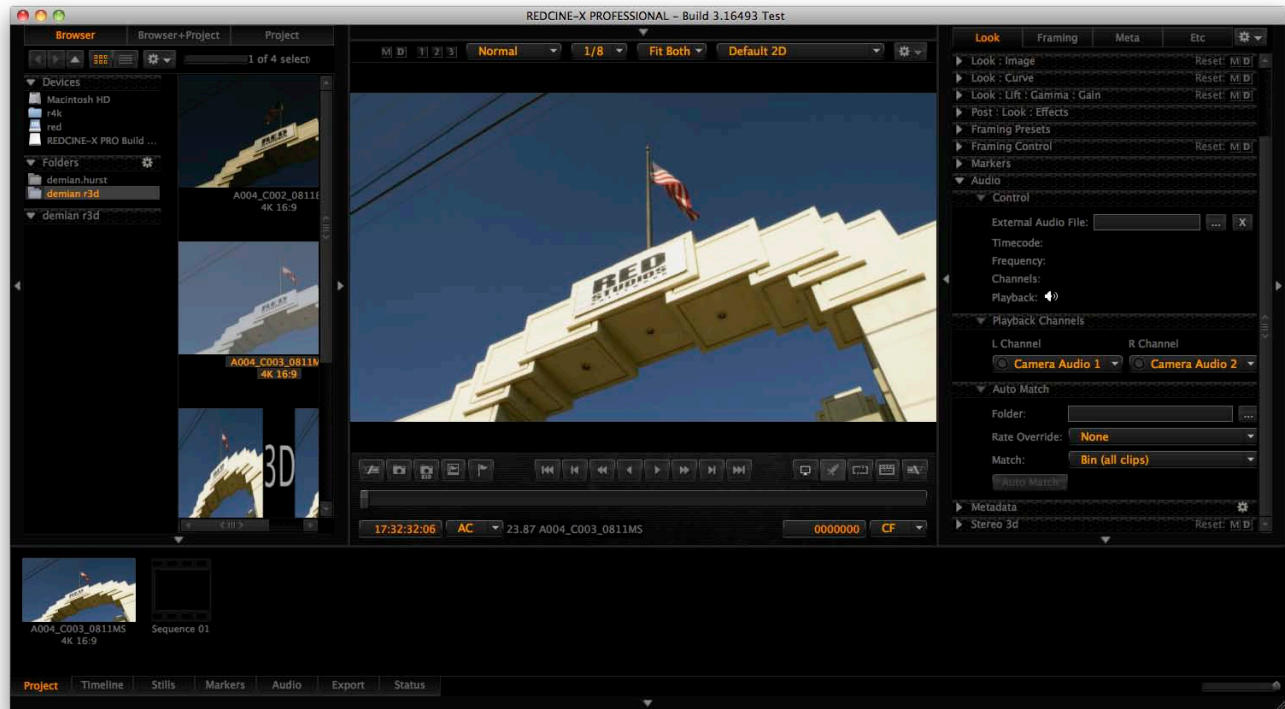
## MONITORING

When using RED Digital Cinema software tools it is recommended your monitor should be set to Adobe 1998, or to SMPTE-C display profile. If you use the HD Cinema display profile, adjust the gamma to 2.2.

## REDCINE-X® PRO

REDCINE-X PRO is available for Intel based Mac OSX and Windows XP platforms. The application performing white balance and one light color correction, image pan/scan, crop and scaling operations.

The application can export either a single clip, or a sequence of clips, as 4K or 2K resolution 10-bit DPX or 16-bit TIFF files. REDCINE-X PRO can also render clips into standalone QuickTime movies using a variety of video codecs including H.264, Apple ProRes and Avid DNxHD



REDCINE-X PRO is available for download at <http://www.RED.com/support>. The REDCINE-X PRO Operation Guide is included with the download package.

## APPENDIX I: MAINTENANCE

**WARNING: DO NOT attempt to modify, dismantle or open your camera, lens or other accessory as doing so may expose you to electric shock and serious injury. There are no user-serviceable parts inside. Alteration or repairs made to the camera, lens or other accessory, except by a RED authorized service facility, will void the Limited Warranty.**

### CLEANING

All RED products are designed for rugged durability, but precision instruments demand proper care. Please note the following care guidelines:

**WARNING: DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times.**

**WARNING: DO NOT use soaps, detergents, ammonia, acetone, alkaline cleaners, abrasive cleaning compounds, or solvents. These substances may damage lens coatings and electronic circuitry.**

### CAMERA AND ACCESSORY EXTERIOR SURFACES

Clean ONLY using a dry cloth. When cleaning your camera and accessories, remember that it is not waterproof and moisture can damage electronic circuitry.

### BRAIN

#### OPTICAL LOW-PASS FILTER (OLPF)

If equipped with an OLPF, use Delkin Devices Digital Duster Kit (P/N DDSS-DUSTER2) or equivalent to clean OLPF surface.

#### LCD SCREEN (TOUCHSCREEN / NON-TOUCHSCREEN)

The specialized AR and AS coatings on RED TOUCH LCD displays must be treated with special care to avoid scratching. To help maintain the specialized AR and AS coatings on RED TOUCH LCD displays, the RED TOUCH LCD comes with a RED MicroFiber bag for cleaning and storage. Using it will preserve the superior quality of these coatings. Hand wash and air-dry the RED MicroFiber bag regularly.

**NOTE: RED's warranty does not cover any LCD display against scratches or damage due to use of improper chemicals to clean the LCD.**

**ONLY USE** a RED MicroFiber bag or equivalent Photographic Solutions PEC\*PADs (P/N 05011) and Isopropyl Alcohol (>95%) or equivalent Pancro Professional Lens Cleaner (P/N PANCROCLN) to clean the screen on Touchscreen and Non-Touchscreen LCDs.

**DO NOT USE** any other solvents, chemicals or third party cleaning kits because they have not been tested on RED TOUCH LCD displays and can possibly damage them. Not approved for use on RED TOUCH LCD displays:

- Rubbing Alcohol
- Isopropyl Alcohol (<90%)
- Windex
- Pre-packaged lens cleaner containing any additives, such as detergent, anti-static, fragrance, etc.

For proper cleaning and storage, remember to protect the RED TOUCH LCD by storing it in the RED MicroFiber bag.

## **EVF**

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC\*PADs (P/N 05011) or equivalent to clean the viewfinder lens. Ensure your spray the solution onto the pad and not directly onto the lens surface.

## **REDMOTE SCREEN**

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC\*PADs (P/N 05011) or equivalent to clean the screen on Touchscreen and Non-Touchscreen LCDs.

## **LENSES**

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC\*PADs (P/N 05011) or equivalent to clean the viewfinder lens. Ensure your spray the solution onto the pad and not directly onto the lens surface.

## **SIDE HANDLE LCD**

Use Pancro Professional Lens Cleaner (P/N PANCROCLN) and Photographic Solutions PEC\*PADs (P/N 05011) or equivalent to clean the screen on the Side Handle LCD.

## BACK FOCUS ADJUSTMENT

**WARNING: THERE IS A SCREW-IN METAL PLUG INSTALLED IN THE CAMERA BODY COVERING THE BACK FOCUS SCREW. THIS PLUG MUST BE REMOVED BEFORE TO PERFORMING A BACK FOCUS ADJUSTMENT. TO REMOVE THE PLUG, USE A T-10 TORX SCREWDRIVER.**

**NOTE: To be able to perform this procedure as written, you must have a PL mount and RED Focus™.**

Back focus is adjusted by turning the back focus adjustment on the top of the camera's front plate using a T-10 Torx screwdriver. This screw is indicated by a Siemens Star with an arrow pointing to its location.



*Back Focus Adjustment Location*

1. Remove the screw-in plug located in the back focus adjustment opening using a T-10 Torx screwdriver.
2. Place the camera on a level, stable surface or mount the camera on a tripod.
3. Install RED Focus to the camera PL mount.
  - a. Remove the camera lens or sensor cover if equipped.
  - b. Install RED Focus onto the camera in the position shown.
  - c. Ensure RED Focus is secured to the camera with the camera lock ring.



# RED EPIC® OPERATION GUIDE

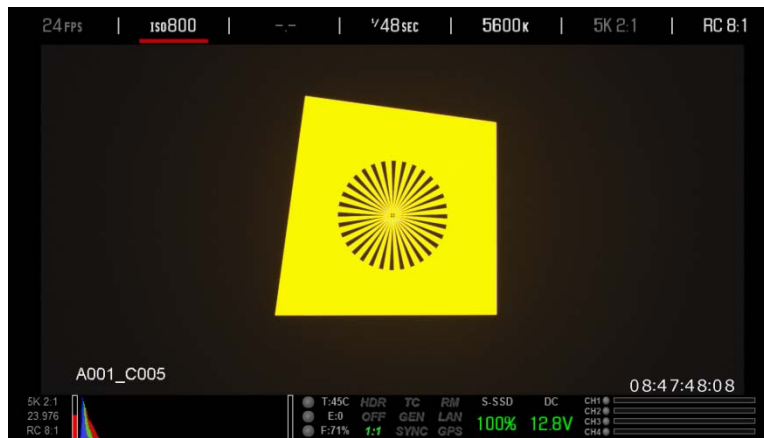
## *RED Focus Properly Installed on Camera*

4. Power up the camera.
5. Power up RED Focus. Refer to POWER UP / DOWN.

**NOTE: Remember that RED Focus will AUTOMATICALLY power down after 3 minutes. Press the Red button on the front to power back up.**

6. Set the camera to Magnify. Go to SECONDARY MENUS > SETTINGS > DISPLAY > FALSE COLOR > MAGNIFY.

**NOTE: The “Focus” option located under SECONDARY MENUS > SETTINGS > DISPLAY > FALSE COLOR > FOCUS can serve as a good double-check for proper focus during this procedure.**



## *RED Focus Displayed Image on Camera*

7. Insert a T-10 Torx® screwdriver into the back focus adjustment screw. The screw is oriented at approximately 80° as shown.



## *Performing Back Focus Adjustment*

8. Carefully and slowly, rotate the back focus adjustment screw to achieve optimum focus.
  - Turning CLOCKWISE moves the sensor forward.

# RED EPIC® OPERATION GUIDE

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- Turning COUNTER-CLOCKWISE moves the sensor rearward.

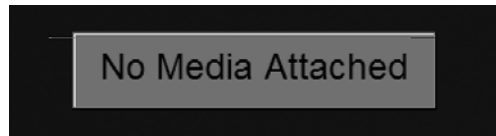
**NOTE: The center of the image will never be in perfect focus as the lines are less than 1/3 of a pixel in size.**

9. The back focus adjustment mechanism is self-locking, and does not require a supplementary locking screw.
10. Install the screw-in plug in the back focus adjustment opening using a T-10 Torx screwdriver.
11. This completes the back focus adjustment.

## APPENDIX J: TROUBLESHOOTING

### NO MEDIA ATTACHED

Displayed if media is not present or not formatted when pressing the record button. Connect media to camera if necessary. If media is already connected, format media and attempt to record again. Refer to APPENDIX B: MANAGING DIGITAL MEDIA for detailed information.



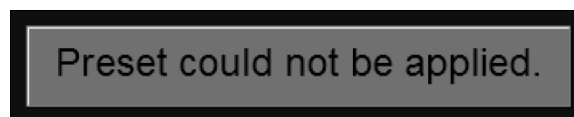
### RECORDING HALTED: RECORD ERROR - SHUTDOWN

Displayed if media removed while recording. DO NOT remove media while camera is recording. Power down the camera, verify the media is inserted properly (inspect connectors for damage), power up and resume recording.



### PRESET COULD NOT BE APPLIED

If the preset could not be applied, "Preset Could Not Be Applied" will appear to inform you. Power down camera, power back up and attempt to apply the preset that failed.



### CAMERA CANNOT BE PAIRED TO REDMOTE

- Ensure REDMOTE display indicates IDLE before attempting to pair the camera to the REDMOTE.
- Ensure the REDMOTE is detached from the rear of the camera body and powered on.
- Ensure the REDMOTE wireless is turned on.
- Ensure camera does not display REDLINK Upgrade Required.

### CANNOT SEE MENUS ON LCD TOUCH SCREEN

Double tap the LCD screen to exit *clean mode*.

## APPENDIX K: TECHNICAL DATA

### TECHNICAL SPECIFICATIONS

<b>SENSOR</b>	14 MEGAPIXEL MYSTERIUM X
<b>PIXEL ARRAY</b>	5120 (h) x 2700 (v)
<b>S/N RATIO</b>	66db
<b>DYNAMIC RANGE</b>	13.5 stops, up to 18 stops with HDRx
<b>MAX IMAGE AREA</b>	5120 (h) x 2700 (v)
<b>LENS COVERAGE</b>	27.7mm (h) x 14.6mm (v) x 31.4 mm (d)
<b>DEPTH OF FIELD</b>	Equivalent to S35mm (Motion) / APS-H (Still) lenses Equivalent to 16mm (Motion) lens in 2K RAW
<b>ACQUISITION FORMATS</b>	5K RAW (Full Frame, 2:1, ANA, WS) 4K RAW (HD) 2K RAW (2.4:1)
<b>PROJECT FRAME RATES</b>	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 fps, all resolutions
<b>DELIVERY FORMATS (FROM REDCINE-X PRO)</b>	4K: DPX, TIFF, OpenEXR (REDRAY via optional encoder) 2K: DPX, TIFF, OpenEXR (REDRAY via optional encoder) 1080p RGB or 4:2:2, 720p 4:2:2 : Quicktime, JPEG Avid AAF, MXF. 1080p 4.2.0, 720p 4:2:0 : H.264, .MP4
<b>PROGRAM OUTPUT</b>	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
<b>MONITOR OUTPUT</b>	HD-SDI and HDMI with Frame Guides and Look Around 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
<b>DIGITAL MEDIA</b>	REDMAG 1.8" SSD Module: (64, 128, 256GB Media)
<b>REDCODE</b>	12 and 16 bit RAW: Compression choices of 18:1 to 3:1 1-120 fps 5K, 4.5K 1-150 fps 4K 1-200 fps 3K 1-300 fps 2K
<b>AUDIO</b>	2 channels, uncompressed, 24 bits, 48KHz. Optional 4 channel, and AES / EBU digital audio.
<b>MONITORING OPTIONS</b>	RED LCD 5" Touchscreen Display BOMB EVF High Definition Viewfinder
<b>REMOTE CONTROL</b>	REDMOTE, Wireless, Ethernet, RS232, GPI Trigger
<b>WEIGHT</b>	4 lbs. Brain only
<b>CONSTRUCTION</b>	Aluminum Alloy
<b>TEMPERATURE RANGES</b>	Operating Range: 0 °C to +40°C (32°F to 104°F) Storage Range: -20°C to +50°C (-4°F to 122°F)

## CAMERA BRAIN DIMENSIONS

*Front View*

# RED EPIC® OPERATION GUIDE

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*Side View*

# RED EPIC® OPERATION GUIDE

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*Top View*

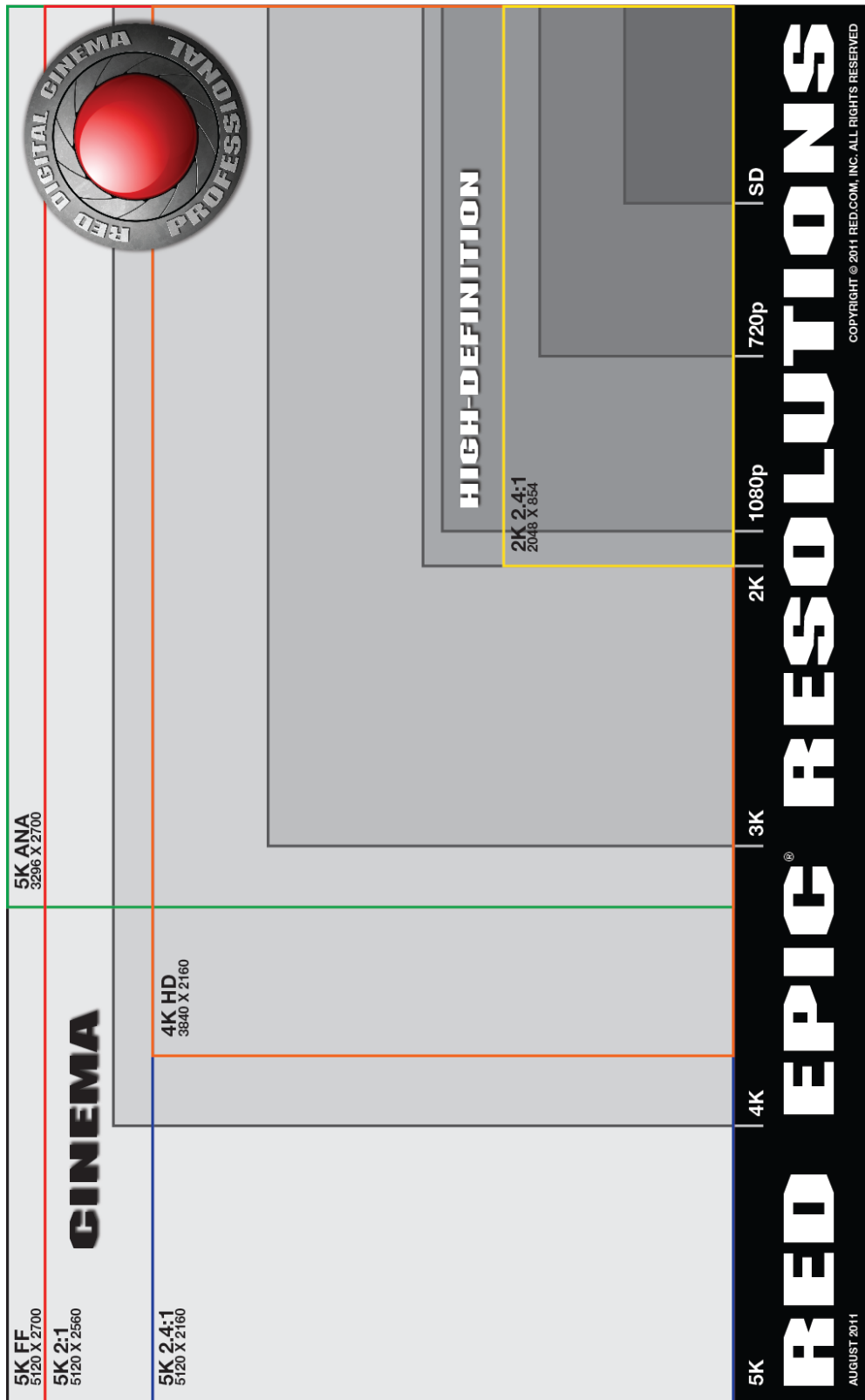
*Bottom View*

# RED EPIC® OPERATION GUIDE

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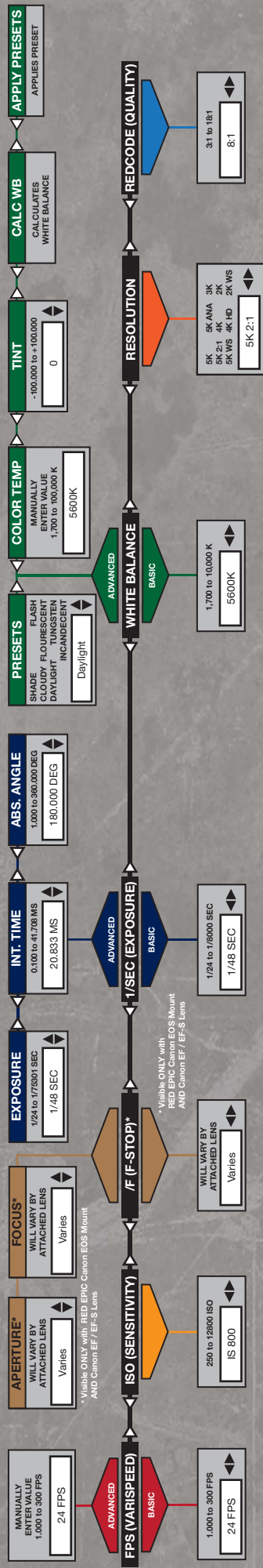
*Back View*

## APPENDIX L: RESOLUTION CHART



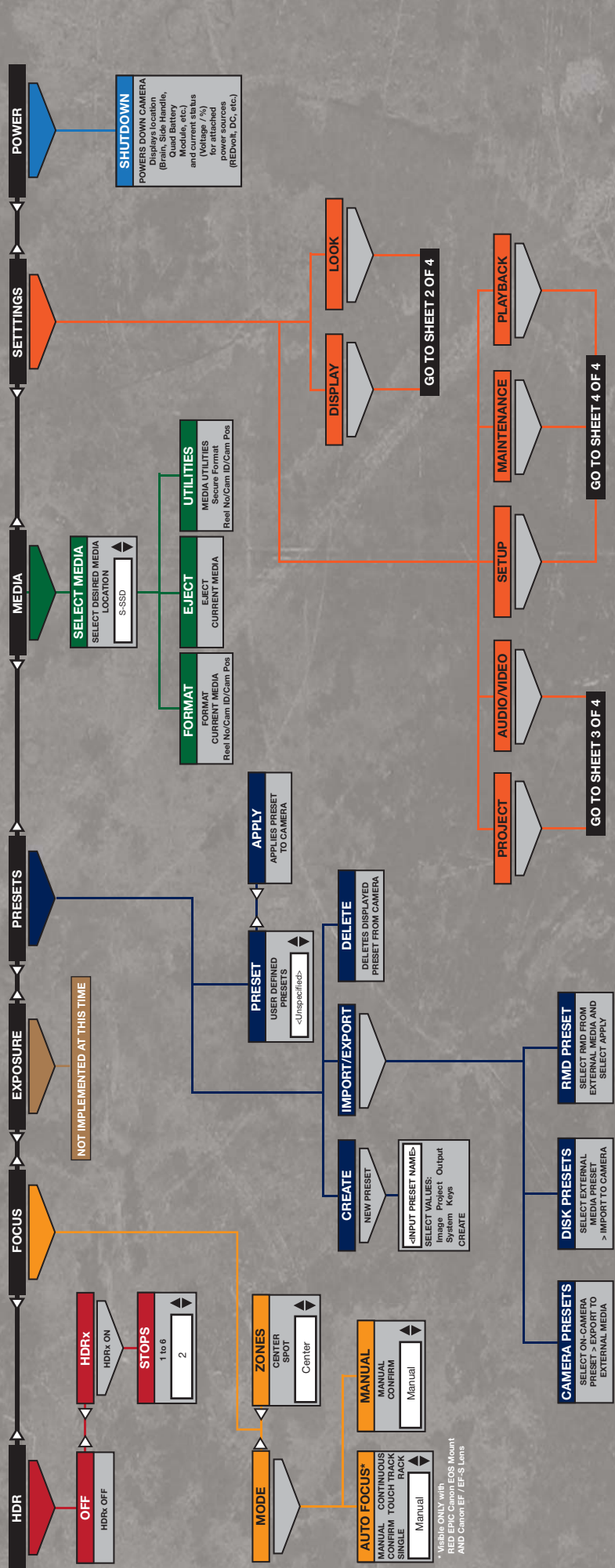
## APPENDIX M: MENU MAPS

DEFAULT VALUES ARE DISPLAYED IN BOXES



## SECONDARY MENUS

PRESS MENU ICON (LCD) OR MENU BUTTON TO ACCESS



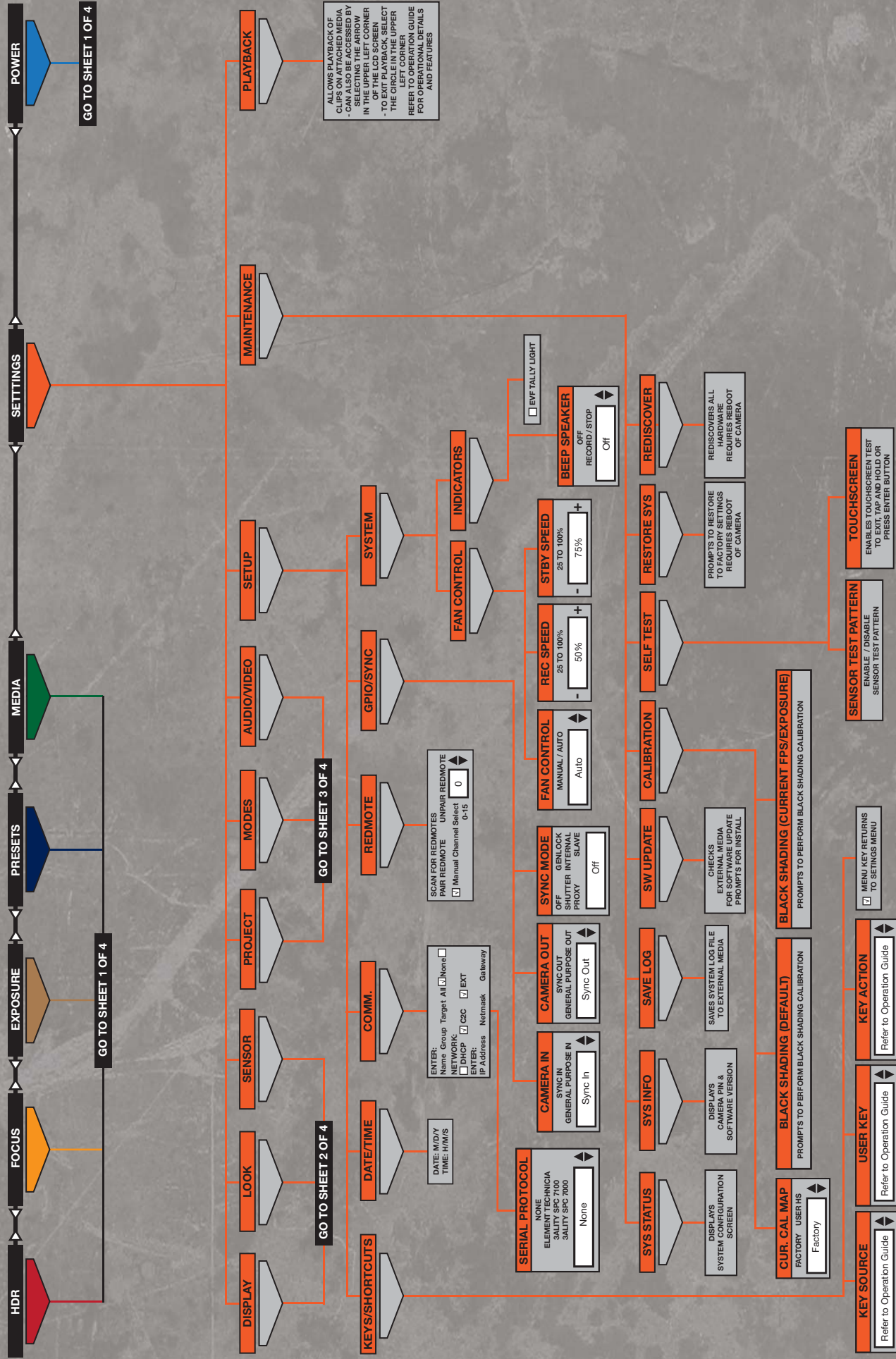




# SECONDARY MENUS

PRESS MENU ICON (LCD) OR MENU BUTTON TO ACCESS

DEFAULT VALUES ARE DISPLAYED IN BOXES





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