

MOTION MOUNT TI PL | MOTION MOUNT TI CANON RED.COM

# **TABLE OF CONTENTS**

Disclaimer	3
Copyright Notice	3
Trademark Disclaimer	3 3 5
Compliance Statements	3
Safety Instructions	5
Chapter 1: Motion Mount Introduction	
Variable ND Filter	6
IR Filter and Linear Polarization	6
Soft Shutter	6
Square Shutter	6
Motion Mount Components	7
Hardware and System Requirements	7
Chapter 2: Motion Mount Installation	8
Lens Mount Alignment	8
Remove a Lens Mount	9
Install the Motion Mount	10
Chapter 3: Motion Mount Operation	11
Motion Mount Settings	11
Access the Motion Mount Menu	11
Neutral Density (ND)	12
Motion Mount Shutter Types  Man Kaya for Mation Mount Settings	18
Map Keys for Motion Mount Settings	23 <b>24</b>
Chapter 4: Motion Mount Maintenance Storage Instructions	24
Clean Motion Mount Glass	24
Chapter 5: Troubleshoot the Motion Mount	26
DSMC Does Not Recognize the Motion Mount	26
Irregular Out-of-Focus Bokeh Effects and Flare	26
Double Exposures in Captured Footage	27
Appendix A: Technical Specifications	28
Motion Mount Ti PL	28
Motion Mount Ti Canon	28
Neutral Density and Shutter Angles	29
Shutter Frame Rates	29
Appendix B: Motion Mount Compatibility	30
Compatibility Requirements	30
Compatible PL Lenses and Devices	31
Incompatible PL Lenses and Devices	33
Compatible Canon EF Lenses	33
Non-Linear Editing (NLE) Applications	33

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#### COMPLIANCE STATEMENTS

#### **INDUSTRIAL CANADA EMISSION COMPLIANCE STATEMENTS**

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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 approval of manufacturer could void the users authority to operate this equipment.

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

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



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

#### **AUSTRALIA AND NEW ZEALAND 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

# MOTION MOUNT OPERATION

#### 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。

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RED declares that the radio equipment described in this document complies 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.

#### **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)



Waste Electrical and Flectronic 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 national legislation.

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

#### **RESPONSIBLE PARTY:**

**RED Digital Cinema** 34 Parker Irvine, CA 92618 USA

#### **SAFETY INSTRUCTIONS**

- Heed all cautions and warnings in these instructions.
- Read these instructions before operating the lens mount.
- Follow these instructions while operating the lens mount.
- Keep these instructions with the lens mount at all times.
- DO NOT attempt to modify, dismantle or open your lens mount 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 lens mount, except by a RED authorized service facility, will void the Limited Warranty. Users are not permitted to make design changes or otherwise modify the operation of the lens mount without the express written approval of RED.
- Install lens mount in accordance with the manufacturer's instructions.
- DO NOT use the lens mount near water. Avoid exposing your lens mount 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 lens mount in the rain or under other conditions with high moisture without appropriate protection, and immediately remove power source if the lens mount is exposed to moisture while attached to the camera.



WARNING: To reduce the risk of fire or electric shock, do not expose the lens mount to rain or moisture.

- DO NOT expose your lens mount to excessive vibration or impact (shock). Be careful not to drop your lens mount. Internal mechanisms may be damaged by severe shock. Mechanical alignment of optical elements may be affected by excessive vibration.
- When cleaning your lens mount, remember that it is not waterproof and moisture can damage electronic circuitry. DO NOT rinse or immerse any element of the lens mount, keep it dry at all times. DO NOT use soaps, detergents, ammonia, alkaline cleaners, and abrasive cleaning compounds or solvents. These substances may damage the glass coating and electronic circuitry. DO NOT use compressed air.
- DO NOT operate or store near any heat sources such as radiators, heat registers, stoves, or any other apparatus that produces 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. Recommended storage and usage temperatures for your lens mount are:
  - Operating range: 0°C to 40°C (32°F to 104°F)
  - Storage range: -40°C to 80°C (-40°F to 176°F)

If there are any performance issues with your lens mount when operating within this temperature range, please file a support ticket at https://support.red.com/home.



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

# MOTION MOUNT INTRODUCTION

The DSMC® RED Motion Mount™ is a revolutionary and adjustable lens mount system for your DSMC. By integrating a global shutter, temporal anti-aliasing soft shutter, and variable neutral density (ND) system into a single lens mount, the Motion Mount delivers on-the-fly shutter adjustments to reduce motion blur and temporal aliasing. The ND filter also includes a linear polarizer and IR filter for improved image color and contrast.

**NOTE:** HDRx® is not available while the Motion Mount is installed.

### **VARIABLE ND FILTER**

The electronic variable ND filter provides an optical density range of 0.48 to 1.20 (1.60 to 4.00 stops) when the Motion Mount soft or square shutters are enabled, or an optical density range of 0.48 to 2.40 (1.60 to 8.00 stops) when "ND Only" mode is selected. You can quickly adjust the ND value through the DSMC touchscreen interface or user keys, eliminating the need to physically change filters.

NOTE: While the Motion Mount is installed, the adjustable electronic ND filter provides a minimum light loss of 1.60 stops (0.48 optical density).

### IR FILTER AND LINEAR POLARIZATION

The Motion Mount incorporates an IR-cut filter and new color science, providing accurate and natural color over a wide range of color temperatures. The IR-cut filter ensures rich, deep shadows in your shots and minimizes IR contamination at high ND levels, without the need for a separate hot mirror.

The built-in linear polarizer improves image quality by increasing contrast and reducing unwanted glare from light that passes through the Motion Mount to the image sensor.

### **SOFT SHUTTER**

The Motion Mount soft shutter performs temporal anti-aliasing in your footage, eliminating sampling rate issues caused by temporal aliasing. This is commonly referred to as the "wagon-wheel effect." Effectively, the Motion Mount improves your images and footage by ensuring smooth and natural motion. As its name implies, the soft shutter "softens" the edges of blur, resulting in crisp, smooth motion and pans.

For more information about temporal anti-aliasing, check out the Temporal Aliasing with Cinema article available at www.red.com/learn/red-101/cinema-temporal-aliasing.

### **SQUARE SHUTTER**

The Motion Mount square shutter, also referred to as "global shutter," eliminates rolling shutter artifacts, such as partial illumination caused by strobes and flashing light. The global shutter ensures uniform exposure throughout your image, regardless of strobes or motion.

For more information about global shutters, check out the Global & Rolling Shutters article available at www. red.com/learn/red-101/global-rolling-shutter.

### MOTION MOUNT COMPONENTS

Each Motion Mount package contains one of the following:

- DSMC RED Motion Mount Ti PL
  - DSMC Mount Body Cap
  - DSMC Mount Back Cap
- DSMC RED Motion Mount Ti Canon
  - DSMC Mount Body Cap
  - DSMC Mount Back Cap





Motion Mount Ti PL (left), Motion Mount Ti Canon (right)

**IMPORTANT:** If any components are damaged or missing, please file a support ticket at https://support.red.com.

### HARDWARE AND SYSTEM REQUIREMENTS

- The Motion Mount is compatible with all DSMC BRAINs
- Requires DSMC firmware v5.1.14 or later
- REDCINE-X PRO® Build 20.0.0 or later

NOTE: The Motion Mount Ti PL and Motion Mount Ti Canon use identical filter and shutter mechanisms. The only differences between the mounts are the mechanical locking systems and compatible lenses.

NOTE: The Motion Mount is 0.9 mm longer than the respective DSMC Ti PL Mount and DSMC Canon Mount.

# 02 MOTION MOUNT INSTALLATION

The Motion Mount® is installed in the same way as other DSMC lens mounts. Installation and removal steps provided in this section apply to the following DSMC lens mounts:

- ▶ DSMC Ti PL Mount
- DSMC Ti Canon Mount
- ▶ DSMC AI Canon Mount
- DSMC Al Leica M Mount
- DSMC Ti Nikon Mount
- DSMC Al Nikon Mount
- DSMC Motion Mount Ti PL
- DSMC Motion Mount Ti Canon

For more information on maintenance, go to "Motion Mount Maintenance" on page 24.

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

**WARNING:** Any damage to your camera, lens mount, or other equipment caused by the incorrect removal or installation of lens mounts is NOT covered under any RED warranty.

**NOTE:** DO NOT allow dirt or debris to enter the camera opening during the installation or removal of a lens mount. Take great care not to drop any screws into the camera opening, as damage may occur to the OLPF.

NOTE: Always avoid physical contact with the Motion Mount glass during installation or removal.

### LENS MOUNT ALIGNMENT





Motion Mount Ti PL (left), Motion Mount Ti Canon (right)

When installing the Motion Mount, ensure that the lens mount is properly aligned. The forward-facing contact pins differ between the two (2) mounts. DSMC Motion Mount Ti PL contacts pins are located on the top of the mount, while DSMC Motion Mount Ti Canon contact pins are located on the bottom of the mount.

### **REMOVE A LENS MOUNT**

REQUIRED TOOL: T20 Torx® driver

- 1. Power off the DSMC.
- 2. Attach the DSMC to a stable platform or position the DSMC on a clean and level work surface so that the lens mount screws are accessible.
- 3. Remove the lens, as well as any DSMC modules, cables, or other accessories that might interfere with removing the lens mount.
- 4. Loosen and remove the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern ("X" pattern) using a T20 Torx driver.

**NOTE:** Screw removal may require a large handle T20 Torx driver and additional leverage.



Remove the lens mount screws

5. Remove the lens mount from the DSMC.



Remove the lens mount

**NOTE:** When the Motion Mount is not in use the rear glass is blue. During operation the rear glass turns yellow. If you remove the Motion Mount shortly after operation, the glass will be yellow and develop blue spots. As the glass cools, it will return to its original blue color. This color transition is typical behavior.

### INSTALL THE MOTION MOUNT

REQUIRED TOOL: T20 Torx® driver

Ensure that the DSMC is powered off and remove any accessories or cables that may interfere with installation.

- 1. Inspect the gold electrical contact pins on the front of the DSMC and the gold contact pads on the rear of the Motion Mount to ensure that they are free of any contamination.
- 2. Align the Motion Mount on the front of the DSMC BRAIN. The DSMC connection pins must align with the Motion Mount pins.



Align Motion Mount pins

Replace and loosely tighten the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern ("X" pattern) until finger tight.

WARNING: DO NOT FULLY TIGHTEN.



Install Screws

4. Tighten the four (4) lens mount screws evenly using a T20 Torx driver in a cross pattern ("X" pattern). DO NOT exceed 350 in-oz, or damage may occur.

WARNING: DO NOT OVERTIGHTEN.

5. After installation, a hardware rediscover or firmware upgrade may be required. If the Motion Mount is not recognized, you will be unable to access the Motion Mount menu at Menu > Settings > Setup > Lens.

To perform a hardware rediscover, go to Menu > Settings > Maintenance > Rediscover. A system reboot is required after a hardware rediscover.

For more information and troubleshooting, go to "DSMC Does Not Recognize the Motion Mount" on page 26.

NOTE: If you need to replace any screws, please contact your Bomb Squad representative.

# MOTION MOUNT **OPERATION**

### MOTION MOUNT SETTINGS

The Motion Mount delivers variable ND and shutter options based on the selected shutter type. The following shutter types are available through the DSMC Motion Mount sub-menu.

- ND Only: Disables soft and square shutter functions. The Motion Mount functions only as an ND filter. For more information, go to "Neutral Density (ND)" on page 12.
- Soft: Enables the soft shutter, softening blur and reduction of temporal aliasing. The Motion Mount continues to function as an ND filter. For more information, go to "Soft Shutter" on page 19.
- Square: Enables the square shutter, ensuring consistent exposure and smooth motion. The Motion Mount continues to function as an ND filter. For more information, go to "Square Shutter" on page 21.

The maximum shutter angle is restricted on the "ND Only" shutter type when ND is below 0.60 (2 stops). If the desired shutter angle is not available with the selected frame rate, increase the ND value to 0.60 (2 stops) or greater.

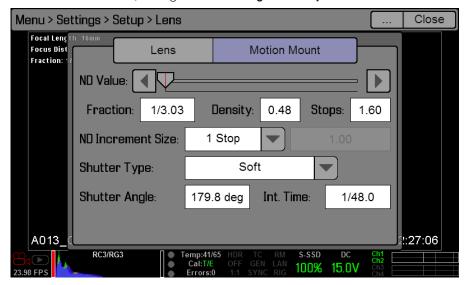
**NOTE:** The ND setting cannot be changed while recording.

**NOTE:** These instructions are specific to DSMC firmware version v5.1.51.

### ACCESS THE MOTION MOUNT MENU

NOTE: These menu settings are only accessible when a DSMC Motion Mount is installed.

- Turn on the DSMC.
- 2. In the DSMC menu, navigate to Settings > Setup > Lens > Motion Mount.



Motion Mount Menu

# **NEUTRAL DENSITY (ND)**

The Motion Mount provides a variable ND filter that incorporates an IR filter and polarizer. You can adjust the ND setting using the on-screen display, or by mapping the following functions to the desired DSMC keys:

- Motion Mount: Increment ND
- Motion Mount: Decrement ND

Variable ND functionality is always enabled when the Motion Mount is installed.

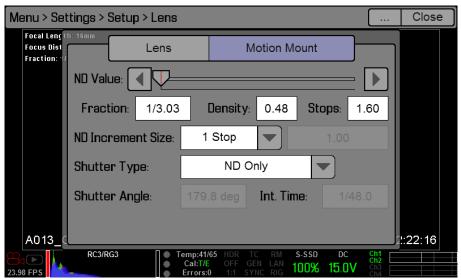
For more information on key mapping, go to "Map Keys for Motion Mount Settings" on page 23.

### SELECT NEUTRAL DENSITY (ND) SETTINGS

- 1. Select an ND value using the **ND Value** slider, or enter a value for any of the following fields:
  - Fraction: Displays the neutral density value as a fraction of light transmission.
  - Density: Displays the neutral density value as an optical density value.
  - **Stop**: Displays the neutral density value as a stop loss.
- Select an ND Increment Size, as desired. If you select Custom, enter the new increment size in the field next to the ND Increment Size drop-down menu. You can select any increment in the range 0.01 to 4.00 stops.

NOTE: When an ND value over 4.00 stops is selected while in "ND Only," the ND value on the main screen overlay turns yellow. The following message also displays in the Motion Mount menu screen: "High ND with wide apertures may cause bokeh asymmetry".

For more information on bokeh asymmetry, go to "Out-of-Focus Field Modification" on page 14.



Motion Mount Settings

### **NEUTRAL DENSITY (ND) RANGE**

The table below provides the available fraction values, optical density values, and stop losses. The values provided are in increments of 1/2 and 1/3 stops.

The available ND range is based on the currently selected shutter type.

- ND Only: The available optical density range for "ND Only" is 0.48 to 2.40 (1.60 to 8.00 stops).
- Soft: The available optical density range for "Soft" is 0.48 to 1.20 (1.60 to 4.00 stops).
- **Square:** The available optical density range for "Square" is 0.48 to 1.20 (1.60 to 4.00 stops).

ND VALUES			SHUTT	ER TYPES
FRACTION	DENSITY	STOPS	ND ONLY	SOFT/SQUARE
1/3.03	0.48	1.60	<b>√</b>	√
1/3.18	0.50	1.67	<b>√</b>	√
1/4.00	0.60	2.00	1	1
1/5.06	0.70	2.34	<b>√</b>	1
1/5.66	0.75	2.50	1	J
1/6.36	0.80	2.67	1	J
1/8.00	0.90	3.00	<b>√</b>	√
1/10.13	1.01	3.34	1	J
1/11.31	1.05	3.50	1	1
1/12.73	1.10	3.67	<b>√</b>	1
1/16.00	1.20	4.00	1	J
1/20.25	1.31	4.34	1	Х
1/22.63	1.35	4.50	<b>√</b>	Х
1/25.46	1.41	4.67	1	Х
1/32.00	1.51	5.00	1	Х
1/40.50	1.61	5.34	<b>√</b>	Х
1/45.25	1.66	5.50	<b>√</b>	Х
1/50.91	1.71	5.67	<b>√</b>	Х
1/64.00	1.81	6.00	1	X
1/81.01	1.91	6.34	1	Х
1/90.51	1.96	6.50	<b>√</b>	Х
1/101.83	2.01	6.67	<b>√</b>	Х
1/128.00	2.11	7.00	1	Х
1/162.02	2.21	7.34	√	Х
1/181.02	2.26	7.50	√	Х
1/203.66	2.31	7.67	√	Х
1/256.00	2.40	8.00	J	Х

### OUT-OF-FOCUS FIELD MODIFICATION

Use of the "ND Only" shutter type, a high ND value, and a very wide aperture may cause undesired distortion or flare in the out-of-focus field, also called bokeh. In some instances, vignetting may also occur at the edge of the image. This is typical when using lenses with smaller image circles. It is recommend that you do not exceed 4.00 stops of ND when shooting with wide open apertures.

NOTE: For instance, if the Motion Mount is set to 8.00 stops of ND, and the lens is set to T1.8, instead of the normal circular bokeh pattern, the out-of-focus area may have undesired flare mostly in one (1) direction.

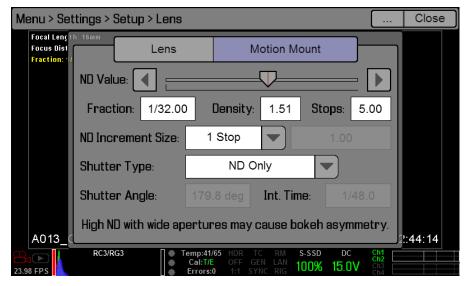
#### **AVOID FLARE AND DISTORTION**

There are several ways to avoid flare. If the lens aperture is changed to a T-stop of 4.0 or greater, the bokeh distortion will be dramatically reduced. Also, the ND value of the Motion Mount can be reduced to produce a more symmetric bokeh. This effect begins around a density value of five (5) stops (ND 1.5, or 1/32), and becomes more apparent as the value approaches eight (8) stops.

If a shot requires a wide aperture-to limit depth-of-field-and eight (8) stops of ND to account for scene illumination and shutter settings, it is recommended that you use a standard four (4) stop (ND 1.2, or 1/16) ND filter in coordination with the Motion Mount. This removes bokeh distortion and flare and also enables use of the "soft" and square" shutter types during the shot.

The effects of flare and distortion will be negligible at apertures greater than T4.0. Flare and distortion may vary based on the lens. RED recommends testing each lens in conjunction with the Motion Mount before an important shoot.

NOTE: If you select an ND value over 4.00 stops while in ND Only mode, the ND value on the main screen overlay turns yellow, and the following message displays on the Motion Mount screen: "High ND with wide apertures may cause bokeh asymmetry".



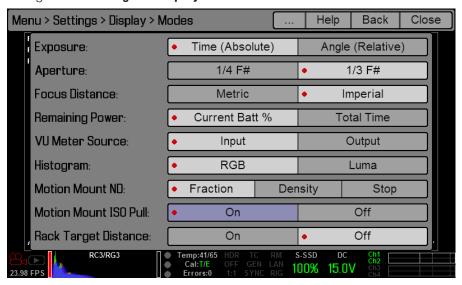
High ND Notification

#### DISPLAY EFFECTIVE ISO

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).

NOTE: 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 DSMC native ISO.

Navigate to **Settings** > **Display** > **Modes**.



- 2. For the Motion Mount ISO Pull setting, select one (1) of the following:
  - **On**: Display the effective ISO.
  - Off: Display actual ISO.
- 3. After you enable the setting, select **Close** to return to the main screen. The effective ISO is displayed in yellow.

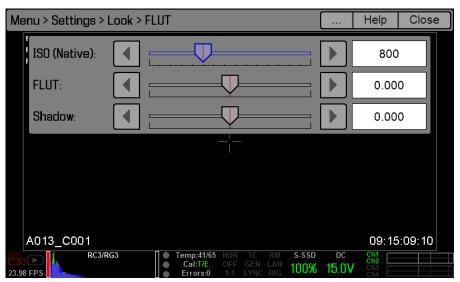


4. Tap the ISO value and select a different ISO on the slider to change the effective ISO.

**NOTE:** Remember, changing the effective ISO changes the native ISO of the camera and NOT the ND value.



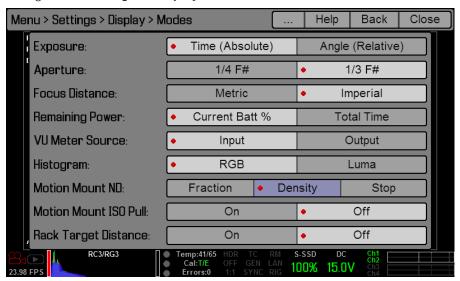
To view or change the DSMC native ISO, press and hold the ISO value to access the Advanced ISO menu. The native ISO is the first value.



### **DISPLAY NEUTRAL DENSITY (ND) SETTINGS**

You can configure how the ND setting is displayed on the DSMC main menu.

Navigate to **Settings** > **Display** > **Modes**.



- For the Motion Mount ND setting, select one (1) of the following:
  - Fraction: Displays the neutral density value as a fraction of light transmission.
  - **Density**: Displays the neutral density value as an optical density value.
  - **Stop**: Displays the neutral density value as a stop loss.
- After you select the display setting, select **Close** to return to the main screen.

The ND value displays in the top left corner.

NOTE: Using a high ND with wide apertures may cause asymmetrical bokeh. If you select an ND value over 4.00 stops with "ND Only" selected, the ND value on the main screen overlay turns yellow. A warning message also displays in the Motion Mount menu on the DSMC. For more information about boken asymmetry, go to "Out-of-Focus Field Modification" on page 14.



### **MOTION MOUNT SHUTTER TYPES**

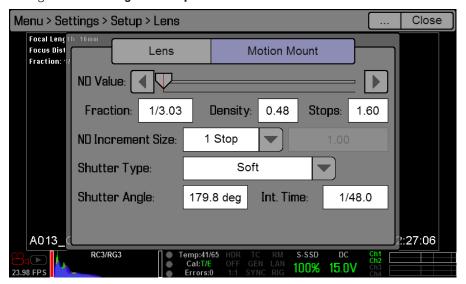
Based on the selected shutter type, the Motion Mount overrides control of all shutter operations. The Motion Mount can operate at frame rates up to 109.98 FPS.

Use the table below to help determine which Motion Mount shutter type to use:

SHUTTI	ER TYPE	ARTIFACTS	
	ROLLING SHUTTER	TEMPORAL ALIASING	
SOFT SHUTTER	None	Dramatically reduced	
SQUARE SHUTTER	None	No effect	

### SELECT MOTION MOUNT SHUTTER TYPE AND SETTINGS

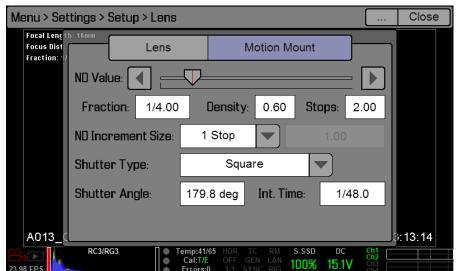
1. Navigate to Settings > Setup > Lens > Motion Mount.



Motion Mount Settings

- Select the **Shutter Type** drop-down menu and choose the desired shutter type:
  - **Soft**: The Motion Mount soft shutter takes control of shutter operation and provides variable ND support. For more information about the soft shutter, go to "Soft Shutter" on page 19.
  - Square: The Motion Mount square shutter takes control of shutter operation and provides variable ND support. For more information about the square shutter, go to "Square Shutter" on page 21.

Select the desired **Shutter Angle** or **Int. Time** (Integration Time).



Shutter Settings

### SOFT SHUTTER

The Motion Mount soft shutter is a breakthrough technology for photography and cinematography. Different from rolling or global shutters that abruptly start and stop image capture, the Motion Mount soft shutter causes the liquid crystal to ramp from opaque to clear in a rounded wave. This ramping shutter technique completely eliminates temporal aliasing artifacts and reduces rolling shutter artifacts.

Temporal Aliasing Advantages:

- Shows correct direction of rotation of cyclical motion, such as rotating propellers.
- Softens blur while preserving clarity.
- Reduces judder while panning.
- Renders movement accurately and naturally.
- Reduces flickering without requiring continuous or synchronized lighting.

Rolling Shutter Advantages:

- Reduces striping or tearing artifacts from uncontrolled strobes and flashes.
- Reduces skew, also known as the "jello" effect, so that fast-moving subjects are not angled or sheared.
- Ensures that images are not blurred or wobbled due to rapid camera movements.

#### **SOFT SHUTTER FRAME RATES**

You can use the Motion Mount shutter at frame rates up to 109.98 FPS, but the soft shutter is most effective at reducing temporal aliasing artifacts and rolling shutter artifacts at lower frame rates.

#### **SOFT SHUTTER ANGLE**

The soft shutter angle ranges from 62.1° to 194.4°. The available shutter angle range at any given time depends on the selected frame rate.

For the most natural and realistic motion, use a soft shutter angle of 194.4°. Then, adjust the shutter angle if necessary.

#### **SOFT SHUTTER: STROBE SAFE OPERATION**

The table below provides the recommended maximum shutter angles for recording strobe lights using the soft shutter.

	RESOLUTION						
		1K	2K	3K	4K	5K	6K
	1	194°	194°	193°	193°	192°	192°
	2	193°	193°	192°	191°	190°	190°
	4	192°	191°	190°	188°	186°	185°
	8	190°	188°	185°	182°	179°	176°
	12	188°	186°	181°	176°	171°	167°
	16	186°	183°	176°	169°	163°	157°
	24	183°	177°	167°	157°	147°	139°
RATE	25	182°	176°	166°	155°	145°	137°
	30	180°	172°	160°	147°	135°	125°
FRAME	40	175°	165°	149°	131°	115°	102°
	48	171°	159°	140°	119°	99°	83°
	50	170°	157°	137°	116°	95°	79°
	60	165°	150°	126°	100°	76°	None
	72	159°	141°	112°	81°	None	None
	75	157°	139°	109°	76°	None	None
	90	150°	128°	92°	None	None	None
	96	147°	123°	85°	None	None	None
	100	145°	121°	80°	None	None	None
	120	135°	106°	None	None	None	None

**CAUTION**: Firmware versions earlier than v5.2.14 allow values outside of these ranges. Settings outside of the supported range will result in a double exposure of the frame.

### **SQUARE SHUTTER**

The Motion Mount square shutter is a global shutter that provides consistent, full illumination for every frame. The Motion Mount fundamentally changes the way your camera exposes for motion, reducing skew and smear artifacts.

The Motion Mount square shutter assists in the following ways:

- Reduces striping or tearing artifacts from uncontrolled strobes and flashes.
- Reduces skew, also known as the "jello" effect, so that fast-moving subjects are not angled or sheared.
- Ensures images are not blurred or wobbled due to rapid camera movements.

#### **SOUARE SHUTTER FRAME RATES**

The square shutter operates at frame rates up to 109.98 FPS; however, the square shutter is most effective at reducing rolling shutter artifacts at lower frame rates.

#### **SOUARE SHUTTER ANGLE**

The square shutter angle ranges from 62.1° to 180°. The available shutter angle range at any given time depends on the selected frame rate.

For the most natural and realistic motion in square shutter mode, start at a shutter angle of 180°. Adjust the shutter angle from there as needed.

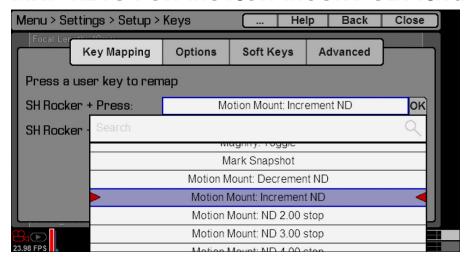
#### **SQUARE SHUTTER: STROBE SAFE OPERATION**

The table below provides the recommended maximum shutter angles for recording strobe lights using the square shutter.

	RESOLUTION					
	1K	2K	3K	4K	5K	6K
1	180°	180°	180°	180°	180°	180°
2	180°	180°	180°	180°	180°	180°
4	180°	180°	180°	180°	180°	180°
8	180°	180°	180°	180°	180°	180°
12	180°	180°	180°	180°	180°	180°
16	180°	180°	180°	180°	180°	180°
24	180°	180°	180°	180°	180°	171°
<b>25</b>	180°	180°	180°	180°	179°	169°
₩ 30	180°	180°	180°	180°	167°	154°
30 40	180°	180°	180°	162°	142°	126°
48	180°	180°	172°	147°	123°	103°
50	180°	180°	169°	143°	118°	97°
60	180°	180°	155°	123°	93°	69°
72	180°	174°	138°	100°	64°	None
75	180°	172°	134°	94°	None	None
90	180°	158°	113°	65°	None	None
96	180°	152°	105°	None	None	None
100	179°	149°	99°	None	None	None
120	167°	131°	71°	None	None	None

**CAUTION**: Firmware versions earlier than v5.2.14 allow values outside of these ranges. Settings outside of the supported range will result in a double exposure of the frame.

### MAP KEYS FOR MOTION MOUNT SETTINGS



Map Keys for Motion Mount

Program user keys to quickly adjust ND value and shutter settings without accessing the Motion Mount menu. To map keys, navigate to **Settings** > **Setup** > **Keys**.

You can map the following Motion Mount actions to the desired user key:

KEY ACTION	DESCRIPTION
Motion Mount: Decrement ND	Decrements the ND value by the ND Increment Size selected in the Motion Mount menu.
Motion Mount: Increment ND	Increments the ND value by the ND Increment Size selected in the Motion Mount menu.
Motion Mount: 2.00 stop	Changes the ND to 2.00 stops.
Motion Mount: 3.00 stop	Changes the ND to 3.00 stops.
Motion Mount: 4.00 stop	Changes the ND to 4.00 stops.
Motion Mount: 5.00 stop	Changes the ND to 5.00 stops.
Motion Mount: ND Max	In "ND Only", changes the ND to 2.41. In "Soft" or "Square", changes the ND to 1.20.
Motion Mount: ND Min	Changes the ND value to 0.48.
Motion Mount: ND Only	Changes the Shutter Type to "ND Only".
Motion Mount: Soft Shutter	Changes the Shutter Type to "Soft".
Motion Mount: Square Shutter	Changes the Shutter Type to "Square".

# MOTION MOUNT **MAINTENANCE**

### STORAGE INSTRUCTIONS

Follow these instructions to protect the Motion Mount when not in use:

- Protect the Motion Mount while not in use by replacing the DSMC Mount Body Cap and the DSMC Mount Back Cap.
- ▶ Store the Motion Mount in a clean, dry environment.

### CLEAN MOTION MOUNT GLASS

As with all optical glass, any type of physical contact with the glass may scratch or damage the surface. RED recommends that you clean the Motion Mount glass using physical contact only if absolutely necessary.

Before cleaning the Motion Mount glass with swabs or wipes and a cleaning solution, ALWAYS use an air bulb to remove any solid particles. Cleaning the Motion Mount glass without removing solid particles increases the risk of scratching the optical surface.

WARNING: Handle the Motion Mount glass carefully. Failure to follow proper cleaning instructions may scratch or damage the optical surface.

### GENERAL CLEANING INSTRUCTIONS

- Avoid using the Motion Mount in dusty or hazardous environments.
- Avoid physical contact with the glass.
- DO NOT rinse the Motion Mount or immerse it in water.
- DO NOT use compressed air to clean the Motion Mount.
- DO NOT use soaps, detergents, ammonia, alkaline cleaners, or abrasive cleaning compounds to clean the Motion Mount.
- DO NOT apply cleaning solution directly to the Motion Mount glass.
- DO NOT use an excess of cleaning solution.
- DO NOT reuse swabs or wipes.

### AIR BULBS

Use a rubber air bulb to remove any solid particles, such as dirt or dust. Use an ionized air bulb to remove solid particles as well as static build-up.

WARNING: DO NOT use compressed air to clean the Motion Mount. The high pressure may damage the glass, and some compressed air can leave an oily residue, which may be difficult to clean.

### SWABS, WIPES, AND CLEANING SOLUTIONS

Always use an air bulb to remove any solid particles before cleaning. If you must make contact with the optical glass, use lens-grade wipes or non-rigid flexible uniform swabs (Example: Delkin® swabs), and a high-quality DSLR sensor or lens cleaning solution (Example: Delkin or Pancro solutions).

- 1. Apply a few drops of cleaning solution directly to the swab or wipe.
- 2. Gently sweep the swab or wipe across the length of the glass in a uniform motion.
  - When using a swab: Ensure that the swab provides full coverage of the glass. Gently sweep the swab across the length of the glass. DO NOT place the corners of the swab on the glass.
  - When using a wipe: Gently sweep the wipe across the length of the glass with a flat, non-rigid flexible instrument in a uniform motion. DO NOT sweep the wipe across the glass with your finger.

WARNING: DO NOT reuse swabs or wipes, since they may have gathered dirt or debris from the glass.

# TROUBLESHOOT THE MOTION MOUNT

This chapter provides troubleshooting tips for the DSMC® RED® Motion Mount. If you continue to experience issues after troubleshooting, please file a support ticket at https://support.red.com.

### DSMC DOES NOT RECOGNIZE THE MOTION MOUNT

#### **SYMPTOM**

The DSMC does not recognize an installed Motion Mount.

#### **EXPLANATION**

DSMC firmware must be v5.1.14 or later to recognize to Motion Mount. If necessary, load the latest DSMC firmware, then perform a hardware rediscover.

#### POTENTIAL RESOLUTIONS

- Upgrade your DSMC firmware to v5.1.14 or later from https://support.red.com.
- Perform a hardware rediscover.
  - A. Navigate to Menu > Settings > Maintenance > Rediscover.
  - B. Select Yes.
  - C. Power off and reboot the DSMC.

### IRREGULAR OUT-OF-FOCUS BOKEH EFFECTS AND FLARE

#### **SYMPTOM**

Footage displays irregular out-of-focus boken effects, distortion, or flare.

#### **EXPLANATION**

The Motion Mount may produce irregular out-of-focus bokeh effects, distortion, or flare in "ND Only" when an ND value over 4.00 stops is selected and a very wide aperture is used.

#### **POTENTIAL RESOLUTIONS**

- Increase aperture to greater than T4.0.
- Reduce the Motion Mount ND value to 4.00 or less.

For more information on boken asymmetry, go to "Out-of-Focus Field Modification" on page 14.

### **DOUBLE EXPOSURES IN CAPTURED FOOTAGE**

#### **SYMPTOM**

Recorded footage displays irregular motion blur or duplicate images, also known as "ghosting".

#### **EXPLANATION**

The Motion Mount soft and square shutters provide improvements in temporal aliasing and motion at frame rates up 109.98 FPS, but are more effective at lower frame rates.

#### **POTENTIAL RESOLUTIONS**

- ▶ Reduce the frame rate used in the shot to below 109.98 FPS and try again.
- ▶ Ensure that you are using a recommended shutter angle.

For more information on recommended Soft Shutter angles, go to "Soft Shutter Angle" on page 19.

For more information on recommended Square Shutter angles, go to "Square Shutter Angle" on page 21.



### **MOTION MOUNT TI PL**

SPECIFICATION	DESCRIPTION
Dimensions	Height: 3.23 in. (82.0 mm) Width: 3.23 in. (82.0 mm) Depth: 1.43 in. (36.2 mm)
Weight	11.2 oz (318 g), Mount Only
Material	Machined titanium
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Maximum Altitude	20,000 ft
Humidity Range	0 to 90% RH
Shock	10 g
Input Voltage	+5.0 V DC
Power Consumption	1.5 W

### **MOTION MOUNT TI CANON**

SPECIFICATION	DESCRIPTION
Dimensions	Height: 3.14 in. (79.9 mm) Width: 3.35 in. (85.0 mm) Depth: 0.92 in. (23.3 mm)
Weight	8.0 oz (227 g), Mount Only
Material	Machined titanium
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Maximum Altitude	20,000 ft
Humidity Range	0 to 90% RH
Shock	10 g
Input Voltage	+5.0 V DC
Power Consumption	1.5 W

### **NEUTRAL DENSITY AND SHUTTER ANGLES**

SPECIFICATION	DESCRIPTION
Square and Soft Shutter Optical Density Range	0.48 to 1.20 (1.60 to 4.00 stops)
ND Only Optical Density Range	0.48 to 2.40 (1.60 to 8.00 stops)
ND Only Angle Range	1° to 360°
Square (Global) Shutter Angle Range <sup>1</sup>	62.1° to 180°
Soft Shutter Angle Range <sup>1</sup>	62.1° to 194.4°

<sup>1.</sup> These values are based on DSMC firmware v5.2.20. Values outside of these ranges are allowed in firmware versions earlier than v5.2.14. Settings outside of the supported range may result in a double exposure of the frame.

### SHUTTER FRAME RATES

SPECIFICATION	DESCRIPTION			
Maximum Frame Rate <sup>1</sup> (Soft and Square Shutter Types)	109.98 FPS			
Limited Frame Rate by Resolution <sup>1</sup>		DSMC BRAIN		
(Soft and Square Shutter Types)		SCARLET DRAGON	EPIC DRAGON	
	6K FF	12.08 FPS	51.88 FPS	
	5K FF	48.73 FPS	56.90 FPS	
	5K 2:1	51.40 FPS	56.68 FPS	
	5K WS	60.92 FPS	64.42 FPS	
	5K HD	48.73 FPS	56.90 FPS	
	4K FF	60.92 FPS	64.61 FPS	
	4K 2:1	64.25 FPS	66.44 FPS	
	4K 2:1 4K WS 4K HD	72.28 FPS	72.28 FPS	
	4K HD	60.92 FPS	64.61 FPS	
	3K FF	74.41 FPS	74.41 FPS	
	3K 2:1	76.22 FPS	76.22 FPS	
	3K WS	81.91 FPS	81.91 FPS	
	3K HD	74.41 FPS	74.41 FPS	
	2K FF	87.93 FPS	87.93 FPS	
	2K 2:1	89.61 FPS	89.61 FPS	
	2K WS	94.77 FPS	94.77 FPS	
	2K HD	87.93 FPS	87.93 FPS	

<sup>1.</sup> These values are based on DSMC firmware v5.2.20. Maximum frame rate is limited to 109.98 FPS when the soft or square shutter is enabled. Maximum frame rates may vary slightly based on the current DSMC firmware revision.

**WARNING:** Selecting frame rates higher than 109.98 FPS while using the Motion Mount may result in the double exposure of frames. To avoid double exposures, RED recommends using a maximum frame rate of 109.98 regardless of selected shutter type. For more information, go to "Double Exposures in Captured Footage" on page 27.

# MOTION MOUNT COMPATIBILITY

The Motion Mount™ Ti PL and Motion Mount Ti Canon enable you to mount most PL cinema lenses and Canon EF-compatible lenses to your DSMC® BRAIN®.

WARNING: Using lenses, adaptors, or other accessories that are not compatible with the Motion Mount may damage the internal glass or other elements in the lens mount.

WARNING: Lenses, adaptors, and other PL-mount devices with mounting elements that protrude more than 27.73 mm behind the PL mounting flange are not compatible with the Motion Mount.

NOTE: Any damage to the Motion Mount Ti PL or the DSMC system caused by using incompatible lenses (including non-standard PL lenses) or devices is not covered under warranty.

### COMPATIBILITY REQUIREMENTS

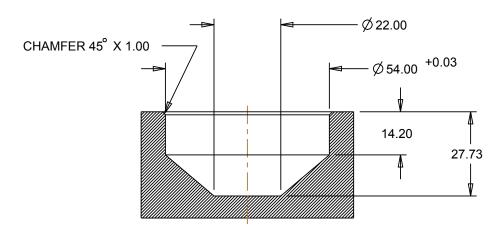
Due to the additional layer of glass in the Motion Mount and the shape of the baffle inside the mount, some lenses that are otherwise compatible with the DSMC may not be compatible with the Motion Mount.

Refer to the following diagram to determine if the maximum protrusion depth and maximum protrusion diameter of a particular lens is compatible with the Motion Mount. If any of the protruding lens elements extend beyond these dimensions, the lens IS NOT COMPATIBLE.

DO NOT use lenses that have mounting elements that exceed the following values:

- **Maximum Protrusion Depth:** 27.73 mm
- Maximum Protrusion Diameter at a Protrusion Depth of 14.20 mm: 54.00 mm
- Maximum Protrusion Diameter at a Protrusion Depth of 27.73 mm: 22.00 mm

WARNING: Use of a lens that extends beyond these dimensions may damage the Motion Mount.



Motion Mount safe zone

### **COMPATIBLE PL LENSES AND DEVICES**

The Motion Mount Ti PL is COMPATIBLE with the lenses listed in the table below:

COMPATIBLE PL LENS/DEVICE	FOCAL LENGTH
Angénieux Optimo	17-80mm T2.2 24-290mm T2.8 28-76mm T2.6 28-340mm T3.2 1.4x Extender 2.0x Extender
ARRI/Fujinon Alura	18-80mm T2.6 30-80mm T2.8 45-250mm T2.8
ARRI/Zeiss Master Prime	16mm T1.3 18mm T1.3 21mm T1.3 25mm T1.3 27mm T1.3 32mm T1.3 35mm T1.3 40mm T1.3 50mm T1.3
ARRI/Zeiss Standard Speed	10mm T2.1 50mm T2.1
ARRI/Zeiss Super Speed	18mm T1.3 25mm T1.3 35mm T1.3 50mm T1.3 85mm T1.3
ARRI/Zeiss Ultra Prime	14mm T1.9 20mm T1.9 40mm T1.9
Century	1.4x Extender 2.0x Extender
Cooke 5i	18mm T1.4 25mm T1.4 32mm T1.4 50mm T1.4 75mm T1.4

COMPATIBLE PL LENS/DEVICE	FOCAL LENGTH
Cooke S4 Prime	14mm T2.0 18mm T2.0 21mm T2.0 25mm T2.0 27mm T2.0 32mm T2.0 35mm T2.0 40mm T2.0 50mm T2.0 65mm T2.0 100mm T2.0
Fujinon Cabrio	19-90mm T2.9
Fujinon Premiere	14.5-45mm T2.0 24-180mm T2.6 75-400mm T2.8-3.8
Hawk V-Lite Anamorphic	45mm T2.2 65mm T2.2
RED PRO PRIME	25mm T1.8 35mm T1.8 50mm T1.8 85mm T1.8 100mm T1.8 300mm T2.9
RED PRO ZOOM	17-50mm T2.9 18-85mm T2.9
RED ZOOM	18-50mm T3.0 50-150mm T3.0

### INCOMPATIBLE PL LENSES AND DEVICES

The Motion Mount Ti PL is NOT COMPATIBLE with the lenses and devices listed in the table below:

INCOMPATIBLE PL LENS/DEVICE	FOCAL LENGTH	DESCRIPTION
Angénieux Optimo DP Series	16-42mm T2.8 30-80mm T2.8	DP Series lenses have a flange depth that does not meet standard specification for PL lenses.
ARRI/Zeiss Standard Speed	12mm T2.1 16mm T2.1 20mm T2.1 24mm T2.1 32mm T2.1 40mm T2.1	The rear flange depth of these lenses are too wide or too long and interfere with the Motion Mount.
Cooke S2/S3	32mm T2.3	The rear flange depth is too long and interferes with the Motion Mount glass.
PL-TO-B4 ADAPTOR	N/A	The rear face of the PL-TO-B4 ADAPTOR interferes with the Motion Mount glass.
RED FOCUS	N/A	The rear face of the RED FOCUS interferes with the Motion Mount glass.
RED PRO PRIME	18mm T1.8	The extended PL cover ring interferes with the ridges on the baffle inside the Motion Mount Ti PL, preventing installation.

### **COMPATIBLE CANON EF LENSES**

The Motion Mount Ti Canon supports all lenses that are compatible with the DSMC Canon Mount.

For more information and a full list of compatible lenses, see the DSMC Operation Guide, available at www.red. com/downloads.

# **NON-LINEAR EDITING (NLE) APPLICATIONS**

The .R3D files captured using the Motion Mount are editable with the following applications:

- REDCINE-X PRO Build 20.0.0 or later
- Adobe® Premiere® Pro CC or later
- Avid® Media Composer
- DaVinci® Resolve
- Edius® Pro
- Final Cut Pro® 7 or Final Cut Pro® X (Requires Apple Workflow Plugin, available at www.red.com/downloads)
- Vegas™ Pro

NOTE: If you are experiencing issues with any of these supported post-production solutions, check for an update or download the latest version of the application from the respective company's website.



# RED DIGITAL CINEMA

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