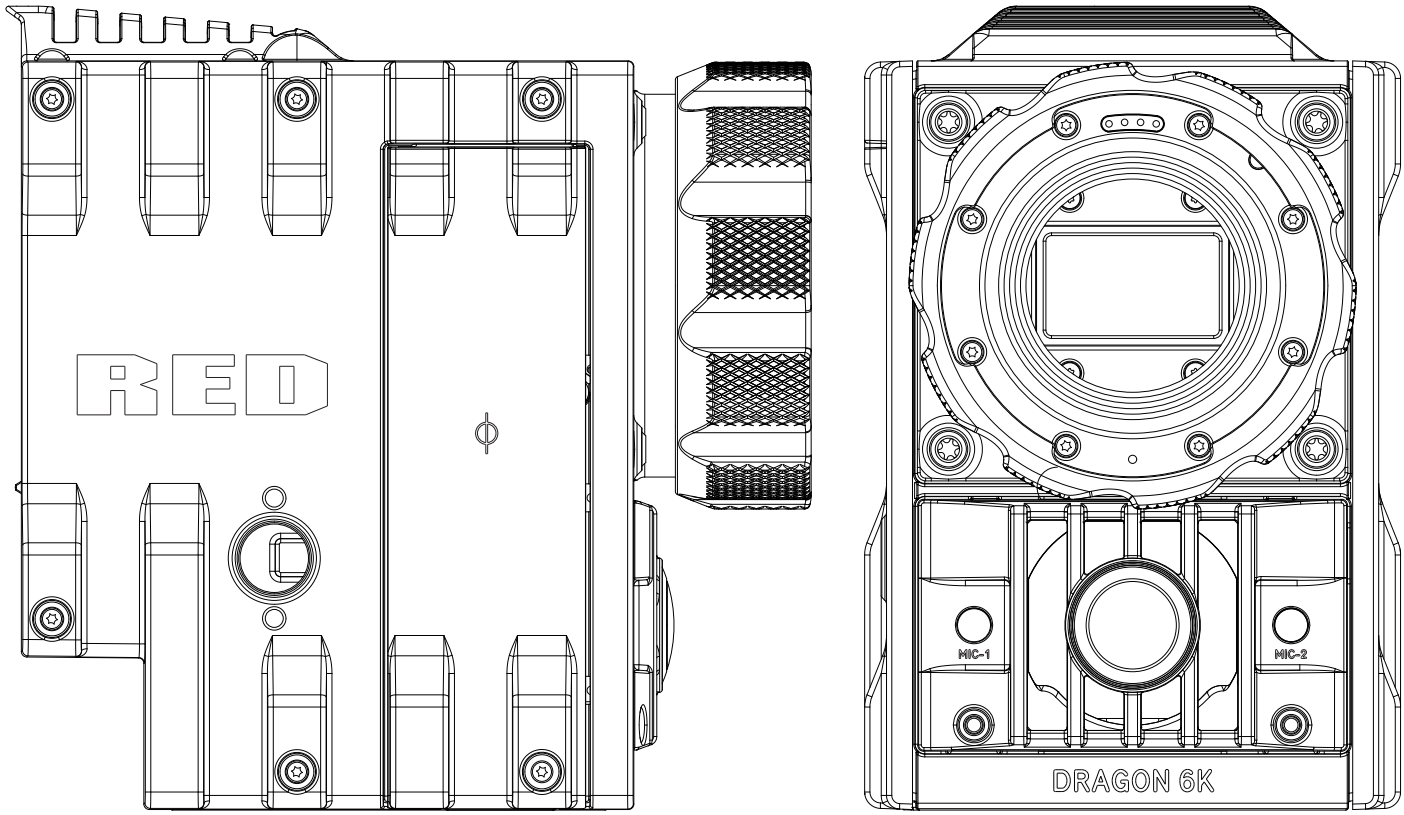
RED DSMC
OPERATION GUIDE



EPIC | SCARLET | V5.1
DRAGON | MYSTERIUM-X

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DISCLAIMER

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COMPLIANCE STATEMENTS

INDUSTRIAL CANADA EMISSION COMPLIANCE STATEMENTS

This device complies with Industry Canada license-exempt RSS standards RSS 139 and RSS 210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENTS

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

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

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 users authority to operate this equipment.

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

Operations subjected to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including that may cause undesirable interference.

CAUTION: Exposure to Radio Frequency Radiation.

The device shall be used in such a manner that the potential for human contact is minimized

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

CAUTION: Regulations of the FCC and FAA prohibit airborne operation of radio-frequency wireless devices because there signals could interfere with critical aircraft instruments.

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

AUSTRALIA AND NEW ZEALAND STATEMENTS

RED declares that the radio equipment described in this document comply with the following international standards.

- IEC 60065 - Product Safety
- ETSI EN 300 328 - Technical requirement for radio equipment

RED declares digital devices described in this document comply with the following Australian and New Zealand standards.

- AS/NZS CISPR 22 – Electromagnetic Interference
- AS/NZS 61000.3.2– Power Line Harmonics
- AS/NZS 61000.3.3 – Power Line Flicker

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 radio equipment described in this document comply with the R&TTE Directive (1999/5/EC) issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 60065 (IEC 60065) – Product Safety
- ETSI EN 300 328 Technical requirement for radio equipment
- ETSI EN 301 489 General EMC requirements for radio equipment.

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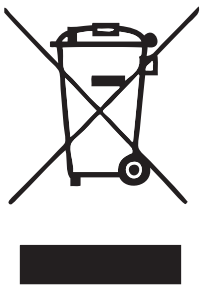
INFORMATION

Products with the CE marking comply with the EMC Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC) issued by the Commission of the European Community. Compliance with these directives implies conformity to the following European Product Family Standards.

- EN 55022 (CISPR 22) – Electromagnetic Interference
- EN 55024-1 (CISPR 24) – Electromagnetic Immunity
- EN 61000-3-2 (IEC610000-3-2) – Power Line Harmonics
- EN 61000-3-3 (IEC610000) – Power Line Flicker
- EN 60065 (IEC60065) – Product Safety

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)



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 you 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.

USAGE RESTRICTIONS FOR PRODUCTS THAT INCORPORATE REDLINK

Products that fall into this category are denoted by inclusion of the Class 2 identifier symbol (exclamation mark in a circle) accompanying the CE Mark on the products regulatory label, example to the left.

FRANCE

Usage Restrictions - Geographic Area Where Restriction Applies : France

For mainland France

- 2.400 - 2.4835 GHz (Channels 1-16) authorized for indoor use
- 2.400 -2.454 GHz (Channels 1-10) authorized for outdoor use

Restrictions d'utilisation - Zone géographique où les restrictions s'appliquent : France

Pour la France métropolitaine

- 2.400 - 2.4835 GHz (Canaux 1 à 16) autorisé en usage intérieur
- 2.400 -2.454 GHz (canaux 1 à 10) autorisé en usage extérieur

NORWAY

This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund

Dette gjelder ikke for det geografiske området innenfor en radius av 20 km fra sentrum av Ny-Ålesund

RESPONSIBLE PARTY:

RED Digital Cinema
34 Parker
Irvine, CA 92618
USA

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SAFETY INSTRUCTIONS

- 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 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 to rain or moisture.

- DO NOT expose the DSMC to laser beams, as laser beams may damage the sensor.
- 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.
- 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.
- 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.
- 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.

- 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:
  - Operating range: 0°C to 40°C (32°F to 104°F)
  - 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 support.red.com.
- The DSMC 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.
- 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.
- 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.

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.

- 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.

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BATTERY STORAGE AND HANDLING

WARNING: Failure to read, understand, and follow these instructions may result in overheating, chemical leakage, smoke emission, fire, or other potentially harmful results.

Always follow proper battery handling and storage practices. Improper handling and/or failure to abide by proper storage instructions may cause permanent damage to batteries, or degrade battery charge holding capacity. Improper handling practices or failure to comply with instructions may also put you at risk.

Lithium-Ion batteries, like the REDVOLT, REDVOLT XL, and RED BRICK, self-discharge over time. When storing for long periods of time, store batteries separately from the camera or charger and remember to charge batteries to a capacity level of 50% to 80%. If batteries will be stored for long periods of time, RED recommends that you check the charge level at least once every six (6) months, and recharge batteries to a capacity level of 50% to 80%.

When not in use, remove the battery from the camera or charger and store the battery in a cool, dry place. Avoid non-insulated storage areas with fluctuating temperatures, extreme hot temperatures (such as inside a hot car), corrosive gas, and direct sunlight. The optimal storage temperature for batteries is between -20°C to 20°C (-4°F to 68°F).

WARNING: Batteries stored in a depleted state may self-discharge and lose the ability to hold a charge.

WARNING: DO NOT use the battery for purposes other than those specificied.

WARNING: If recharging operation fails to complete even when a specified recharging time has elapsed, immediately stop further recharging.

WARNING: If recharging operation fails to complete even when a specified recharging time has elapsed, immediately stop further recharging.

- DO NOT store batteries in a fully charged state for extended periods of time.
- DO NOT store batteries in a fully depleted state for extended periods of time.
- DO NOT store batteries in the camera, in a camera module, or in a charger for extended periods of time.
- DO NOT store batteries in extreme hot or cold temperatures.
- DO NOT store batteries in direct sunlight.
- Store the battery in a location where children cannot reach it.
- DO NOT use third-party chargers with your RED batteries.
- DO NOT disassemble or modify the battery.
- DO NOT overcharge batteries. Overcharging may increase internal temperature beyond the recommended limits and cause permanent damage to the battery.
- DO NOT connect the positive (+) and negative (-) terminals to a metal object such as a wire.
- DO NOT transport or store the battery together with metal objects such as jewelry, hairpins, etc. as they may generate heat if they come into contact with the battery.
- DO NOT discard the battery into fire or heat.
- DO NOT store, use, or recharge the battery near a heat source such as a fire or a heater.
- DO NOT allow the battery to get wet.
- DO NOT pierce the battery with pointed or other sharp objects.
- DO NOT step on, throw, or strike the battery with a hammer.
- DO NOT use a battery that appears to be deformed or damaged.
- DO NOT directly solder the battery.
- DO NOT put the battery into a microwave oven or a pressurized container.
- DO NOT use or subject the battery to intense sunlight or hot temperatures such as in a car in hot weather.
- The battery incorporates built-in safety devices. DO NOT use it in a location where static electricity may be present.
- DO NOT exceed the recharging temperature range of 0˚C to 40˚C (32˚F to 104˚F).
- RED recommends that you only use RED chargers to recharge RED batteries.
- If the battery leaks or gives off a bad odor, discontinue use immediately.
- If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appears abnormal during use, recharging or storage, immediately remove it from the equipment or battery charger and discontinue use.
- If electrolyte begins leaking from the battery and comes into contact with your skin or clothing, immediately wash it away with running water. Failure to do this may result in skin inflammation.
- If the battery leaks and the electrolyte reaches the eyes, do not rub them. Instead, rinse the eyes with clean running water and immediately seek medical attention. Failure to do this may result in eye injury.
- If you find discoloration, a bad odor due to leakage, overheating and/or other irregularities when using the battery for the first time, contact your Bomb Squad Representative immediately.

NOTE: For more information regarding RED battery charging and instructions for care, please refer to our Terms and Conditions.

SHIPPING DISCLAIMER

Unless you have been certified to ship dangerous goods, you must work with a Dangerous Goods, Class 9-certified shipper to assist you with a shipment that includes a RED BRICK (or other regulated lithium ion batteries). Please note that applicable laws prohibit the shipping of batteries that are physically damaged. We urge you to look into the formal rules and regulations of shipping Class 9 Dangerous Goods prior to preparing your shipment. For more information on these regulations, please visit www.iata.org and www.dot.gov.

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01 DSMC OVERVIEW

Congratulations on your purchase of one of the following RED DSMC® Digital Still and Motion Cameras:

- EPIC-M RED DRAGON (CARBON FIBER)
- EPIC-M
- EPIC-X
- SCARLET-X

Each RED DSMC BRAIN is equipped with a DRAGON or MYSTERIUM-X sensor.

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.

EPIC Digital Still and Motion Cameras (DSMC)

DRAGON SENSOR

The new 6K RED DRAGON™ sensor allows you to capture over nine (9) times more resolution than standard HD. The result is unrivaled detail and impressive native exposure eclipse 35mm film in both latitude and image density.

The DRAGON sensor is a model for image innovation, leading the way in the evolution of digital cinema technology. Boasting industry-leading specs in resolution, frame capture, dynamic range, and color science, the RED DRAGON sensor raises the bar for digital still and motion cameras, again.

MYSTERIUM-X® SENSOR

The MYSTERIUM-X sensor is specifically designed for use with the RED DSMC BRAIN, and in the EPIC it provides variable frame rate imaging at up to 95 FPS at 5K FF resolution, and up to 400 FPS at 1K WS 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% gray 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.

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IMAGE PROCESSING

The digital image received from the sensor is formatted as a pixel defect corrected (but in all other aspects unprocessed) 16-bit per pixel RAW data frame.

Each RAW frame or sequence of RAW frames in a clip is compressed using proprietary wavelet based REDCODE® RAW compression, then stored to a RED MINI-MAG or 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; that is, 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 1920 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, 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 to one or more of the outputs.

NOTE: The REDCINE-X® PRO software can create and export .RMD "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. For more information about Look files, go to "Looks" on page 104.

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.

For example, if you select an HDR value of +2 and your primary track exposure is 1/48 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 these 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 and 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 24 FPS, the camera is recording two 24 FPS tracks, which is the data rate equivalent of 48 FPS; however, after combining the A and X tracks in post-production, you will see only one 24 FPS blended image sequence.

HDRx provides multiple options for exploitation in post-production.

- Blend the two tracks in post tools like REDCINE-X PRO or any other application that supports the SDK to create Magic Motion™. This blending of the two tracks comes with a slider so that 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.
- Export to EXR file format to get a multi-view EXR with both exposures (like a stereo EXR).

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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 post-production options are reduced.

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

NOTE: HDRx mode can be used with sensor syncing.

MAGIC MOTION

Shooting at 24 FPS and with an 180 degree (1/48 sec) 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 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 RED MINI-MAG or REDMAG 1.8" SSD.

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 –52 dBFS to 0 dBFS with audio input type, reference level and audio input clipping indicators.

Audio monitor output options include a 2-channel headphone output on the DSMC BRAIN and 2-channel line level analog outputs from the optional PRO I/O MODULE, plus 2-channel and 4-channel 24-bit 48 KHz 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 30 dB to 60 dB. The camera operator should choose a Gain value that aligns the input signal to the 0 dBu reference line drawn on the camera’s Audio Level Meter (or the 0 VU reference line if operating at that level).

This setting provides up to 30 dB of input signal headroom above reference 0 dBu level before clipping (up to 26 dB above 0 VU 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 0 dBu (–20 dBFS) reference mark drawn on the camera’s Audio Level Meter, or if using 0 VU as reference level, a mixer output level that aligns a reference tone signal to the 0 VU (–16 dBFS) reference mark.

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

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VIDEO MONITORING OUTPUTS

In its default configuration, the RED DSMC 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 DSMC BRAIN.

All monitors are able to display a variety of features, including:

- Surround View™, which is an additional lookaround 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 zebra indicators, 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.

BOMB EVF (LCOS) AND BOMB EVF (OLED)

The BOMB EVF (LCOS) and BOMB EVF (OLED) are high-definition, lightweight viewfinders that align quality performance with compact form factor.

For applications where use of an attached RED EVF or RED LCD is not desired, such as 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 TOUCH LCD

The RED TOUCH LCD pixel progressive scan color display allows you to view your image and navigate through menu settings using touchscreen functionality.

For applications where use of an attached RED EVF or RED LCD is not desired, such as 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.

NOTE: DO NOT use the RED LCD as a handle to lift or carry the DSMC. Damage to the RED LCD or other components of the DSMC system caused by using the RED LCD as a handle is not covered under warranty.

NOTE: The RED LCD swivel axis has a total range of adjustment of approximately 360˚ (180˚ clockwise or counterclockwise from the nominal “rear-facing” display orientation). The range of adjustment for the tilt axis is approximately 180˚. At the end of the adjustment range are internal “hard stops” for both axes. Once the swivel or tilt hard stops have been reached, IMMEDIATELY STOP APPLYING FORCE TO THE LCD. Continuing to apply force after reaching the internal stops may damage the friction hinge. Damage to the RED LCD or other components of the DSMC system caused by using excessive force to rotate the RED LCD is not covered under warranty.

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.

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LENS MOUNTS

The RED DSMC comes with a DSMC TI 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 15 mm offset studio and 15 mm lightweight rods are also available.

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

Lens mounts can be changed out 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.

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, referencing 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, which is 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.

ADDITIONAL RESOURCES

The following resources offer additional information about RED, the DSMC system, and the RED community:

- **RED.com**: Check the official RED website for the latest information about RED products.
- **RED Learn Articles**: RED offers in-depth technical articles about RED cameras, post-production, and digital cinematography.
- **RED.com/downloads**: Go to the RED Downloads page to download the latest firmware, operation guides, and post-production software.
- **Support.red.com**: Check the RED SUPPORT site for FAQs, or to file a support ticket.
- **Reduser.net**: Discuss all things RED on the REDUSER third-party forum.
- **In-Camera Help**: Select the **Help** button on an in-camera screen to open up the help for that screen.

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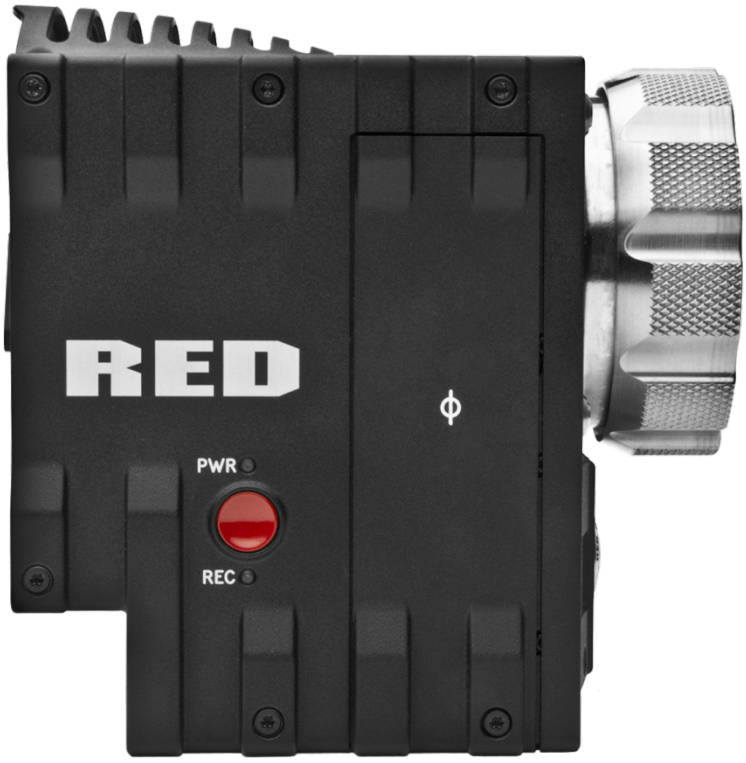
02 COMPONENTS AND MODULES

This section provides an overview of the DSMC components and modules.

WARNING: The DSMC 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.

BRAIN



EPIC BRAIN

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BRAIN LEDS

LED	COLOR/FLASHING	DESCRIPTION
Power Status LED (PWR)	Red	Power present; camera off
	Yellow	Power present; camera booting
	Green	Power present; camera on
	Green flashing	Power present; running on battery
	Yellow flashing	Power present; 5–10 minutes of battery time left
	Red flashing	Power present; less than 5 minutes of battery time left
Record Status LED (REC)	Off	No media present
	Green	Ready to record
	Red	Recording
	Red slow flashing	Recording; 25% media left
	Red fast flashing	Recording; 5% media left
	Yellow	Finalizing
Power Status LED (PWR) and Record Status LED (REC)	Both green flashing	Firmware update in progress
	Both red flashing	Firmware update failing

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SIDE SSD MODULES

RED offers the following side SSD modules:

- RED MINI-MAG Side SSD Module
- Carbon Fiber RED MINI-MAG Side SSD Module
- DSMC 1.8" SSD Side Module
- DSMC 1.8" SSD Side Module (DRAGON)
- Carbon Fiber DSMC 1.8" SSD Side Module (DRAGON)

For more information about installing and using the side SSD modules, see the DSMC Media Operation Guide available at www.red.com/downloads.

RED MINI-MAG SIDE SSD MODULE

RED offers the following RED MINI-MAG modules:

- **RED MINI-MAG Side SSD Module**: Mounts to any standard aluminum DSMC BRAIN.
- **Carbon Fiber RED MINI-MAG Side SSD Module**: Mounts to any carbon fiber DSMC BRAIN, and is only available with a carbon fiber DSMC BRAIN.

Each RED MINI-MAG module attaches to the DSMC so that you can mount a RED MINI-MAG to your camera.

Each RED MINI-MAG module has the same EVF/LCD LEMO connector, user keys, and REC button as the DSMC 1.8" SSD Side Module.

WARNING: The RED MINI-MAG modules are NOT HOT SWAPPABLE, meaning you cannot remove or install the modules while the camera is powered on. Before installing or removing the modules you MUST power down the camera. Failure to do so may result in damage to the module or DSMC that will not be covered under warranty.

RED MINI-MAG Side SSD Module

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DSMC 1.8" SSD SIDE MODULE

RED offers the following DSMC 1.8" SSD Side Modules:

- **DSMC 1.8" SSD Side Module**: Mounts to any standard aluminum DSMC BRAIN.
- **DSMC 1.8" SSD Side Module (DRAGON)**: Mounts to a DSMC with a RED DRAGON sensor, and is only available with a DSMC with a RED DRAGON sensor.
- **Carbon Fiber DSMC 1.8" SSD Side Module (DRAGON)**: Mounts to a carbon fiber DSMC BRAIN, and is only available with a carbon fiber DSMC BRAIN.

Each DSMC 1.8" SSD Side Module attaches to the DSMC so that you can mount a REDMAG 1.8" SSD to your camera.

Each DSMC 1.8" SSD Side Module has the same EVF/LCD LEMO connector, user keys, REC button, and LED as the RED MINI-MAG Side SSD Module.

WARNING: The DSMC 1.8" SSD Side Module is NOT HOT SWAPPABLE, meaning you cannot remove or install the module while the camera is powered on. Before installing or removing the module you MUST power down the camera. Failure to do so may result in damage to the module or DSMC that will not be covered under warranty.

DSMC 1.8" SSD Side Module (Rear and Front)

SIDE SSD MODULE CONTROLS

This section describes the controls for all of the side SSD modules.

CONTROL	DESCRIPTION
User Key 1	Programmable key User Key 1 + 2 Press: Eject Media
User Key 2	Programmable key User Key 1 + 2 Press: Eject Media
REC button	Programmable key Full Press: Record Toggle Half Press: AF Start

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SIDE SSD MODULE LEDS

This section describes the LED for all of the side SSD modules.

LED	COLOR/FLASHING	DESCRIPTION
Media Indicator LED	Off	No media present
	Green	Ready to record
	Red	Recording
	Red slow flashing	Recording; 25% media left
	Red fast flashing	Recording; 5% media left
	Yellow	Finalizing
	Yellow flashing	Accessing media (for example, when formatting)

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DSMC SIDE HANDLE

The DSMC SIDE HANDLE provides the following:

- A battery compartment for one REDVOLT battery.
- An LCD display that shows key camera parameter values.
- Many programmable user keys and buttons. For a full list of all DSMC SIDE HANDLE user keys and their default actions, go to “Default Key Functions” on page 138.

DSMC SIDE HANDLE Front (left), DSMC SIDE HANDLE Rear (right)

DSMC SIDE HANDLE (Top)

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INSTALL DSMC SIDE HANDLE

WARNING: The DSMC SIDE HANDLE is NOT HOT SWAPPABLE, meaning you cannot remove or install the DSMC SIDE HANDLE while the camera is powered on. Before installing or removing the DSMC SIDE HANDLE, you MUST power down the camera. Failure to do so may result in damage to the DSMC SIDE HANDLE or DSMC that will not be covered under warranty.

REQUIRED TOOL: T10 Torx® driver

1. Power down the camera.
2. Use a T10 Torx driver to remove the single screw located at the bottom of the BRAIN side plate (if installed).
3. Rotate the BRAIN side plate upwards to disengage the lip at the top of the side plate from the camera BRAIN, and remove the BRAIN side plate.
4. Insert the lip at the top of the DSMC SIDE HANDLE into the area where the lip from the BRAIN side plate was installed.
5. Press the DSMC SIDE HANDLE down flush along side of camera BRAIN.
6. Rotate the thumbscrew upward while applying steady pressure until tight.

REMOVE DSMC SIDE HANDLE

WARNING: The DSMC SIDE HANDLE is NOT HOT SWAPPABLE, meaning you cannot remove or install the DSMC SIDE HANDLE while the camera is powered on. Before installing or removing the DSMC SIDE HANDLE, you MUST power down the camera. Failure to do so may result in damage to the DSMC SIDE HANDLE or DSMC that will not be covered under warranty.

1. Power down the camera.
2. Rotate the thumbscrew downward until the DSMC SIDE HANDLE detaches from the camera body.
3. Pull the bottom of the DSMC SIDE HANDLE away from the BRAIN to disengage the lip at the top of the DSMC SIDE HANDLE away from the camera BRAIN.
4. Remove the DSMC SIDE HANDLE from the camera.

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DSMC MODULES

WARNING: The DSMC modules are NOT HOT SWAPPABLE, meaning you cannot remove or install the modules while the camera is powered on. Before installing or removing modules, you MUST power down the camera. Failure to do so may result in damage to the modules or DSMC that will not be covered under warranty.

PRO I/O MODULE

The PRO I/O MODULE brings together the essential I/O connections into one module, providing a central hub for professional audio and video components.

- Centralized ports make it easy to manage connections and cables.
- LCD/EVF port allows you to connect an additional RED LCD or EVF.
- Customize triggers and interface with third-party GPIO and RS232 control devices using RED PRO I/O cables.
- Attach an additional DSMC module or a REDMOTE to the back of the PRO I/O MODULE for additional expansion.
- Internal cooling system maintains appropriate operating temperature.

PRO I/O MODULE

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REAR SSD MODULE

The REAR SSD MODULE secures onto the back of a MODULE ADAPTOR or a +1 ADAPTOR MODULE to serve as a rear location for recording to a REDMAG 1.8" SSD.

For more information about installing and using the REAR SSD MODULE, see the DSMC Media Operation Guide available at www.red.com/downloads.

REAR SSD MODULE

PRO BATTERY MODULE (DUAL)

The PRO BATTERY MODULE (DUAL) enables DSMC BRAIN power support using two REDVOLT batteries. The PRO BATTERY MODULE (DUAL) also supports hot-swapping of REDVOLT batteries.

For more information about installing and using the PRO BATTERY MODULE (DUAL), see the DSMC Power Operation Guide available at www.red.com/downloads.

PRO BATTERY MODULE (DUAL)

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PRO BATTERY MODULE (QUAD)

The PRO BATTERY MODULE (QUAD) harnesses the power of four REDVOLT batteries or two REDVOLT XL batteries to power the DSMC BRAIN. Similar to the PRO BATTERY MODULE (DUAL), this module enables hot-swap support for continuous power to the camera without missing a shot.

For more information about installing and using the PRO BATTERY MODULE (QUAD), see the DSMC Power Operation Guide available at www.red.com/downloads.

PRO BATTERY MODULE (QUAD)

INSTALL MODULES

Use the instructions in this section to install and remove DSMC modules.

INSTALL MODULE ADAPTOR

Use the instructions in this section to install the MODULE ADAPTOR.

REQUIRED TOOL: T20 Torx® driver

You must install a MODULE ADAPTOR to the back of the camera BRAIN before you install a DSMC module. MODULE ADAPTORs are sold separately from the DSMC modules.

1. Power down the camera.
2. Remove the REDMOTE, if attached.
3. Place the MODULE ADAPTOR over the V-mount on the rear of the camera BRAIN.

MODULE ADAPTOR

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4. Use a T20 Torx driver to tighten the screws by about two turns in a cross pattern. DO NOT FULLY TIGHTEN.
5. Fully tighten the screws in a cross pattern. DO NOT OVERTIGHTEN.

Install Screws

INSTALL THE +1 ADAPTOR MODULE

Use the instructions in this section to install the +1 ADAPTOR MODULE.

WARNING: DSMC modules and adaptors are NOT HOT SWAPPABLE, meaning you cannot remove or install the modules while the camera is powered on. Before installing or removing modules, you MUST power down the camera. Failure to do so may result in damage to the modules or DSMC that will not be covered under warranty.

REQUIRED TOOL: T20 Torx driver

1. Power down the camera.
2. Remove the REDMOTE, if attached.
3. Align the +1 ADAPTOR MODULE with the back of the DSMC BRAIN.

Install +1 ADAPTOR MODULE

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4. Insert the HDMI connector into the DSMC BRAIN.

Insert the HDMI Connector to DSMC BRAIN

5. Use a T20 Torx driver to tighten four (4) captive screws. Tighten screws in a cross pattern approximately two turns each. DO NOT FULLY TIGHTEN.

Tighten the screws in an “X” pattern

6. Fully tighten four (4) screws in a cross pattern. DO NOT OVERTIGHTEN.

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ATTACH DSMC MODULE

WARNING: The DSMC modules are NOT HOT SWAPPABLE, meaning you cannot remove or install the modules while the camera is powered on. Before installing or removing modules, you MUST power down the camera. Failure to do so may result in damage to the modules or DSMC that will not be covered under warranty.

NOTE: The instructions below are applicable to all DSMC modules. The QUAD BATTERY MODULE is shown.

REQUIRED TOOL: T20 Torx® driver

1. Insert the lip at the top of the module into the recess at the top of the MODULE ADAPTOR.

Insert Module Lip

2. Rotate the module down flush with the rear of the MODULE ADAPTOR.

Press Module Flush

3. While applying steady pressure to hold the module against the MODULE ADAPTOR, use a T20 Torx driver to rotate the lock on the MODULE ADAPTOR clockwise to the Lock position in order to secure the module.

REMOVE DSMC MODULE AND ADAPTOR PLATE

REQUIRED TOOL: T20 Torx® driver

1. Power down the camera.
2. Use a T20 Torx driver to rotate the lock on the MODULE ADAPTOR counterclockwise to the Unlock position.
3. Rotate the module upwards and down to disengage the lip at the top of the module from the MODULE ADAPTOR.

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4. Remove the module from the MODULE ADAPTOR.

Remove Module

5. Use a T20 Torx driver to loosen the screws attaching the MODULE ADAPTOR to the camera BRAIN.

Loosen MODULE ADAPTOR

6. Remove the MODULE ADAPTOR from the camera BRAIN.

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REMOVE THE +1 ADAPTOR MODULE

Use the instructions in this section to remove the +1 ADAPTOR MODULE.

WARNING: DSMC modules and adaptors are NOT HOT SWAPPABLE, meaning you cannot remove or install the modules while the camera is powered on. Before installing or removing modules, you MUST power down the camera. Failure to do so may result in damage to the modules or DSMC that will not be covered under warranty.

REQUIRED TOOL: T20 Torx driver

1. Power down the camera.
2. Using a T20 Torx driver, loosen four (4) captive mounting screws attaching the +1 ADAPTOR MODULE to the DSMC BRAIN.

Loosen the screws in an “X” pattern

3. Disconnect the HDMI connector from the DSMC BRAIN.
4. Remove the +1 ADAPTOR MODULE from the DSMC BRAIN.

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MODULE ADAPTOR

The MODULE ADAPTOR enables DSMC modules to connect the DSMC BRAIN for expandable functionality. The MODULE ADAPTOR features additional ¼-20 mounting points on top for further add-ons and configuration support. Most RED DSMC modules require a MODULE ADAPTOR or +1 ADAPTOR MODULE to attach to your DSMC BRAIN.

WARNING: MODULE ADAPTOR is NOT compatible with the +1 ADAPTOR MODULE.

MODULE ADAPTOR

+1 ADAPTOR MODULE

The +1 ADAPTOR MODULE mounts onto the back of a DSMC BRAIN and provides power and support for an additional RED EVF/LCD. The +1 ADAPTOR MODULE also includes an AUX power port for 4-pin third party accessories. Other 2-pin accessories are also compatible when using a 4-PIN TO 2-PIN ADAPTOR CABLE.

WARNING: The +1 ADAPTOR MODULE IS NOT compatible with the MODULE ADAPTOR.

WARNING: DO NOT use the EVF/LCD port if a PRO I/O MODULE is connected to the DSMC BRAIN.

NOTE: The +1 ADAPTOR MODULE requires DSMC firmware v4.0.8 or later.

+1 ADAPTOR MODULE

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+1 ADAPTOR MODULE CONNECTIONS

+1 ADAPTOR MODULE Connections

CONNECTOR	CONNECTOR TYPE	CONNECTOR FUNCTION
Mounting	1/4-20 mounting	Supports bolt-on auxiliary equipment
EVF/LCD[1]	N/A	Custom digital video and power interconnection between DSMC BRAIN and RED EVF or RED LCD; Pinout not published
Auxiliary power out (PWR)	4-pin 0B LEMO	Supplies unregulated (+) 11.5 to 17 V battery pass-through; Max sustained current is 2 A
REDMOTE® dock connector	8-point POGO connector	Power and support for the REDMOTE
Dock connector	SEARAY connector	Supports power and communication with modules

1. **WARNING:** DO NOT use the EVF/LCD connector if a RED PRO I/O MODULE is connected to the DSMC BRAIN.

NOTE: The default auxiliary power output setting is on. Use the on-screen menu to toggle this setting ON/OFF. In the menu screen, go to **Power** > **Power Out** > **+1 PWR**. After a DSMC firmware upgrade or factory reset, the default auxiliary power output setting will be turned on. Thereafter, the last power output setting is restored.

MULTIPLE CONTROL SURFACES

The DSMC BRAIN may only utilize one control surface (LCD) at any given time. If multiple RED Touch LCDs are attached to the camera BRAIN and the +1 ADAPTOR MODULE, you may prioritize the primary control surface in the menu settings at: **Settings** > **Display** > **Monitor Control** > **Priority**. Control will automatically be given to the highest priority display attached. You may also prioritize the primary monitor control surface commands and the secondary monitor when using multiple monitors.

- The +1 ADAPTOR MODULE monitor is labeled “Rear LCD” in the on-screen menu.
- Settings can be configured to transfer primary monitor settings to the secondary monitor in the event that the primary monitor is disconnected. To accomplish this, go to **Settings** > **Display** > **Monitor Control** > **Monitor** and change the selected monitor to “Rear LCD” prior to disconnecting the primary monitor.
- The monitor port on the +1 ADAPTOR MODULE is automatically disabled when a PRO I/O MODULE is attached to the camera.

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+1 ADAPTOR MODULE ACCESSORIES

+1 ADAPTOR MODULE Accessories

ACCESSORY	CONNECTOR TYPE	CONNECTOR FUNCTION
4-PIN TO 2-PIN ADAPTOR CABLE	4-pin 0B to 2-pin 0B LEMO	Power support for 2-pin based accessories
Micro HDMI-to-HDMI Adaptor	Micro HDMI to Standard HDMI	HDMI video connection from DSMC BRAIN to support auxiliary EVF/LCD attachment

NOTE: The 4-PIN TO 2-PIN ADAPTOR CABLE converts 4-pin power into a 2-pin female LEMO connection, enabling support for 2-pin based accessories from the +1 ADAPTOR MODULE or PRO I/O MODULE.

NOTE: The Micro HDMI-to-HDMI Adaptor is field-replaceable.

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REPLACE HOOD SCOOP

The hood scoop on some EPIC-X and EPIC-M models sweep back and extend beyond the rear plane of the camera. Replacement hood scoops are available to allow for the attachment of an LCD display or other RED accessories to the mounting locations on the top of the +1 ADAPTOR MODULE.

Replace the Hood Scoop

Use the following instructions to replace DSMC fan hood scoop.

1. Use a T8 Torx driver to remove the four (4) M3x0.5 x 6 mm cap screws holding the hood scoop.
2. Lift off the old hood scoop.
3. Place the replacement hood scoop on the camera. Align the hood scoop screw holes with the threaded holes on top of the camera.
4. Attach the replacement top vent scoop to the DSMC BRAIN by installing the four (4) M3x0.5 x 6 mm cap screws in a cross pattern with a T8 Torx driver. DO NOT FULLY TIGHTEN.
5. Tighten the M3x0.5 x 6 mm cap screws evenly. DO NOT exceed 30 in-oz, or damage may occur.

   WARNING: DO NOT OVERTIGHTEN.

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REDMOTE

The REDMOTE is a camera control unit for RED DSMCs that attaches to the rear of the camera BRAIN or rearmost expansion module. The REDMOTE may also be detached from the camera or rearmost module and provide wireless remote control of the camera over proprietary REDLINK™ protocol.

For complete details about how to use the REDMOTE, go to “REDMOTE Operation” on page 113.

For a full list of all REDMOTE user keys and their default actions, go to “Default Key Functions” on page 138.

IMPORTANT: For the REDMOTE to operate properly, ensure that both REDMOTE and DSMC firmware are upgraded to the most recent versions.

REDMOTE

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DSMC DISPLAYS

BOMB EVF (LCOS) AND BOMB EVF (OLED)

For a full list of all EVF user keys and their default actions, go to “Default Key Functions” on page 138.

BOMB EVF (LCOS)

The BOMB EVF (LCOS) is a high-definition, lightweight viewfinder that aligns quality performance with compact form factor.

- **Resolution:** 1280 (wide) x 784 (high) full-color
- **Contrast Ratio:** 1000:1 typical
- **Available Diopter Range:** 2.0 to -5.0.l

BOMB EVF (LCOS)

BOMB EVF (OLED)

The RED BOMB EVF (OLED) brings advanced OLED technology into the field, providing truer blacks and more color accurate images.

- **Resolution:** 1280 (wide) x 1024 (high) full-color
- **Contrast Ratio:** > 10,000:1 typical
- **Available Diopter Range:** 2.0 to -5.0.l

BOMB EVF (OLED)

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LCDS

RED offers three (3) LCDs:

- RED TOUCH 5.0" LCD with 800 X 400 resolution (touchscreen)
- RED TOUCH 9.0" LCD with 1280 X 784 resolution (touchscreen)
- RED PRO LCD 7" with 1024 X 600 resolution

Each touchscreen LCD features 4:4:4 progressive scan.

When using either the RED TOUCH 5.0" LCD or RED TOUCH 9.0" LCD, you can navigate the DSMC menus and adjust camera parameters by directly touching icons on the touchscreen LCD screen.

For a full list of all LCD user keys and their default actions, go to “Default Key Functions” on page 138.

RED TOUCH 5.0” LCD

TOUCHSCREEN LCD GESTURES

- **Tap:** Tap on an icon to bring up a quick adjustment display.
- **Double-Tap:** If the monitor is in Clean mode, changes to Overlay mode.
- **Hold:** Touch and hold on an icon to bring up an advanced interface display.
- **Slide:** When a menu or drop-down menu is open, touch and slide to increment a value.
- **Pinch:** Touch with two fingers, then open or close to magnify or normalize the video image. By default, this gesture is disabled.

NOTE: Some of the touchscreen gestures can be disabled. For more information about how to enable/disable these gestures, go to “Gestures” on page 51.

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TOUCHSCREEN LCD PRECAUTIONS

CAUTION: DO NOT use the threaded holes when mounting the LCD to the RED camera BRAIN. Doing so may damage the camera or the display.

DO NOT Use Threaded Holes to Mount to DSMC

WARNING: DO NOT use the RED LCD as a handle to lift or carry the DSMC. Damage to the RED LCD or other components of the DSMC system caused by using the RED LCD as a handle are not covered under warranty.

NOTE: The RED LCD swivel axis has a total range of adjustment of approximately 360˚ (180˚ clockwise or counterclockwise from the nominal “rear-facing” display orientation). The range of adjustment for the tilt axis is approximately 180˚. At the end of the adjustment range are internal “hard stops” for both axes. Once the swivel or tilt hard stops have been reached, IMMEDIATELY STOP APPLYING FORCE TO THE LCD. Continuing to apply force after reaching the internal stops may damage the friction hinge. Damage to the RED LCD or other components of the DSMC system caused by using excessive force to rotate the RED LCD is not covered under warranty.

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03 POWER THE DSMC

NOTE: For more information about powering the DSMC, see the DSMC Power Operation Guide available at www.red.com/downloads.

NOTE: For more information about the Power menu, go to "Power Menu" on page 95.

POWER CONSUMPTION

The camera draws approximately 60 watts when recording in 5K resolution, at 24 FPS in 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.

POWER PRIORITY

When multiple power sources are available to the camera, power consumption is prioritized as follows:

1. DC power supply
2. Attached RED BRICK (Lowest % first)
3. Battery module batteries (Lowest % first)
4. REDVOLT battery in the DSMC SIDE HANDLE

POWER STATUS

The power status of each power source displays on the Power In screen. To view the Power In screen, go to **Menu** > **Power** > **Power In**.

POWER UP

1. Attach a power source to the DSMC. For more information about the different power sources, go to "Power Status" on page 36.

   The Power Status LED illuminates red, indicating that an appropriate power source is connected.
2. Locate the Power/Record button on the right side of the DSMC BRAIN.

   NOTE: The Power/Record button also serves as a Record Start/Stop button once the camera is powered up.
3. Press and release the Power/Record button.

   The Power Status LED initially goes out, and within 5 seconds illuminates yellow to confirm the camera is powering up.

   The Power Status LED then illuminates green to confirm that the camera is powered up and ready to use.

NOTE: Once powered up, if the Power Status LED illuminates red AND is flashing, there is less than five minutes of battery time left.

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POWER DOWN

NOTE: The DSMC automatically powers down if the supply voltage drops to 11.5 Volts.

Use either of the following ways to power down the DSMC:

- Go to **Menu** > **Power** and select **Shutdown**.
- Press and continue to hold the Power/Record button in its fully depressed position until the Shutting Down notification shows on the display.

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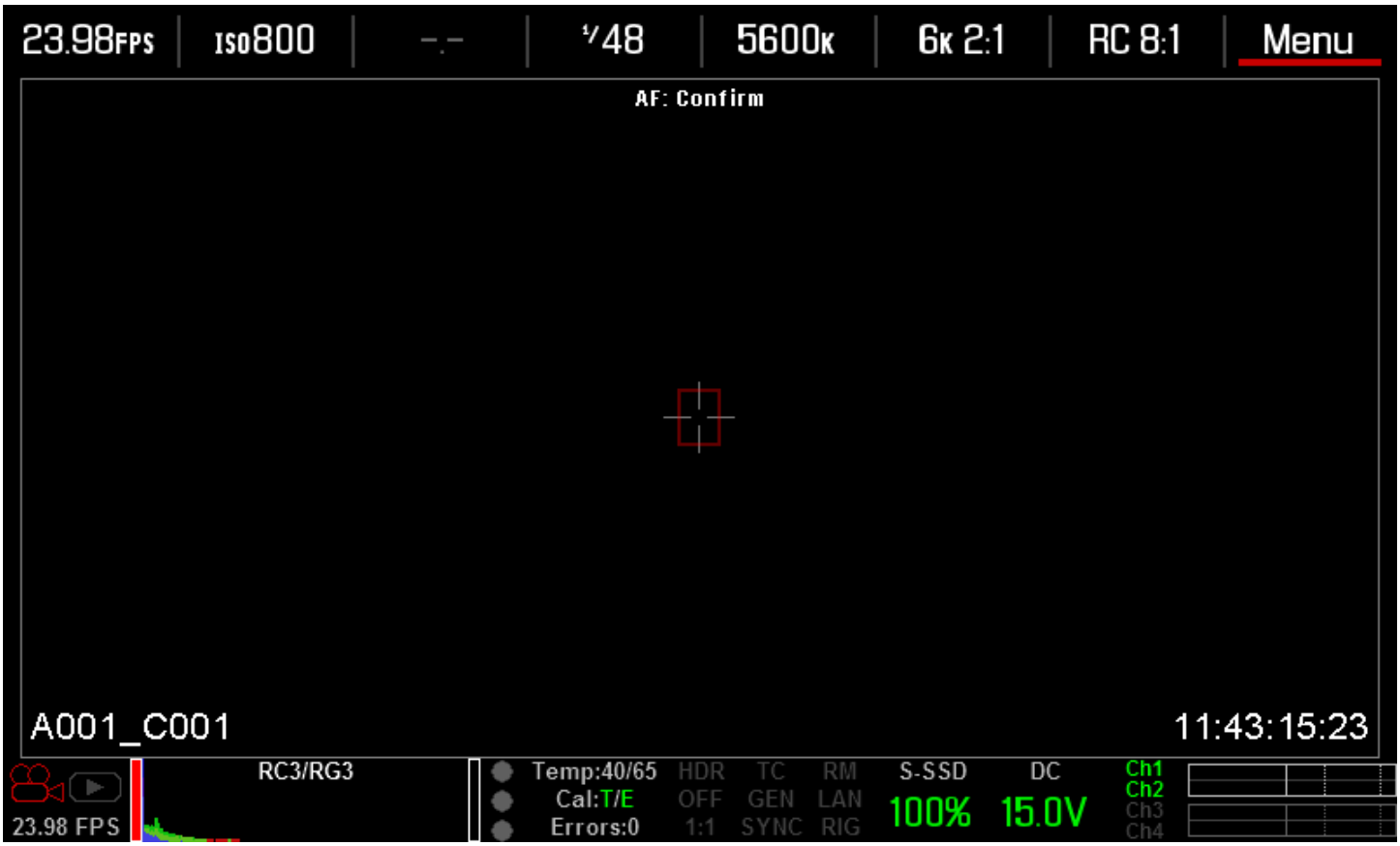
04 GRAPHICAL USER INTERFACE

VIEWFINDER OUTPUTS

The following is a general description of the structure of the camera's graphical user interface that overlays the video monitor signal on the Viewfinder outputs (RED PRO LCD, RED TOUCH, BOMB EVF, and external monitors) of the camera.



The display elements include:

- **Audio Meter**: Audio input selection and levels
- **Cal: T/E**: Indicator of relative change in sensor temperature and exposure since your last calibration
- **Clip Level Bar**: Relative number of RAW pixels near clip
- **Clip Meter**: RGB sensor RAW clipping status
- **Cursors**: Reference cursors – Safe Action/Safe Title, Picture Center, Grid Overlay
- **Drop**: Indicates if any frames were dropped during recording of the clip
- **F Stop**: Functional when optional mount and lens are installed
- **False Color Mode**: Displays false color overlay mode

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- **Frame Guide**: Record or Projection area
- **Frame Rate**: Current frame capture rate
- **Genlock**: Indicates presence of valid Genlock signal/HD-SDI sync to genlock
- **HDR Mode**: Displays HDRx mode status
- **Histogram**: RGB Histogram
- **ISO**: Camera sensitivity
- **LAN**: Indicates communication via Ethernet connection
- **Lens Info**: Lens information when using specific Canon or Cooke lenses
- **Magnify**: Tallies 1:1 if magnify is selected
- **Media Status**: Media location and remaining media capacity in %
- **Menu**: Access the Advanced Menus
- **Next Clip Filename**: Filename of the clip that will be shot next
- **Noise Level Ba**r: Relative number of RAW pixels in noise
- **Power**: Indicates DC supply voltage or % of remaining battery capacity Including current supply voltage
- **Record/Playback Toggle**: Toggles between Record and Playback modes
- **REDCODE**: REDCODE setting
- **Resolution**: Record Resolution
- **RIG**: Indicates 3D rig metadata is present
- **RM**: Indicates communication to REDMOTE
- **Shutter Speed**: Exposure time or shutter angle
- **Shutter Sync**: Indicates sensor shutter sync status
- **TC**: Indicates presence of valid SMPTE timecode signal and Jam Sync status
- **Temperature**: Displays camera sensor and core temperature in that order (xx/xxC)
- **Timecode**: Current timecode value
- **White Balance**: Color Temperature

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

Whichever parameter is underlined with a red bar may be immediately adjusted by pressing ENTER in the Navigation Group of the DSMC 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 Absolute 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 un-

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der 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 Widow. Adjust the value using the Scroll Wheel and then press ENTER to confirm the value change, then close the sub-menu.

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.

LENS INFORMATION DISPLAY

RED DSMC TI PL MOUNT AND 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 varies 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 OR DSMC NIKON MOUNT AND LENS

When a DSMC Canon Mount or a DSMC Nikon Mount is installed with an electronically supported lens 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 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 **Settings** > **Setup** > **Lens**. For more information, go to "Lens Tab" on page 79.

LOWER STATUS ROW

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

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

ICON BEHAVIOR

CAL: T/E

- **T or E Green**: No change in sensor temperature or exposure from the levels recorded during calibration
- **T or E Yellow**: Slight change in sensor temperature or exposure from the levels recorded during calibration
- **T or E Red**: Significant change in sensor temperature or exposure from the levels recorded during calibration
- The - and + indicate whether the sensor temperature or exposure has decreased or increased

NOTE: The T and E change colors independently of each other.

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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, or the presented signal cannot cross-lock to project (24.00 FPS vs. 23.98 FPS).
- **GEN Red**: During process of sync, or genlock is lost while recording.
- **GEN Green**: A genlock signal matching the current HD-SDI monitor rate has been locked to.
- **GEN Yellow**: When timing is cross-locking to compatible but not matching monitor rate. For example, genlock = 24.00, and HD-SDI monitor rate = 25.00.

NOTE: 3D operation should not be done if GEN is yellow. This is a warning that genlock source settings and camera settings are not aligned. Phasing of the sync between cameras cannot be guaranteed when GEN is yellow.

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, or genlock or sensor sync is lost while recording.
- **SYNC Green**: A genlock signal compatible with the HD-SDI monitor rate has been locked to and the sensor timing is also locked to it.

LAN

- **LAN Gray**: External control of the camera is not currently enabled.
- **LAN Yellow**: If the LAN icon is yellow, you will see the message “For reliable external control over Ethernet your camera’s hardware may need to be upgraded. Please contact your Bomb Squad representative”. If you see this message, you will not be able to control the camera externally. Please contact your Bomb Squad representative to have your hardware upgraded.

POWER STATUS

If powering camera through DC power, the current voltage will be displayed. If using batteries, the remaining battery time displays.

If using a RED BRICK 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**: 1.7 – 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 DSMC 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 remaining battery capacity and the displayed text is color coded as follows:

- **Green**: >10 minutes
- **Yellow**: 5-10 minutes
- **Red**: <5 minutes

If using a RED BRICK battery connected to DC IN, power status displays BRICK and reports the % of remaining

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battery capacity and the displayed text is color coded as follows:

- **Green**: >10 minutes
- **Yellow**: 5-10 minutes
- **Red**: <5 minutes

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 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 post-production.

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 1/8 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 clipping and may not be recoverable by lowering ISO or FLUT values in post-production.

DSMC SIDE HANDLE

As you navigate and adjust settings in the Basic Menus they will be reflected on the DSMC SIDE HANDLE LCD display.

The display elements include:

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

REDMOTE

The display elements include:

- **Battery Indicator**: Displays battery life or charge status (shown) of REDMOTE
- **Camera ID**: Displays camera ID (DEFAULT shown)
- **Clip Filename**: Filename of the clip that will be shot
- **Clip Meter**: RGB sensor RAW clipping status
- **False Color Mode**: Displays false color overlay mode
- **Frame Rate**: Current frame capture rate
- **Genlock**: Indicates presence of valid Genlock signal/HD-SDI sync to genlock
- **HDR Mode**: Displays HDRx mode status
- **Histogram**: RGB Histogram
- **ISO**: Camera sensitivity
- **LAN**: Indicates communication via Ethernet connection

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- **Magnify**: Tallies 1:1 if magnify is selected
- **Media Status**: Media location and remaining media capacity in %
- **Power**: Indicates D.C supply voltage or % of remaining battery capacity Including current supply voltage
- **Project Frame Rate**: Current project TIME BASE
- **REDCODE**: REDCODE setting
- **Resolution** Recording Resolution
- **RIG**: Indicates 3D rig metadata is present
- **Shutter Speed**: Exposure time or shutter angle
- **Shutter Sync**: Indicates sensor shutter sync status
- **TC**: Indicates presence of valid SMPTE timecode signal
- **Timecode**: Current timecode value
- **White Balance**: Color Temp
- **Wireless Status**: Displays signal strength when connected wirelessly

NAVIGATE GRAPHICAL USER INTERFACE

The primary method to navigate Menus is via the Scroll Wheel on the REDMOTE or DSMC SIDE HANDLE. Press Enter to open the menu, and then rotate the Scroll Wheel clockwise to move right, counter clockwise to move left. However, the Left and Right direction Navigation Keys (REDMOTE or DSMC SIDE HANDLE) or Adjustment Ring (DSMC SIDE HANDLE) may also be used for this purpose.

The Up Navigation Key selects the Advanced Settings menu when pressed (if parameter has an Advanced Settings menu).

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

NAVIGATE MENUS WITH 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, then click **Advanced...**.
- Touch anywhere outside the overlay windows to enter the value changes and to hide the sub-menus.

TOUCHSCREEN SHORTCUTS

The bottom portion of the touchscreen contains shortcuts to the most-used camera screens.

ACCESS SOFT KEYS

User-programmable Soft Keys A-D and 1-4 may be accessed by tapping the left or right regions of the touchscreen.

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05 BASIC MENUS

Basic Menus are the menus that are available at the top row of the display screen. The Basic Menus include: Frame Rate (FPS), ISO (Sensitivity), F Stop, Exposure, White Balance, Resolution, and REDCODE (Quality).

This section gives an overview of each of the Basic Menus, and directs you to the corresponding sections in the "Advanced Menus" chapter for more information.

ACCESS ADVANCED MENUS FROM BASIC MENUS

Except for the REDCODE menu, you can select the **Advanced...** button to access the related settings in the Advanced Menus.

For example, if you open the Resolution menu and select Advanced..., the camera takes you directly to the Settings > Project > Format screen, where you can modify the resolution, aspect ratio, anamorphic setting, and lookaround setting.

EDIT LIST FEATURE

In each Basic Menu, you can select the **Edit List...** button to change the values that display for each setting.

For example, if you open the Frame Rate menu and select Edit List..., the camera lets you remove or add values to available Frame Rate values.

FRAME RATE (FPS)

Select the sensor frame rate (also referred to as the capture frame rate). The sensor frame rate is the number of frames per second (FPS) that are recorded. The sensor frame rate is different from the project time base, which is the rate at which the footage will be played back.

The default sensor frame rate is 23.98 FPS, or the selected project time base when it is a value other than 23.98 FPS or 24 FPS.

Select the **Advanced...** button to access the Settings > Project > Frame Rate screen. For more information about the basic and advanced frame rate settings, as well as the minimum and maximum frame rates for each resolution, go to "Frame Rate" on page 56.

ISO (SENSITIVITY)

Select the native camera ISO rating. The sensitivity value is adjustable in 1/3 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.

RED recommends that you set the ISO near 800, then adjust the lens T-stop and lighting or ND filters to match. The ISO can later be adjusted around one stop for fine-tuning.

The range is ISO 250–12,800, and the default is ISO 800.

Select the **Advanced...** button to access the Settings > Look > FLUT screen. For more information about these settings, go to "FLUT" on page 55.

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F STOP (T STOP)

The 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, which is the 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 chose 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 displays the current aperture (F stop) of the attached lens.

DSMC NIKON MOUNT AND CANON MOUNT INSTALLED

The F-stop menu appears when a DSMC Nikon Mount, DSMC Canon Mount, or DSMC Canon MOTION MOUNT is installed with a supported lens.

This adjusts the aperture (F stop) of the attached lens.

Select the **Advanced...** button to access the Settings > Setup > Lens screen. For more information about the advanced focus settings, go to "Autofocus Modes (DSMC Nikon and Canon Mounts)" on page 97.

EXPOSURE

Select the exposure value in any of the following common units: Exposure, Integration Time, and Angle.

Select the **Advanced...** button to access the Settings > Project > Exposure screen. For more information about these settings, go to "Exposure" on page 61.

WHITE BALANCE (COLOR TEMPERATURE)

Select a color temperature. The range is 1700 to 10,000 KELVIN, and the default is 5600 KELVIN.

Select the **Advanced...** button to access the Settings > Look > Color Temperature screen. For more information about these settings, go to "Color Temperature" on page 55.

RESOLUTION

Select the resolution of your project.

Select the **Advanced...** button to access the Settings > Project > Format screen. For more information about the available resolutions for your camera and the advanced format settings, go to "Format" on page 64.

REDCODE

Select the target REDCODE compression ratio for your project.

If the camera is able to achieve the target compression ratio, the compression ratio displays in white. If the camera is unable to achieve the target compression ratio, the compression ratio displays in yellow.

The current compression ratio is automatically recalculated when changes are made to the project resolution, aspect ratio, anamorphic setting, frame rate, HDRx mode, media, or the target REDCODE compression ratio. To see all of the maximum available REDCODE values, see the DSMC Media Operation Guide at www.red.com/downloads.

Range for EPIC DRAGON and SCARLET-X DRAGON cameras is 2:1 to 22:1.

Range for MYSTERIUM-X cameras is 3:1 to 18:1.

Default is 8:1.

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06 ADVANCED MENUS

The Advanced Menus include: Settings, Media, Playback, Power, HDR, Focus, and Presets.

You can access the Advanced Menus the following ways:

- Press the **Menu** button on the DSMC® SIDE HANDLE or REDMOTE.
- Press the **Menu** icon on the LCD.
- Go to any Basic Menu except the REDCODE menu, and select the **Advanced...** button to access the related settings in the Advanced Menus. For example, if you open the Resolution menu and click Advanced, the camera takes you directly to the Settings > Project > Format screen, where you can modify the resolution, aspect ratio, anamorphic setting, and lookaround setting.

SETTINGS MENU

This section describes the various secondary controls available to configure the camera. Menu options are Display, Look, Project, Audio, Recording, Setup, and Maintenance.

DISPLAY

Available options are Tools, Zebra, Monitor Control, Modes, Guides, and Test Signals.

TOOLS

The Tools menu allows you to use different false color modes and display modes. False color options are None, Exposure, Focus, Video, and Edge. Display mode options are Magnify and RAW.

You can access the Tools menu the following ways:

- Navigate to **Settings** > **Display** > **Tools**.
- Press the Histogram in the lower left area of the on-screen display.

For more information about the different false color modes, check out the Exposure with RED Cameras: False Color & Zebra Tools article available at www.red.com/learn/red-101/exposure-false-color-zebra-tools.

FALSE COLOR MODES

NOTE: Only monitors with the Tools check box selected in the Monitor Control screen will show the false colors. For more information about monitor control, go to “Monitor Control” on page 48.

NOTE: When enabled, the false color modes will affect video that’s recorded through HDMI or HD-SDI out to an external recorder when the Tools check box is selected. If you’re recording through HDMI or HD-SDI, RED recommends using the false color modes only as tools to help you configure your project settings, and that you disable these modes before you start recording.

NONE

Turns off all of the false color modes.

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EXPOSURE

Displays color overlay on top of a monochrome image that allows you to check for proper exposure. When enabled, the icon "E√" displays in the Lower Status Group.

Purple (underexposure) and red (overexposure) are based on RAW data, which means that these colors show which areas are clipping or close to clipping. This also means that these indicators are not affected by any RGB domain adjustments, such as ISO, FLUT, white balance, gain, or other Look information.

Green is based on the RGB levels of the video out signal (that is, the "cooked" look, and not the RAW data).

The Exposure meter color bands provide the following information:

- **Purple**: Underexposed; indicates sensor exposure levels that are likely to be noisy if gained up in post-production.
- **Green**: IRE 41–48.
- **Red**: Overexposed; indicates sensor exposure levels that are at clipping.

FOCUS

Emphasizes edges in the image without changing brightness or 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 enabled, the icon "F√" displays in the Lower Status Group.

VIDEO

Displays a multi-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 enabled, the icon "V√" displays in the Lower Status Group.

Color bands are based on the RGB levels of the video out signal (that is, the "cooked" look, and not the RAW data), so settings like ISO, FLUT, color space and gamma affect these values.

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

- **Purple**: IRE 0–4
- **Blue**: IRE 5
- **Teal**: IRE 10–12
- **Green**: IRE 41–48
- **Pink**: IRE 61–70
- **Straw**: IRE 92–93
- **Yellow**: IRE 94–95
- **Orange**: IRE 96–98
- **Red**: IRE 99–100

EDGE

Shows the edges/outlines of objects that are in focus. When enabled, the "F√" indicator displays in the Lower Status Group.

NOTE: This will potentially interfere with recordings done via HDMI or HD-SDI in Clean mode.

DISPLAY MODES

MAGNIFY

Displays the central region of the sensor in 1:1 pixel resolution. When enabled, the 1:1 text in the Lower Status Group is green, and you will see the AF Window and the magnified region.

The AF Window determines the center point of the magnified region. If you have a lens or lens mount that is not capable of autofocus with the DSMC, use Confirm mode to turn on the AF Window.

The magnified region cannot zoom in on any areas close to the edge of the screen and the size of the magnified

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region depends on the monitor screen.

The camera automatically exits magnify mode when you start recording. When using a touchscreen, you can also perform this function by pinching your fingers together and apart.

NOTE: HDR mode, frame rate, and resolution cannot be modified when in Magnify mode.

RAW

Displays images unaffected by any LOOK settings (including ISO, FLUT, color space, and gamma). When enabled, the word RAW displays in the Histogram in the Lower Status Bar.

The RAW image parameters are:

- **Color Space**: REDcolor2
- **Gamma Space**: REDlogFilm
- **White Balance**: 5600K
- **ISO**: 800 ISO
- **Tint**: 0 Tint

NOTE: When enabled, RAW will affect video that's recorded through HDMI or HD-SDI out to an external recorder. Otherwise, the RAW image parameters DO NOT affect the image metadata; the parameters only define the output on the monitor.

ZEBRA

Use zebra mode to 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-tones or shadows. Zebras are visible when in 1:1 zoom. By default, the zebra indicators are disabled.

As with other IRE-based modes, zebra mode is only applicable for the current ISO and Look settings (such as with HD-SDI output), and not for the raw image data. If anything is changed in post-production, the indicators will not be representative of the final output tones. For more information about zebra indicators, check out the Exposure with RED Cameras: False Color & Zebra Tools article available at www.red.com/learn/red-101/exposure-false-color-zebra-tools.

ENABLE ZEBRA INDICATORS

1. Select a **Zebra** check box.
2. Select the low and high IRE values. Each value range is 1–100.
   - **Zebra 1**: Areas of the image exposed within the IRE range are indicated by diagonal lines at -45. Default is IRE 98–100.
   - **Zebra 2**: Areas of the image exposed within the IRE range are indicated by diagonal lines at 45. Default range is IRE 41–48.

MONITOR CONTROL

MONITOR

NOTE: Changes to the settings on the Monitor Control screen take effect after you close the screen.

Select the monitor you want to configure from the drop-down menu at the top of the screen. The other settings on the screen are applicable to the selected monitor.

MODE

Determines what elements display on the monitor:

- **Clean**: Only the video displays; you do not see any menus or overlays.
- **Overlay**: The overlay displays (you can select different overlays from the Overlay drop-down menu). The overlay includes the menus and the Lower Status Bar.

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- **Mirror**: Mirrors another screen at the same resolution. You cannot mirror a screen that is set to Clean. The Mirror option is available based on the settings of the other attached monitors, and includes the name of the monitor that you can mirror.

You can only set four monitors to Overlay at a time. To assign additional monitors to Overlay, mirror another monitor that has the same resolution and is set to Overlay.

OVERLAY

Select which overlay shows on top of the video. There are several default overlays that are always available and are denoted by the (RED) at the end of the overlay name. You can create custom overlays in the Overlay tab. For more information about creating overlays, go to "Overlay" on page 49.

RESOLUTION

Determines the resolution of the monitor. This option is only available for HDMI and HD-SDI monitors since the resolutions for LCD/EVF monitors are determined automatically. Available options are:

- **720 P**
- **1080 P**

FREQUENCY

Determines the frequency of the monitor. The available frequencies depend on the selected monitor. For HD-SDI monitors, the frequency depends on the project rate.

MONITOR CHECK BOXES

- **Tools**: Enables the false color modes on the monitor. For more information about false color modes, go to "Tools" on page 46.
- **Flip/Mirror UI**: The overlay is flipped vertically and mirrored horizontally (not rotated). This setting is useful when mounting a monitor upside down. This setting does not change how your footage is captured; you will only see the difference on the monitor.
- **Flip Video**: The video footage is flipped horizontally on your monitor, so that it is upside down. This setting does not change how your footage is captured; you will only see the difference on the monitor.
- **Framed Overlay**: The video display is scaled down on the monitor so that the overlay items fit outside of the video area rather than over it.
- **Auto Hide Menus**: Hides the menus (top and bottom bars on the display). When this option is disabled, the video is scaled so that the menus are not overlaid on the video. When this option is enabled, the video is not scaled, and you can bring up the menus on the LCD by pressing the **Menu** button on the DSMC SIDE HANDLE or by tapping the screen. This lets you have a control surface on a monitor without having to scale the video. Enabling this option on a non-control surface results in the menus never displaying on that monitor.

NOTE: If you have two touch LCDs attached to the DSMC with the same resolution and one is currently the control surface, you can set the other to mirror it and give the effect of having two control surfaces.

OVERLAY

You can create custom overlays that include specific items and icons. Overlays can be stored on the camera or transferred to SSD, so that you can build a library of overlays or quickly copy an overlay from one camera to another via SSD.

- **Camera**: Overlays that are saved internally on the camera and that display in the Overlay drop-down menu on the Monitor Control: Monitor tab.
- **Media**: Overlays that are on the SSD in the path shown (for example, S-SSD\Overlays).

NOTE: Overlays that end with (RED) are provided by default and cannot be edited, deleted, or exported.

OVERLAY ACTIONS

- **Create...**: Create a new custom overlay using a blank new overlay template in the Overlay Editor.

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- **Clone...**: Create a new custom overlay using the selected camera overlay as a template in the Overlay Editor.
- **Edit...**: Edit the selected camera overlay in the Overlay Editor.
- **Delete...**: Delete the selected camera overlay.

EXPORT AND IMPORT OVERLAYS

- : Export selected overlay from camera to SSD.
- **All** : Export all overlays from camera to SSD.
- : Import selected overlay from SSD to camera.
- **All**: Import all overlays from SSD to camera.

CREATE AND EDIT OVERLAYS

1. Go to **Settings** > **Display** > **Monitor Control** > **Overlay**.
2. Select **Create**, or select an existing overlay and select **Clone** or **Edit**.
3. If creating a new overlay, enter a name for the overlay and click **OK**.
4. Select any of the following check boxes to add the corresponding guides to the overlay:
   - **Frame Guide**
   - **Action Guide**
   - **Title Guide**
5. Click a button on the matrix to add a user interface element to that position on the matrix.

   By default, the Magnify indicator (MI) is on the top left, the Record indicator (REC) is on the top right, the Clip Name (CLIP) is on the bottom left, and the Time Code (TC) is on the bottom right.

   Selecting one of the buttons opens a new dialog that lets you choose a user interface element.
6. Select the **Item** that you want to add.
7. Select the **Size** of the item.
8. If you are adding a Custom Label (LBL), enter the **Custom Text** for that item.
9. Click **Add** to return to the previous screen.
10. Add all of the items to the overlay.
11. After setting up your overlay, select **Create** or **Save**.

    The new overlay displays in the Camera list.

NOTE: Except for the Custom Label (LBL), you can only add each element once. If you add an element you have already added to the overlay, the element will move to the new position.

PRIORITY

The camera can only have a single control monitor which allows you to interact with the camera settings.

The order of the list determines which monitor is the control monitor.

The monitor that has highest priority (is closest to the top of the list) and is set to Overlay mode in the Monitor Control screen is the control monitor. For more information about changing the monitor mode, go to “Mode” on page 48.

To change the order of the monitors in the list, select a monitor and use the **Up** and **Down** buttons to move the monitor up and down, respectively.

BRIGHTNESS

You can control the brightness of each of your LCDs and EVFs. Slide to the right for a brighter display; slide to the left for a dimmer display.

NOTE: A rear LCD/EVF is one that is plugged into any rear RED module, such as the +1 ADAPTOR MODULE or the PRO I/O MODULE.

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ADVANCED

GESTURES

- **Pinch to Magnify**: Use two fingers to pinch inward OR slide apart on the LCD to toggle 1:1 Magnify. For more information about 1:1 Magnify, go to "Magnify" on page 47.
- **Double-Click Right 25% to Record**: Double-tap the right 25% of the video area on the LCD to toggle record.
- **Double-Click Left 25% to Start AF**: Double-tap the left 25% of the video area on the LCD to start autofocus when compTatible lenses are used. For a list of compatible lenses, go to "Supported Lenses" on page 134.

OTHER

- **Lock Touch Screen**: Touches to the LCD are locked out. To unlock, touch the screen and follow the on-screen instructions.
- **Use Small Dialogs on 9" LCD**: The dialogs on the RED TOUCH 9.0" LCD are smaller than the default dialogs.
- **EVF Tally Light**: The Record Tally red LED on the EVF lights when recording.

DISPLAY MODES

Settings in this screen determine how different settings display on the main screen.

EXPOSURE

- **Time (Absolute)**: Displays the exposure time in seconds (1/xx sec). When you change the frame rate in this mode, the shutter time stays the same, but the shutter angle changes. This is the default.
- **Angle (Relative)**: Displays the exposure as an angle (1–360 degrees). When you change the frame rate in this mode, the shutter angle stays the same, but the exposure time changes.

NOTE: If the target you select is not currently achievable, the shutter speed turns yellow, which indicates that the camera is using the closest available shutter speed. Unachievable settings are grayed out on the Exposure spin wheel until you change a parameter that's limiting the shutter speed (such as sensor frame rate).

APERTURE

- **1/4 F#**: Aperture spinner shows 1/4 stops.
- **1/3 F#**: Aperture spinner shows 1/3 stops. This is the default.

FOCUS DISTANCE

- **Metric**: Displays lens focus distances in meters.
- **Imperial**: Displays lens focus distances in feet and inches. This is the default.

REMAINING POWER

- **Current Batt %**: Displays the remaining percentage of active battery. This is the default.
- **Total Time**: Displays the total run-time left of battery power, taking into account all available batteries.

VU METER SOURCE

- **Input**: Displays levels of audio inputs (pre-mixer). This is the default.
- **Output**: Displays levels of audio outputs (post-mixer).

HISTOGRAM

- **RGB**: Displays red, green, and blue channels on histogram. This is the default.
- **Luma**: Displays luma channel on histogram.

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MOTION MOUNT ND

Only applicable when using a DSMC® RED MOTION MOUNT™.

Select how the ND value displays in the top left corner of the main screen.

- **Fraction**: Displays the neutral density value as a fraction of light transmission. This is the default.
- **Density**: Displays the neutral density value as an optical density value.
- **Stop**: Displays the neutral density value as a stop loss.

MOTION MOUNT ISO PULL

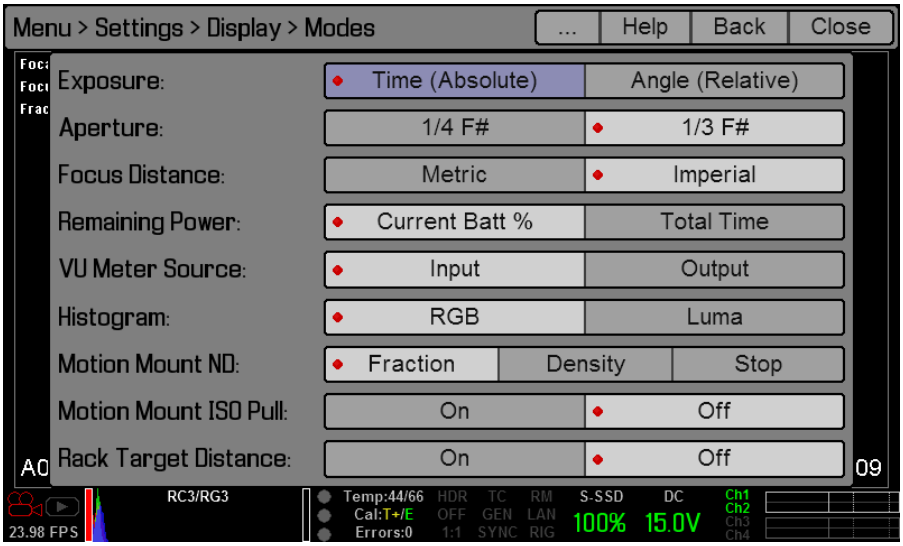
Only applicable when using a DSMC® RED MOTION MOUNT™.

When using any ND filter, including the MOTION MOUNT, the effective ISO is reduced because the ND filter reduces light transmission to the sensor. The MOTION MOUNT and DSMC give you the ability to see both the effective ISO (on the main screen) and the native camera sensor ISO (in the FLUT screen).

- **On**: Displays the effective ISO. While the effective ISO is displayed on the main screen, you should continue to follow standard exposure best practices and select your ISO based on the camera's native ISO.
- **Off**: Displays actual ISO. This is the default.

RACK TARGET FOCUS

Displays the focus distance of each rack point on the main screen when rack focus is enabled. For more information about rack focus, go to "Set Up Rack Focus" on page 101.



GUIDES

Set up how you want the Frame Guide, Action Guide, and Title Guide to display. You can also enable/disable each of these guides.

MODE

- **Off**: Do not show guide.
- **Full**: Guide has the same aspect ratio as the record format.
- **4:3**, **16:9**, **1.85:1**, **1.9:1**, **2.4:1**: Guide has the selected aspect ratio.
- **User**: Select a customized aspect ratio for the guide from the drop-down menu that appears when you select this option.
- **Absolute**: Guide is defined by absolute pixel dimensions rather than aspect ratio and scale. When you select Absolute, the Scale field is replaced with Width/Height fields.

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SCALE

Percentage to scale guide from its maximum possible size. Available range is 0–100%.

WIDTH/HEIGHT

The Width/Height fields replace the Scale field when you select Absolute from the Mode drop-down menu. Select the values for the width and height of the guide in pixels.

OFFSET X/Y

Percentage to offset guide from its default centered position. Available range is 0–100%.

- **100%**: Right-aligned (for X offset) and bottom-aligned (for Y offset).
- **-100%**: Left-aligned (for X offset) and top-aligned (for Y offset).

APPEARANCE

- **Line Style**: You can choose the following line styles: Solid, Dashed, or Bracket.
- **Color**: Select a color for the guide. Select the color that provides maximum color contrast with the scene you are shooting. The default is White.
- **Opacity**: Set the guide opacity. Available options are 0%, 25%, 50%, 75% and 100%.

RELATIVE TO FRAME GUIDE

Only available on the Action Guide and Title Guide tabs.

Select this check box so that the guide is sized and positioned relative to (and bounded by) the Frame Guide instead of the record format.

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GENERAL TAB

You can enable/disable and select the location (Relative To), color, and opacity of the following elements:

- **Center**: The center crosshair.
- **Grid**: Rule-of-thirds grid.
- **Shading**: The shaded region outside of the area of interest.

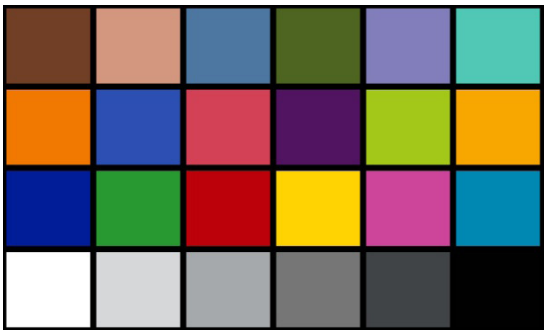
TEST SIGNALS

Permits the video monitor outputs to be replaced with one of the following video test patterns:

- **Chip Chart**
- **SMPTE Bars**
- **LUMA RAMP**

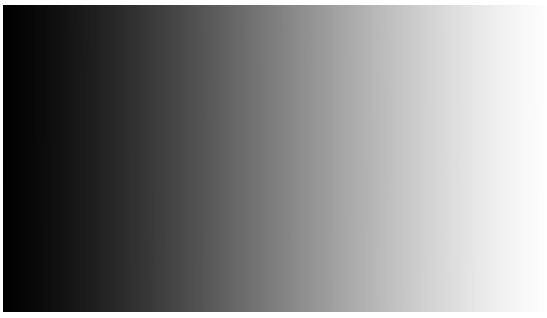
To enable a test signal, select the test signal box. To exit the test signal, tap the touchscreen once or press the **Enter** or **Menu** button on the DSMC SIDE HANDLE or REDMOTE.

You can also enable an **Audio Tone** while a test pattern is active.



Chip Chart

SMPTE Bars with Pluge Pulse



Luma Ramp

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.

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LOOK

The Look menu permits adjustment of Color, Gain, FLUT®, Curves, Color/Gamma, and Color Temperature metadata values. These parameters will affect the look of the monitor path, but do not affect the actual REDCODE RAW data being recorded.

COLOR

You can adjust the following:

- **Saturation**: Adjusts color saturation. Range is 0.0 (monochrome) to 4.0 (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.
- **Exposure**: Adjusts exposure compensation. Available range is -7.0 to 7.0. Default is 0.0.

GAIN

You can adjust the Red channel, Blue channel, and Green channel individually. The range for each is 0.0 (none of the color) to 10.0, and the default for each is 1.0.

FLUT

You can adjust the following:

- **ISO (Native)**: Adjusts the camera's native ISO value. RED recommends that you set the ISO near 800, then adjust the lens T-stop and lighting or ND filters to match. The ISO can later be adjusted around one stop for fine-tuning. Range is ISO 250–12,800. Default is ISO 800.
- **FLUT**: FLUT (Floating Point Lookup Table) adjusts mid-range tone values. Range -8.0 to 8.0. Default is 0.0.
- **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.

CURVES

You can define the curves for the Luma, Red, Green, and Blue channels.

Select **Reset Curve** to reset the currently selected curve.

COLOR/GAMMA

You can adjust the monitor output Color Space and Gamma curves. RED recommends using the most recently released Color Space and Gamma settings, and use legacy settings (such as REDcolor2) only if you need to record footage to match footage that you recorded with that legacy setting.

For more information about RED gamma settings, check out the Understanding REDlogFilm and REDgamma article available at www.red.com/learn/red-101/redlogfilm-redgamma.

COLOR TEMPERATURE

Select a color temperature. The range is 1700 to 10,000 KELVIN, and the default is 5600 KELVIN.

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 adjusts the RGB color balance with a compensating magenta-green color component. Tint range is -100 to 100, with a default of 0.000.

NOTE: Selecting Auto White Balance calculates a new Tint value. This value doesn't change if you adjust the color temperature manually. If you select any preset, Tint will be reset to 0.000.

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PRESETS

Each preset has 0 Tint. Available preset options are:

- **Incandescent**: 2800 K
- **Tungsten**: 3200 K
- **Fluorescent**: 4500 K
- **Flash**: 5500 K
- **Daylight**: 5600 K
- **Cloudy**: 7500 K
- **Shade**: 9000 K

AUTO WHITE BALANCE

The auto 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 the auto white balance function, follow the instructions below:

1. Place a white or gray object under the ambient light.
2. Select **Auto White Balance**.

PROJECT

The project menu sets the operating parameters the camera will use for a given project. Options available are Frame Rate, Exposure, Time Code, Slate, and Format.

FRAME RATE

SENSOR FRAME RATE

Select the sensor frame rate (also referred to as the capture frame rate). The sensor frame rate is the number of frames per second (FPS) that are recorded. The sensor frame rate is different from the project time base, which is the rate at which the footage will be played back.

The default sensor frame rate is 23.98 FPS, or the selected project time base when it is a value other than 23.98 FPS or 24 FPS.

PROJECT TIME BASE

Defines the rate at which the footage will be played back. When changing the project time base, the sensor frame rate will default to the project time base, but may be over-ridden using the sensor frame rate controls.

The time base setting is displayed in the lower left corner of Viewfinder output(s).

Multiple projects with differing time bases may be stored on an SSD.

The following project time bases are currently available:

- 23.98 FPS (default)
- 24.00 FPS
- 25.00 FPS
- 29.97 FPS
- 47.95 FPS
- 48.00 FPS
- 50.00 FPS
- 59.94 FPS

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VARISPEED

When a sensor frame rate other than the current project time base is selected, the FPS text turns yellow and the word VARISPEED replaces the Audio Meter in the lower right corner of the display.

Audio is not recorded in VARISPEED mode.

EPIC DRAGON FRAME RATES

The table below describes the maximum frame rate for each resolution of the EPIC DRAGON camera.

The minimum frame rate is always 1 FPS.

The table below omits rows for the anamorphic formats, since the maximum frame rate for each anamorphic format and the corresponding non-anamorphic format is the same.

NOTE: All frame rates in the table below are based on a 23.98 time base, 8:1 compression, and with Lookaround disabled.

FORMAT	MAX FRAME RATE (FPS)	FORMAT	MAX FRAME RATE (FPS)
6K FF	82.81	3.5K 2:1	141.63
6K 2:1	84.51	3.5K WS	166.77
6K WS	100.21	3.5K HD	130.92
6K HD	83.12	3.5K 3:2	114.12
6K 4:1	166.77	3.5K 4:3	101.76
6K 8:1	324.89	3.5K 5:4	95.55
5.5K FF	87.66	3.5K 4:1	273.55
5.5K 2:1	91.69	3.5K 8:1	399.60
5.5K WS	108.29	3K FF	159.1
5.5K HD	85.16	3K 2:1	167.62
5.5K 4:1	180	3K WS	197.86
5.5K 8:1	347.17	3K HD	159.1
5K FF	95.69	3K 3:2	134.68
5K 2:1	100.83	3K 4:3	119.94
5K WS	119.08	3K 5:4	112.56
5K HD	95.69	3K 4:1	328.13
5K 4:1	197.86	3K 8:1	399.60
5K 8:1	381.39	2.5K FF	192.09
4.5K FF	107.06	2.5K 2:1	200.88
4.5K 2:1	111.98	2.5K WS	237.08
4.5K WS	132.24	2.5K HD	194.36
4.5K HD	108.29	2.5K 3:2	161.45
4.5K 3:2	89.94	2.5K 4:3	143.8
4.5K 4:1	219.66	2.5K 5:4	134.95
4.5K 8:1	399.60	2.5K 4:1	392.77
4K FF	119.51	2.5K 8:1	399.60
4K 2:1	124.01	2K FF	237.94

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FORMAT	MAX FRAME RATE (FPS)	FORMAT	MAX FRAME RATE (FPS)
4K WS	148.68	2K 2:1	239.67
4K HD	119.51	2K WS	295.68
4K 3:2	101.14	2K HD	237.94
4K 4:3	90.06	2K 3:2	201.50
4K 5:4	84.51	2K 4:3	179.51
4K 4:1	239.67	2K 5:4	168.47
4K 8:1	399.60	2K 4:1	399.60
3.5K FF	135.51	2K 8:1	399.60

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SCARLET-X DRAGON FRAME RATES

The table below describes the maximum frame rate for each resolution of the SCARLET-X DRAGON camera.

The minimum frame rate is always 1 FPS.

NOTE: All frame rates in the table below are based on a 23.98 time base, 8:1 compression, and with Lookaround disabled.

FORMAT	MAX FRAME RATE (FPS)
6K FF	12.08 (in Burst mode)
5K FF	24.22
5K 2:1	25.52
5K WS	30.17
5K HD	25.81
4K FF	38.42
4K 2:1	38.69
4K WS	47.94
4K HD	40.96
3K FF	67.29
3K 2:1	70.91
3K WS	83.80
3K HD	71.70
2K FF	121.83
2K 2:1	128.50
2K WS	150
2K HD	121.83

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EPIC MYSTERIUM-X AND SCARLET MYSTERIUM-X FRAME RATES

The table below describes the maximum frame rate for each resolution of the EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X cameras.

The minimum frame rate is always 1 FPS.

The table below omits rows for the anamorphic formats, since the maximum frame rate for each anamorphic format and the corresponding non-anamorphic format is the same.

NOTE: All frame rates in the table below are based on a 23.98 time base, 8:1 compression, and with Lookaround disabled.

FORMAT	MAX FRAME RATE (FPS) EPIC MYSTERIUM-X	MAX FRAME RATE (FPS) SCARLET MYSTERIUM-X
5K FF	95.83	12
5K 2:1	100.83	12
5K WS	120.83	12
5K HD	95.83	12
5K 1.22:1	95.83	12
4K FF	120.83	30
4K WS	152.47	36
4K HD	120.83	30
3K FF	159.88	48
3K WS	200.88	60
3K HD	159.88	48
2K FF	239.67	60
2K WS	301.79	75
2K HD	239.67	60
1K HD	356.58	90
1K WS	400	120

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EXPOSURE

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

You can change exposure while recording.

Decreasing shutter speed increases the amount of time during 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 during which light falls on the sensor, decreasing exposure and motion blur on objects moving within the frame.

From the Exposure menu, you can set the exposure value as a shutter speed (1/xx sec) or a shutter angle (xx degrees). For more information on how to change whether shutter or shutter angle displays, go to "Display Modes" on page 51.

If the camera is able to achieve the target exposure, the exposure value displays in white. If the camera is unable to achieve the target exposure, the exposure value displays in yellow.

NOTE: If the camera ramps to a frame rate that it cannot maintain with the exposure setting, the camera changes the exposure to the longest exposure possible for the frame rate. To maintain consistent exposure throughout the recording, select an exposure that is valid at all ramp target frame rates. For more information on speed ramp mode, go to "Speed Ramp Mode" on page 71.

EXPOSURE (SHUTTER SPEED)

Enter the exposure value as a shutter speed (1/xx sec).

With the exception of EPIC DRAGON, the slowest available speed is 1/frame rate, so for 24 FPS, the slowest speed is 1/24 sec. In EPIC DRAGON, the slowest available speed is 1/8 sec, regardless of the sensor frame rate.

The fastest available speed is 1/131,579 sec (7.6 microseconds).

Default is 1/48 sec.

INTEGRATION TIME

Enter the exposure value as a shutter integration time (xx milliseconds).

The range of available integration times depends on the sensor frame rate.

In EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X, the slowest available speed is 1000 ms (Exposure: 1/1 sec). In EPIC DRAGON, the slowest available speed is 125.109 ms (Exposure: 1/8 sec).

Default is 20.833 ms.

ANGLE

Enter the exposure value as a shutter angle (xx degrees).

Range is 1.000–360.000°.

Default is 180.000°.

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EXPOSURE CONVERSIONS

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

CONVERT SHUTTER SPEED TO SHUTTER ANGLE (FOR 24 FPS)

- Equivalent Degrees = (Shutter Speed x Frame Rate x 360)
- For example: (1/48 x 24 x 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

CONVERT SHUTTER ANGLE TO SHUTTER SPEED (FOR 24 FPS)

- Equivalent Shutter = 1/(Frame Rate x 360/Angle)
- For example: 1/(24 x 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

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TIME CODE

Select a Time Code Display mode:

- **TOD**: TOD stands for Time of Day, and indicates that the time code runs continually.
- **Edge**: The time code starts and stops coincident with recording.

Select the **Time Code Source** to be used. Available options are User Provided, External: BRAIN, and External: Rear Module.

TIME CODE SOURCE	MODE	DESCRIPTION
User Provided (Internal)	Use Real Time Clock (RTC)	Uses the camera's Real Time Clock as the time code counter source. You can also specify the user bits of the time code.
	Set Manually	You can define a custom value as the time code counter seed. The three numerical boxes below allow you to set hours, minutes and seconds (in that order). You can also specify the user bits of the time code.
External: BRAIN	Varies by device	Uses the time code from an external device connected to the time code connector on the camera BRAIN.
External: Rear Module	Varies by device	Uses the time code from an external device connected to the time code connector on a rear module, such as the RED PRO I/O MODULE.

TIME CODE AND HANC DATA

The time code displayed becomes the primary time code HANC data while the other time code is sent as secondary.

SLATE

Use the Slate sub-menu to add metadata to your clips.

After configuring the following fields, the information will populate in the Media screen when you format media:

- Cam ID
- Cam Pos

AUTO-INCREMENTING TAKE

If there is a value entered in the **Take** box on the **Scene** tab, the camera will automatically increment the take number every time the camera starts and stops recording.

NOTE: The scene name is limited to eight (8) characters.

AUTO SLATE

If you enter frame values for **Head Slate** and **Tail Slate** on the **Auto Slate** tab, these values will only show in-camera. The Head Slate and Tail Slate metadata values are currently disabled in REDCINE-X PRO.

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FORMAT

Use the Format screen to select the project's resolution, aspect ratio, anamorphic setting, and lookaround setting.

After selecting format settings, select **Set Format**.

EPIC DRAGON FORMATS

The table below describes the formats that are available for EPIC DRAGON cameras.

Default for EPIC DRAGON is 6K 2:1.

The table below omits rows for the anamorphic formats, since the pixel dimensions for each anamorphic format and the corresponding non-anamorphic format are the same. For more information about anamorphic settings, go to "Anamorphic" on page 68.

RESOLUTION	DESCRIPTION	DIMENSIONS (PIXELS)	
		WIDTH	HEIGHT
6K FF	6K RAW Full Frame	6144	3160
6K 2:1	6K RAW 2:1	6144	3072
6K WS	6K RAW Wide Screen—2.4:1	6144	2592
6K HD	6K RAW HD—16:9—16:9	5568	3132
6K 4:1	6K RAW 4:1	6144	1536
6K 8:1	6K RAW 8:1	6144	768
5.5K FF	5.5K RAW	5632	2948
5.5K 2:1	5.5K RAW 2:1	5632	2816
5.5K WS	5.5K RAW Wide Screen—2.4:1	5632	2376
5.5K HD	5.5K RAW HD—16:9	5376	3024
5.5K 4:1	5.5K RAW 4:1	5632	1408
5.5K 8:1	5.5K RAW 8:1	5632	704
5K FF	5K RAW Full Frame	5120	2700
5K 2:1	5K RAW 2:1	5120	2560
5K WS	5K RAW Wide Screen—2.4:1	5120	2160
5K HD	5K RAW HD—16:9	4800	2700
5K 4:1	5K RAW 4:1	5120	1280
5K 8:1	5K RAW 8:1	5120	640
4.5K FF	4.5K RAW	4608	2412
4.5K 2:1	4.5K RAW 2:1	4608	2304
4.5K WS	4.5K RAW Wide Screen—2.4:1	4608	1944
4.5K HD	4.5K RAW HD—16:9	4224	2376
4.5K 3:2	4.5K RAW 3:2	4320	2880
4.5K 4:1	4.5K RAW 4:1	4608	1152
4.5K 8:1	4.5K RAW 8:1	4608	576
4K FF	4K RAW Full Frame	4096	2160

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RESOLUTION	DESCRIPTION	DIMENSIONS (PIXELS)	
		WIDTH	HEIGHT
4K 2:1	4K RAW 2:1	4096	2048
4K WS	4K RAW Wide Screen—2.4:1	4096	1728
4K HD	4K RAW HD—16:9	3840	2160
4K 3:2	4K RAW 3:2	3840	2560
4K 4:3	4K RAW 4:3	3840	2880
4K 5:4	4K RAW 5:4	3840	3072
4K 4:1	4K RAW 4:1	4096	1024
4K 8:1	4K RAW 8:1	4096	512
3.5K FF	3.5K RAW Full Frame	3584	1876
3.5K 2:1	3.5K RAW 2:1	3584	1792
3.5K WS	3.5K RAW Wide Screen—2.4:1	3584	1512
3.5K HD	3.5K RAW HD—16:9	3456	1944
3.5K 3:2	3.5K RAW 3:2	3360	2240
3.5K 4:3	3.5K RAW 4:3	3360	2520
3.5K 5:4	3.5K RAW 5:4	3360	2688
3.5K 4:1	3.5K RAW 4:1	3584	896
3.5K 8:1	3.5K RAW 8:1	3584	448
3K FF	3K RAW Full Frame	3072	1620
3K 2:1	3K RAW 2:1	3072	1536
3K WS	3K Wide Screen—2.4:1	3072	1296
3K HD	3K RAW HD—16:9	2880	1620
3K 3:2	3K RAW 3:2	2880	1920
3K 4:3	3K RAW 4:3	2880	2160
3K 5:4	3K RAW 5:4	2880	2304
3K 4:1	3K RAW 4:1	3072	768
3K 8:1	3K RAW 8:1	3072	384
2.5K FF	2.5K RAW Full Frame	2560	1340
2.5K 2:1	2.5K RAW 2:1	2560	1280
2.5K WS	2.5K Wide Screen—2.4:1	2560	1080
2.5K HD	2.5K RAW HD—16:9	2304	1296
2.5K 3:2	2.5K RAW 3:2	2400	1600
2.5K 4:3	2.5K RAW 4:3	2400	1800
2.5K 5:4	2.5K RAW 5:4	2400	1920
2.5K 4:1	2.5K RAW 4:1	2560	640
2.5K 8:1	2.5K RAW 8:1	2560	320
2K FF	2K RAW Full Frame	2048	1080

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RESOLUTION	DESCRIPTION	DIMENSIONS (PIXELS)	
		WIDTH	HEIGHT
2K 2:1	2K RAW 2:1	2048	1024
2K WS	2K RAW Wide Screen—2.4:1	2048	864
2K HD	2K RAW HD—16:9	1920	1080
2K 3:2	2K RAW 3:2	1920	1280
2K 4:3	2K RAW 4:3	1920	1440
2K 5:4	2K RAW 5:4	1920	1536
2K 4:1	2K RAW 4:1	2048	512
2K 8:1	2K RAW 8:1	2048	256

SCARLET-X DRAGON FORMATS

The table below describes the formats that are available for SCARLET-X DRAGON cameras.

RESOLUTION	DESCRIPTION	DIMENSIONS (PIXELS)	
		WIDTH	HEIGHT
6K	6K RAW Full Frame	6144	3160
5K	5K RAW Full Frame	5120	2700
5K 2:1	5K RAW 2:1	5120	2560
5K WS	5K RAW Wide Screen—2.4:1	5120	2160
5K HD	5K RAW HD—16:9	4800	2700
4K	4K RAW Full Frame	4096	2160
4K 2:1	4K RAW 2:1	4096	2048
4K WS	4K RAW Wide Screen—2.4:1	4096	1728
4K HD	4K RAW HD—16:9	3840	2160
3K	3K RAW Full Frame	3072	1620
3K 2:1	3K RAW 2:1	3072	1536
3K WS	3K RAW Wide Screen—2.4:1	3072	1296
3K HD	3K RAW HD—16:9	2880	1620
2K	2K RAW Full Frame	2048	1080
2K 2:1	2K RAW 2:1	2048	1024
2K WS	2K RAW Wide Screen—2.4:1	2048	864
2K HD	2K RAW HD—16:9	1920	1080

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EPIC AND SCARLET MYSTERIUM-X FORMATS

The table below describes the formats that are available for EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X cameras.

Default for EPIC MYSTERIUM-X is 5K 2:1.

Default for SCARLET MYSTERIUM-X is 4K.

The table below omits rows for the anamorphic formats, since the pixel dimensions for each anamorphic format and the corresponding non-anamorphic format are the same. For more information about anamorphic settings, go to "Anamorphic" on page 68.

RESOLUTION	DESCRIPTION	DIMENSIONS (PIXELS)		DIMENSIONS (MM)		
		WIDTH	HEIGHT	WIDTH	HEIGHT	DIAGONAL
5K FF	5K RAW Full Frame	5120	2700	27.65	14.58	31.26
5K 2:1	5K RAW 2:1	5120	2560	27.65	13.82	30.91
5K WS	5K RAW Wide Screen—2.4:1	5120	2160	27.65	11.66	30.01
5K HD	5K RAW HD—16:9	4800	2700	25.92	14.58	29.74
5K 1.22:1	5K RAW 1.22:1	3300	2700	17.80	14.58	23.01
4K FF	4K RAW Full Frame	4096	2160	22.12	11.66	25.01
4K WS	4K RAW Wide Screen—2.4:1	4096	1708	22.12	9.22	23.96
4K HD	4K RAW HD—16:9	3840	2160	20.74	11.66	23.79
3K FF	3K RAW Full Frame	3072	1620	16.59	8.75	18.75
3K WS	3K Wide Screen—2.4:1	3072	1284	16.59	6.93	17.98
3K HD	3K RAW HD—16:9	2880	1620	15.55	8.75	17.84
2K FF	2K RAW Full Frame	2048	1080	11.06	5.83	12.50
2K WS	2K RAW Wide Screen—2.4:1	2048	854	11.06	4.61	11.98
2K HD	2K RAW HD—16:9	1920	1080	10.37	5.83	11.90
1K HD	1K RAW HD—16:9	1280	720	6.91	3.89	7.93
1K WS	1K Wide Screen—2.4:1	1280	480	6.91	2.59	7.38

RESOLUTION

Select your **Resolution**.

- For a list of available resolutions for your EPIC DRAGON, go to "EPIC DRAGON Formats" on page 64.
- For a list of available resolutions for your SCARLET-X DRAGON, go to "SCARLET-X DRAGON Formats" on page 66.
- For a list of available resolutions for your EPIC MYSTERIUM-X or SCARLET MYSTERIUM-X, go to "EPIC and SCARLET MYSTERIUM-X Formats" on page 67.

ASPECT RATIO

Select your **Aspect Ratio**. The available aspect ratios are determined by your selected resolution.

- For a list of available aspect ratios for your EPIC DRAGON, go to "EPIC DRAGON Formats" on page 64.
- For a list of available aspect ratios for your SCARLET-X DRAGON, go to "SCARLET-X DRAGON Formats" on page 66.
- For a list of available resolutions for your EPIC MYSTERIUM-X or SCARLET MYSTERIUM-X, go to "EPIC and SCARLET MYSTERIUM-X Formats" on page 67.

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ANAMORPHIC

Select your **Anamorphic** setting, if applicable. The anamorphic setting de-squeezes the image on the monitor and marks the footage as anamorphic in the clip's metadata. When you open the clip in REDCINE-X PRO, the program automatically de-squeezes the image. The available anamorphic settings depend on your camera type.

EPIC DRAGON

EPIC DRAGON supports anamorphic 1.3x and 2x with each format.

SCARLET DRAGON

SCARLET DRAGON supports anamorphic with each format, but does not de-squeeze the image, so the Anamorphic settings do not display on the Format menu. If you use an anamorphic lens with SCARLET DRAGON, you can de-squeeze the recorded clips in REDCINE-X PRO. There are also third-party monitors that offer a built-in de-squeeze option.

EPIC MYSTERIUM-X AND SCARLET MYSTERIUM-X

EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X cameras support the following anamorphic settings:

- **5K FF**: Anamorphic 1.3x and 2x
- **5K 1.22:1**: Anamorphic 2x

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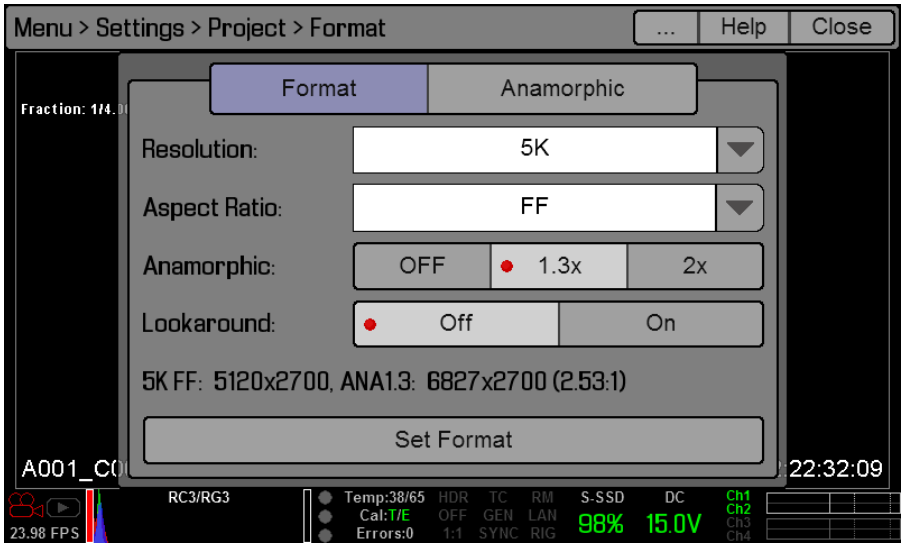
DE-SQUEEZED RESOLUTION AND DE-SQUEEZED ASPECT RATIO

When you select an anamorphic setting, both the actual format and the de-squeezed format display at the bottom of the Format screen.

When using an anamorphic setting, the camera does not crop the sensor image, so the recorded image has the same resolution and dimensions as the corresponding non-anamorphic format.

When you de-squeeze the footage in post-production, the resulting footage has the resolution and aspect ratio listed as the second format at the bottom of the Format screen. Since the camera does not crop the image, you will have additional horizontal area to frame your image. You can then crop or scale your footage to the intended aspect ratio.

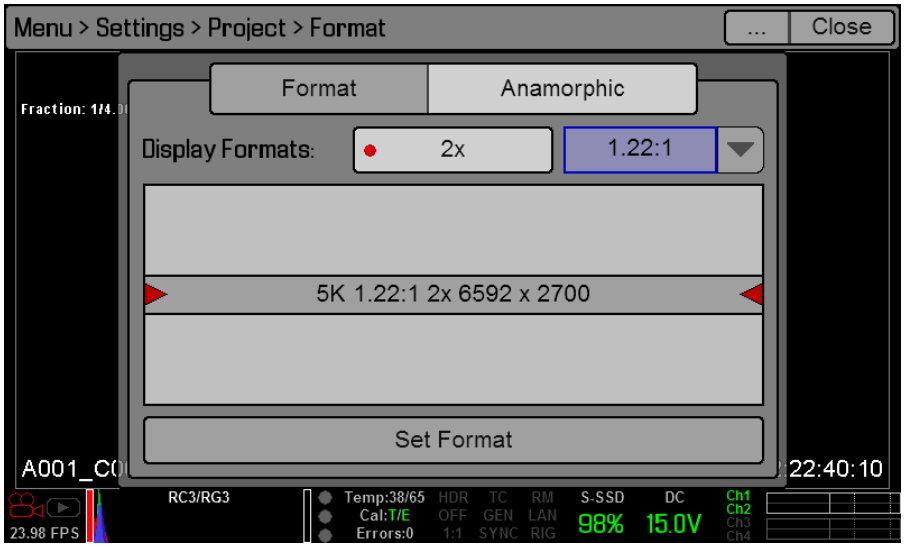


SHORT-CUT TO INDUSTRY-STANDARD ANAMORPHIC FORMATS

To quickly access industry-standard anamorphic formats, go to **Menu** > **Settings** > **Project** > **Format** > **Anamorphic**. The Anamorphic tab is a short-cut to all of the industry-standard anamorphic formats, so that you can easily select the most common anamorphic formats. The Anamorphic tab lists the following anamorphic formats for your camera:

- **EPIC DRAGON**: Every format with a 5:4 or 4:3 aspect ratio and a 1.3x or 2x anamorphic setting.
- **EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X**: 5K 1.22:1 2x

NOTE: The Anamorphic tab only lists industry-standard anamorphic formats. To access all of the anamorphic and non-anamorphic formats, go to **Menu** > **Settings** > **Project** > **Format** > **Format**.



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LOOKAROUND

When Lookaround is enabled, the Frame Guide and recording area are scaled down on the display so that you can see what images are going to enter the recording area.

You can assign a Shading overlay to the Lookaround area (the area outside of the recording area) in the Guides: General screen. For more information about Shading settings, go to “General Tab” on page 54.

Lookaround limits the available frame rates. Also, higher resolutions (such as 5K Full Frame in EPIC MYSTERIUM-X and 6K Full Frame in EPIC DRAGON) show the full sensor area or full sensor height on the video display, so Lookaround is either very limited or not possible in these formats.

AUDIO

The AUDIO menu lets you configure the audio subsystem. For more information about the DSMC audio system, go to “Audio Subsystem” on page 108.

RECORDING

This menu lets you select and configure different recording modes. Available tabs are Mode, Frame Processing, and Pre-Record.

RECORDING MODE

You can select the following recording modes: Continuous Record, Internal Timelapse Timer, External Frame Trigger, Speed Ramp Mode, and External Record Only.

CONTINUOUS RECORD

This is the “normal” recording mode. The camera continuously records frames at the current sensor frame rate. You can limit each recording to a specific amount of frames using the Limit Recording to setting.

INTERNAL TIMELAPSE TIMER

In this mode, the camera periodically records the specified number of frames at a specified interval. The current sensor frame rate determines the timing of the frames per pulse.

You can limit each recording to a specific amount of frames using the Limit Recording to setting.

You can also use the Timer/Trigger Settings to set a specific amount of frames to be captured during an interval of 1–3,599 seconds. When using the Timer/Trigger Settings, the trigger is the REC key or any key that is programmed to start recording. The Interval setting specifies the frequency at which the frame or group of frames is captured.

For example, in Internal Timelapse Timer mode, you can choose to record a total amount of 1000 frames, and take 1 frame every 4.67 seconds. After you’ve recorded 1000 frames (which takes 4,670.00 seconds), the recording process stops.

While recording in this mode, you can see how many frames you’ve recorded out of the total amount of frames on the overlay.

EXTERNAL FRAME TRIGGER

In this mode, the camera records the specified number of frames for each external trigger. This mode limits the REDCODE based on sustainable record rates.

You can limit each recording to a specific amount of frames using the Limit Recording to setting.

You can also use the Timer/Trigger Settings to set a specific amount of frames to be captured during a pulse of the trigger. When using the Timer/Trigger Settings, the action Record: External Frame Trigger is used for the external trigger and may be mapped to any user key or camera input.

While recording in this mode, you can see how many frames you’ve recorded out of the total amount of frames on the overlay.

NOTE: There may be a delay between receiving the external trigger and capturing the next frame(s). This delay

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may be as long 1 frame period at the current sensor frame rate. To achieve completely synchronized frames to an external trigger you must set **Sensor Sync Mode** to **MoCo**. For more information about setting the Sensor Sync Mode, go to "GPIO/SYNC" on page 75.

SPEED RAMP MODE

NOTE: The Ramp Settings are not accessible on any EPIC DRAGON or SCARLET-X DRAGON.

This mode lets you program the current sensor frame rate to transition to a target sensor frame rate during recording.

1. Select **Speed Ramp Mode** from the **Recording Mode** drop-down menu.
2. Use the **Limit Recording to fields** to set the recording to end at a predefined frame limit (optional).
3. Select a ramp target:
   - **Ramp A/B/C/D**: Each ramp target is tied to a specific Target/Duration combination.
   - **Ramp Reset**: Allows you to ramp to the starting frame rate with the specified Duration.
4. Set the **Target** frame rate.
5. Set the **Duration**. This is how long it takes the camera to transition from your current frame rate to the target frame rate.
6. Go to **Settings** > **Setup** > **Keys** and program one of the following keys to start the speed ramp:
   - **Record: Start Speed Ramp A/B/C/D**
   - **Record: Start Speed Ramp Reset**
7. Start recording.
8. When you are ready to start the speed ramp, press the key that you've mapped to start the speed ramp.

   The frame rate transitions to your target frame rate during the duration you set up. After you reach your target frame rate, the camera continues to record at that frame rate until you stop recording.

NOTE: If the camera ramps to a frame rate that it cannot maintain with the exposure setting, the camera changes the exposure to the longest exposure possible for the frame rate. To maintain consistent exposure throughout the recording, select an exposure that is valid at all ramp target frame rates.

EXTERNAL RECORD ONLY

This mode allows for external recording only. That is, the recording is NOT saved to the camera's SSD, and external recording is blocked if an SSD is mounted to the camera. An external recorder is required and can be triggered automatically via HD-SDI (if supported by the recorder).

BEEP SPEAKER

- **Off**: The camera does not make a sound when recording starts/stops. This is the default.
- **Record/Stop**: The camera beeps when recording starts/stops.

FRAME PROCESSING

NOTE: Frame processing is not supported in Speed Ramp Mode. For more information about ramping, go to "Speed Ramp Mode" on page 71.

Frame processing allows for the combination of multiple captured frames into one recorded frame. The combination occurs before the resultant frame is encoded. You can select the following frame processing settings: No Frame Processing, Frame Summing, Frame Averaging.

When in Frame Summing mode or Frame Averaging mode, the current integration time is applied to each frame. This means if the integration time is not the entire frame time (or 360 degrees) there will be gaps between the images used to create the combined frame. This may lead to unexpected motion artifacts.

The effect of frame processing is only visible during record. In Frame Summing mode, this means the exposure will change between preview and record. You may have to experiment with your exposure and frame processing settings before you achieve the effect you want.

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NO FRAME PROCESSING

Normal frame processing mode. The Frames to Process selection does not affect your recording.

FRAME SUMMING

Combines the specified number of frames into one frame, and adds together the exposure time for each of the original frames. The resultant frame has an effective integration time that is equal to the current integration time multiplied by the number of frames.

For example, if you select 16 as your Frames to Process value, and set your exposure to 1/48 sec, your resulting image has an effective integration time of 1/3 sec (16 x 1/48).

Frame summing results in a final image that is brighter and possibly blurrier than any of the original frames, so you can use frame summing to achieve the effect of long-exposure.

FRAME AVERAGING

Combines the specified number of frames into one frame, and averages the exposure time for each of the original frames. The resultant frame has an effective integration time that is equal to the current integration time.

For example, if you select 16 as your Frames to Process value, and set your exposure to 1/48 sec, your resulting image still has the exposure value of 1/48 sec, along with the effect of long-exposure.

You can use frame averaging to achieve the effect of long-exposure along with the benefits of reduced noise. However, frame averaging does affect motion blur characteristics.

PRE-RECORD

When enabled, the Pre-Record setting continuously captures a cache of footage before you start recording. You can select to have 4–30 seconds (incremented at two second intervals) of pre-record time added to your actual footage.

When Pre-Record is enabled, you won't miss the start of a shot by being a little slow on the trigger.

- **Pre-Record Duration**: Select the pre-record time.
- **Always trigger Pre-Record before recording**: When selected, Pre-Record will always be activated when you initiate recording:
  A. Press the **Record** button to activate Pre-Record.
  B. Press the **Record** button a second time to start recording.
  C. Press the **Record** button a third time to stop recording.
- **Trigger Pre-Record Now**: When selected, the Pre-Record screen closes and Pre-Record mode starts.
- If you want to use Pre-Record only for specific situations, map Pre-Record to a key (**Settings** > **Setup** > **Keys** > **Record: Start Pre-Record**). For more information about mapping keys, go to "Keys" on page 72.

SETUP

This menu permits a variety of system setup tasks to be accomplished. Options available are Keys, Date/Time, Communication, REDmote, GPIO/Sync, Fan Control, and Lens.

KEYS

Map keys to often-used actions to easily control the camera. For a full list of all of the default key mappings, go to "Default Key Functions" on page 138.

KEY MAPPING

To map or remap a user key:

1. Press the user key on the camera that you want to map.
2. Select an action from the **Press** (or **CCW**) drop-down menu that you want to map to the user key.

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3. To un-map a key, select **-Key Disabled-** from the drop-down menu.
4. If you want, map a **Release** or (**CW**) action to the key.

   A Release action occurs when you press a key and then release it.

OPTIONS

- **MENU Key Returns to Settings Menu**: Pressing the Menu key on the DSMC SIDE HANDLE or REDMOTE moves you up one level in the menu tree.
- **Lock DSMC SIDE HANDLE Keys**: None of the DSMC SIDE HANDLE keys perform any actions when pressed, unless you set up the exceptions below:
  - **Record Key Remains Active When Locked**: If the DSMC SIDE HANDLE keys are locked, the Record key continues to function when pressed.
  - **Navigation Keys Remain Active When Locked**: If the DSMC SIDE HANDLE keys are locked, the navigation keys continue to function. Navigation keys include: Up, Down, Left, Right, Enter, Menu, Wheel CCW, and Wheel CW.
- **Show Key Action Notifications**: A notification displays on the bottom of the display when you perform an action mapped to a key.

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SOFT KEYS

The following sets of soft keys are available on the touch LCD:

- **A**, **B**, **C**, **D** (left side of the touch LCD)
- **1**, **2**, **3**, **4** (right side of the touch LCD)

To map or remap a soft key, select an action from the drop-down menu next to the key you want to map.

- **Enable Soft Keys on touchscreen**: Tap the left or right side of the LCD to show the soft keys.
- **Show key actions as labels**: When the soft keys display, the number/letter of the key and the key action display.

ADVANCED

You can use this tab to map any key, even if the key is not currently accessible. For example, you can map the REDMOTE keys even if a REDMOTE is not present.

WARNING: It is possible to remap the navigation keys using this tab. However, if you don't have a touch LCD attached, it may be possible to lock out control. Take extreme care when remapping any of the navigation keys.

DATE/TIME

You can use this screen to reset the internal clock of the camera. The time and date are used as timestamps on the .R3D files when recording to an SSD.

The camera uses the 24-hour clock convention (military time). For example, 2:35 p.m. should be entered as 14:35:00.

The date and time are saved when you close the Date/Time screen.

COMMUNICATION

The Communication screen allows you to set a unique identification for your camera (or a group of cameras) when operating in a command and control communications network.

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

The communication structure allows for a lot of flexibility. For example, on a multi-rig 3D shoot, you can either send commands to an individual camera (Example: Set CAM_A_L to 1/48 exposure), to a group of cameras (Example: Set "3DRIG_A" to 48 FPS), or to all cameras (Example: Start Recording on all cameras).

With the exception of the None setting, all command filtering happens on the receiver side of the communication link.

- **Name**: Enter a unique camera name to use in network communications. The field is limited to eight (8) characters.
- **Group**: Enter a group name if you want to identify the camera 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". Group names (like camera names) can be used to uniquely address commands to a specific group of networked cameras. The field is limited to eight (8) characters, and the default name is DEFAULT.
- **Target**: Specify which devices the camera can send commands to:
  - **All**: The camera can send commands to all devices on the network.
  - **None**: The camera cannot send commands to any devices on the network. The camera can only receive messages.
  - **Custom**: The camera can send commands to a specific camera/device (enter the name of the camera/device in the Custom text box) or a specific group (enter the name of the group in the Custom text box). The camera or group name must match the name entered in the Name or Group field of the target device(s).

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SERIAL PROTOCOL

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

Select one of the following protocols from the **Serial Protocol** drop-down menu:

- None (default)
- Element Technica
- 3ality SPC 7100
- 3ality SPC 7000
- RED Control Protocol
- RCP 3D Metadata

NETWORK

Use the settings on the Network tab to configure the Gigabit Ethernet port. 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 (have the same netmask address) and have the same gateway address.

- **DHCP**: Enables DHCP. If a DHCP-server is available in the communications network, the camera will obtain an IP address, netmask address, and gateway address automatically from the DHCP server. You cannot manually enter anything in the IP Address, Netmask, and Gateway fields when this check box is selected.
- **Enable Camera to camera**: Changes to settings on this camera will be sent out via the network as UDP packets as a SET command, which will then set the property on other cameras. SET commands sent to this camera will not be propagated.
- **Enable External Control**: This camera can be controlled via TCP/IP from an external device.

NOTE: If you see the message “For reliable external control over Ethernet your camera’s hardware may need to be upgraded. Please contact your Bomb Squad representative”, you will not be able to control the camera externally. If you see this message, please contact your Bomb Squad representative to have your hardware upgraded.

REDMOTE

A REDMOTE that is docked to the DSMC is automatically paired with the DSMC. The MAC address of a locally attached REDMOTE is displayed in brackets.

To pair the DSMC with REDMOTEs wirelessly, select **Scan for REDMOTES**. The DSMC scans for any REDMOTEs that are turned on with REDLINK wireless enabled. The available wireless REDMOTEs appear in the left panel. Use the **Pair** and **Unpair** buttons to select and pair/unpair REDMOTEs.

- **REDLINK Enable**: When selected, the DSMC produces a wireless signal. Be sure to disable wireless in any setting in which the wireless signal could interfere with other devices, such as in a helicopter.
- **REDLINK Channel**: Select the communication channel for the REDLINK wireless connection in the event of interference from other wireless devices.

GPIO/SYNC

SYNC

- **Sensor Sync Mode**: Allows the shutter timing (scan start) to be synced to an external signal.
  - **Off**: Sensor free runs at the current sensor frame rate. This is the default option.
  - **Genlock**: Sensor synchronizes with the incoming compatible genlock signal. Genlock syncing of the monitors is separate from syncing of the sensor, and other methods of sensor sync can be selected while genlocking the monitors. HD-SDI monitor genlock syncing occurs automatically when a genlock signal that is compatible with the selected monitor frequency is present.
  - **MoCo**: Each rising edge on the sync input triggers a frame to be captured. To use MoCo (Motion Con-

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trol), go to the **BRAIN GPIO** tab and set the **Camera Input** option to **Sync In**.

NOTE: When using MoCo, you must set the frame rate to be at least two times (2x) the fastest trigger rate used. A high frame rate usually increases the compression, but when you're using MoCo, REDCODE is calculated based on FPS/2. Therefore, if you are in MoCo mode, and you set the frame rate to 100.83 FPS, the maximum REDCODE is calculated based on a frame rate of 50.415 FPS.

- **Genlock Source**: Select which genlock input should be used:
  - **BRAIN** (default)
  - **Rear Module**

BRAIN GPIO

- **Camera Input**: Select one of the following options to configure the input for devices connected to the SYNC connector on the BRAIN:
  - **Sync In**: The camera input is used as a sync-in signal for MoCo.
  - **General Purpose In**: Use the **BRAIN GPI In High/Low** drop-down menus to map inputs to actions.
- **Camera Output**: Select one of the following options to configure the output for devices connected to the CTRL connector on the BRAIN:
  - **Sync Out**: Provides an output sync signal to act as a shutter start tally.
  - **Recording Indicator Out**: Provides a signal when recording is in process.

NOTE: For more information about connectors, go to "Input/Output Connectors" on page 124.

GEN AND SYNC STATUS ICONS

The Lower Status Row of the camera display has GEN and SYNC icons, which change color based on the current genlock and sync statuses. For information about what each color indicates, go to "Icon Behavior" on page 40.

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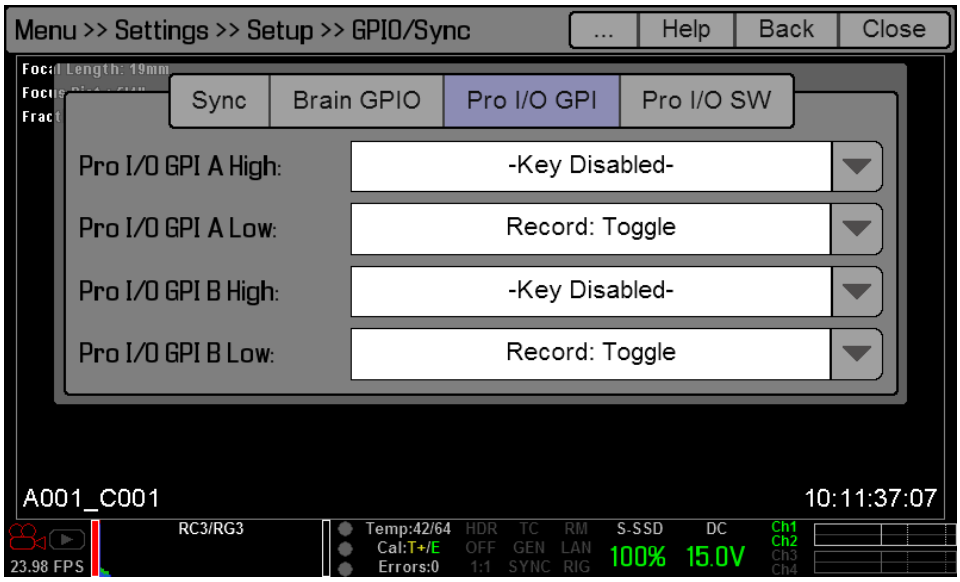
PRO I/O GPIO AND PRO I/O SW

Use the PRO I/O GPI and PRO I/O SW screens to assign General Purpose Inputs and Outputs (GPIO) on the PRO I/O MODULE. You can map I/O actions to the GPIO and AUX connectors on the PRO I/O MODULE.

When mapping actions, High and Low refer to the voltage; High is the rising edge (transition from low voltage to high voltage) and Low is the falling edge (transition from high voltage to low voltage). In practice, Low/High correlates to the press/release of a trigger or the on/off position of a switch.

For example, if you connect a start/stop trigger to the GPIO connector on the PRO I/O MODULE and keep the default GPIO A High and Low settings (Key Disabled and Record: Toggle, respectively), then pressing the trigger starts/stops recording.



GPIO CONNECTOR

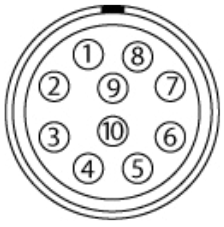
This table describes the I/O options for the GPIO connector on the PRO I/O MODULE:

I/O OPTION	DEFAULT ACTION	PIN
GPI A High	Key Disabled	2
GPI A Low	Record: Toggle	2

AUX CONNECTOR

This table describes the I/O options for the AUX connector on the PRO I/O MODULE:

I/O OPTION	DEFAULT ACTION	PIN
GPI B High	Key Disabled	6
GPI B Low	Record: Toggle	6
SW 1 High	Key Disabled	7
SW 1 Low	Go to: Playback	7
SW 2 High	Key Disabled	5
SW 2 Low	Record: Toggle	5



NOTE: For more information about the PRO I/O MODULE, see the PRO I/O Operation Guide available at www.red.com/downloads.

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FAN AND TEMPERATURE MANAGEMENT

Each RED DSMC is controlled by complex thermal algorithms to ensure that both the sensor and camera operate at a safe temperature. Each fan control mode affects the sensor temperature, sensor warm-up time, fan speed, and resulting fan noise.

When selecting a fan mode, RED recommends that you take into consideration how each fan mode behaves, and then select a fan mode that fits the needs of your project.

Regardless of your sensor type and target temperature, you will get the best image quality by performing a black shading calibration at the temperature you want to use for your shoot.

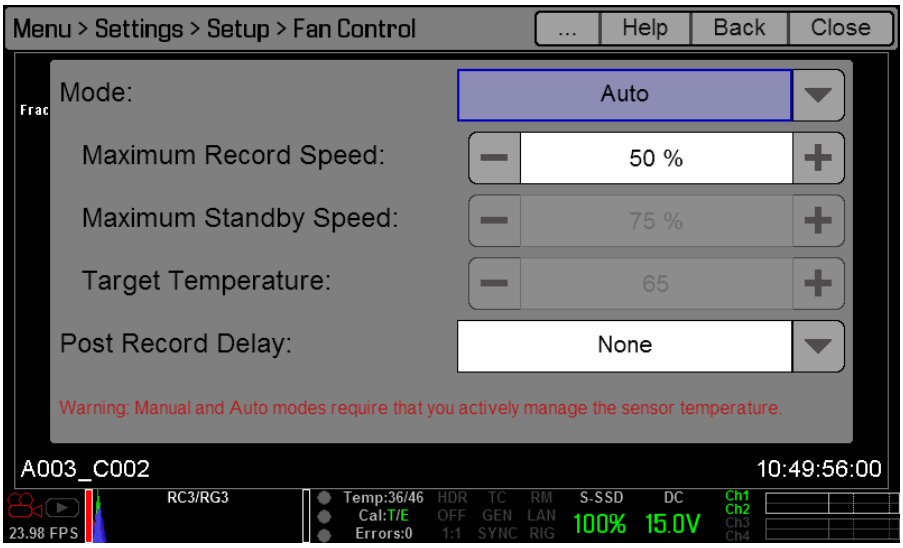
FAN CONTROL MODES

Select a fan control mode for your bottom fan. If a top fan is installed, it will activate at a constant speed when necessary.

NOTE: If you select a new fan setting, run the DSMC until the core temperature stabilizes, and then perform a black shading calibration.

NOTE: If you're using a top fan, the top fan may not run immediately after turning on the DSMC, as the top fan runs when the DSMC requires additional cooling power.

NOTE: Manual and Auto modes require that you actively manage the sensor temperature, because these modes focus on controlling fan speed and do not target a narrow sensor temperature range. The T/E status icons can be used as guides for proper temperature calibration.



ADAPTIVE

Select a target temperature and the bottom fan self-adjusts to maintain the selected temperature. The default target temperature is 65°C. This is the default mode for EPIC DRAGON and SCARLET-X DRAGON.

After the camera reaches the target temperature, and if the ambient temperature remains constant, Adaptive mode results in a consistent fan speed and fan noise over time.

Targeting a higher temperature raises the sensor temperature, lengthens the sensor warm-up time, and lowers the fan speed. Targeting a lower temperature lowers the sensor temperature, shortens the sensor warm-up time, and increases the fan speed.

- **EPIC DRAGON and SCARLET-X DRAGON**: Target temperature range is 55°C to 70°C. A target temperature of 65°C works best across most environmental conditions.
- **EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X**: Target temperature range is 45°C to 70°C. Target temperatures above 50°C will give noticeable fan noise improvements when compared to Auto mode.

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ADAPTIVE PREVIEW QUIET RECORD

Select a maximum bottom fan record speed, and the standby mode fan speed self-adjusts accordingly so that enough cooling is provided overall. This mode maintains a lower fan noise level than Auto mode during recording.

The default Maximum Record Speed is 50%. The Maximum Record Speed range is 25–100%. A slower speed setting results in a faster standby mode fan speed, and vice versa.

NOTE: The maximum speeds are intended as target speeds only; actual fan speeds may at times be higher than specified to satisfy any unmet cooling requirements due to long recording times or high ambient temperatures.

AUTO

This is the default mode for EPIC MYSTERIUM-X and SCARLET MYSTERIUM-X cameras.

Select a maximum bottom fan record speed, and the standby mode fan speed self-adjusts accordingly so that enough cooling is provided overall.

The default Maximum Record Speed is 50%. The Maximum Record Speed range is 25–100%. A slower speed setting results in a faster standby mode fan speed, and vice versa.

NOTE: The maximum speeds are intended as target speeds only; actual fan speeds may at times be higher than specified to satisfy any unmet cooling requirements due to long recording times or high ambient temperatures.

QUIET

The bottom fan self-adjusts to maintain the lowest possible noise level in record and standby mode while still cooling the DSMC. Using Quiet results in a higher sensor temperature when compared to Auto mode.

NOTE: In v5.1.14, this fan mode was called “Quiet Preview and Record”.

MANUAL

Select a speed for the bottom fan in both record and standby modes. The bottom fan self-adjusts to maintain the selected speeds. The default Maximum Record Speed is 50% and the default Maximum Standby Speed is 75%. The range for both Maximum Record Speed and Maximum Standby Speed is 25–100%.

NOTE: The maximum speeds are intended as target speeds only; actual fan speeds may at times be higher than specified to satisfy any unmet cooling requirements due to long recording times or high ambient temperatures.

POST RECORD DELAY

Select the amount of time that it takes for the bottom fan to switch from record to standby mode. Default is None.

LENS

LENS TAB

The options you see on the Lens tab change based on the lens mount that’s currently attached.

PL MOUNT

- **Auto-Detect PL Lenses**: By default, this feature is enabled.
- **Detect Lens**

CANON AND NIKON LENS SETTINGS

The settings below display when a DSMC Nikon Mount, DSMC Canon Mount, or DSMC Canon MOTION MOUNT is installed with a supported lens.

- **Aperture**: Enter the F-stop value. The range and default depend on the attached lens.
- **Focus**: Enter the focal distance. The default value is the value read from the lens. The range depends on the attached lens.

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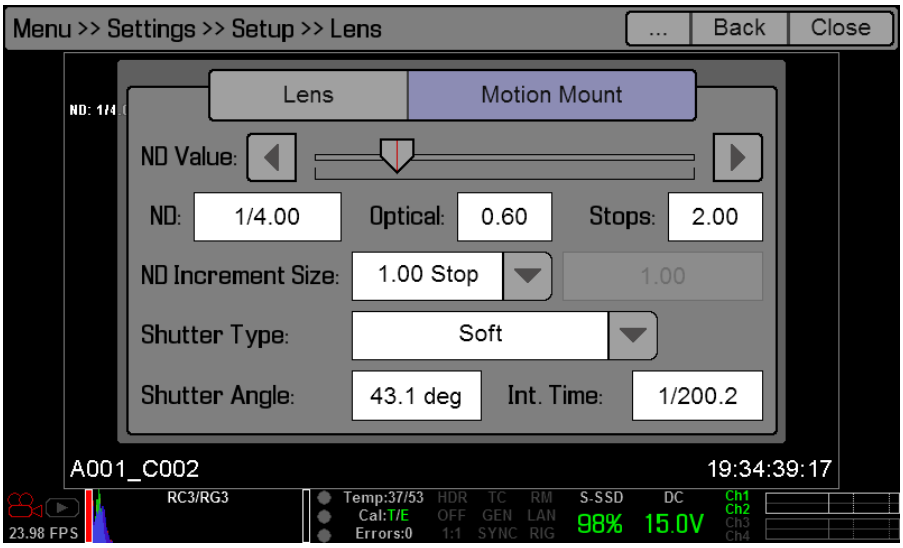
MOTION MOUNT TAB

NOTE: The Motion Mount menu is only accessible when a DSMC® RED MOTION MOUNT™ is installed. For more information about using the MOTION MOUNT, see the DSMC MOTION MOUNT Operation Guide, available at www.red.com/downloads.

1. Navigate to **Settings** > **Setup** > **Lens** > **Motion Mount**.
2. Select one of the following **Motion Mount** settings from the **Shutter Type** drop-down menu:
   - **ND Only**: The MOTION MOUNT functions only as an ND filter.
   - **Soft**: The MOTION MOUNT soft shutter takes over shuttering duties, and the MOTION MOUNT continues to function as an ND filter.
   - **Square**: The MOTION MOUNT square shutter takes over shuttering duties, and the MOTION MOUNT continues to function as an ND filter.



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MAINTENANCE

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

SAVE LOG

When you contact RED for support, you may be asked to send a LOG file from your camera along with your support ticket. The LOG file is a diagnostic tool that can assist RED with camera troubleshooting. For more information about RED support, or to create a support ticket, go to https://support.red.com.

To save a LOG file, follow the instructions below:

1. Go to **Settings** > **Maintenance**.
2. Select **Save Log**.

   The LOG file is saved as a *.txt file in the SSD root directory.

UPGRADE

You can check for upgrades for the following items:

- **Camera**: For more information on the camera firmware upgrade procedure, go to “Upgrade DSMC Firmware” on page 106.
- **REDMOTE:** For more information on the REDMOTE upgrade procedure, go to “Upgrade REDMOTE Firmware” on page 120.
- **MEDIA:** For more information on the media upgrade procedure,see the DSMC Media Operation Guide, available at www.red.com/downloads.

CALIBRATE

You can perform a sensor calibration, a motion calibration, and a lens calibration.

SENSOR CALIBRATION

Sensor calibration, also known as black shading, is a process during which the camera optimizes image quality by ensuring that pixel sensitivity remains consistent throughout an image. Black shading generates a calibration map based on system and environment settings.

After calibration, the sensor should show a uniform noise profile over the whole area without any falloffs on any side.

Calibration is required:

- After an extreme change in temperature (+/- 30°F or +/-15°C) from the currently selected calibration map.
- After an extreme change in exposure time (+/- 1/2 sec) from the currently selected calibration map.
- For EPIC DRAGON or SCARLET-X DRAGON: After each firmware upgrade.
- For EPIC MYSTERIUM-X or SCARLET MYSTERIUM-X: After a firmware upgrade if instructed to do so in the firmware release notes.

To check at which temperature/exposure time the currently selected calibration was taken, go to **Settings** > **Maintenance** > **System Status** > **Calibration**.

For more information about black shading, check out the Black Shading Calibration article available at www.red.com/learn/red-101/black-shading-calibration.

NOTE: Calibration maps will still be available after performing a system restore; however the factory calibration map will be reselected.

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CALIBRATION CAPTURE (BLACK SHADING)

Not including preparation time, the calibration procedure takes several minutes. To perform black shading calibration, follow the instructions below:

1. Ensure that the camera reaches the temperature that you want to use for your shoot.
2. Set the exposure to the exposure you want to use for your shoot.
3. Before you calibrate, ensure that the sensor is as dark as possible.
   - Preferably, take off the lens, and install the lens mount cap provided by RED.
   - If you cannot take off the lens, put a lens cap on the lens. (Not all lens-caps completely block IR. Lens caps are made to protect the lens, not necessarily to block light.)
   - If possible, use a dark room.
   - Just closing the iris is NOT sufficient.
4. Ensure a properly formatted SSD is attached to the camera.

   Even if you are not saving the calibration map to an SSD, an SSD is required to store the raw images during calibration. For more information on formatting media, see the RED DSMC Media Operation Guide available at www.red.com/downloads.
5. Go to **Menu** > **Settings** > **Maintenance** > **Calibrate** > **Sensor**.
6. Select one of the following:
   - **Save As user HS**: The calibration map created by black shading will overwrite the user HS calibration map. User HS is the name for the current in-camera user-created calibration map.
   - **Save To Media**: The calibration map created by black shading will be saved to an SSD.
   - Leave both **Save** check boxes deselected: The calibration will only be applied until the camera is powered off, and will not be saved.
7. Select one of the following black shading options:
   - **Black Shading (Default)**: This option uses fixed settings which are the same settings that are used for the factory calibration (1/48 sec exposure).
   - **Black Shading (Current FPS/Exposure)**: This option generates a calibration map with the currently set frame rate and exposure. This can be used to generate a calibration for long exposures.

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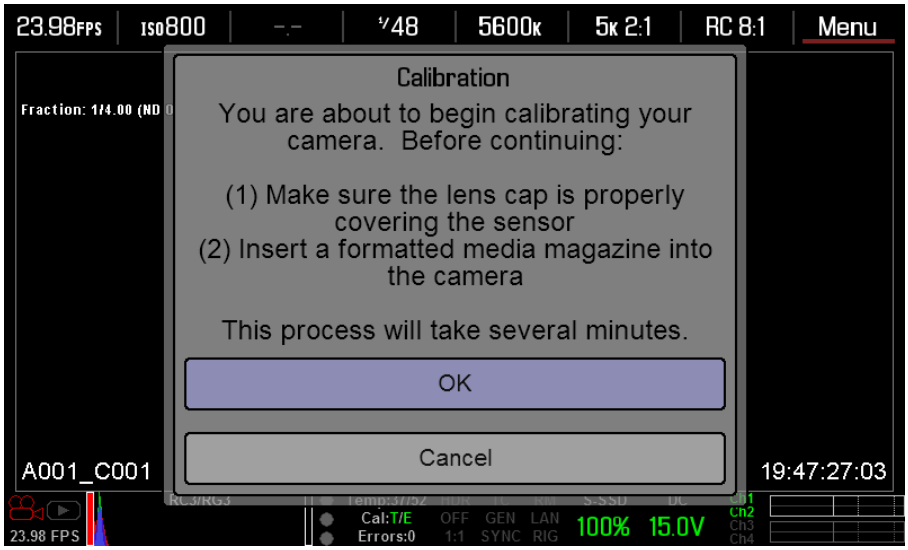
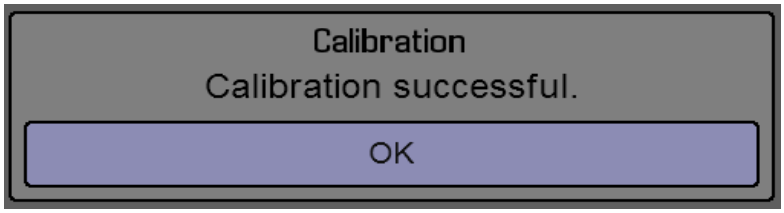
8. After selecting a black shading option, a dialog box displays, reminding you to cover the sensor and insert an SSD. Select **OK** to continue.



The system initializes and then makes two (2) passes through the following phases of the calibration:

- Capturing
- Analyzing
- Erasing
- Programming

9. When the Calibration Successful dialog displays, select **OK** to complete black shading calibration.



The new calibration map is automatically selected.

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CALIBRATION MAP NAMING CONVENTIONS

When you create a calibration map, the camera creates a unique name for the calibration map that uses the format described in the table below:

NAME	DESCRIPTION	EXAMPLE
Exposure (Shutter Speed)	Current exposure (shutter speed); to set exposure, go to **Menu** > **Setting** > **Projects** > **Expoure**	48
Sensor Temperature	Sensor temperature (Celsius); in the Lower Status Row, this is the number to the left of the forward slash (Temp: **34**/35)	32C
Year	Year that the calibration map is created (yyyy)zzz	2014
Month	Month that the calibration map is created (mm)	01
Day	Day that the calibration map is created (dd)	28
Time	Time according to the 24-hour clock in the camera (hhmmss)	122150

For example, a sequence of calibration maps may look like this:

- 48_32C_20140128122150
- 72_34C_20140128122858
- 120_41C_20140128124306

NOTE: If you mount an SSD with calibration files to your computer, each calibration map displays as a sub-folder in a folder called Calibration. If you want to save a calibration map to your hard drive, you must copy the entire sub-folder (for example, 48_32C_20140128122150) to your drive.

CALIBRATION MANAGEMENT

Use the Calibration Management screen to apply, import, and export calibration maps.

- **Calibration Map**: The calibration maps that are saved internally on the camera:
  - **Factory**: This is the calibration map generated during the manufacturing process, and is the default map.
  - **User HS**: The user-created calibration map.
- **Media**: The calibration maps that are on the SSD in the path shown (for example, S-SSD\calibration).

CALIBRATION MAP ACTIONS

- **Set**: Set and apply the selected camera calibration map.
- **Delete**: Delete the selected camera calibration map. You can't delete the factory map.
- **Apply**: Apply the selected calibration map from the SSD temporarily (without importing to the camera).

EXPORT AND IMPORT CALIBRATION MAPS

You can export and import calibration maps between the camera BRAIN and an SSD. By exporting calibration maps to an SSD, you can build a library of calibration maps that can be used in different settings.

- : Export selected calibration map from camera to SSD.
- : Import selected calibration map from SSD to camera. This overwrites the user HS calibration map.

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MOTION SENSOR CALIBRATION

The DSMC displays data from the accelerometer to help orient the camera. After a firmware upgrade or Factory Restore, the motion sensors need to be re-calibrated.

To calibrate the motion sensors, follow the instructions below:

1. Go to **Settings** > **Maintenance** > **Calibrate**.
2. Select **Motion**.
3. Place the camera on a flat, levelled surface, and do not move the camera during calibration.
4. Select **Calibrate Motion Sensors**.

   The sensors calibrate.

LENS CALIBRATION

There are currently a quantity of electronic lenses that are compatible with the DSMC CANON MOUNT or DSMC NIKON MOUNT, but are not electronically supported by RED cameras. The Lens Calibration feature allows you to create custom lens configuration files for these electronic lenses so that you can use features such as rack focus and autofocus with your lenses.

While the custom configuration files will not be as precise as the files for the lenses that are fully electronically supported by RED cameras, the files will provide the F-stop range and focal lengths so that you can electronically control the lens with the camera.

NOTE: The camera may not be able to calibrate some electronic lenses.

NOTE: The camera does not create calibration files for lenses that are already electronically supported. For a full list of supported lenses, go to “Supported Lenses” on page 134.

CREATE LENS CALIBRATION FILES

The calibration process creates a calibration file for the current focal length of the electronic lens. Calibrate the lens at each of your camera’s focal lengths to create a full lens calibration file.

1. Attach a DSMC CANON MOUNT or DSMC NIKON MOUNT.
2. Attach an electronic lens.
3. Manually set the first focal length you want to calibrate.

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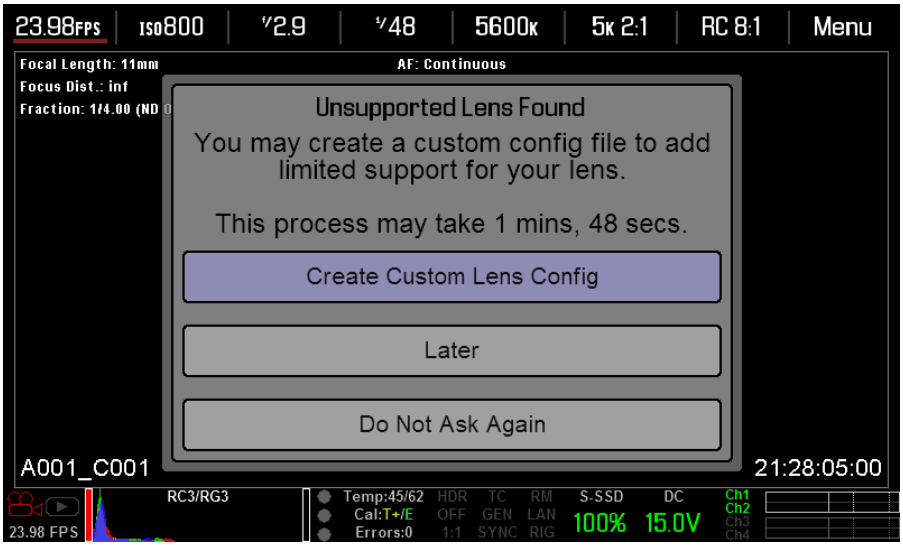
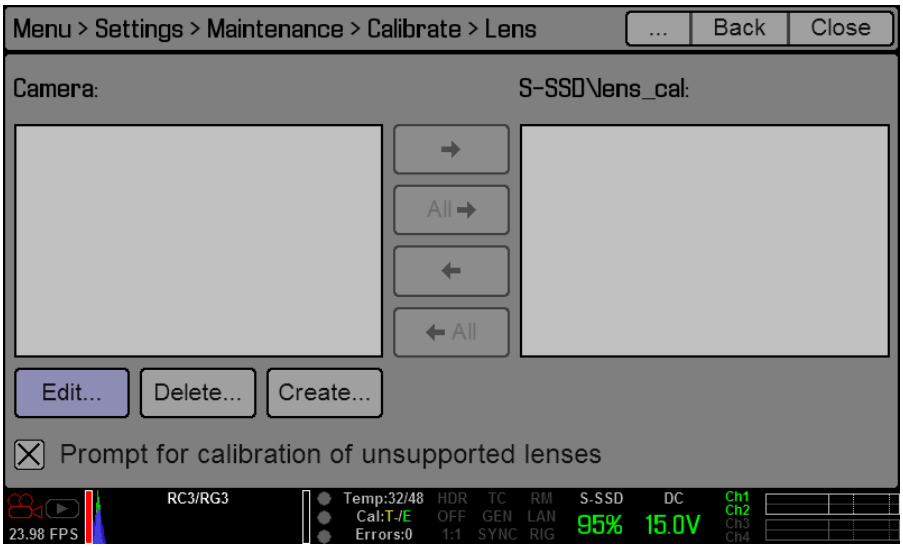
4. There are two ways to start the lens calibration process:
   - When you attach a lens that the camera does not recognize as being fully electronically supported, the "Unsupported Lens Found" dialog box displays and asks if you want to calibrate the lens. Select **Create Custom Lens Config**.



   - Go to **Settings** > **Maintenance** > **Calibrate** > **Lens** and select **Create...**.



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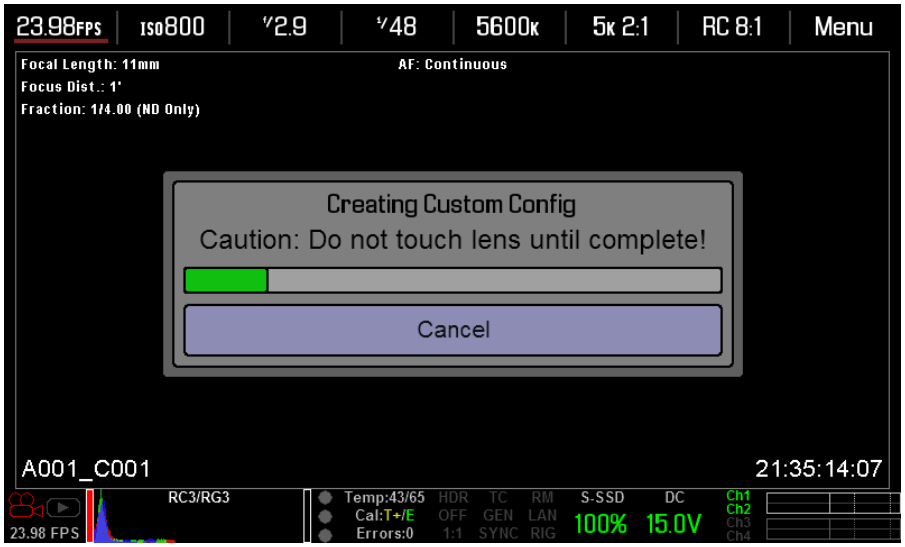
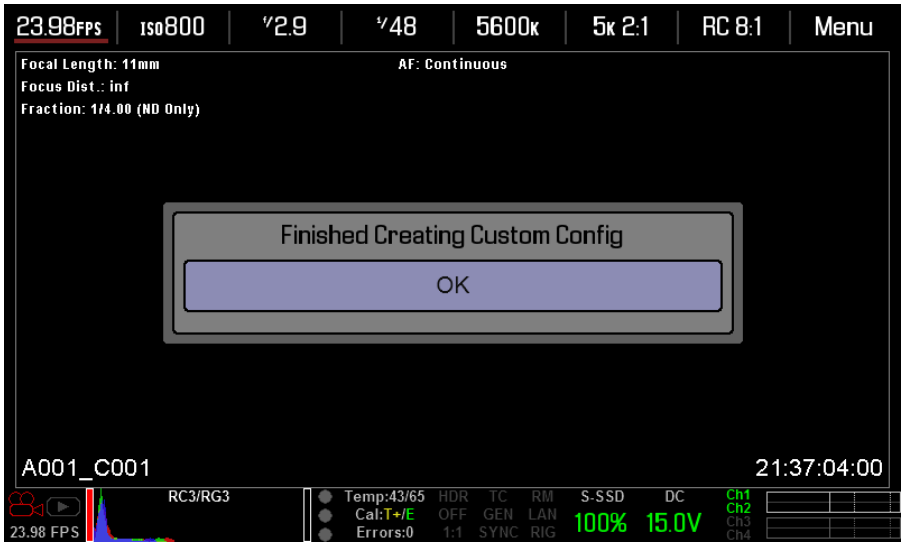
The lens calibration process for the current focal length starts and a progress bar displays. Once the calibration process starts, DO NOT touch the lens, as doing so may cause the lens to calibrate incorrectly.



5. Click **OK** after the calibration file is created.



6. To calibrate the next focal length, follow the instructions below:
   A. Go to **Settings** > **Maintenance** > **Calibrate** > **Lens**.

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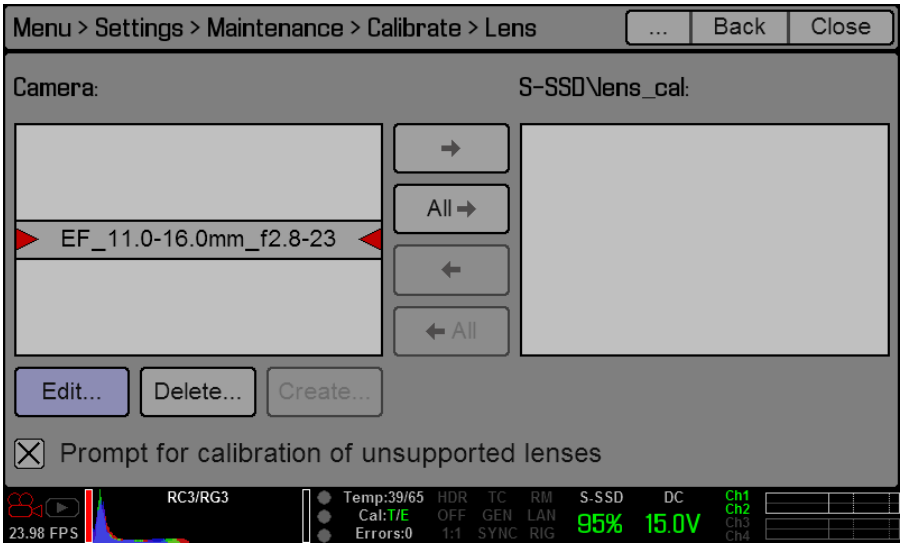
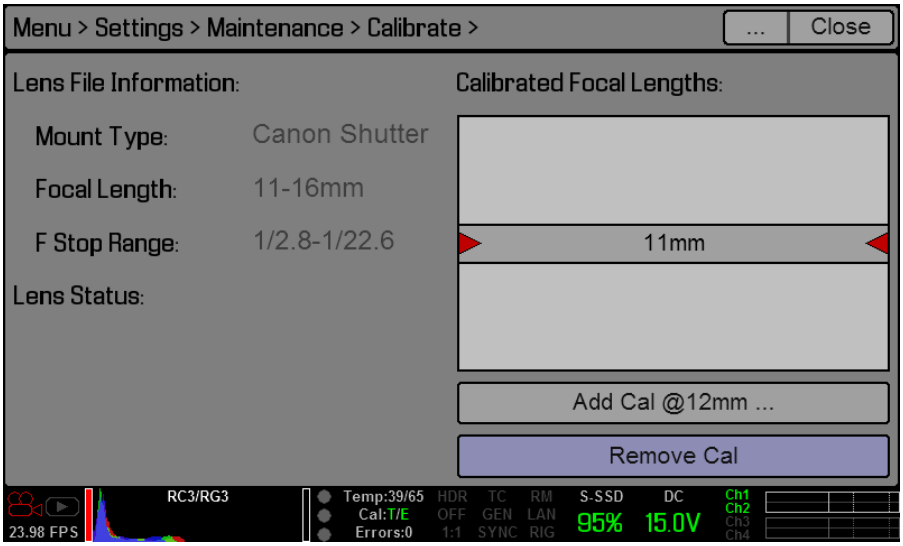
B. Select the calibration file name in the **Camera** list and select **Edit...**.



C. Manually set the next focal length.

D. Select **Add Cal @ xx...**, where "xx" is the current focal length.

NOTE: If you calibrate a focal length that has already been calibrated, the new files overrides the previous file.



The lens calibration process for the current focal length starts and a progress bar displays. Once the calibration process starts, DO NOT touch the lens, as doing so may cause the lens to calibrate incorrectly.

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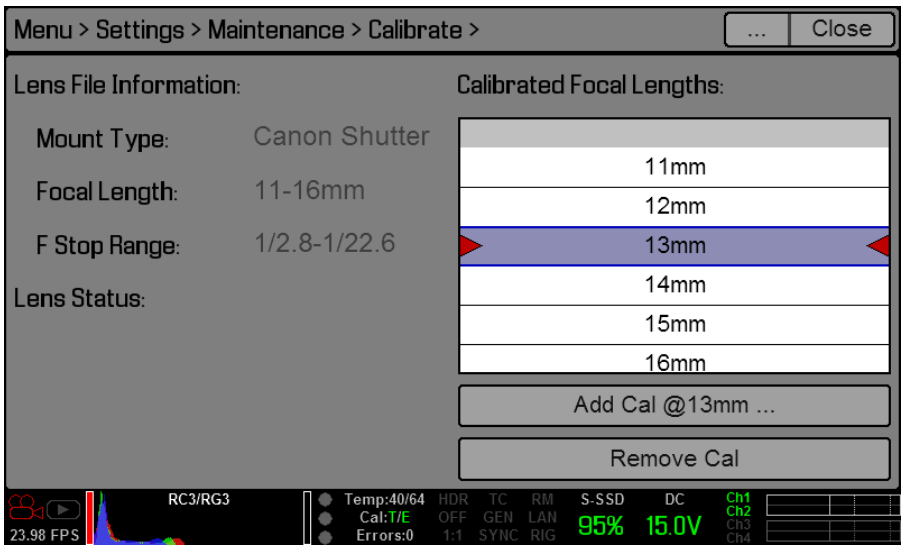
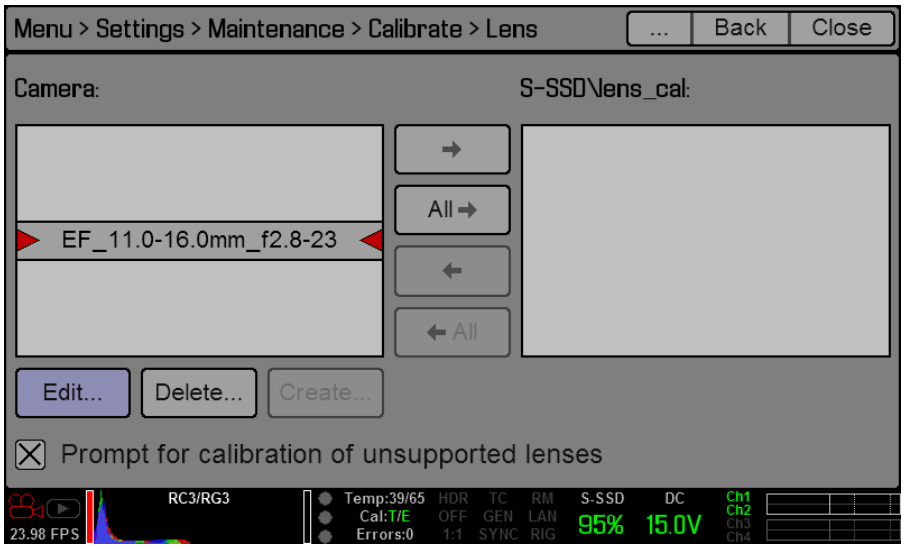
7. Repeat Step 6 for each focal length of the lens.

   The lens calibration file remains on the camera after system restores and firmware upgrades.



VIEW AND MODIFY LENS CALIBRATION INFORMATION

1. Go to **Settings** > **Maintenance** > **Calibrate** > **Lens**.
2. Select the calibration file name in the **Camera** list and select **Edit...**.



The following information displays:

- Mount Type
- Focal Length
- F Stop Range: Overall F-stop range of lens.
- Lens Status
- Calibrated Focal Lengths

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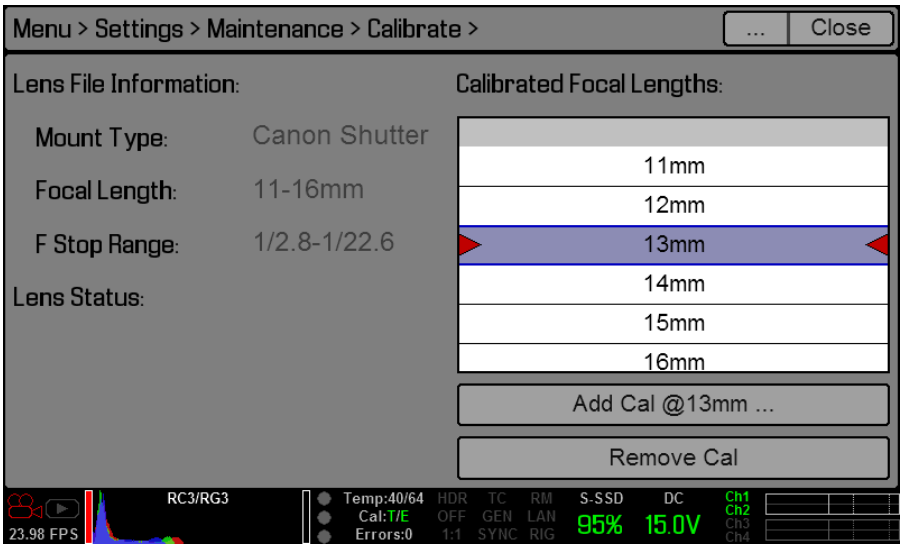
3. You can perform any of the following actions:
   - **Add Cal @ xx...**: Calibrate the current focal length; “xx” is the current focal length.
   - **Remove Cal**: Remove the calibration for the selected focal length.



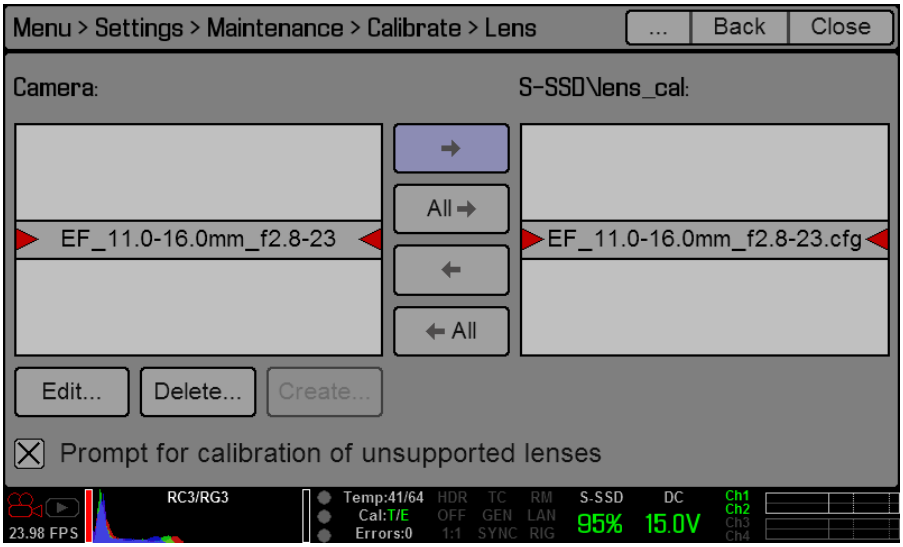
EXPORT AND IMPORT LENS CALIBRATION FILES

Lens calibration files can be stored on the camera or transferred to SSD, so that you can build a library of lens calibration files or quickly copy a lens calibration file from one camera to another via SSD.

When exporting lens calibration files from camera to SSD, the files are saved to a folder on the SSD called “lens_cal”.

DO NOT change the file name of the calibration file after you save it to an SSD.

- : Export selected calibration file from camera to SSD.
- **All** : Export all calibration files from camera to SSD.
- : Import selected calibration file from SSD to camera.
- **All**: Import all calibration files from SSD to camera.



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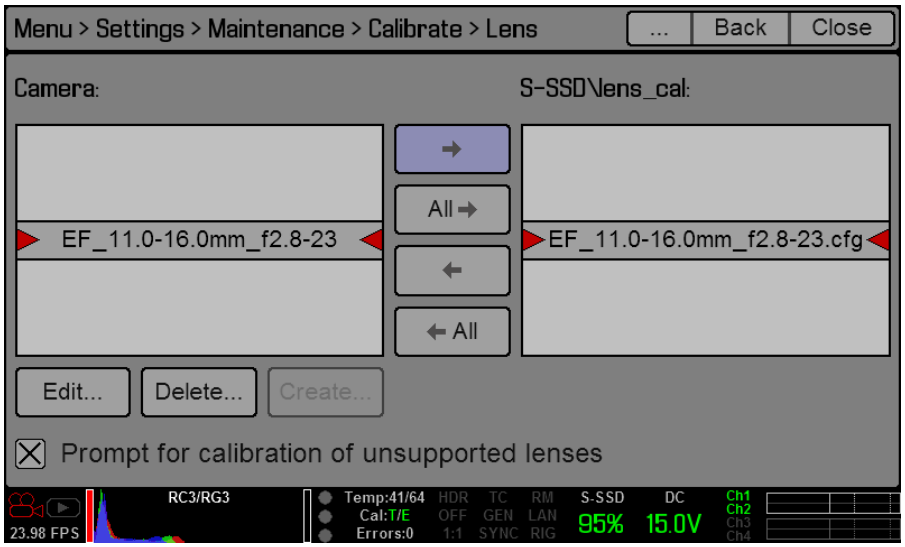
LENS CALIBRATION ACTIONS

- **Edit...**: View and edit the selected calibration file.
- **Delete...**: Delete the selected calibration file.
- **Create...**: Create a new calibration file. This option is disabled if you already have a calibration file for the attached lens.
- **Prompt for calibration of unsupported lenses**: Select this check box to ensure that the “Unsupported Lens Found” dialog box displays every time the camera detects an unsupported electronic lens at boot-up. De-select this check box to disable the “Unsupported Lens Found” dialog box.



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SELF TEST

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

ENABLE/DISABLE SENSOR TEST PATTERN

This feature is currently only used during the manufacturing process.

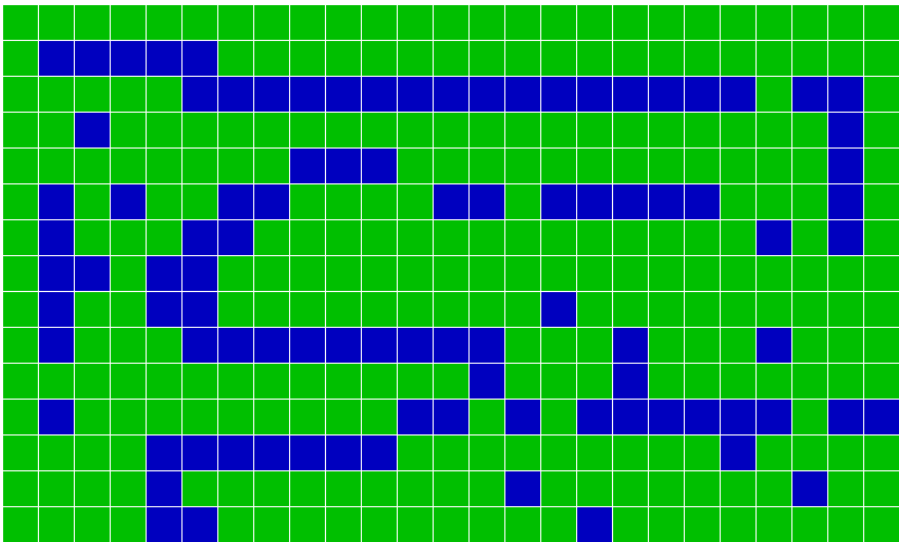
When selected, enables/disables the sensor test pattern (White Screen). To turn on, select **Enable Sensor Test Pattern**.

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 touchscreen 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:

1. Place your finger on the touchscreen and hold it there until the main screen appears.
2. Press the **Enter** or **Menu** button on the DSMC 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, the camera automatically powers down.

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

Rediscovers 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...” displays. The camera automatically powers down and you will need to manually power it up.

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SYSTEM STATUS

The System Status menu displays key project and system information on the following tabs: Project Status, Module Status, Camera Info.

PROJECT STATUS

Displays the currently selected camera and project settings.

MODULE STATUS

Displays which modules are attached to the BRAIN.

- **Not Detected**: The module is either not attached, or is not detected by the BRAIN.
- **Attached**: The module is attached and detected.

CAMERA INFO

Displays the following camera information:

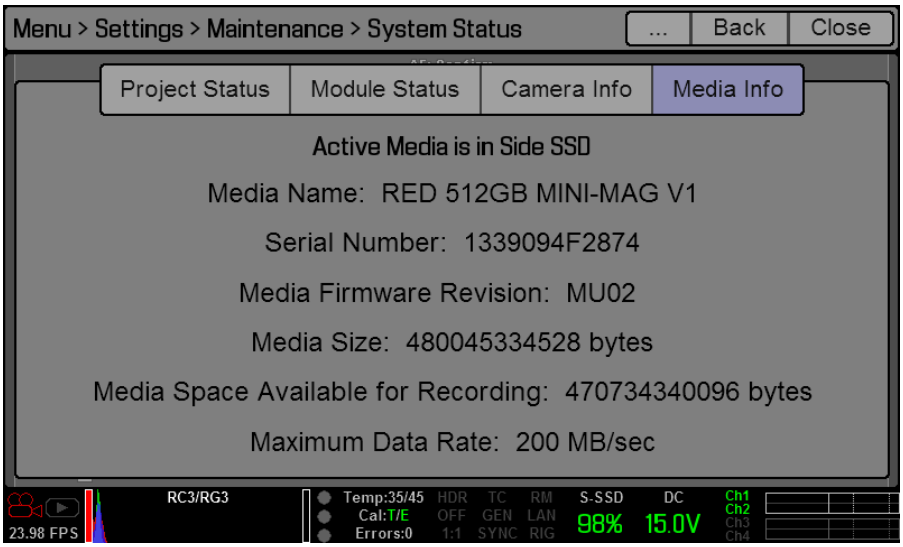
- **Model**: Includes camera type (EPIC or SCARLET) and sensor type.
- **Version**: Current firmware version.
- **P.I.N.**: The personal identification number that is specific to your camera.
- **SVN revision**: The current revision number of your firmware.
- **Hours of operation**: The number of hours that your camera has been turned on.

MEDIA INFO

Displays the following media information:

- **Media Status**: Active media, module type.
- **Media Name**: Storage capacity, SSD type, and version/revision of the SSD.
- **Serial Number**: Serial number of the SSD.
- **Media Firmware Revision**: Firmware version on the SSD.
- **Media Size**: Total capacity on the SSD.
- **Media Space Available for Recording**: Total capacity left on the SSD that can be recorded to.
- **Maximum Data Rate**: The maximum data rate when writing files to the SSD.

NOTE: When an SSD is not attached, the Media Info tab displays the following: “No Active Media Found”.



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MEDIA MENU

The Media Menu is used to format an SSD prior to use on the camera as well as to eject (unmount) the SSD prior to removal from the camera.

For more information about using media, see the RED DSMC Media Operation Guide, available at www.red.com/downloads.

UTILITIES

The Utilities sub-menu provides advanced options for performing a secure format of the media device, as well as updating your media firmware.

- **Secure Format...**:
- **Download Media Firmware:**

PLAYBACK MENU

To view clips on the SSD that's attached to the camera, go to **Menu** > **Playback**. In addition to playing clips, you can change the look of the clips by changing the settings that are available when in Playback mode.

PLAYBACK MENUS

In Playback mode, you can access a pared-down version of the usual menu system. Major differences between the Playback menu system and the usual menu system are described below:

MEDIA

List all available clips on the attached SSD.

You can perform the following actions:

- ➡ : Move selected clip to the Play List.
- **All** ➡ : Move all clips to the Play List.
- **Apply Image Metadata**: Image data such as color, gain, curves, etc. that were recorded with the image will be displayed with the playback image. When deselected, the current playback Look settings will be used.
- **Load**: Closes the menu and brings up the selected clip in Playback mode.

RECORD (EXIT)

Select **Record** to exit Playback mode. You can also press any button that's mapped to Record to exit Playback mode.

META

Displays the metadata for the selected clip.

PLAYBACK STATUS BAR

Displays the progress of the clip during playback. When using the touchscreen, you can swipe your finger right and left to fast-forward and rewind the clip, respectively.

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LOWER CONTROLS

0From left to right, the screen displays the following: Playback/Record toggle, Histogram, Load Previous Clip, Frame-by-Frame Reverse, Rewind, Play/Pause toggle, Frame-by-Frame Forward, Load Next Clip, Play Options, Marker Options.

PLAYBACK/RECORD TOGGLE

Toggles between Record mode and Playback mode.

HISTOGRAM

Displays the clip histogram. The histogram changes based on any changes made to the Look settings. For more information about Looks, go to “Looks” on page 104.

When using the touchscreen, touching the histogram displays the Tools menu.

PLAYBACK SPEED

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

IN/OUT POINT MARKERS

Allows you to set In and Out Points during clip playback. This allows you to play only a certain portion of the clip. The In/Out Markers help when the clip is long and you want to focus on a particular segment. The In (red) and Out (green) points display in the Playback Status Bar.

FRAME-BY-FRAME REVERSE/FORWARD

Allows you to move through the clip frame-by-frame, going either forward or in reverse.

PLAY/PAUSE TOGGLE

Allows you to play and pause the clip.

PLAY ONCE/LOOP TOGGLE

Allows you to choose to play the clip one time or to loop the clip in the player.

PLAYBACK DIRECTION TOGGLE

Allows you to play the clip forward or backwards.

ADDITIONAL CLIP/CAMERA INFORMATION

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

POWER MENU

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

NOTE: For more information about powering the DSMC, see the DSMC Power Operation Guide available at www.red.com/downloads.

POWER IN

The power status is displayed for the BRAIN DC, DSMC SIDE HANDLE, Rear 1, Rear 2, Rear 3, and Rear 4. The screen displays the voltage of the source or the percentage of the power left, as well as the time left, if applicable.

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POWER OUT

The Power Out menu shows the status of the power out ports on the PRO I/O MODULE and the +1 ADAPTOR. The statuses are:

- **N/A**: The device is not present.
- **OK**: The power out port is functional.
- **FAULT**: There is a fault. Click **RESET** to clear the fault.

POWER SAVE

You can select the following power saving options (the default for each is Never):

- **Low Power Preview**: The camera uses a lower amount of power after the specified period of inactivity.
- **Sleep**: All monitors turn off and keys will not perform mapped actions after the specified period of inactivity. Touch the screen or press a key to exit Sleep mode.
- **Auto Shutdown**: The camera shuts down after the specified period of activity.

SHUTDOWN

Shutdown controls are interlocked to prevent accidental powering down of the camera. For details on the different ways to power down your RED DSMC, go to “Power Down” on page 37.

1. Go to **Menu** > **Power**.
2. Select **Shutdown**.

   The camera immediately powers down.

HDR MENU

NOTE: HDR mode cannot be modified when in Magnify 1:1 mode or when test signals are enabled.

NOTE: You cannot use HDR mode when:

- A MOTION MOUNT is installed.
- A Sensor Sync Mode (Genlock or MoCo) is enabled.
- Speed Ramp mode is enabled.
- A Frame Processing mode (Frame Summing or Frame Averaging) is enabled.

By default HDRx is disabled, and the HDR text in the Lower Status Group of the Viewfinder screen is gray.

To enable HDRx, follow the instructions below:

1. Go to **Menu** > **HDR**.
2. Select **HDRx**.

   The HDR text in the Lower Status Group of the Viewfinder screen turns white.
3. Select the number of **Stops**. The range is 1–6, and the default is 2.

NOTE: For more information about HDRx, check out the High Dynamic Range Video with HDRx article available at www.red.com/learn/red-101/hdrx-high-dynamic-range-video.

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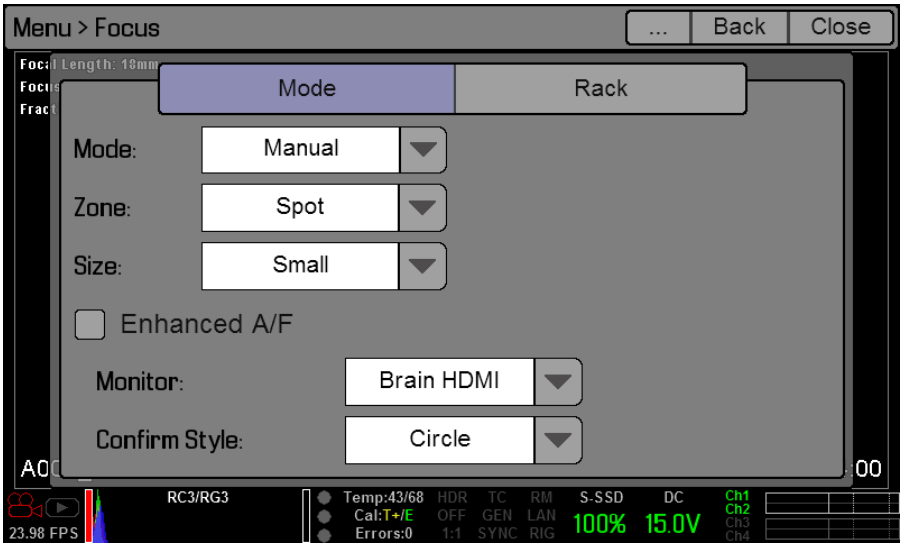
FOCUS MENU

MODE TAB

The Focus Menu is used to enable and select Focus parameters, including Mode, Zone, Size, and Enhanced A/F.



MODE

Select one of the following from the **Mode** drop-down menu:

- **Manual**: When selected, all focus operations are manual.
- **Confirm**: Enables the Center or Spot focus target. This mode provides additional focus assistance by 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, you should “rock” the focus ring: Focus through the point of optimum focusing and back again in decreasing amplitude, as when “zeroing-in” for precision manual focus.

AUTOFOCUS MODES (DSMC NIKON AND CANON MOUNTS)

When you have any of the following conditions, there are additional options in the Modes drop-down menu:

- DSMC Nikon Mount and a supported lens is attached. The lens focus switch is set to “A” or “M/A”.
- DSMC Canon Mount and a supported lens is attached. The lens focus switch is set to “AF”.
- DSMC Canon MOTION MOUNT and a supported lens is attached. The lens focus switch is set to “AF”.

When any of the conditions above are met, you have the additional following options in the Modes drop-down menu:

- **Single**: When you press the key mapped to AF: Start, the camera performs single-shot AF. Optimized for rapid focus even under low-contrast conditions. Works with both Center and Spot zones.
- **Continuous**: When you press the key mapped to AF: Start, the camera attempts to keep objects in the target in focus. Works best with good lighting and contrast. Works with both Center and Spot zones.
- **Touch Track**: Dynamically updates a positionable AF point using the touchscreen. Only works with Spot zone. Keep Spot target on subject while moving across frame, as the lens continuously focuses on that target.
- **Rack**: Enables rack focus. Only works with Spot zone. For more information about configuring rack focus, go to “Rack Tab” on page 101.

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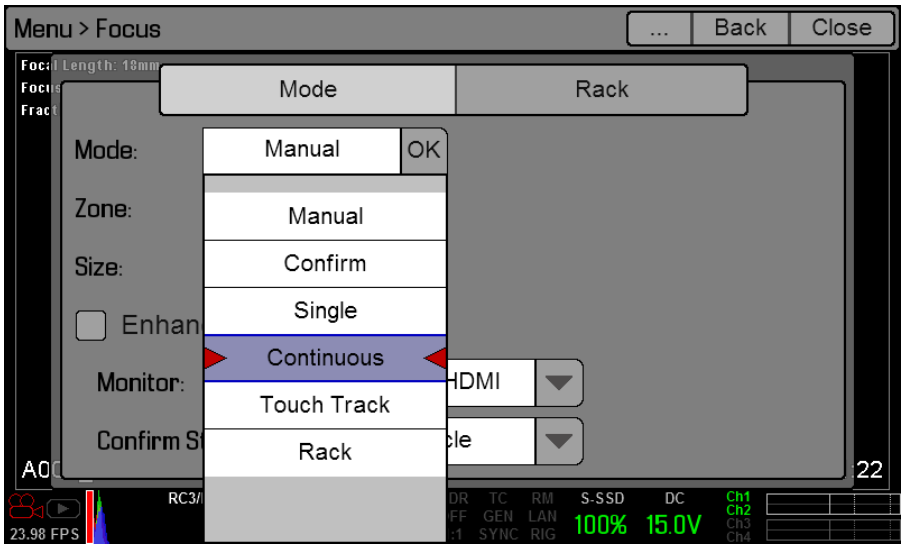

In Single, Continuous, and Touch Track modes, a single target displays on the screen that indicates where the image will be in focus. In Rack mode, multiple targets display on the screen to indicate the different areas between which the camera will rack focus.

Press the key mapped to AF Mode: Cycle (REDMOTE/DSMC SIDE HANDLE button A default) to cycle through the Focus Mode options in order.

Performance of autofocus may be reduced under the following conditions:

- Subject is dark or distant.
- Inadequate contrast between the subject and background.
- Scene has reflective highlights.
- Subject is backlit.
- Inadequate surface contrast/detail inside the window.

NOTE: Edge mode can be used for additional assistance in these conditions. For more information about Edge mode, go to “Edge” on page 47.

ZONES

Available options are Center and Spot (default).

Both the Center and Spot targets change color to indicate the focus state of the objects in the targets.

TARGET COLOR	DESCRIPTION
Blue	Camera is focusing
Red	Objects are out of focus
Yellow	Objects are almost in focus
Green	Objects are in focus

CENTER

Provides a large target square for focus that is centered in the recording area.

SPOT

Provides a target for precise focus that you can move around the recording area.

MOVE THE SPOT FOCUS TARGET

Perform either of the following to move the Spot target using the touchscreen LCD:

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- Press and hold the touchscreen LCD on the location you want to relocate the Spot target.
- Press and hold the touchscreen LCD where the Spot target currently is, and drag the Spot target.

To move the Spot target using the SIDE HANDLE or REDMOTE:

1. Go to the main screen.
2. Press the **Down Arrow** in the Navigation Group.
   The Spot target line weight increases and the red cursor under Menu dims slightly.
3. Use the directional arrows to move the Spot target to the desired location.
4. Press the **Enter** button.
5. To exit, press the **Menu** button.

SIZE

Choose any of the sizes for the Spot target:

- Small
- Medium
- Large

ENHANCED A/F

Enhanced A/F has an autofocus algorithm that offers better performance and improved visual indicators when in Confirm mode.

ENABLE ENHANCED A/F

1. Go to **Menu** > **Focus** > **Mode**.
2. Select **Confirm** from the **Mode** drop-down menu.
3. Select an option from the **Zone** drop-down menu.
4. If you selected Spot from the Zone drop-down menu, select a size from the **Size** drop-down menu.
5. Select the **Enhanced A/F** check box.
6. Select the monitor that you want to dedicate to using the Enhanced A/F feature from the **Monitor** drop-down menu:
   - BRAIN HDMI
   - BRAIN HD-SDI

   The selected monitor will be in Clean mode (no overlay) with a set resolution of 720p and update frequency of 60 Hz. The target does not display on the selected monitor. You will not have control over this monitor until you disable the Enhanced A/F feature.

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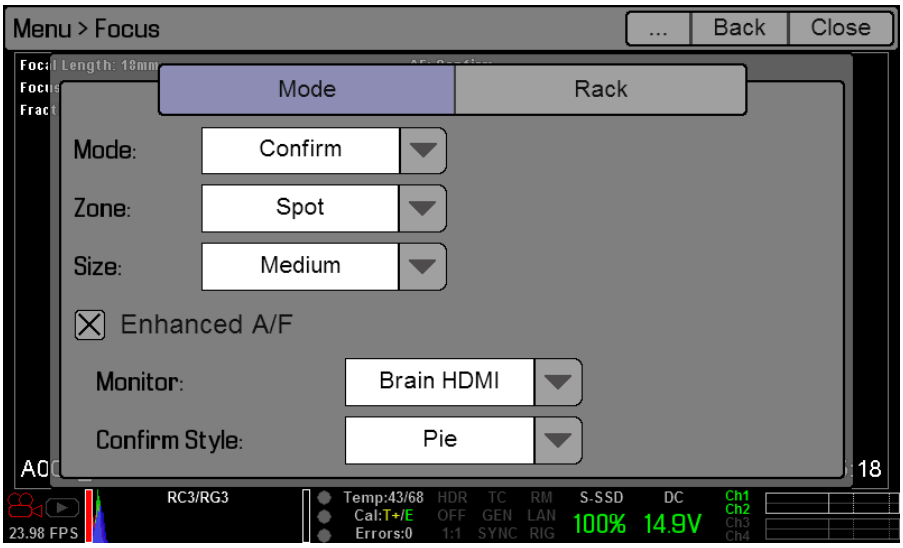
7. Select the Confirm target style from the **Confirm Style** drop-down menu:

CONFIRM STYLE	DESCRIPTION	OBJECTS IN TARGET ARE IN FOCUS...	OBJECTS IN TARGET ARE OUT OF FOCUS
None	Square target; operates just like the target square in Confirm mode	Target is yellow or green	Target is red
Circle	Yellow circle around a square target	Target is yellow or green; yellow circle is almost the same size as the square	Target is red; yellow circle gets bigger
Bar	Bar target	Target is yellow or green; vertical bar on the right side is filled up	Target is red; vertical bar on the left side is almost empty
Pie	Pie target	Target is yellow or green; line around the curve is filled up	Target is red; line around the curve is almost empty

8. Exit the **Focus** screen.



The target displays on the touchscreen LCD, and the monitor that you selected for the Enhanced A/F feature is in Clean mode.

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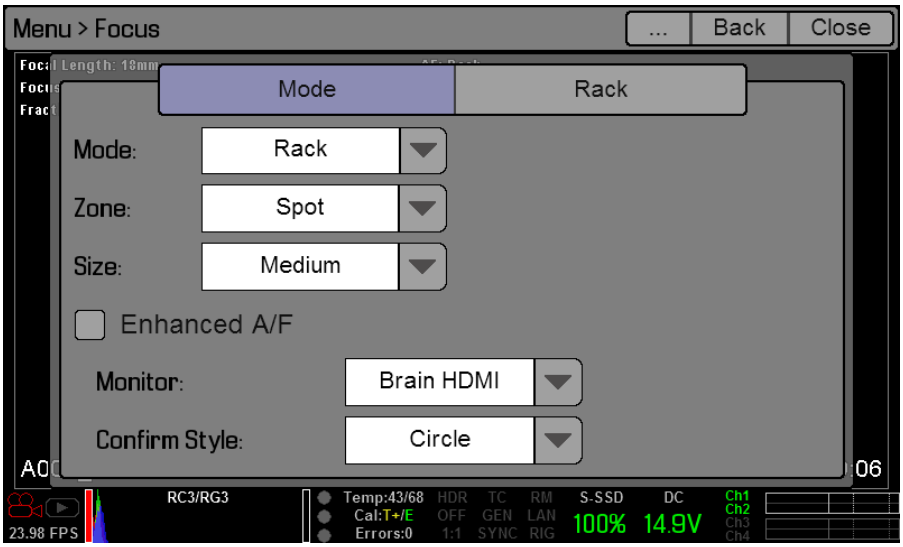
RACK TAB

Use the Rack tab to configure up to four focus points and execute rack focus between them.

SET UP RACK FOCUS

1. Ensure that a DSMC Nikon Mount, DSMC Canon Mount, or DSMC Canon MOTION MOUNT is installed and that a supported lens is attached.
2. Go to **Menu** > **Focus** > **Mode**.
3. Select **Rack** from the **Mode** drop-down menu.

   Spot is automatically selected from the Zone drop-down menu, since rack focus only works with Spot zone.
4. Select a size from the **Size** drop-down menu.



5. Go to the **Rack** tab.
6. Use the **Rack Speed** slider to change the speed at which the lens moves. Move the slider to the left for a slower speed, and to the right for a faster speed.
7. Select the number of rack points you want from the **Rack Points** drop-down menu. You can select up to four points.

   A line for each rack point displays, indicated by the letters A, B, C, and D. The focus distance displays for each rack point.
8. If needed, select **Re-Autofocus** to run the autofocus algorithm, which resets the focus distance to the focus

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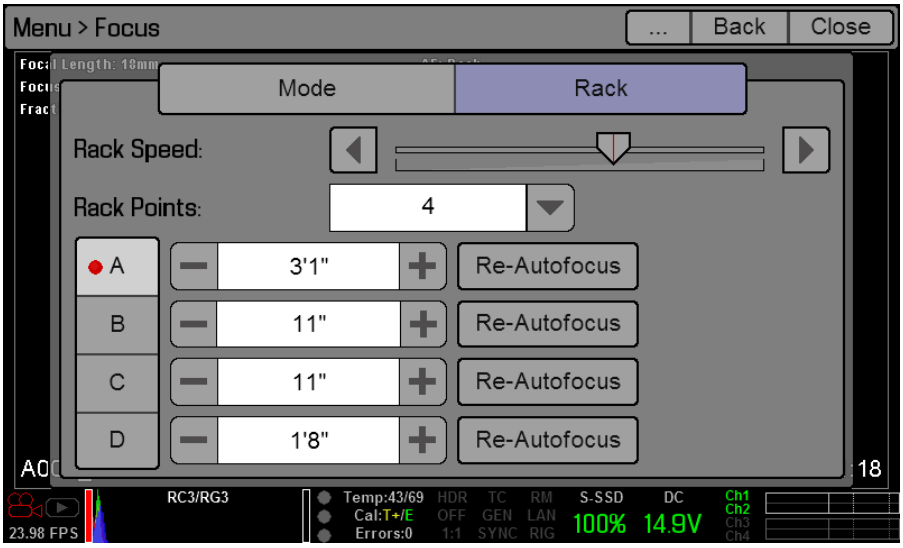
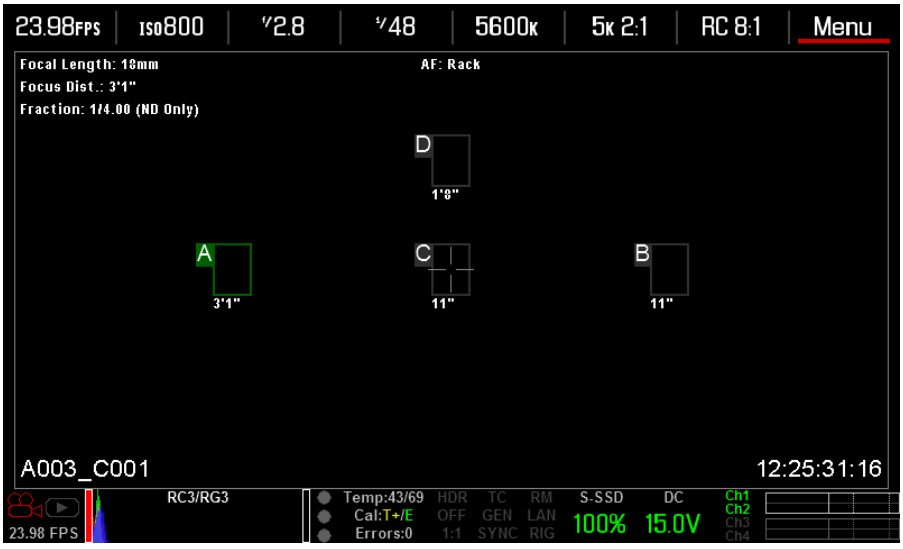
distance calculated by the algorithm.



9. To set a rack point location, follow the instructions below:
   A. Select the rack point that you want to set: **A**, **B**, **C**, or **D**.
   B. Select **Close** to return to the main screen.
   C. Press and hold the touchscreen LCD on the location where you want the rack point to be.
   D. You can also press and drag the rack point to another location. In order to prevent a rack point from being accidentally moved when touching it to rack focus to that point, the rack point is less sensitive to touch than the other focus targets. If you need to fine-tune the location of your rack point, first drag the rack point farther than it needs to be and then drag it to where you want it to be.

      When you move a rack point, the camera autofocuses.



NOTE: To view the focus distance for each rack point on the main screen, go to **Menu** > **Settings** > **Display** > **Modes** and enable **Rack Target Distance** mode. For more information about display modes, go to "Display Modes" on page 51.

10. You can select another rack point by using any of the following methods:
   – Select another rack point on the touchscreen LCD.
   – Press the key that is mapped to **AF: Start** (default is SH Record Half Press) to cycle to the next rack point in order (A, B, C, and D). For example, if rack point A is currently selected when you trigger the

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AF: Start action, the focus racks from point A to point B.

– Press a key that is mapped to racking to a specific rack point. For more information, go to “Map Keys to Cycle Rack Focus” on page 103.

MAP KEYS TO CYCLE RACK FOCUS

You can map user keys to rack focus between different rack points. For more information about mapping keys, go to “Keys” on page 72.

You can map the following actions:

- AF: Start
- AF: Rack to A
- AF: Rack to B
- AF: Rack to C

PRESETS MENU

The DSMC has three types of presets:

- **Camera Presets**: These are used to store and recall camera setup information, such as in-camera Looks, key mappings, I/O configurations, etc. Your RED DSMC has a number of factory-installed presets.
- **Looks**: These allow you to save the specific color, image, white balance, and detail settings to be used for other projects. Looks that are generated in-camera display on the Camera Presets tab. Looks that are generated in REDCINE-X PRO and are imported to the DSMC via an SSD display on the Looks tab.
- **Auto Presets**: These allow you to specify pre-selected presets for Startup, Preview, and Playback.

You can create custom presets and Looks. Presets and Looks can be stored on the camera or transferred to SSD, so that you can build a library of presets and Looks, or quickly copy presets and Looks from one camera to another via SSD.

- **Camera**: Presets or Looks that are saved internally on the camera.
- **Media**: Presets or Looks that are on the SSD in the path shown (for example, S-SSD\presets).

CAMERA PRESETS

PRESETS ACTIONS

- **Apply:** Apply the selected preset.
- **Create...**: Create a new preset using the camera’s current settings.
- **Update...**: Update the selected preset by allowing the parameter set to be modified and all the values to be updated to their current in-camera values. You cannot update factory-installed presets, which end with “(RED)”.
- **Clone...**: Create a new preset using the selected preset’s parameter set as a template.
- **Delete...**: Delete the selected preset.

EXPORT AND IMPORT PRESETS

When exporting presets from camera to an SSD, the presets are saved to a folder on the SSD called “Presets”.

When importing presets from an SSD to camera, the presets must be stored on the SSD in a folder called “Presets”.

- : Export selected preset from camera to SSD.
- **All** : Export all presets from camera to SSD.
- : Import selected preset from SSD to camera. You will be asked if you want to apply the preset.
- **All**: Import all presets from SSD to camera. You will be asked if you want to apply the preset.

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CREATE PRESETS

1. Set up the camera how you want the preset to be configured.

   For example, if you want to create a preset specifically for your zebra indicators, first go to Settings > Display > Zebra and configure your zebra indicators the exact way that you want them to be in the preset.
2. Go to **Presets** > **Camera Presets**.
3. Select **Create**, or select an existing preset and select **Clone** or **Update**.
4. If creating a new preset, enter a name for the preset and click **OK**.
5. Select the following tabs to display different sets of preset options: **Display**, **Key**, **Look**, **Project**, and **System**.
6. Select the following:
   - : Add selected setting to the preset.
   - **All** : Add all settings to the preset.
   - **X**: Remove selected setting from the preset.
7. Select **Create**.

   The preset is saved and stored in the camera.

LOOKS

A Look is made up of the following settings: Color, Gain, FLUT, Curves, Color/Gamma, Color Temperature. These settings are configured either in-camera (in the Settings > Look menu) or in REDCINE-X PRO (in the Looks panel).

CREATE AND MANAGE IN-CAMERA LOOKS

Create in-camera looks in the **Presets** > **Camera Presets** tab. You can apply, create, update, clone, delete, and export these in-camera Looks the same way you would with any of the other presets created in the Camera Presets tab. For more information about creating and managing presets and in-camera Looks, go to “Camera Presets” on page 103.

IMPORT LOOKS FROM REDCINE-X PRO

1. While your SSD is mounted to your computer, create a folder on the SSD called **Looks**.
2. Save your RMD files (that have been exported from REDCINE-X PRO) to the **Looks** folder on the SSD.
3. Eject the SSD from your computer.
4. Mount the SSD to your DSMC.
5. Go to **Presets** > **Looks**.
6. Select one of the following:
   - : Import selected Look from SSD to camera.
   - **All**: Import all Looks from SSD to camera.

For more information about creating and exporting Looks from REDCINE-X PRO, check out the “REDCINE-X PRO: Saving Looks to Camera” video tutorial, available at www.red.com/learn/workflow/redcine-x-saving-looks-camera.

MANAGE IMPORTED LOOKS

All Looks that you import from REDCINE-X PRO are managed in the Presets > Looks tab. When exporting Looks from camera to SSD, the Looks are saved to a folder on the SSD called “Looks”.

You can perform the following actions with imported Looks:

- : Export selected Looks from camera to SSD.
- **All** : Export all Looks from camera to SSD.

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- **Apply**: Apply the selected Look.
- **Delete...**: Delete the selected Look.

AUTO PRESETS

- **On Startup**: The selected preset is applied every time the camera is turned on.
- **On Enter Preview**: The selected preset is applied every time the camera enters Preview mode. This includes at startup and when exiting Playback mode.
- **On Enter Playback**: The selected preset is applied every time the camera enters Playback mode.

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07 UPGRADE DSMC FIRMWARE

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

Make a habit of frequently visiting www.red.com/downloads to check for new versions of camera firmware, updated operation guides, and post-production software.

Your REDMOTE also requires a firmware upgrade. For more information on upgrading your REDMOTE, go to “Upgrade REDMOTE Firmware” on page 120.

VERIFY CURRENT CAMERA FIRMWARE

To see the firmware version that is currently installed on your DSMC, go to **Menu** > **Settings** > **Maintenance** > **System Status** > **Camera Info**.

The current firmware version displays. A higher number reflects a later release.

UPGRADE DSMC FIRMWARE

Install the most recent firmware. Unless otherwise specified in the online release notes, you do not need to upgrade to any firmware in between your current version and the most recent version available online.

NOTE: You must black shade an EPIC DRAGON or SCARLET-X DRAGON after upgrading it.

NOTE: Upgrading your camera deletes all in-camera user-generated Preset, Look, and Custom Overlay files.

1. If you have user-generated preset files on your camera, follow the instructions below to save the files to an SSD:
   A. Power up the camera, insert an SSD (RED MINI-MAG or RED STATION REDMAG 1.8") into the camera, and format the SSD.
   B. Go to **Menu** > **Presets** and copy user-generated Camera Preset and Look files to the SSD.
   C. Go to **Menu** > **Settings** > **Display** > **Monitor Control** and copy user-generated Overlay files to the SSD.
   D. Shut down the camera, and remove the SSD. You will copy the files back to your camera after the upgrade procedure, as described in Step 13.
2. Connect an SSD (RED MINI-MAG or RED STATION REDMAG 1.8") to your computer.

   NOTE: On Mac computers with REDCINE-X PRO installed, RED Watchdog mounts the SSD as Read-Only by default, which means that you are unable to write files (including firmware upgrade files) to the SSD. Change the **Mount** preference to **Read-Write** before attempting to copy firmware to the SSD.
3. Download the most recent firmware for your DSMC from www.red.com/downloads:
   – **EPIC DRAGON Firmware**: Firmware for any EPIC BRAIN with a DRAGON sensor.
   – **SCARLET DRAGON Firmware**: Firmware for any SCARLET BRAIN with a DRAGON sensor.
   – **SCARLET Firmware**: Firmware for any SCARLET BRAIN with a MYSTERIUM-X sensor.
   – **EPIC Firmware**: Firmware for any EPIC BRAIN with a MYSTERIUM-X sensor.
4. Unzip the firmware zip file.
5. Copy the **force_upgrade** folder and its contents to the top level of the SSD directory.
6. Eject or unmount the SSD, and then remove the SSD.

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7. Ensure the camera is powered down and the REDMOTE is undocked.
8. Insert the SSD with the force_upgrade folder into your DSMC.
9. Power up the DSMC.

   The upgrade automatically runs at power up.

   During upgrade, the fans run at high speed and the PWR and REC LEDs flash green. After approximately 15 seconds, the LEDs stop flashing and the camera powers down. Nothing displays on the external monitors during the upgrade.
10. After the camera powers down, remove the SSD and wait 10 seconds.
11. Power up the camera.

    The camera may take 30 seconds or longer to upgrade all the attached modules. During this time the PWR and REC LEDs flash green and nothing displays on the external monitors.
12. Go to **Menu** > **Settings** > **Maintenance** > **System Status** > **Camera Info** and verify that the firmware version listed matches the firmware version that you downloaded.
13. To restore user-generated preset files to your camera, follow the instructions below:
    A. Power up the camera and insert the SSD with the saved preset files into the camera.
    B. Go to **Menu** > **Presets** and copy user-generated Camera Preset and Look files from the SSD to the camera.
    C. Go to **Menu** > **Settings** > **Display** > **Monitor Control** and copy user-generated Overlay files from the SSD to the camera.
14. After upgrading an EPIC DRAGON or SCARLET-X DRAGON, go to **Menu** > **Settings** > **Maintenance** > **Calibrate** > **Sensor** and black shade your camera using the **Black Shading (default)** option. For more information about black-shading, go to “Sensor Calibration” on page 81.

    NOTE: You must black shade an EPIC DRAGON or SCARLET-X DRAGON after upgrading it.
15. After offloading firmware upgrade files and/or preset files from any SSD, reformat the SSD before recording to it.

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08 AUDIO SUBSYSTEM

AUDIO FORMAT

The audio format is always either 2 or 4 channels of 24-bit audio data recorded at 48kHz. The audio data is embedded in the R3D file and can be exported from REDCINE-X into separate audio files.

CHANNEL SETUP

The audio channels are set up under SETTINGS > AUDIO > AUDIO CHANNELS. Separate tabs exist to set up the channel 1/2 and channel 3/4 properties.

SOURCE SELECTION

Audio is always recorded at channel pairs. Each of the two channel pairs can be assigned to one of the following sources:

- None
- Camera Analog Microphone Input (Cam Analog)
- PRO I/O Analog Microphone/Line In Input (PRO I/O Analog)
- PRO I/O AES A or AES B Digital Input (PRO I/O AES A)

NOTE: AES A can only be assigned to channel 1/2, and AES B can only be assigned to channel 3/4.

CHANNEL MODES

The analog sources can be set to different modes to match the incoming audio signals. The following camera input modes are available: BALANCED MICROPHONE, UNBALANCED MICROPHONE. If you're using the PRO-I/O MODULE, these additional modes are also available: LINE IN 0 DBU and LINE IN 0 VU.

- **Balanced**: Balanced microphone input. Usually used with microphones that provide XLR connectors and have an internal battery. If you select BALANCED, you can enable the 48V Phantom Power.
- **Unbalanced**: Unbalanced microphone input with 3.3V bias. This type of input is usually provided by unpowered microphones with 3.5 mm TRS plug.
- **Line In 0 dBu**: Fixed input gain with limiter settings if limiter is enabled. (Only available with the PRO-I/O MODULE.)
- **Line In 0 VU**: Same gain as 0 dBu but different compression/limiter settings if enabled. If no limiter is enabled, Line In 0 dBu and Line In 0 VU behave the same. (Only available with the PRO-I/O MODULE.)

PHANTOM POWER

Audio inputs that are set to BALANCED MICROPHONE input can enable the 48V phantom power on a per-channel basis.

NOTE: Phantom Power is not available on non-upgraded EPIC-M's and early EPIC-X. If your camera does not allow you to select PHANTOM POWER, please contact your Bomb Squad representative for upgrade information.

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LIMITER

A limiter can be added to the analog input signal chain that adds about 12 dB dynamic headroom to avoid clipping on signal spikes. While it is best practice to use an external audio mixer to control the signal strength the limiter can be used in more dynamic environments where an external mixer is not practical to reduce the risk of clipped audio samples.

NOTE: The limiter is not available on non-upgraded EPIC-M's and early EPIC-X. Please contact your Bomb Squad representative for upgrade information.

AUDIO RECORDING

Audio Recording is enabled if any of the input channel pairs are set to anything other than NONE. For successful audio recording, the following parameters need to be set correctly:

- At least one channel pair has a currently present source selected
- Input gain is set correctly so that the Peak Meter shows valid data
- None of the following modes are enabled:
  - Varispeed mode (framerate differs from project rate)
  - Single frame MoCo mode
  - Timelapse mode
  - Ramp mode
  - Single frame stills mode

NOTE: Even if audio is not recorded (in varispeed, single frame, timelapse, or ramp mode), audio will be passed through to the headphones.

PEAK METER

The peak meters always show the incoming audio signal, no matter if the channel is recorded or not, as long as a source is selected. When a channel is actively recorded, the channel has a lighter outline and the channel indicator left of the peak meter is green.

The peak meters are updated 12 times per second with the maximum signal from the last 1/12 of a second period. If the input signal exceeds –1 dBFS, the whole bar is red.

The total range of the peak meter is –52 dBFS to 0 dBFS. From left to right, the lines on the meter correspond to the following dBFS values:

- **First line (far left border; solid)**: –52 dBFS
- **Second line (solid)**: –20 dBFS
- **Third line (dashed)**: –12 dBFS
- **Fourth line (dashed)**: –2 dBFS
- **Fifth line (far right border; solid)**: 0 dBFS

NOTE: In the American broadcast and post-production systems, –20 dBFS roughly corresponds to 0 VU and 4 dBu. In a digital system, dBu is just an approximation; the technically correct unit for digital audio levels is dBFS.

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DATA PATH

The following diagram outlines the data flow in Preview. The only difference in playback is that the data comes from the R3D file and the input channel selection is disabled.

HD-SDI/HDMI EMBEDDED AUDIO

HDMI/HD-SDI audio output is limited to the first two channels and the channels will be the same between HDMI and HD-SDI.

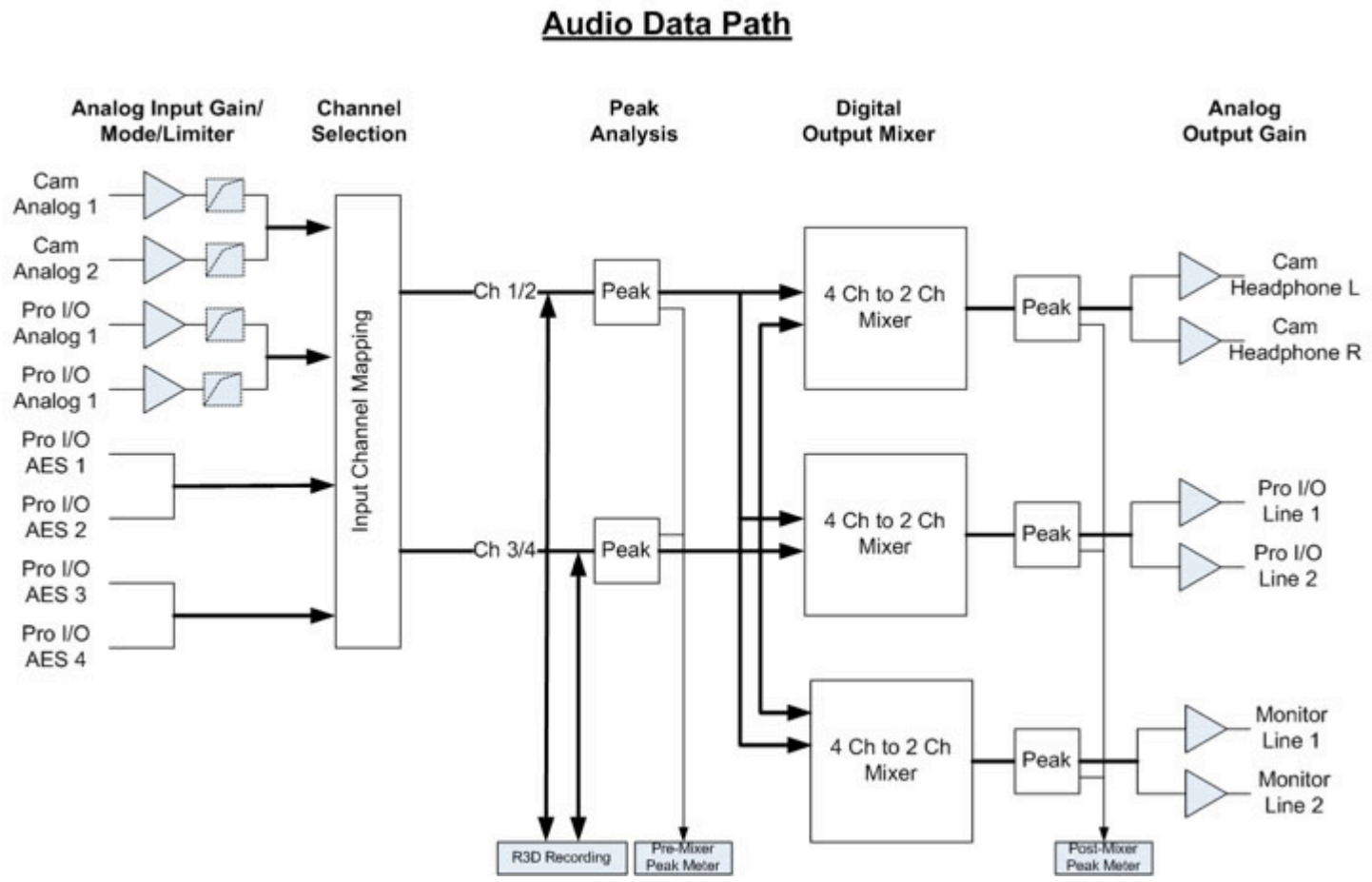
AUDIO CONTROL

Audio channel level inputs are displayed in the lower section of the screen. When audio is enabled, the circle next to CH1, CH2 etc... will be green and the box around the signal will be highlighted.

When setting the levels for Camera, Rear, and Monitor Mix, the VU meter will show the output levels for these ports. The display can be permanently switched to display the audio levels for the output, which is helpful in external recording mode.

PRE-AMP

Allows you to adjust pre-amplifier levels. Range 30 to 60 dB.



HEADPHONE

Allows you to adjust levels for headphones that you plug into the DSMC BRAIN. Range –28 dB to –0 dB.

The headphone output volume can be set individually for each channel. (Or can be linked together as the input gain controls.)

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Additionally, the output of each channel may be muted individually.

The signal strength of the line out cannot be controlled and is fixed at –15 dB gain. Line input will pass without gain through the system.

CAM MIX, REAR MIX, AND MONITOR MIX

- **Cam Mix (Camera Mix)**: Controls audio for the camera.
- **Rear**: Controls audio for any rear module, such as the PRO I/O MODULE. The input gain is fixed.
- **Monitor**: Controls audio output levels to external HDMI and HD-SDI monitors.

Audio tracks may be assigned to the Left, Middle, or Right side of a stereo mix.

Additionally each channel can be enabled/disabled independently in the output mix.

As this is a digital mixer, each output is normalized to not exceed the output signal range. This means that if for example 1 channel is passed through to an output and a second channel is mixed into the same output, the level of the first channel will drop to half.

AUDIO DURING PLAYBACK

During playback the same audio controls for the volume out and the headphone and PRO I/O mixer are available. All channels recorded will be played back.

Audio output will be unmuted automatically when entering playback mode.

AUDIO CONTROL

Audio channel level inputs are displayed in the lower section of the screen. When a channel was recorded, the channel has a lighter outline and the channel indicator left of the peak meter is green.

PRE-AMP

Allows you to adjust pre-amplifier levels. Range 30 dB to 60 dB.

HEADPHONE

Allows you to adjust levels for headphones that you plug into the DSMC BRAIN. Range –28 dB to –0 dB.

CAM MIX, REAR MIX, AND MONITOR MIX

- **Cam Mix (Camera Mix)**: Controls audio for the camera.
- **Rear Mix**: Controls audio for any rear module, such as the PRO I/O MODULE.
- **Monitor Mix**: Controls audio output levels to external HDMI and HD-SDI monitors.

Audio tracks may be assigned to the Left, Middle, or Right side of a stereo mix.

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

Audio is always recorded at channel pairs. Each of the two channel pairs can be assigned to one of the following sources:

- None
- Camera Analog Microphone Input (Cam Analog)
- PRO I/O Analog Microphone/Line In Input (PRO I/O Analog)
- PRO I/O AES A or AES B Digital Input (PRO I/O AES A)

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

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MODE

The following camera input modes are available: BALANCED MICROPHONE, UNBALANCED MICROPHONE. If you're using the PRO-I/O MODULE, these additional modes are also available: LINE IN 0 DBU and LINE IN 0 VU.

LINK

Enables linkage between Channel Gain controls.

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09 REDMOTE OPERATION

OVERVIEW

The REDMOTE is a camera control unit for RED DSMCs that attaches to the rear of the DSMC BRAIN or rearmost expansion module. The REDMOTE may also be detached from the camera or rearmost module and provide wireless remote control of the camera over proprietary REDLINK™ protocol. The REDMOTE has 16 wireless channels starting at 2.4GHz and ending at 2.4835GHz.

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.

The 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 or cell phone charger. Under typical operating conditions, the REDMOTE should operate for up to 8 hours without requiring a re-charge and support a wireless communication range of approximately 50 ft.

CONTROL, CONNECTORS AND DISPLAY

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

CONTROLS

REDMOTE

For a full list of all REDMOTE user keys and their default actions, go to “Default Key Functions” on page 138.

IMPORTANT: For the REDMOTE to operate properly, ensure that both REDMOTE and DSMC firmware are upgraded to the most recent versions.

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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 the current firmware, 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.

LED	COLOR/FLASHING	DESCRIPTION
UPPER LED	Red	Camera startup; camera recording
LOWER LED (REC)	Green	Camera ready; REDMOTE connected
	Green flashing	Searching/Establishing communication

ROCKER SWITCH

The function of the ROCKER SWITCH may be assigned by the operator to one of a number of operational controls.

For a full list of all REDMOTE user keys and their default actions, go to “Default Key Functions” on page 138.

USER FUNCTION KEYS

The function of each User Function Key may be assigned by the operator to one of a number of operational controls.

For a full list of all REDMOTE user keys and their default actions, go to “Default Key Functions” on page 138.

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.

NAVIGATION GROUP

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

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.

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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 the current firmware, 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.

NOTE: In the current firmware, 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.

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.
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.

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.

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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.

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. The camera settings and status are displayed on the REDMOTE LCD.

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 24 FPS 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.

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.

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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 menus (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 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.

   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.
3. 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.

   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.

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.

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.

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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.

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 **Soft Menu Button 2** 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.
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**.
6. Select **Setup Slot** and press the **Enter** button.

   A new Setup window will appear displaying available parameters to display.
7. Select the desired parameter and press the **Enter** button.

   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.

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 REDMOTE.

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 REDMOTE 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 REDMOTE will continue to operate when in the wireless mode after no detected activity (i.e. no button presses are detected) before powering down.

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Default value is OFF. (REDMOTE 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 the current firmware, buttons 7 and 8 are undefined.

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 flash, 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. 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).

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2. Connect the Mini-USB end to the REDMOTE USB Port located on the lower right side (under rubber protective cover).

   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.

   Green battery indicator will flash, indicating REDMOTE is charging.

   A fully discharged REDMOTE battery will be fully charged in approximately 6 hours.

UPGRADE REDMOTE FIRMWARE

UPGRADE REDMOTE THROUGH DSMC

When you dock a REDMOTE on the DSMC, the DSMC checks to see if the REDMOTE is running the latest firmware. If the REDMOTE firmware is slightly outdated, you have the option to update the REDMOTE through the DSMC, without having to install updates from a USB. If the REDMOTE firmware is severely outdated, the screen will tell you to install the most recent version from a USB.

UPGRADE REDMOTE (MACINTOSH)

INSTALL REDMOTE UPGRADE UTILITY (MACINTOSH)

The REDMOTE Upgrade Utility allows you to upgrade the firmware on your REDMOTE.

NOTE: You must pair the REDMOTE to the camera after you upgrade the REDMOTE with the REDMOTE Upgrade Utility.

1. Download the **DSMC Toolkit** file located at www.red.com/downloads.
2. Uncompress and open the **DSMC_Toolkit_vX.X** zip file.
3. Open the **REDMOTE_Upgrade_Utility** folder.
4. Open the **Mac** folder.
5. Open **REDMOTE.dmg**.
6. Open **REDMOTE Upgrade Utility.**
7. Go to “Configure REDMOTE Connection with Computer (Macintosh)” on page 120.

CONFIGURE REDMOTE CONNECTION WITH COMPUTER (MACINTOSH)

The next step in upgrading REDMOTE firmware is to establish communication between the computer and the REDMOTE.

1. Connect a USB to mini-USB cable between the MAC and the USB connector on the REDMOTE.

   NOTE: When properly connected to the PC, the battery charge indicator will flash.
2. Go to **System Preferences** and choose **Network**.

   NOTE: This may open automatically when the REDMOTE is connected.
3. Look for a device called **RNDIS/ ...Gadget**.
4. Change **Configure IPv4** setting to **Manually**.
5. In the **IP Address** field, enter **192.168.0.1**.
6. In the **Subnet Mask** field, enter **255.255.255.0**.
7. Click **Apply**.

   The Status should change to Connected after changes.

   NOTE: After entering the IP address as shown above you may not connect during the upgrade procedure. If you go back and check the IP address you see that it is 0.0.0.0 and the status of the device is shown as Connected, you may need to enter the IP address again.

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8. Go back to **REDMOTE Upgrade Utility** and click **Connect** to establish communication with the REDMOTE.

   Connection is Established With REDMOTE will be displayed when connected. If the connection is not established, then disable all internet connections and try again.
9. Go to "Upgrade REDMOTE Firmware (Macintosh)" on page 121.

UPGRADE REDMOTE FIRMWARE (MACINTOSH)

The following information will guide you through proper updating of your REDMOTE firmware.

1. Download the **REDMOTE Firmware** file located at www.red.com/downloads.

   NOTE: Review the **read_me_redmote_vX.X.XX** instructions contained in the **REDMOTE_vX.X.XX.zip** file.
2. Uncompress the zip file.
3. Open the **REDMOTE_vX.X.XX** folder.
4. Click **Select File** in **REDMOTE Upgrade Utility**.
5. Open the **redmote.1.bin** file in the **REDMOTE_Firmware_vX.X.XX** folder.

   The following displays: "Selected File: redmote.1.bin".
6. Click **Start Upgrade**.

   The following displays: "File Transfer Progress".

   The REDMOTE displays the following: "Upgrading Firmware...". A green status bar show sthe progress of the upgrade. The upgrade process can also be tracked on another display.

   After the file transfer is completed, the REDMOTE displays the following: "Firmware Upgrade Successfully Done".
7. Click **OK**.
8. Click **Disconnect** to close the REDMOTE Upgrade Utility.

   The REDMOTE reboots.

   After the upgrade is complete, the REDMOTE displays "POWER UP" and then "SEARCHING".
9. Select **Cancel**.
10. Go to **Settings** > **Maintenance** > **System Status** > **Camera Info** and verify the current REDMOTE firmware version.

    The REDMOTE upgrade is complete and you can now attach it to the DSMC BRAIN.

    NOTE: You may not need to pair the REDMOTE after upgrading REDMOTE firmware. However, you must pair the REDMOTE after you upgrade camera firmware.

UPGRADE REDMOTE (WINDOWS)

INSTALL REDMOTE UPGRADE UTILITY (WINDOWS)

The REDMOTE Upgrade Utility allows you to upgrade the firmware on your REDMOTE.

NOTE: You must pair the REDMOTE to the camera after you upgrade the REDMOTE with the REDMOTE Upgrade Utility.

1. Download the **DSMC Toolkit** file located at www.red.com/downloads.
2. Uncompress and open the **DSMC_Toolkit_vX.X** zip file.
3. Open the **DSMC_Toolkit_vX.X** zip file.
4. Open the **REDMOTE_Upgrade_Utility** folder.
5. Open the **Win** folder.
6. Open **REDMOTE_upgrade_setup.exe**.
7. Click **Extract All**.

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8. Select a destination and click **Extract**.

   NOTE: If you receive an error when attempting to install the REDMOTE Upgrade Utility, right-click the setup file and select **Run as Administrator** to proceed.
9. Go to the location where you extracted the **DSMC_Toolkit_vX.X** file.
10. Open the **REDMOTE_Upgrade_Utility** folder.
11. Open the **Win** folder.
12. Open **REDMOTE_upgrade_setup.exe**.

    The License Agreement opens.
13. Click **I Agree**.
14. Ensure that the **Install REDMOTE Firmware update** check box is selected and click **Next**.
15. Select a destination and click **Next**.
16. Select the **Start Menu** folder in which you would like to create the program's shortcuts. The default is **REDMOTE Update**.
17. Click **Install**.
18. Click **Close** after setup completes successfully.
19. Go to "Configure REDMOTE Connection with Computer (Windows)" on page 122.

CONFIGURE REDMOTE CONNECTION WITH COMPUTER (WINDOWS)

The next step in upgrading REDMOTE firmware is to establish communication between the computer and the REDMOTE.

1. Connect a USB to mini-USB cable between the PC and the USB connector on the REDMOTE.

   If connecting for the first time, a RNDIS/Gadget driver will be installed on the system.

   When the driver is installed, the battery charge indicator flashes on the REDMOTE.

   NOTE: If the REDMOTE will not connect to the PC, download the **REDMOTE Firmware** file from www.red.com/downloads, open the **read_me_redmote_vX.X.XX** file, and follow the instructions to manually set up the network connection. For additional assistance, contact RED SUPPORT at https://support.red.com.
2. Open the **REDMOTE_update** program from the **Start Menu** folder you created the shortcut for.
3. Click **Connect** to establish communication between the REDMOTE and REDMOTE_update.

   The following displays when the REDMOTE is connected: "Connection is Established With REDMOTE". If the connection is not established, disable all internet connections and try again.
4. Go to "Upgrade REDMOTE Firmware (Windows)" on page 122.

UPGRADE REDMOTE FIRMWARE (WINDOWS)

The following information will guide you through proper updating of your REDMOTE firmware.

1. Download the **REDMOTE Firmware** file located at www.red.com/downloads.

   NOTE: Review the **read_me_redmote_vX.X.XX** instructions contained in the **REDMOTE_vX.X.XX.zip** file.
2. Uncompress the zip file.
3. Open the **REDMOTE_Firmware_vX.X.XX** folder.
4. Click **Select File** in **REDMOTE Upgrade Utility**.
5. Navigate to the **redmote.1.bin** file located in the **REDMOTE_Firmware_vX.X.XX** folder and click **Open**.

   The following displays: "Selected File: redmote.1.bin".
6. Click **Start Upgrade**.

   The following displays: "File Transfer Progress".

   The REDMOTE displays the following: "Upgrading Firmware...". A green status bar show sthe progress of

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the upgrade. The upgrade process can also be tracked on another display.

After the file transfer is completed, the REDMOTE displays the following: “Firmware Upgrade Successfully Done”.

7. Click **OK**.
8. Click **Disconnect** to close the REDMOTE Upgrade Utility.

   The REDMOTE reboots.

   After the upgrade is complete, the REDMOTE displays “POWER UP” and then “SEARCHING”.
9. Select **Cancel**.
10. Go to **Settings** > **Maintenance** > **System Status** > **Camera Info** and verify the current REDMOTE firmware version.

    REDMOTE upgrade is complete and you can now attach it to the DSMC BRAIN.

    NOTE: You may not need to pair the REDMOTE after upgrading REDMOTE firmware. However, you must pair the REDMOTE after you upgrade camera firmware.

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A INPUT/OUTPUT CONNECTORS

SSD MODULE CONNECTORS

The connectors for the following modules are described in detail in the RED DSMC Media Operation Guide, available at www.red.com/downloads:

- Side SSD modules
- REAR SSD MODULE

CAMERA BRAIN

CAMERA BRAIN FRONT

EPIC BRAIN and Side SSD Module

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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.

Nominal input impedance for each microphone jack is 2.4K ohm.

Microphone Input Connector

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

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 0 dBu (-20 dBFS) and 0 VU (-16 dBFS) levels.

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

COMPATIBLE CABLE

- **790-0229**: XLR Microphone Cable (20")

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CAMERA BRAIN REAR

HD-SDI OUT

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	N/A

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.

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.

COMPATIBLE CABLE

- **790-0341**: RED HD-SDI Cable (6')

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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.

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.

COMPATIBLE CABLE

- **790-0331**: RED HDMI Cable (5')

HEADPHONE

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

Headphone Output Connector

PIN	SIGNAL	DESCRIPTION	DIRECTION
TIP	LEFT	Left channel audio	Out
RING	RIGHT	Right channel audio	Out
SLEEVE	GND	Camera ground	N/A

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

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

NOTE: In the current firmware, the above selection is not available; the output is set to 1L/2R.

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SYNC (VIDEO SYNC)

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

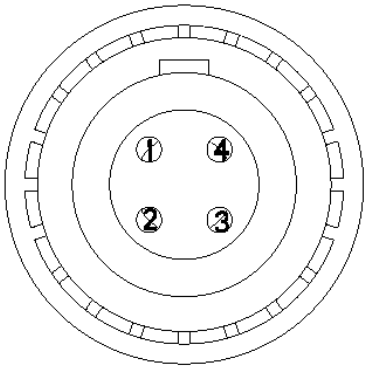
The shutter Sync input signal acts as an immediate response hardware trigger to commence a scan. This is useful for motion control and other applications where the camera is driven by a master timing device. When using SYNC as the camera shutter timing reference, fine shutter start time timing (SHUTTER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

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. Sensor shutter sync to GENLOCK is only supported with HD-SDI.



SYNC (Video Sync) 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

The Camera BRAIN's Shutter Sync/GPI Trigger uses a 3.3 V Schmitt trigger (5 V tolerant). It is not a switch closure circuit. Therefore, it requires 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

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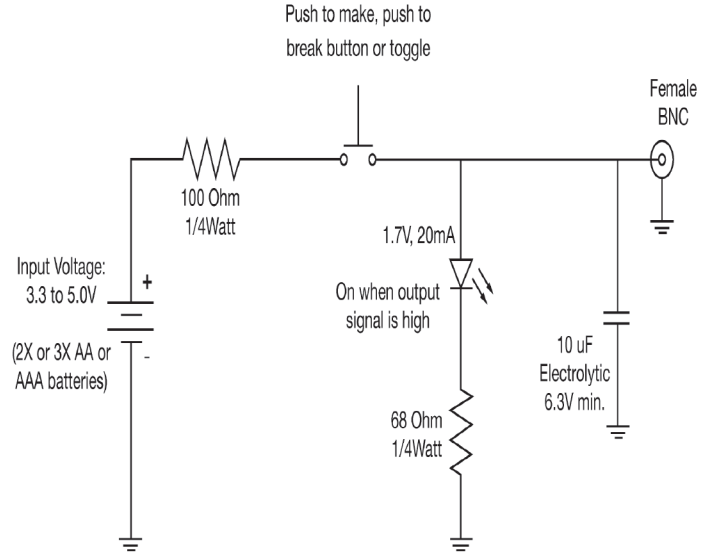
TRIGGER BUTTON CIRCUIT



Component values are approximate.
Use standard values.

COMPATIBLE CABLES

- **790-0154**: 3BNC-to-00 LEMO Sync Cable
  - **White BNC**: Shutter Sync/GPI
  - **Yellow BNC**: SMPTE Timecode
  - **Green BNC**: RS170A Genlock
- **790-0187**: 4-Pin 00 LEMO-to-Flying Lead
- **790-0415**: RED Start/Stop Cable (14-Pin LEMO to SYNC, CTRL, BNC)
- **790-0428**: RED Start/Stop Cable (14-Pin to 00 SYNC)

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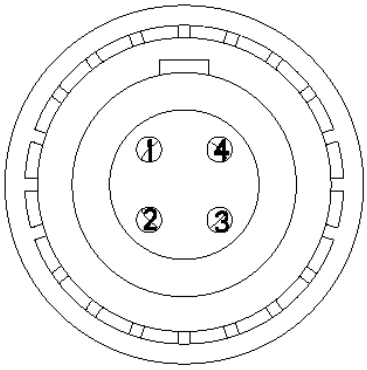
CTRL (RS232 CONTROL)

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.



CTRL (RS232) Connector
Mating Connector: 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

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.

COMPATIBLE CABLES

- **790-0187**: 4-Pin 00 LEMO-to-Flying Lead
- **790-0415**: RED Start/Stop Cable (14-Pin LEMO to SYNC, CTRL, BNC)

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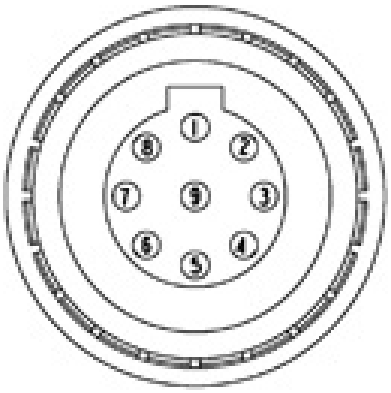
GIG-E (ETHERNET)

The GIG-E 9-pin LEMO connector provides a 1000BASE-T (IEEE 802.3ab) gigabit Ethernet connection for remote camera setup, master/slave camera communication, and external metadata ingest. Since the GIG-E connector does not support slower speeds (10BASE-T and 100BASE-T), ensure that any device you connect to supports 1000BASE-T.



GIG-E Connector
Mating Connector: FGG.0B.309.CLAD32Z

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

COMPATIBLE CABLES

- **790-0159**: LEMO-to-CAT5E Ethernet Cable (9')
- **790-0163**: Master/Slave Gig-E Cable (4')

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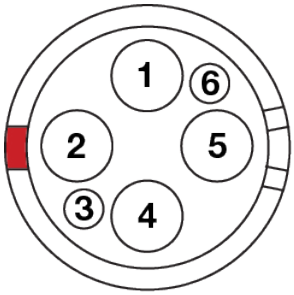
DC IN (POWER INPUT)

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.



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	+VBATT	N/A
3	SCL-BATT	Serial Battery Bus Clock
4	GROUND	Power Return (Camera Ground)
5	GROUND	N/A
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.

COMPATIBLE CABLES

- **790-0138**: 2B-to-1B LEMO Power Adaptor Cable
- **790-0164**: XLR Power Cable (10')
- **790-0165**: XLR Power Cable (30")

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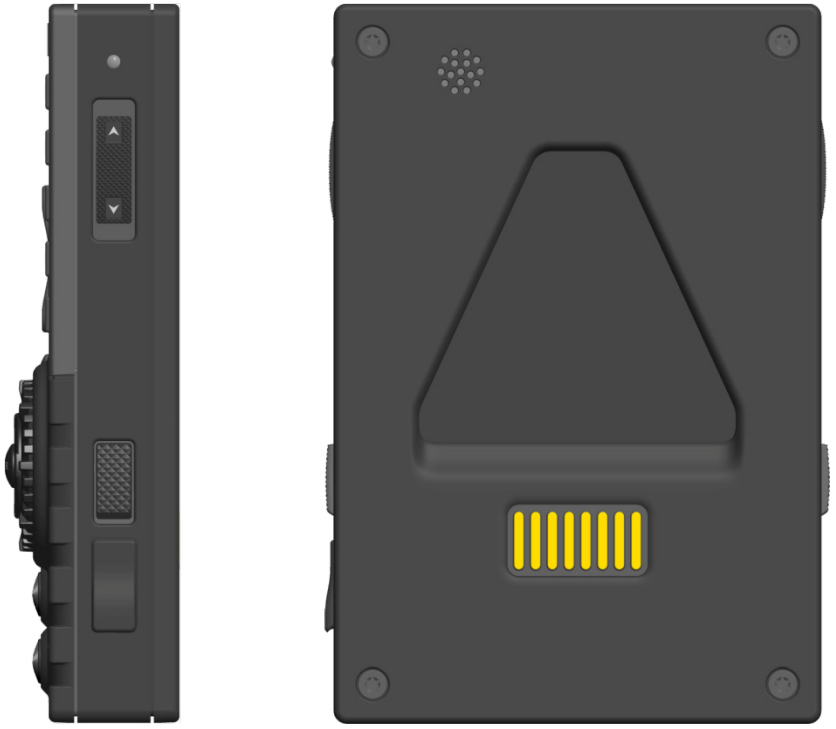
REDMOTE

This section describes the physical connectors on the REDMOTE.



REDMOTE

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.

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B SUPPORTED LENSES

WARNING: All lenses are hot swappable. However, lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install lens mounts while the camera is powered on. Before installing or removing lens mounts, you MUST power down the camera. Failure to do so may result in damage to the lens mounts or DSMC that will not be covered under warranty.

LENS WEIGHT AND LENS SUPPORT

Use a lens support system when mounting heavy or long lenses to your camera.

When mounting a heavy or long lens, ensure that the full weight of the lens is never directly on the camera or lens mount. Mount the lens to the support system first, and then carefully mount the lens to the camera.

Due to the lightweight construction of the carbon fiber BRAIN and magnesium mounts, most setups with the carbon fiber BRAIN require a lens support system for all but the lightest lenses.

WARNING: Failure to use lens supports appropriate for the lens and camera setup may lead to damage of the DSMC and lens mount. Any damage caused by not using a lens support system will not be covered under warranty.

DSMC PL MOUNT SUPPORTED LENSES

The DSMC TI PL Mount, DSMC PL Mount (Magnesium), and the DSMC RED Motion Mount Ti PL are designed to work with most standard PL mount cinema lenses and devices. For information about the compatibility of the DSMC RED Motion Mount Ti PL, see the DSMC Media Operation Guide at www.red.com/downloads.

WARNING: Using a non-standard PL mount lens or device with a DSMC PL mount may damage the DSMC and lens mount. Any damage caused by not using a standard PL mount lens or device will not be covered under warranty.

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DSMC CANON MOUNT SUPPORTED LENSES

The DSMC Canon Mount and DSMC Canon MOTION MOUNT electronically support the following lenses:

COMPATIBLE LENS TYPE	FOCAL LENGTH
Canon EF	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 20mm f/2.8 USM
	Canon EF 24mm f/1.4L II
	Canon EF 24mm f/2.8
	Canon EF 24mm f/2.8 IS USM
	Canon EF 24-70mm f/2.8L
	Canon EF 24-70mm f/2.8L II USM
	Canon EF 24-70mm f/4L IS USM
	Canon EF 24-105mm f/4L IS
	Canon EF 28mm f/1.8 USM
	Canon EF 28mm f/2.8
	Canon EF 28mm f/2.8 IS USM
	Canon EF 28-300mm f/3.5-5.6L IS
	Canon EF 35mm f/1.4L
	Canon EF 35mm f/2
	Canon EF 35mm f/2.0 IS USM
	Canon EF 50mm f/1.2L
	Canon EF 50mm f/1.4 USM
	Canon EF 50mm f/2.5 Compact Macro
	Canon EF 70-200mm f/2.8L IS
	Canon EF 70-200mm f/2.8L IS II USM
	Canon EF 70-200mm f/2.8L USM
	Canon EF 70-200mm f/4L
	Canon EF 70-300mm f/4.5-5.6 DO IS USM
	Canon EF 70-300mm f/4-5.6L IS
	Canon EF 70-300mm f/4-5.6L IS USM
	Canon EF 85mm f/1.2L II
	Canon EF 85mm f/1.8 USM
	Canon EF 100mm f/2.0 USM
	Canon EF 100mm f/2.8L Macro IS USM
	Canon EF 100-400mm f/4.5-5.6L IS
	Canon EF 135mm f/2.0L
	Canon EF 135mm f/2.8 Soft Focus
	Canon EF 180mm f/3.5L Macro
	Canon EF 200mm f/2.0L IS
	Canon EF 200mm f/2.8L II
	Canon EF 200-400mm f/4L IS USM Extender 1.4x
	Canon EF 300mm f/2.8L IS
	Canon EF 300mm f/2.8L IS II USM
	Canon EF 300mm f/2.8L IS II USM with 1.4x III Extender
	Canon EF 300mm f/2.8L IS II USM with 2x III Extender
	Canon EF 300mm f/4L IS
	Canon EF 400mm f/2.8 IS II USM
	Canon EF 400mm f/2.8L IS
	Canon EF 400mm f/2.8L IS with 1.4x Extender
	Canon EF 400mm f/2.8L IS with 2x Extender

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COMPATIBLE LENS TYPE	FOCAL LENGTH
Canon EF	Canon EF 400mm f/2.8L IS II Canon EF 400mm f/4.0 DO IS Canon EF 400mm f/5.6L Canon EF 500mm f/4L IS Canon EF 500mm f/4L IS USM Canon EF 500mm f/4L IS with 1.4x Extender Canon EF 500mm f/4L IS with 2x Extender Canon EF 500 f/4L IS II USM Canon EF 600mm f/4L IS Canon EF 600mm f/4L IS II USM Canon EF 800mm f/5.6L IS
Canon EF-S	Canon EF-S 10-22mm f/3.5-4.5 USM Canon EF-S 15-85mm f/3.5-5.6 IS 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	Sigma 10-20mm f/3.5 EX DC HSM Sigma 18-35mm DC HSM Sigma 20mm f/1.8 EX DG ASP RF Sigma 24mm f/1.8 EX DG ASP Macro AF Sigma 24-70mm f/2.8 IF EX DG HSM Sigma 28mm f/1.8 EX DG ASP Macro AF Sigma 50mm f/1.4 EX DG HSM Sigma 85mm f/1.4 EX DG HSM
Sigma APO	Sigma APO 120-300mm f/2.8 EX DG OS HSM Sigma APO 180mm f/2.8 Macro EX DG OS HSM
Tamron	Tamron SP 10-24mm f/3.5-4.5 Di II
Tokina AT-X 116 Pro	Tokina AT-X 116 Pro DX, 11-16mm f/2.8 SD IF DX Tokina AT-X 116 Pro DX-II, 11-16mm f/2.8 SD IF DX
Zeiss Distagon	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 Makro-Planar	Zeiss Makro-Planar 50mm f/2 Zeiss Makro-Planar 100mm f/2
Zeiss Otus	Zeiss Otus 55mm f/1.4
Zeiss Planar	Zeiss Planar 50mm f/1.4 ZE Zeiss Planar T* 85mm f/1.4

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DSMC NIKON MOUNT SUPPORTED LENSES

The DSMC Nikon Mount electronically supports the following lenses:

COMPATIBLE LENS TYPE	FOCAL LENGTH
Nikkor AF	AF Nikkor 50mm f/1.8D AF DX Fisheye-Nikkor 10.5mm f/2.8G ED AF Fisheye-Nikkor 16mm f/2.8D[1]
Nikkor AF-S	AF-S Nikkor 14-24mm f/2.8 G ED AF-S Nikkor 17-35mm f/2.8D ED IF AF-S Nikkor 17-55mm f/2.8G ED DX AF-S Nikkor 24mm f/1.4 G ED AF-S Nikkor 24-70mm f/2.8 G ED AF-S Nikkor 35mm f/1.4 G AF-S Nikkor 40mm f/2.8G DX AF-S Nikkor 50mm f/1.4 G AF-S Nikkor 70-200mm f/2.8 G II ED VR AF-S Nikkor 85mm f/1.4 G AF-S Nikkor 600mm f/4G ED VR N AF-S Micro-Nikkor 60mm f/2.8 G ED AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED
Sigma	Sigma 18-35mm f/1.8 DC HSM
Tamron	Tamron SP 24-70mm f2.8 Di VC USD[1]
Tokina	Tokina AT-X 107 DX, 10-17mm f/3.5-4.5 Fisheye DX[1] Tokina AT-X 116 Pro DX, 11-16mm f/2.8 SD IF DX[1] Tokina AT-X 116 Pro DX-II, 11-16mm f/2.8 SD IF DX[1]
Zeiss Planar	Zeiss Planar T* 50mm f/1.4 ZF.2[1]

1. Iris control only, no AF.

DSMC LEICA-M MOUNT LENSES

The RED DSMC Leica-M Mount is compatible with all Leica M-series lenses with focal lengths of 50mm and greater, EXCEPT for the 50mm f2.0 Dual-Range Summicron. The 50mm Dual-Range Summicron has a protruding lug on the exterior of the lens body for mounting a supplementary finder, and this lug interferes with the locking ring on the DSMC Leica-M Mount.

Most Leica lenses with focal lengths of less than 50mm will encounter mechanical interference between the rear lens cell and the camera's front panel.

- A new OLPF frame (included) is required to use the Leica-M mount.
- Replacement OLPF frame is compatible with all DSMC lens mounts.
- OLPF frame upgrade may be performed by customer or RED, free of charge.

WARNING: Attempting to mount Leica lenses of focal lengths of less than 50mm could result in damage to the lens and/or the camera.

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C DEFAULT KEY FUNCTIONS

CAMERA BRAIN

KEY	FUNCTION	KEY	FUNCTION
Record Half Press	Key Disabled	Record Half Release	Key Disabled
Record Full Press	Record: Toggle	Record Full Release	Key Disabled
GPI In High	Record: Start	GPI In Low	Record: Stop

DSMC SIDE HANDLE

KEY	FUNCTION	KEY	FUNCTION
User A Press	AF Mode: Cycle	User A Release	Key Disabled
User B Press	WB: Auto Calc	User B Release	Key Disabled
User C Press	Magnify: Toggle	User C Release	Key Disabled
User D Press	Exposure Check: Toggle	User D Release	Key Disabled
User 1 Press	Slot: Set ISO	User 1 Release	Key Disabled
User 2 Press	Slot: Set Aperture	User 2 Release	Key Disabled
User 3 Press	Slot: Set Shutter	User 3 Release	Key Disabled
User 4 Press	Slot: Set Color Temp	User 4 Release	Key Disabled
User 5 Press	Exposure Check: Toggle	User 5 Release	Key Disabled
User 6 Press	Key Disabled	User 6 Release	Key Disabled
User 7 Press	Eject Media	User 7 Release	Key Disabled
User 1+4 Press	SH: Toggle Key Lock	User 1+4 Release	Key Disabled
Still Select	Focus Mode: Still	Movie Select	Focus Mode: Motion
Record Half Press	AF: Start	Record Half Release	Key Disabled
Record Full Press	Record: Toggle	Record Full Release	Key Disabled
Backlight Press	SH: Toggle Backlight	Backlight Release	Key Disabled
Rocker + Press	Iris: Open	Rocker + Release	Key Disabled
Rocker - Press	Iris: Close	Rocker - Release	Key Disabled
Rotary Front CW	Navigation: CW	Rotary Front CCW	Navigation: CCW
Nav Menu Press	Navigation: Menu	Nav Menu Release	Key Disabled
Nav North Press	Navigation: Up	Nav North Release	Key Disabled
Nav South Press	Navigation: Down	Nav South Release	Key Disabled

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DSMC SIDE HANDLE

KEY	FUNCTION	KEY	FUNCTION
Nav West Press	Navigation: Right	Nav East Release	Key Disabled
Nav East Press	Navigation: Left	Nav West Release	Key Disabled
Nav Enter Press	Navigation: Select	Nav Enter Release	Key Disabled
Rotary Jog CW	Navigation: CW	Rotary Jog CCW	Navigation: CCW

SIDE SSD MODULE

KEY	FUNCTION	KEY	FUNCTION
Record Full Press	Record: Toggle	Record Full Release	Key Disabled
Record Half Press	AF: Start	Record Half Release	Key Disabled
User 1 Press	Key Disabled	User 1 Release	Key Disabled
User 2 Press	Key Disabled	User 2 Release	Key Disabled
User 1+2 Press	Eject Media		

REDMOTE

KEY	FUNCTION	KEY	FUNCTION
User A Press	AF Mode: Cycle	User A Release	Key Disabled
User B Press	RAW Check: Toggle	User B Release	Key Disabled
User C Press	Magnify: Toggle	User C Release	Key Disabled
User D Press	Exposure Check: Toggle	User D Release	Key Disabled
Still Select	Focus Mode: Still	Movie Select	Focus Mode: Motion
Record Full Press	Record: Toggle	Record Full Release	Key Disabled
Record Half Press	AF: Start	Record Half Release	Key Disabled
Rocker + Press	Iris: Open	Rocker + Release	Key Disabled
Rocker - Press	Iris: Close	Rocker - Release	Key Disabled
Nav Menu Press	Navigation: Menu	Nav Menu Release	Key Disabled
Nav North Press	Navigation: Up	Nav North Release	Key Disabled
Nav South Press	Navigation: Down	Nav South Release	Key Disabled
Nav West Press	Navigation: Right	Nav East Release	Key Disabled
Nav East Press	Navigation: Left	Nav West Release	Key Disabled
Nav Enter Press	Navigation: Select	Nav Enter Release	Key Disabled
Rotary CW	Navigation: CW	Rotary CCW	Navigation: CCW

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LCD (BRAIN AND REAR)

KEY	FUNCTION	KEY	FUNCTION
Down Press	Br. Down (Decrease brightness)	Up Press	Br. Up (Increase brightness)
User 1 Press	Magnify: Toggle	User 1 Release	Key Disabled
User 2 Press	Exposure Check: Toggle	User 2 Release	Key Disabled
User 1+2 Press	LCD: Toggle Lock		

EVF (BRAIN AND REAR)

KEY	FUNCTION	KEY	FUNCTION
User 1 Press	Magnify: Toggle	User 1 Release	Key Disabled
User 2 Press	Exposure Check: Toggle	User 2 Release	Key Disabled

PRO I/O GPIO

KEY	FUNCTION	KEY	FUNCTION
GPI A High	Key Disabled	GPI A Low	Record: Toggle
GPI B High	Key Disabled	GPI B Low	Record: Toggle
SW 1 High	Key Disabled	SW 1 Low	Go to: Playback
SW 2 High	Key Disabled	SW 2 Low	Record: Toggle

UI SOFT KEYS

KEY	FUNCTION	KEY	FUNCTION
UI Softkey A Press	Key Disabled	UI Softkey 1 Press	Key Disabled
UI Softkey B Press	Key Disabled	UI Softkey 2 Press	Key Disabled
UI Softkey C Press	Key Disabled	UI Softkey 3 Press	Key Disabled
UI Softkey D Press	Key Disabled	UI Softkey 4 Press	Key Disabled

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D | 3D SETUP AND OPERATION

OVERVIEW

The following information outlines basic procedures to connect two RED DSMCs 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 its own METADATA.

MASTER CAMERA

Perform the following steps on the Master camera:

1. Go to **Settings** > **Setup** > **Communication**.
2. Type a name for the camera (CAM A, LEFT, etc) in the **Name** field.
3. For **Target**, select **All**.
4. Give the camera a unique IP address.
5. Go to “Slave Camera” on page 141.

SLAVE CAMERA

Perform the following steps on the Slave camera:

1. Go to **Settings** > **Setup** > **Communication**.
2. Type a name for the camera (CAM B, RIGHT, etc) in the **Name** field.
3. For **Target**, select **None**.
4. Give the camera a unique IP address that is different from the Master camera’s IP address.

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.

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The Reel No, Cam ID and Cam Pos can be set when formatting the media or after formatting by using the SET option.

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
- **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 3rd party device.
4. Yellow BNC connector is for SMPTE unbalanced Timecode input.
5. Green BNC connector is for Tri-Level Sync (Genlock) input.
6. White BNC connector is a dual-purpose (Shutter SYNC input or GPI) input.
7. Go to **Settings** > **Setup** > **GPIO/Sync**.
8. Select **Genlock** from the **Sensor Sync Mode** drop-down menu.
9. Verify the camera's project frame rate matches the Genlock and Timecode generator(s) framerate(s).

   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 **Menu** > **Power** > **Shutdown**, the Slave camera will also power down.

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E 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 records RAW sensor data using wavelet based REDCODE RAW compression to a RED MINI-MAG or 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 post-production 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 stand-alone QuickTime movies using a variety of video codecs including H.264, Apple ProRes and Avid DNxHD.

REDCINE-X PRO is available for download at www.red.com/downloads. The REDCINE-X PRO Operation Guide is included with the download package.

NOTE: You must use REDCINE-X PRO build 22.4 or later to edit .R3D files from DSMC firmware v5.2.9. To see the marked frames from clips shot on DSMC firmware v5.2.9, use build 30 or later.

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F DSMC 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.

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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.

DSMC 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 DSMC 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 performing a back focus adjustment. To remove the plug, use a T10 Torx driver.

NOTE: To perform this procedure as written, you must have a PL mount and RED Focus™. For more information on using the RED Focus, see the RED Focus Operation Guide, available at www.red.com/downloads.

Back focus is adjusted by turning the back focus adjustment on the top of the camera's front plate using a T10 Torx driver. This screw is indicated by a Siemens Star with an arrow pointing to its location.

Back Focus Adjustment Location

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1. Remove the screw-in plug located in the back focus adjustment opening using a T10 Torx driver.
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.
4. Remove the camera lens or sensor cover if equipped.
5. Install RED Focus onto the camera in the position shown.
6. Ensure RED Focus is secured to the camera with the camera lock ring.

RED Focus Installed on DSMC

7. Power up the camera.
8. Power up RED Focus.

   NOTE: Remember that RED Focus will AUTOMATICALLY power down after 3 minutes. Press the Red button on the front to power back up.
9. Go to **Settings** > **Display** > **Tools**.
10. Select **Magnify**.

    NOTE: The “Focus” option located under **Settings** > **Display** > **Tools** can serve as a good double-check for proper focus during this procedure.
11. Insert a T10 Torx driver into the back focus adjustment screw. The screw is oriented at approximately 80° as shown.

Back Focus Adjustment

12. Carefully and slowly, rotate the back focus adjustment screw to achieve optimum focus.
13. Turning CLOCKWISE moves the sensor forward.
14. 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. The back focus adjustment mechanism is self-locking, and does not require a supplementary locking screw.
15. Install the screw-in plug in the back focus adjustment opening using a T10 Torx driver.

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G | TROUBLESHOOT YOUR DSMC

PERFORM A STRESS TEST

Perform a stress test before important projects to ensure the reliability and stability of your gear. A stress test subjects your camera and equipment to the increased stress of prolonged operation. If any components are developing issues, this test will help identify those problems before you have an equipment failure during a major shoot.

1. Configure your DSMC as desired.
2. Perform a black shade calibration (sensor calibration).
3. Enable the Sensor Test Pattern in the Maintenance menu.
4. Select the desired resolution.
5. Select the highest available frame rate.
6. Perform a secure format of the SSD.
7. Record a full SSD of footage.
8. Perform a secure format of the SSD.
9. Repeat step 6 to step 8 to test multiple SSDs.
10. If any errors occur, save a log file and submit a Technical Support request at https://support.red.com.

NOTE: Problems or dropped frames found during the stress test are are displayed as “Errors” in the bottom of the user interface.

PRESET COULD NOT BE APPLIED

SYMPTOM

The camera displays the following message: “Preset Could Not Be Applied”.

POTENTIAL RESOLUTION

Power down the camera, power it back up, and attempt to apply the preset that failed.

CAMERA CANNOT BE PAIRED TO REDMOTE

SYMPTOM

The camera cannot pair to the REDMOTE.

POTENTIAL RESOLUTIONS

- 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 in turned on.
- Ensure camera does not display REDLINK Upgrade Required.

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CANNOT SEE MENUS ON LCD TOUCHSCREEN

SYMPTOM

The LCD touchscreen does not display menus.

POTENTIAL RESOLUTION

Double-tap the LCD touchscreen to exit Clean mode.

SCREEN FREEZES OR DOES NOT DISPLAY

SYMPTOM

The screen freezes or does not display.

POTENTIAL RESOLUTION

Perform a Hard Restore. A Hard Restore functions like a System Restore in that it permits ALL camera configuration and setup data to be reset to factory default values.

To perform a Hard Restore, follow the instructions below:

1. Press and hold the PWR/REC button on the BRAIN for 20 seconds or until the fans turn at a high speed.
2. Release the PWR/REC button.
3. The screen displays on the LCD.

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.

IMAGE APPEARS GRAINY

SYMPTOM

Image or footage appears grainy.

POTENTIAL RESOLUTION

Perform a black shading calibration before recording additional clips. For more information about performing black shading calibrations, go to “Sensor Calibration” on page 81.

BLACK AND WHITE IMAGE

SYMPTOM

The display shows that an image is in black and white, and the menus are still in color.

POTENTIAL RESOLUTIONS

- Go to **Settings** > **Look** > **Color**, and check the **Saturation** setting. If the Saturation setting is set to a low value, change the Saturation to a higher value.
- Perform a System Restore. For more information about performing a System Restore, go to “Restore System” on page 92.

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OFFLINE CLIPS AND AN EXTRA R3D FILE

SYMPTOMS

- After mounting an SSD with clips to your computer, REDCINE-X PRO shows that all or most clips are “Offline”.
- The RDC folder for a clip shows two R3D files. The first R3D file is very small (a few kilobytes).

EXPLANATION

A “phantom” R3D file sometimes results from either of the following:

- **Using Pre-Record**: An extra 12 KB R3D file is created when pressing the Record button too quickly.
- **Using an external start/stop trigger**: An extra 12 KB R3D file is created. This file is very small (a few kilobytes).

In both situations, the expected R3D file is also in the RDC folder, and is completely intact.

POTENTIAL RESOLUTION

Delete the “phantom” file from the RDC folder on your computer. After deleting the file, your clips will load correctly in REDCINE-X PRO.

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H TECHNICAL SPECIFICATIONS

EPIC DRAGON

EPIC DRAGON TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Sensor	19 MEGAPIXEL RED DRAGON™
Pixel Array	6144 (h) x 3160 (v)
S/N Ratio	80 dB
Dynamic Range	16.5+ stops
Max Image Area	6144 (h) x 3160 (v)
Lens Coverage	30.7mm (h) x 15.8mm (v) x 34.5 mm (d)
Lens Mount	DSMC TI PL Mount DSMC TI Canon Mount DSMC AL Canon Mount DSMC AL Leica M Mount DSMC AL Nikon Mount DSMC TI Nikon Mount DSMC RED MOTION MOUNT™ TI PL DSMC RED MOTION MOUNT™ TI CANON (all lens mounts sold separately)
Max Depth of Field	Equivalent to S35mm (Motion)/APS-H (Still) lenses
Acquisition Formats	Go to “EPIC DRAGON Frame Rates” on page 57 for a full list of EPIC DRAGON formats and pixel dimensions
Project Frame Rates	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 FPS, all resolutions
Delivery Formats	4K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	2K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	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
Program Output	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Monitor Output	HD-SDI and HDMI with Frame Guides and Lookaround 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Digital Media	REDMAG 1.8" SSD: 48GB, 64GB, 128GB, 256GB, 512GB RED MINI-MAG: 512GB

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EPIC DRAGON TECHNICAL SPECIFICATIONS	
SPECIFICATION	**DESCRIPTION**
REDCODE™	To see all of the maximum available REDCODE values, see the DSMC Media Operation Guide at www.red.com/downloads
Audio	2 channel, uncompressed, 24 bit, 48KHz
	Optional 4 channel, and AES/EBU digital audio
Monitoring Options	RED TOUCH 5.0" LCD RED PRO 7" LCD RED TOUCH 9.0" LCD BOMB EVF (LCOS) RED BOMB EVF (OLED)
Remote Control	REDLINK Wireless, Ethernet, RS232, GPI Trigger
Weight	5 lbs (body only)
Construction	Aluminum Alloy
Operating Temperature Range	0˚C to 40˚C (32˚F to 104˚F)
Storage Temperature Range	-20˚C to 50˚C (-4˚F to 122˚F)

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EPIC MYSTERIUM-X

EPIC MYSTERIUM-X TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Sensor	14 MEGAPIXEL MYSTERIUM-X™
Pixel Array	5120 (h) x 2700 (v)
S/N Ratio	66 dB
Dynamic Range	13.5 stops, up to 18 stops with HDRx™
Max Image Area	5120 (h) x 2700 (v)
Lens Coverage	27.7mm (h) x 14.6mm (v) x 31.4 mm (d)
Lens Mount	DSMC TI PL Mount DSMC TI Canon Mount DSMC AL Canon Mount DSMC AL Leica M Mount DSMC AL Nikon Mount DSMC TI Nikon Mount DSMC RED MOTION MOUNT™ TI PL DSMC RED MOTION MOUNT™ TI CANON (all lens mounts sold separately)
Max Depth of Field	Equivalent to S35mm (Motion)/APS-H (Still) lenses Equivalent to 16mm (Motion) lens in 2K RAW
Acquisition Formats	Go to "EPIC and SCARLET MYSTERIUM-X Formats" on page 67 for a full list of EPIC MYSTERIUM-X formats and pixel dimensions
Project Frame Rates	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 FPS, all resolutions
Delivery Formats	4K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	2K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	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
Program Output	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Monitor Output	HD-SDI and HDMI with Frame Guides and Lookaround 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Monitor/Program Output	HD-SDI and HDMI with Frame Guides and Lookaround or Clean Feed 1080p 4:2:2 720p 4:2:2 SMPTE Timecode HANC Metadata, 24-bit 48Khz Audio
Digital Media	REDMAG 1.8" SSD: 48GB, 64GB, 128GB, 256GB, 512GB RED MINI-MAG: 512GB
REDCODE™	To see all of the maximum available REDCODE values, see the DSMC Media Operation Guide at www.red.com/downloads
Audio	2 channel, uncompressed, 24 bit, 48KHz Optional 4 channel, and AES/EBU digital audio

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EPIC MYSTERIUM-X TECHNICAL SPECIFICATIONS	
SPECIFICATION	**DESCRIPTION**
Monitoring Options	RED TOUCH 5.0" LCD RED PRO 7" LCD RED TOUCH 9.0" LCD BOMB EVF (LCOS) RED BOMB EVF (OLED)
Remote Control	REDLINK Wireless, Ethernet, RS232, GPI Trigger
Weight	5 lbs (body only)
Construction	Aluminum Alloy
Operating Temperature Range	0˚C to 40˚C (32˚F to 104˚F)
Storage Temperature Range	-20˚C to 50˚C (-4˚F to 122˚F)

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SCARLET-X DRAGON

SCARLET-X DRAGON TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Sensor	19 MEGAPIXEL RED DRAGON™
Pixel Array	6144 (h) x 3160 (v)
S/N Ratio	80 dB
Dynamic Range	16.5+ stops
Max Image Area	6144 (h) x 3160 (v)
Lens Coverage	30.7mm (h) x 15.8mm (v) x 34.5 mm (d)
Lens Mount	DSMC TI PL Mount DSMC TI Canon Mount DSMC AL Canon Mount DSMC AL Leica M Mount DSMC AL Nikon Mount DSMC TI Nikon Mount DSMC RED MOTION MOUNT™ TI PL DSMC RED MOTION MOUNT™ TI CANON (all lens mounts sold separately)
Max Depth of Field	Equivalent to S35mm (Motion)/APS-H (Still) lenses
Acquisition Formats	6K RAW (Full Frame) 5K RAW (Full Frame, 2:1, WS, HD) 4K RAW (Full Frame, 2:1, WS, HD) 3K RAW (Full Frame, 2:1, WS, HD) 2K RAW (Full Frame, 2:1, WS, HD)
Project Frame Rates	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 FPS, all resolutions
Delivery Formats	4K: DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	2K: DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	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
Program Output	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Monitor Output	HD-SDI and HDMI with Frame Guides and Lookaround 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Digital Media	REDMAG 1.8" SSD: 48GB, 64GB, 128GB, 240GB, 256GB, 512GB RED MINI-MAG: 512GB

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SCARLET-X DRAGON TECHNICAL SPECIFICATIONS	
SPECIFICATION	**DESCRIPTION**
Maximum Frames Per Second (FPS)	6K FF: 12 FPS (in Burst mode) 5K FF: 48 FPS 4K FF: 60 FPS 3K FF: 80 FPS 2K FF: 120 FPS 5K WS: 60 FPS 4K WS: 75 FPS 3K WS: 100 FPS 2K WS: 150 FPS
Audio	2 channel, uncompressed, 24 bit, 48KHz
	Optional 4 channel, and AES/EBU digital audio
Monitoring Options	RED TOUCH 5.0" LCD RED PRO 7" LCD RED TOUCH 9.0" LCD BOMB EVF (LCOS) RED BOMB EVF (OLED)
Remote Control	REDLINK Wireless, Ethernet, RS232, GPI Trigger
Weight	5 lbs (body only)
Construction	Aluminum Alloy
Operating Temperature Range	0˚C to 40˚C (32˚F to 104˚F)
Storage Temperature Range	-20˚C to 50˚C (-4˚F to 122˚F)

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SCARLET MYSTERIUM-X

SCARLET MYSTERIUM-X TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Sensor	14 MEGAPIXEL MYSTERIUM-X™
Pixel Array	5120 (h) x 2700 (v)
S/N Ratio	66 dB
Dynamic Range	13.5 stops, up to 18 stops with HDRx™ On 6 FPS with 5K Full Frame and HDRx™ On 15 FPS with 4K HD and HDRx™ On
Max Image Area	5120 (h) x 2700 (v)
Lens Coverage	27.7mm (h) x 14.6mm (v) = 31.4 mm (d)
Lens Mount	DSMC TI PL Mount DSMC TI Canon Mount DSMC AL Canon Mount DSMC AL Leica M Mount DSMC AL Nikon Mount DSMC TI Nikon Mount DSMC RED MOTION MOUNT™ TI PL DSMC RED MOTION MOUNT™ TI CANON (all lens mounts sold separately)
Max Depth of Field	Equivalent to S35mm (Motion)/APS-H (Still) lenses Equivalent to 16mm (Motion) lens in 2K RAW
Acquisition Formats	Go to “EPIC and SCARLET MYSTERIUM-X Formats” on page 67 for a full list of SCARLET MYSTERIUM-X formats and pixel dimensions
Project Frame Rates	23.98, 24, 25, 29.97, 47.96, 48, 50, 59.94 FPS, all resolutions
Delivery Formats	4K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	2K : DPX, TIFF, OpenEXR (.RED via RRencode Plugin)
	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
Program Output	HD-SDI Clean Feed 2K RGB, 1080p RGB or 4:2:2, 720p 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Monitor Output	HD-SDI and HDMI with Frame Guides and Lookaround 2K RGB, 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48Khz Audio
Digital Media	REDMAG 1.8" SSD: 48GB, 64GB, 128GB, 256GB, 512GB RED MINI-MAG: 512GB
REDCODE™	To see all of the maximum available REDCODE values, see the DSMC Media Operation Guide at www.red.com/downloads
Audio	2 channel, uncompressed, 24 bit, 48KHz Optional 4 channel, and AES/EBU digital audio

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SCARLET MYSTERIUM-X TECHNICAL SPECIFICATIONS	
SPECIFICATION	**DESCRIPTION**
Monitoring Options	RED TOUCH 5.0" LCD RED PRO 7" LCD RED TOUCH 9.0" LCD BOMB EVF (LCOS) RED BOMB EVF (OLED)
Remote Control	REDLINK Wireless, Ethernet, RS232, GPI Trigger
Weight	5 lbs (body only)
Construction	Aluminum Alloy
Color	Battleship Gray BRAIN Body Black Canon Mount and SIDE SSD All DSMC Modules Black
Operating Temperature Range	0˚C to 40˚C (32˚F to 104˚F)
Storage Temperature Range	-20˚C to 50˚C (-4˚F to 122˚F)

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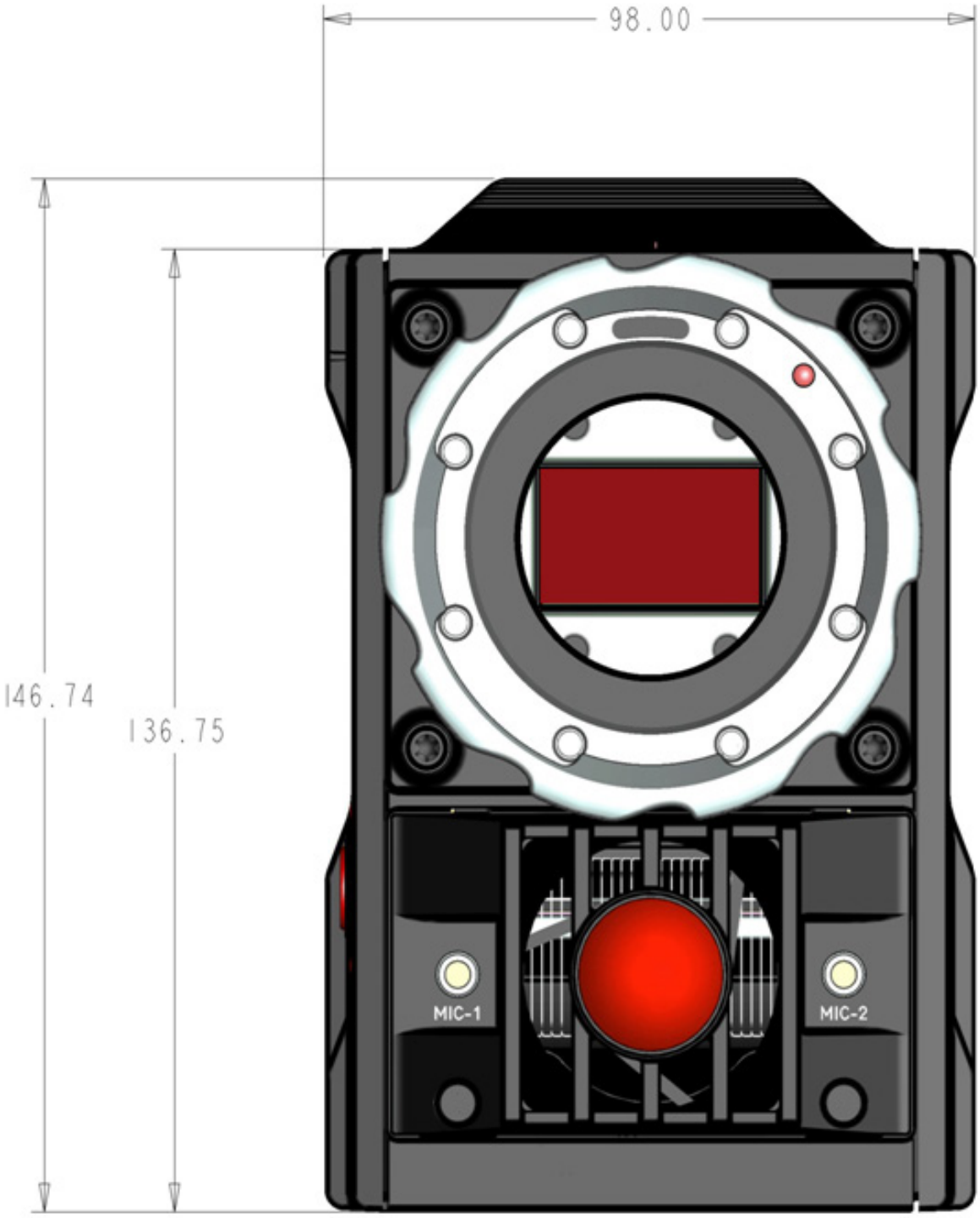
DSMC BRAIN DIMENSIONS

NOTE: Dimensions are shown in mm.

EPIC BRAIN DIMENSIONS

FRONT VIEW



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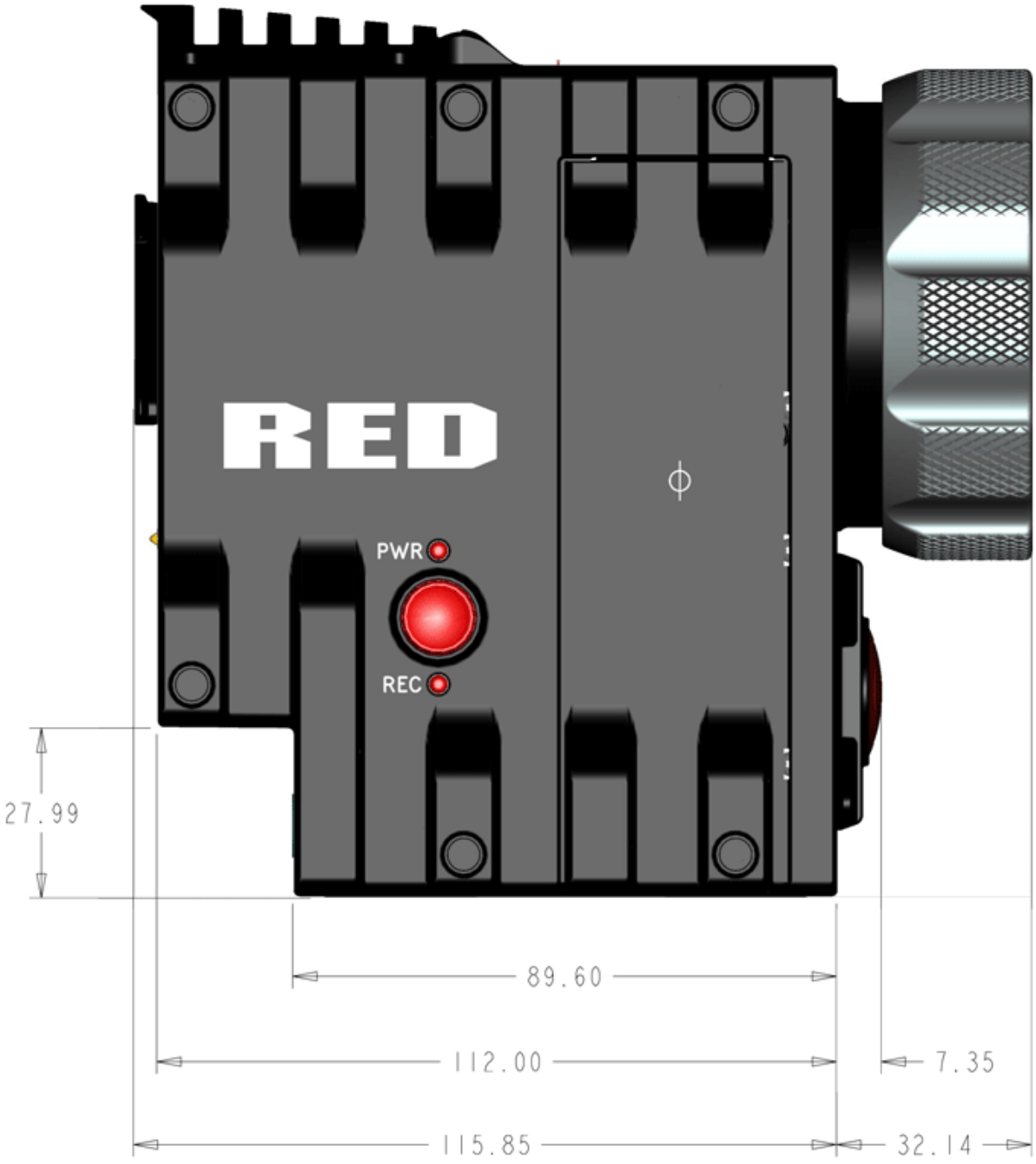
SIDE VIEW



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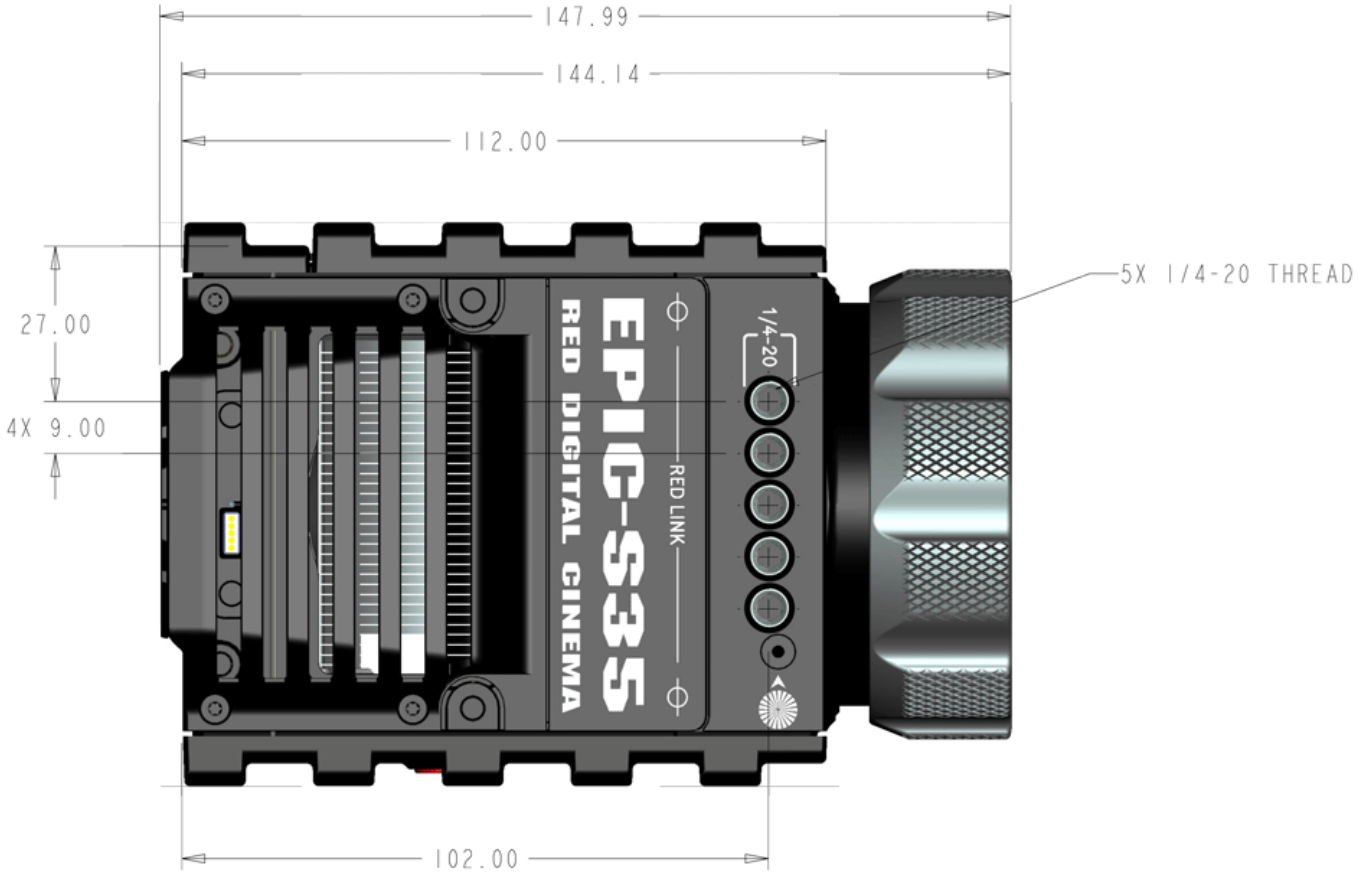
TOP VIEW



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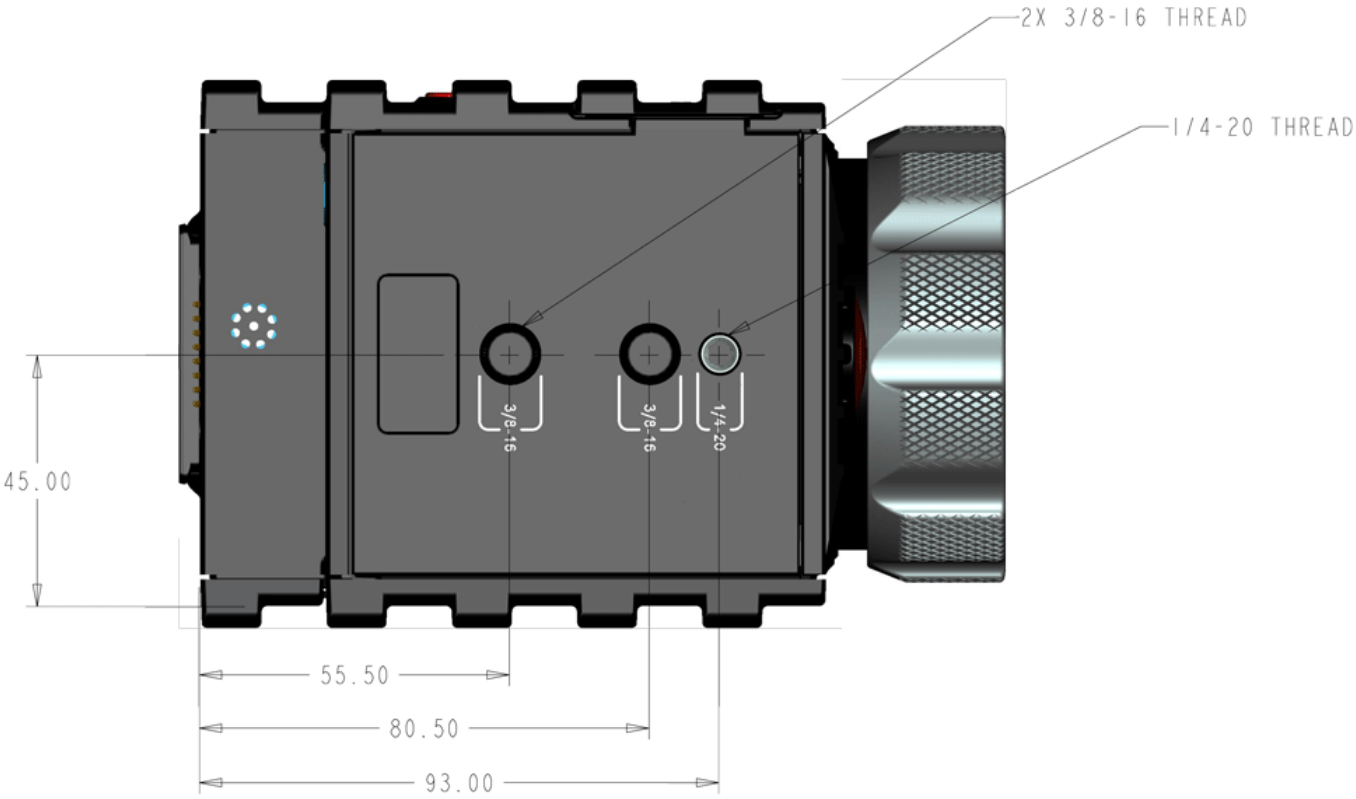
BOTTOM VIEW



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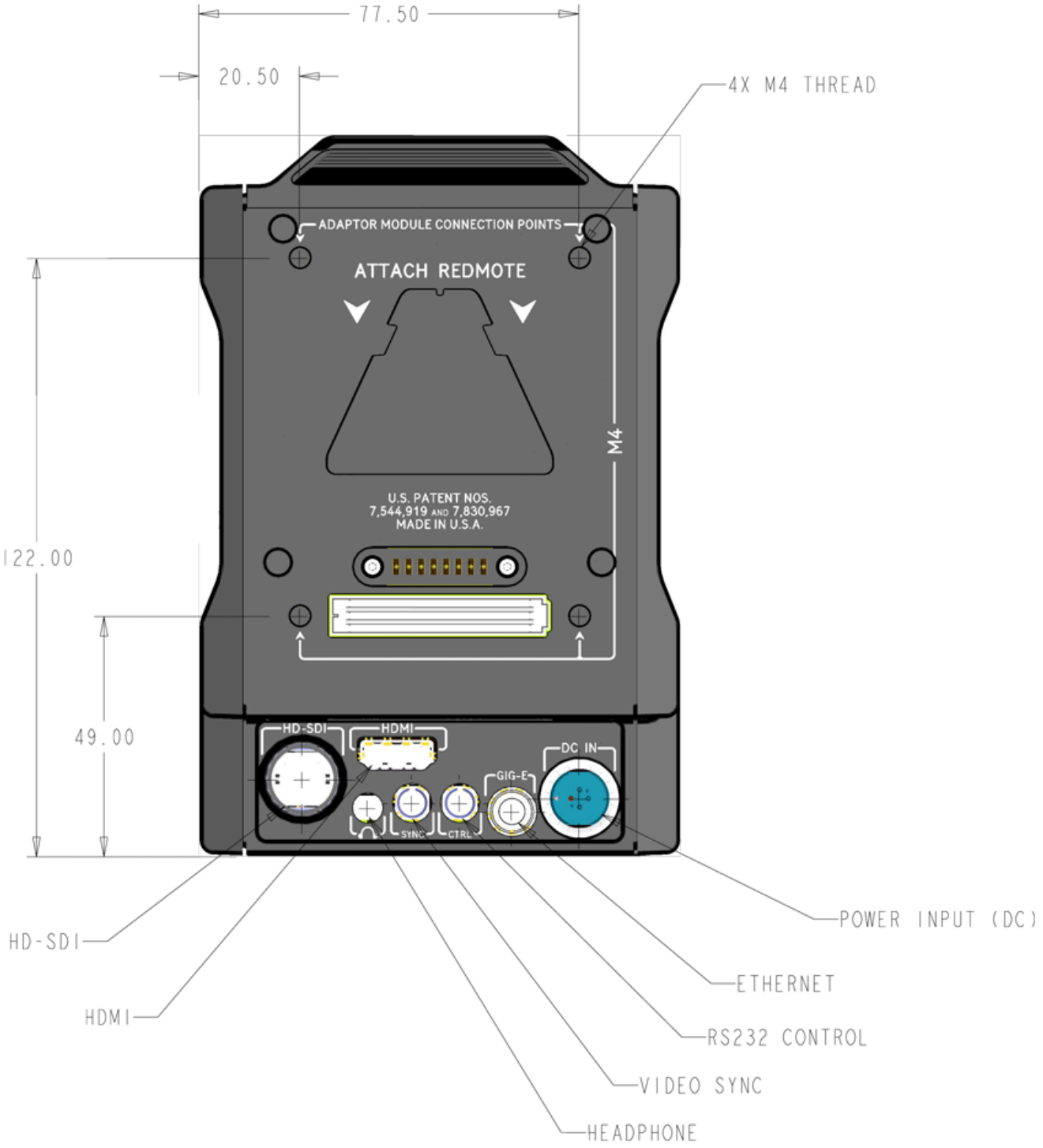
BACK VIEW



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I MENU MAP

See the menu map on the following page.

The menu map is applicable to the following cameras, except as noted in the DSMC Operation Guide:

- EPIC DRAGON
- EPIC MYSTERIUM-X
- SCARLET-X DRAGON
- SCARLET MYSTERIUM-X

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