



# Teradek RT

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Lens Control System

Reference Guide



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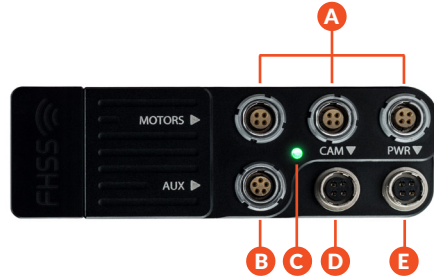
# PHYSICAL PROPERTIES

## RECEIVERS

### MK3.1

The MK3.1 supports up to three motors and features an auxiliary (AUX) port for slave controllers or wired mode support. In addition, the MK3.1 receiver offers a start/stop function for select HD cameras.

- A: Motor ports
- B: AUX port
- C: Receiver Status LED
- D: Camera input
- E: Power input



### MDR-M/MB

The MDR-M is a 2-channel receiver with RED integration and other intelligent camera control features. The MDR-MB is an alternative version of the MDR-M that includes an integrated LP-E6 battery plate to power the receiver.

- A: Operating Mode button
- B: Receiver Status LED
- C: Reset button
- D: Power input
- E: CAM/Control input
- F: Motor input
- G: Accessory inputs
- H: LP-E6 battery plate (MB)

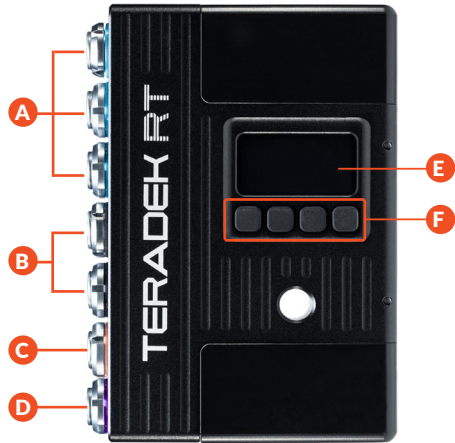


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## MDR.X

The MDR.X receiver can control up to three motors for FI+Z control (Focus, Iris, and/or Zoom), and features several configurable options accessible via the built-in OLED display.

- A: Motor inputs
- B: Accessory inputs
- C: Power input
- D: CAM/Control input
- E: OLED display
- F: Menu buttons



# CONTROLLERS

## CTRL.3

The CTRL.3 is a feature-rich 3-axis wireless controller that offers built-in lens mapping. When paired with compatible SmallHD monitors, CTRL.3 displays critical lens data as overlays directly on the monitor, allowing camera assistants to pull focus and keep eyes on the image.

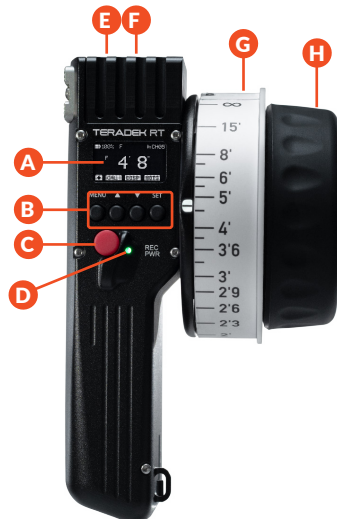
- A: AUX input
- B: REC/PWR button
- C: Force joystick
- D: Status LED
- E: A/B thumbwheels
- F: OLED Menu screen
- G: Menu buttons
- H: Limit buttons
- I: Slider
- J: Mini-USB
- K: Lens ring
- L: Knob



## CTRL.1

The CTRL.1 is a powerful, single-axis wireless controller with lens mapping\* support and data storage, saving time on calibration during lens swaps. CTRL.1 allows for either focus, iris or zoom control, and is compatible with all other RT devices.

- A: OLED display
- B: Menu buttons
- C: Record/Power button
- D: Controller Status LED
- E: Mini-B USB (*not shown*)
- F: AUX input (*not shown*)
- G: Lens ring
- H: Control knob

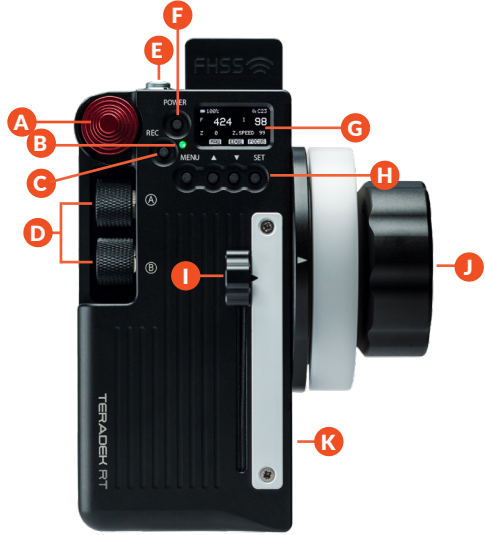


\* Available when you purchase the Lens Mapping license.  
For more details, see pg. 26.

## MK3.1 CONTROLLER (4 AXIS/6 AXIS)

Teradek's RT MK3.1 Wireless Controllers provide 4-axis or 6-axis lens motor control. Both controllers offer a large focus knob, one slider control, and two side knobs (A and B), while the 6-axis controller includes a Force Joystick zoom button for smooth, sensitive zoom moves.

- A: Force joystick (6-axis only)
- B: Controller Status LED
- C: Record button
- D: A/B slide knobs
- E: AUX input
- F: Power button
- G: OLED display
- H: Menu buttons
- I: Slider
- J: Main knob
- K: Micro USB (not shown)



# SMARTKNOB

The Smartknob is a standalone wired lens controller for Canon EF and Nikon AF lenses attached to RED DSMC or DSMC2 cameras.

- A: Configurable button (A)
- B: Configurable button (B)
- C: Receiver/input
- D: Configurable button (R)
- E: Mini USB
- F: Power input
- G: Configurable button (W)
- H: Configurable button (X)
- I: Configurable button (Y)
- J: Focus knob



# SLAVE CONTROLLERS

The Zoomrocker and Thumbwheel are both ergonomic slave controller options that offer highly flexible thumb/finger control, along with a recording (REC) trigger.

## Thumbwheel

- A: Record button
- B: Thumb knob
- C: AUX output



## Zoomrocker

- A: Record button
- B: Rocker paddle
- C: AUX output





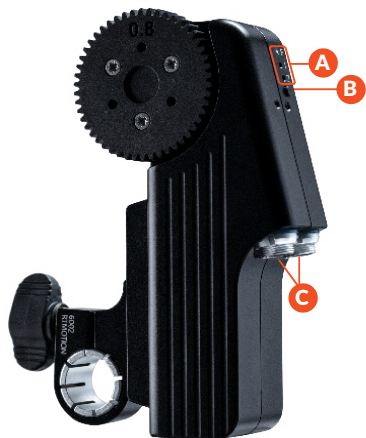
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# MOTORS

## MOTR.X

The MOTR.X operates with lightning-fast speed and incredible torque while remaining totally silent. The MOTR.X has six times the service life of brushed motors and features new in/out motor ports for passing data and power to any additional motors.

- A: Motor class indicators
- B: Axis button
- C: Data/Power connectors



## MK3.1

The MK3.1 Brushless Motor is a revolution in wireless lens control, offering superior response, smoother operation, and four times the service life of brushed motors. The MK3.1 Brushless Motor works with any Teradek RT Lens Control System.

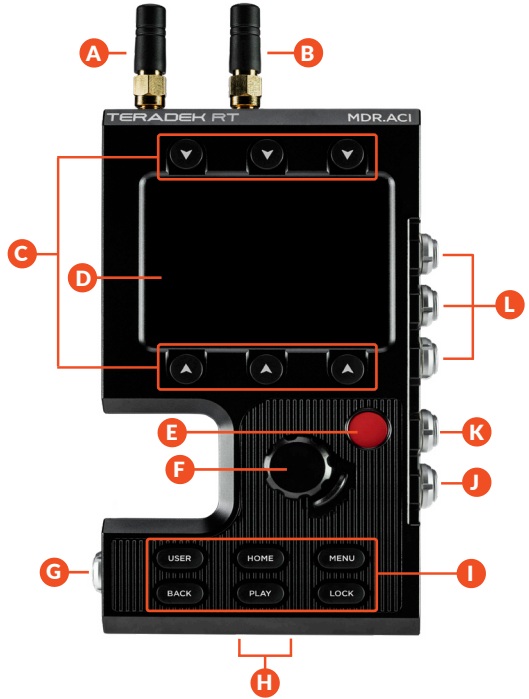
- A: Motor class indicators
- B: Axis button
- C: Data/Power connectors



# ACI/MDR.ACI

The Teradek RT ACI (Assistant Camera Interface) module simplifies camera control and management by combining a smartly-designed software UI with physical controls. The hardware attaches seamlessly to the side of RED DSMC2 cameras and can operate with any DSMC2 I/O module with a CTRL port.

- A:** RF antenna (*MDR.ACI*)
- B:** BLE 5.0 Bluetooth antenna (*MDR.ACI*)
- C:** Home screen/User menu buttons
- D:** LCD display
- E:** Record button
- F:** Menu navigation wheel
- G:** ACI Control/Power input
- H:** USB-C ports
- I:** Control/Menu buttons
- J:** AUX input-1 (*MDR.ACI*)
- K:** AUX input-2 (*MDR.ACI*)
- L:** Motor inputs (*MDR.ACI*)



# GETTING STARTED

---

## CONNECT AND POWER (Controller/Receiver)

**NOTE: The camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.**

- 1** Mount the receiver on to the camera, then connect power to the receiver's PWR port.
- 2** Attach the motor(s) to the rods/lens.
- 3** Connect the motor(s) to any available motor port on the receiver using a 4-pin connector. The motor(s) will begin calibrating.
- 4** Insert an LP-E6 battery in the controller and hold down the POWER button for two seconds. If using a MDR-MB, you must also insert an LP-E6 battery into that unit.

## PAIRING

If the controller is new or has not been paired to a receiver, you can use one of the following two methods to pair both devices:

### Wireless Pairing via Controller

Press the **MENU** button on the controller, then navigate to **WIRELESS>FIND RECEIVER** to scan for active receivers and automatically pair. The Controller status LED will turn green once paired.

### Wired Pairing

Connect a 5-pin connector from the controller's AUX input to the AUX input on the receiver. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The Controller Status LED will turn blue once paired.

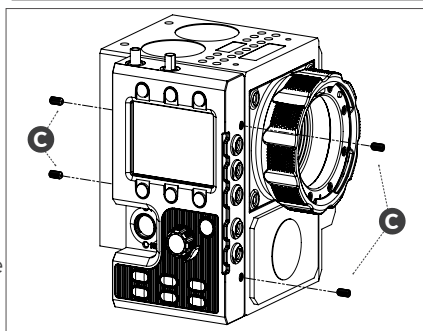
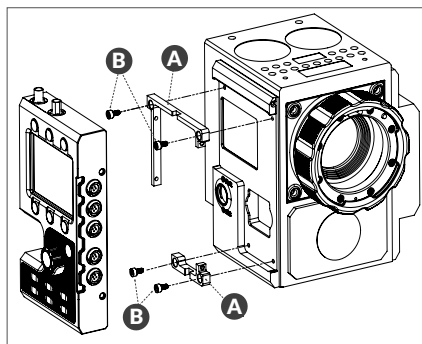
## CAMERA RUN/STOP

- 1** Press the **MENU** button on the controller.
- 2** Navigate to **MENU>CAMERA**, then select the camera you have connected, or select **RED CTRL** if using a RED camera.
- 3** Press the **REC** button on the controller to start/stop recording on the camera. If using a RED camera, access the user interface to run/stop the camera

## CONNECT AND POWER (ACI/MDR.ACI Unit)

**NOTE:** The camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

- 1 Attach the top and bottom brackets (A) to the side of the camera using the included M3 screws (B).
- 2 Insert the four set screws (C) on the ACI unit so that they do not interfere with the notched areas.
- 3 Place the ACI unit firmly against the side of the DSMC2 camera using the alignment guides in the attachment brackets, then tighten the four screws (C) with the Hex L key.
- 4 Attach a RED or RED-approved I/O expander and power source to the camera.
- 5 Connect the larger 4-pin connector on the ACI Control + Power Y-cable to the Control/Power input on the ACI unit (G), then connect the smaller 4-pin connector to the CTRL port on the I/O expander.
- 6 Connect power to the ACI by attaching the P-Tap connector on the Y-cable to the power source.
- 7 If using an MDR.ACI unit, attach the motor(s) to the rods/lens, then connect the motor(s) to the corresponding motor ports using a 4-pin connector. The motors will calibrate after connecting power.



## PAIRING

### Wireless Pairing via Controller

Press the **MENU** button on the controller, then navigate to **WIRELESS>FIND RECV** to scan for active receivers and automatically pair. The Controller status LED will turn green once paired.

### Wireless Pairing via MDR-ACI

Press the **Menu** button on MDR-ACI, navigate to **MDR Settings>Channel**, then select the same channel the controller is on to automatically pair.

### Wired Pairing

Navigate to **MDR Settings>Port IN-1** to set the mode to **Wired**, then connect a 5-pin connector from the controller's AUX input to the **AUX 1** input on the MDR-ACI. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The LED on the controller will turn blue once paired.

# OPERATION

## RECEIVERS

### MK3.1

#### AUX Port

The AUX port supports the use of **Analog controllers** (thumbwheel, zoomrocker, etc.), **Wired-Mode** operation (controller connected directly to the receiver), as well as TTL-level serial communication. The AUX port does not need to be manually configured as it will automatically detect which cable is plugged in.



The following functions are supported by the AUX port:

#### Analog Controllers





Analog controllers connect directly to the AUX port (**B**), and can be configured to control any available axis (focus, iris, and zoom). Run/Stop triggering is also supported, provided that you have a camera connected to the CAM port (**D**).







#### Wired Mode

Devices with a 5-pin **WIRED MODE** socket can connect to the AUX port via a suitable wired-mode cable. The Status LED on both devices will illuminate **BLUE** to indicate that a connection has been made, and that Wireless transmission is disabled. When the wired-mode cable is unplugged (after a successful connection) the receiver will automatically detect the Controller via RF changing frequency if necessary.

#### Setting the AUX port's mode

To configure the AUX port manually, enter the controller's menu, then navigate to **AUX>MODE** to make a selection.

CONNECTIONS	
<b>MOTORS</b>	4-pin (Motor ports) 
<b>PWR (Power)</b>	HR10 4-pin (Power Input, 7-17V DC) 
<b>CAM (Camera)</b>	HR10 4-pin (Trigger Output for camera) 
<b>AUX</b>	5-pin (Analog controllers or Wired Mode) 
<b>USB</b>	Micro USB (For firmware updates)

STATUS LED	
 <b>GREEN</b> - Connected	 <b>PURPLE</b> - Please Wait
 <b>ORANGE</b> - Not Connected or PC Mode	 <b>RED (solid)</b> - Camera running
 <b>BLUE</b> - Wired Mode	 <b>RED (pulse)</b> - Camera trigger

## MDR RECEIVERS (M/MB)

### Standard Mode

This is the default operating mode. MDR receivers will accept controller (wireless) and/or thumbwheel commands, and forward them to the motor(s) and camera. Standard mode also enables LATITUDE's Wi-Fi access point\*, adding full Wi-Fi/FoolControl capability to DSMC and DSMC2 cameras.

### Flight Mode\*

In Flight Mode, the MDR receiver will disable its wireless module. This is useful for saving battery power if the system is being controlled via wired mode. No wireless data will be transmitted.





### Transmitter Mode

In Transmitter Mode, the MDR receiver will route the input signals (i.e. plugged into IN-1, IN-2) over the RF link to the MDR receiver on camera. This enables many unique configurations, including using two thumbwheels (plus MDR) on a director's monitor to control Focus/Iris and run/stop.

### Long Range FoolControl\*

If you connect your iOS device to LATITUDE's Access Point while in Transmitter mode, the MDR receiver will re-transmit the FoolControl communications over the long-range RF link to an MDR receiver on-camera, increasing the usable range of FoolControl. This increases the usable range of FoolControl, and is particularly suited for drone work.



CONNECTIONS	
<b>MOTORS</b>	4-pin 0B (Teradek motor ports) 
<b>PWR (Power)</b>	2-pin 0B (Power Input, 7-17V DC) 
<b>CTRL</b>	4-pin 00B (Trigger Output for camera) 
<b>AUX</b>	5-pin 0B (Analog controllers or Wired Mode) 
<b>USB</b>	Mini-USB (For firmware updates)

STATUS LED*	
<span style="color: green;">●</span> <b>GREEN</b> - Standard Mode	<span style="color: purple;">●</span> <b>PURPLE</b> - Transmitter Mode
<span style="color: cyan;">●</span> <b>CYAN</b> - Flight Mode	<span style="color: red;">●</span> <b>RED</b> - Camera running

Wi-Fi DEFAULTS*	
<b>SSID</b>	LATITUDE-XXXXX
<b>Password</b>	latitude
<b>Admin URL</b>	192.168.0.1
<b>Admin Username</b>	admin
<b>Admin Password</b>	PASSWORD

\* MDR-M/MB only.

# MDR.X





## Menu Operation

Press the **MENU** button, then use the **▲**, **▼**, and **SET** buttons to navigate through the different menu options.

The MDR.X menu options are identical to some of the menu options found on Teradek RT controllers. For more details on the available menu options, please refer to page 20.

- **MOTORS** - Configure the attached motor(s).
- **CAMERA** - Select the make of the camera
- **WIRELESS** - Configure wireless settings.
- **SCREEN** - Change OLED settings.
- **BUTTONS** - Assign functions to the buttons.
- **RX CONFIG** - Assign a specific function (**MODE**) or class (**AXIS**) to the receiver's auxiliary port(s).
- **ADV** - Obtain information about the receiver and perform essential system functions such as debugging and factory reset.



CONNECTIONS	
<b>MOTORS</b>	4-pin 0B (Teradek motor ports) 
<b>PWR (Power)</b>	2-pin 0B (Power Input, 7-17V DC) 
<b>CAM</b>	6-pin 0B (Trigger Output for camera) 
<b>AUX</b>	5-pin 0B (Analog controllers or Wired Mode) 
<b>USB</b>	Mini USB (For firmware updates)


STATUS LED	
<b>GREEN</b> - Connected	<b>PURPLE</b> - Please Wait
<b>ORANGE</b> - Not Connected or PC Mode	<b>RED (solid)</b> - Camera running
<b>BLUE</b> - Wired Mode	<b>RED (pulse)</b> - Camera trigger

# CONTROLLERS

## CTRL.3

The CTRL.3 is a lightweight, ergonomic 3-axis lens controller with built-in lens mapping and data storage. When paired with any compatible SmallHD monitors with integrated Bolt receivers, the CTRL.3 can overlay lens focal distance directly on the monitor, creating the world’s first all-in-one wireless video & lens control solution. In addition to F/I/Z control, the CTRL.3 system enables you to remotely start/stop select HD cameras such as ARRI, Blackmagic, Phantom Flex, RED, Sony, and LANC-compatible models.

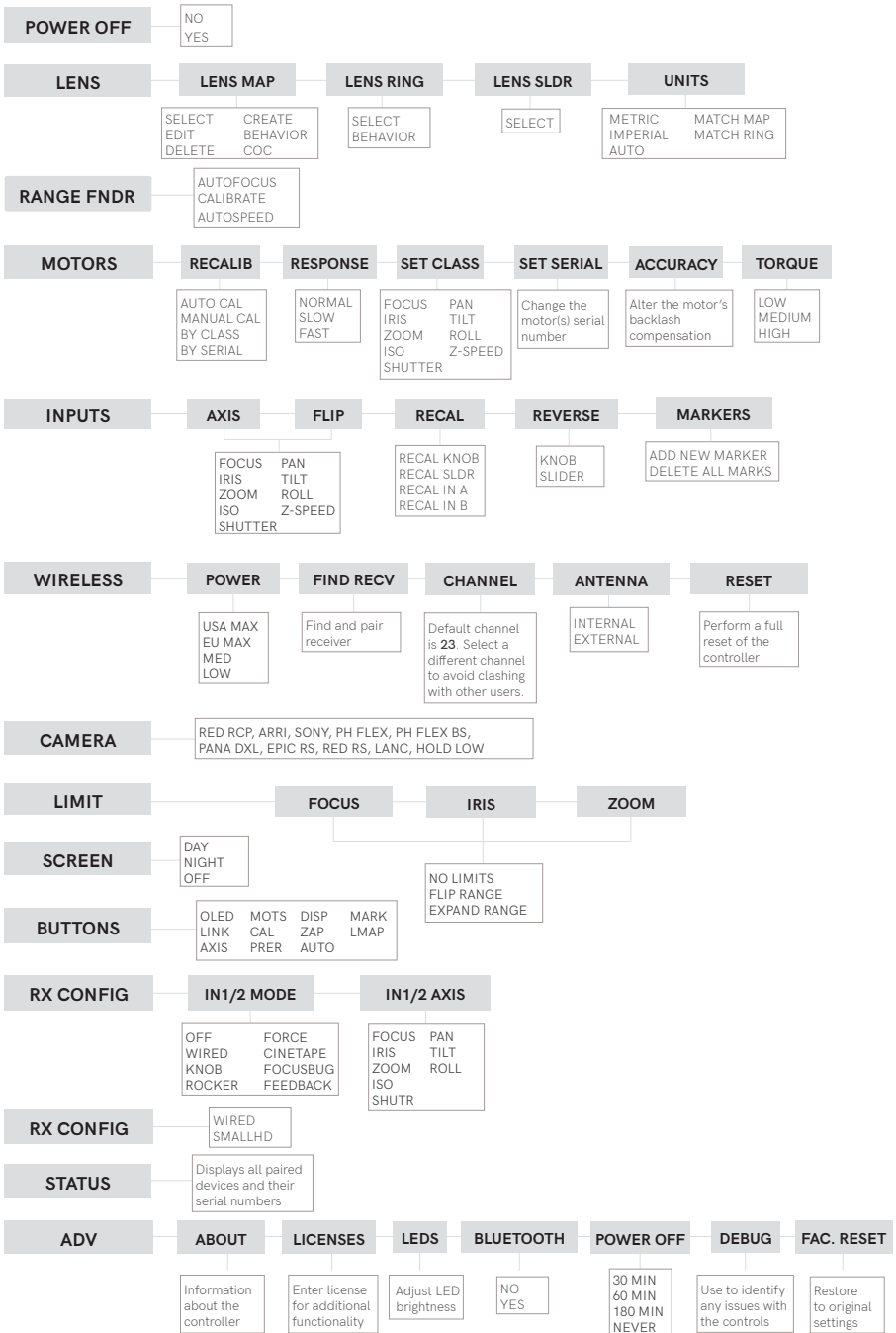


CONNECTIONS	
<b>AUX</b>	5-pin 0B (For Wired Mode) 
<b>USB</b>	Mini-USB (For firmware updates)

STATUS LED	
<b>● YELLOW</b> - No wireless connection	<b>○ WHITE</b> - Checking RF module status
<b>● RED</b> - Camera recording	<b>● GREEN</b> - Wireless is synced
<b>● ORANGE</b> - PC/Bootloader Mode	<b>● BLUE</b> - Wired-mode connection




# CTRL.3 CONTROLLER MENU MAP



## CTRL.1

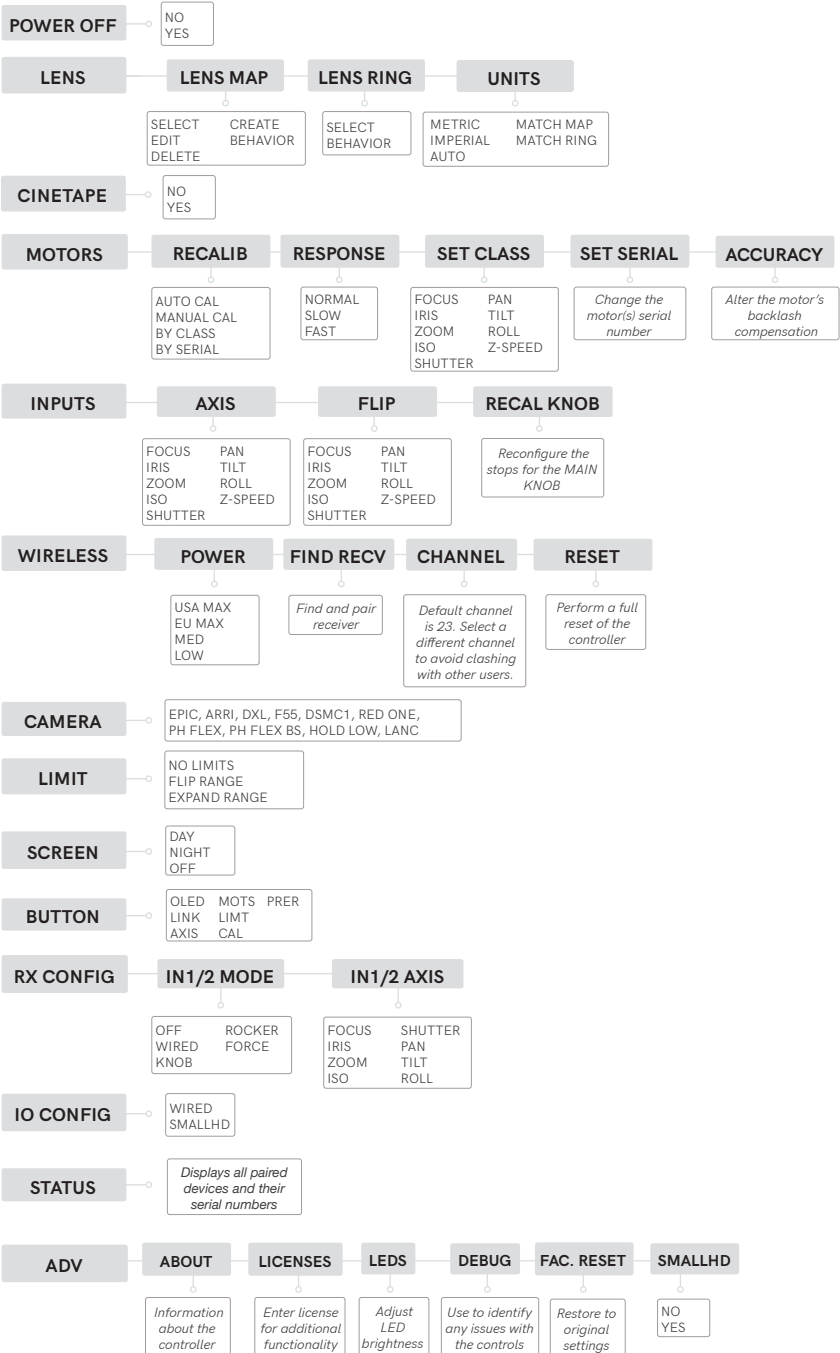
The CTRL.1 hand unit is a powerful, single-axis wireless controller with lens mapping support and data storage, saving time on calibration during lens swaps. Paired with compatible SmallHD monitors with integrated Bolt receivers, the CTRL.1 can overlay lens focal distance directly on the monitor, creating the world's first all-in-one wireless video and lens control solution. In addition to F/I/Z control, the CTRL.1 system enables you to remotely start/stop select HD cameras such as ARRI, Blackmagic, Phantom Flex, RED, Sony, and LANC-compatible models.



CONNECTIONS	
<b>AUX</b>	5-pin 0B (For Wired Mode) 
<b>USB</b>	Mini-USB (For firmware updates)

STATUS LED	
<b>YELLOW</b> - No wireless connection	<b>WHITE</b> - Checking RF module status
<b>RED</b> - Camera recording	<b>GREEN</b> - Wireless is synced
<b>ORANGE</b> - PC/Bootloader Mode	<b>BLUE</b> - Wired-mode connection


# CTRL.1 CONTROLLER MENU MAP



## MK3.1 4-Axis/6-Axis

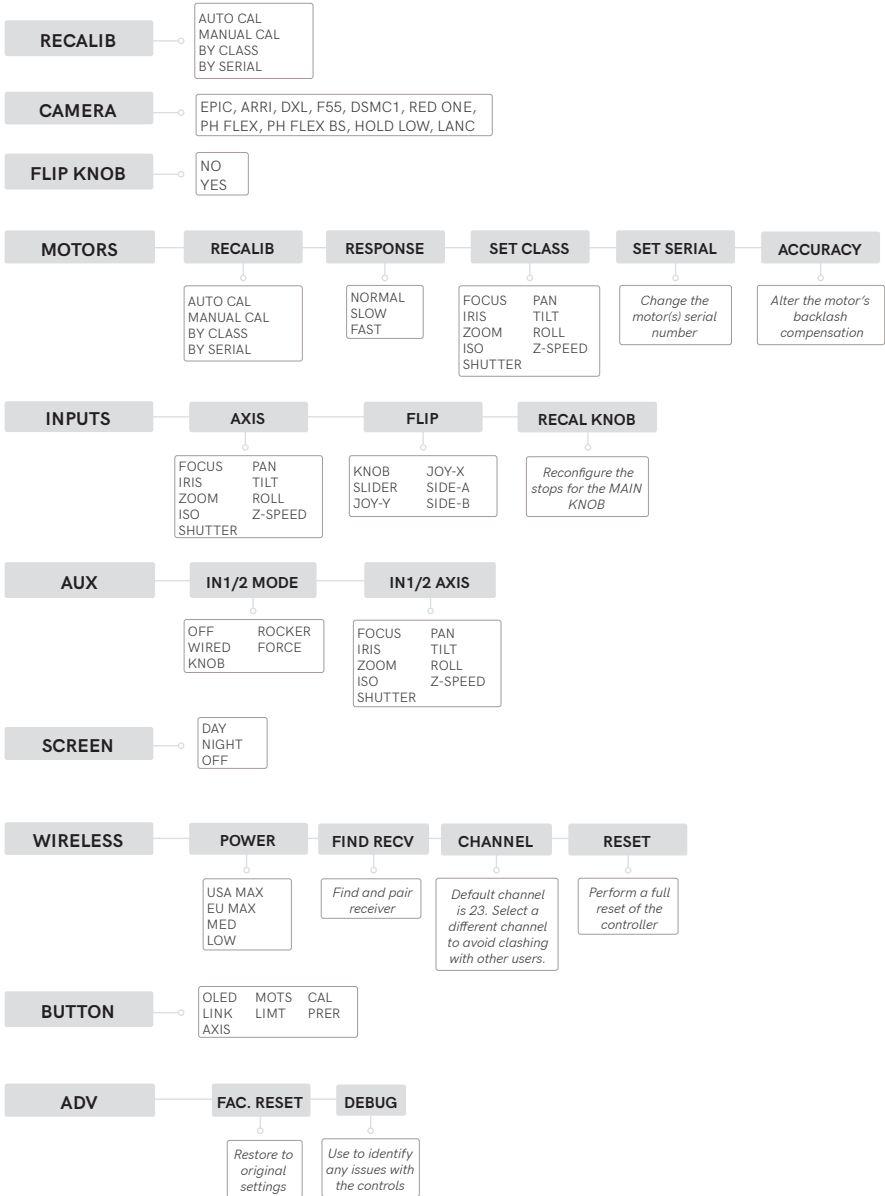
Teradek’s RT MK3.1 wireless controllers provide 4-axis or 6-axis lens motor control (receiver and motors available separately). The 6-Axis Controller includes a Force Joystick zoom button for smooth, sensitive zoom moves. Both controllers offer a large focus knob, one slider control, and two side knobs (A and B). Each input on either controller can be mapped to any lens axis (focus, iris, zoom direction/speed, or 3D function) as you prefer. In addition to F/I/Z control, the MK3.1 system enables you to remotely start/stop select HD cameras such as ARRI, Blackmagic, Phantom Flex, RED, Sony, and LANC-compatible models.



CONNECTIONS	
<b>AUX</b>	5-pin 0B (For Wired Mode) 
<b>USB</b>	Micro USB (For firmware updates)

STATUS LED	
<b>YELLOW</b> - No wireless connection	<b>WHITE</b> - Checking RF module status
<b>RED</b> - Camera recording	<b>GREEN</b> - Wireless is synced
<b>ORANGE</b> - PC/Bootloader Mode	<b>BLUE</b> - Wired-mode connection

# MK3.1 CONTROLLER MENU MAP



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## MENU SETTINGS

### LENS (CTRL.1/CTRL.3 only)

The Lens Menu contains lens map configurations and lens ring options that can be accessed once you have purchased and activated the Lens Mapping license.

For detailed instructions on how to activate the lens mapping and lens data overlay features, please refer to page 26.

#### LENSMAP

- **SELECT** - Select a stored lens map
- **EDIT** - Edit a stored lens map
- **DELETE** - Delete a stored lens map
- **CREATE** - Create a new lens map
- **BEHAVIOR** - Extend or maintain current lensmap limits
- **COC** (CTRL.3 only) - Define the depth of field value

#### LENSRING

- **SELECT** - Select the appropriate lens ring size
- **BEHAVIOR** - Select whether the knob stops at the first mark of the lens ring, or if it continues past the first mark of the lens map

#### LENS SLDR (CTRL.3 only)

Select the appropriate iris strip slider according to the aperture values.

- **F/1**
- **F/1.4**
- **F/2**
- **F/2.8**

#### UNIT

- **METRIC** - Applies the Metric units of measurements
- **IMPERIAL** - Applies the Imperial units of measurements
- **AUTO** - Automatically detects units
- **MATCH MAP** - Match lensmap units of measurements
- **MATCH RING** - Match lensring units of measurements

### CINETAPE (CTRL.1/CTRL.3 only)

CineTape is an ultrasonic device that continuously measures the distance between a subject and the camera's film-plane. This information is transmitted from the camera to the receiver and controller. When this feature is enabled, the controller uses the data from Cinetape to streamline the focus measurement process (e.g. to quickly focus on a slate before returning to manual control, or auto-focusing) and to ensure accurate measurements.

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## MOTORS

Use the **MOTORS** menu to configure any of the attached motors. After the motor(s) have been attached and calibrated (**RECALIB**), you can adjust the **RESPONSE** (normal, slow, fast), **CLASS** (focus, iris, zoom), or alter the serial number (**SERIAL**) and **ACCURACY** of the motors.

### RECALIB

- **AUTO CAL** - Automatically calibrate all attached motors
- **MANUAL CAL** - Manually calibrate end stops for each motor
- **BY CLASS** - Recalibrate motor(s) according to class (Focus, Iris, Zoom, etc.)
- **BY SERIAL** - Recalibrate motor(s) according to serial number

### RESPONSE

- **NORMAL** - Moderately smooth movements (default)
- **SLOW** - Very smooth movements, useful for Iris or Zoom assignments
- **FAST** - Very sharp movements with low-latency

### CLASS\*

- **FOCUS** - Adjusts the focal plane by moving the focus ring
- **IRIS** - Adjusts the aperture
- **ZOOM** - Alter the apparent distance of the subject by moving the zoom ring
- **ISO** - Modify the camera's light sensitivity
- **SHUTR** - Adjust the shutter speed
- **PAN** - Move focal plane horizontally
- **TILT** - Move focal plane vertically
- **ROLL** - Move focal plane side to side
- **Z-SPD** - Zoom speed

*\* Currently, MOTR.X only supports FOCUS, IRIS and ZOOM class assignments.*

### SERIAL

Change the motor's internal serial number. This setting is stored inside the motor.

### ACCURACY

Alter the motor's factory-calibrated backlash compensation.

---

## INPUTS

With the **INPUTS** menu, you can recalibrate the controller's knob and assign or reverse the direction of a specific axis.

### AXIS OPTIONS

- **FOCUS** - Focus axis
- **IRIS** - Aperture axis
- **ZOOM** - Zoom axis
- **ISO** - Light sensitivity
- **SHUTR** - Shutter speed
- **PAN** - Move focal plane horizontally
- **TILT** - Move focal plane vertically
- **ROLL** - Rotate focal plane side to side
- **Z-SPD** - Zoom speed

### FLIP

Reverse the direction of a specific axis.

### RECAL SLDR (CTRL.3 only)

Reconfigure the slider's physical stops according to the aperture values.

### RECAL KNOB

Reconfigure the knob's physical stops according to a specific lens ring's measurements.

## WIRELESS

Use the **WIRELESS** menu to pair a controller with a receiver and adjust the controller's transmission power.

### POWER

- **USA MAX** - Maximum range legal in USA
- **EU MAX** - Maximum range legal in EU
- **MED** - Medium range (best balance of range and battery life)
- **LOW** - Low Range (required when very close to camera)

### FIND RECV

Find and pair a receiver within range.

### CHANNEL

Select a specific channel to avoid clashing with other devices. Default channel is 23.

### RESET

Perform a full reset of the controller.



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## CAMERA

Use the **CAMERA** menu to select the type of camera the receiver is attached to. Specific cables for the different camera connections are available for purchase.

- **RED RCP** - RED DSMC, DSMC2 (all models)
- **ARRI** - Arri Alexa
- **SONY** - Sony VENICE, Sony FS7, Sony F55
- **PH FLEX** - Phantom 4K Flex (RUN/STOP MODE)
- **PH FLEX BS** - Phantom 4K Flex (BURST- used to trigger in loop mode)
- **PANA DXL** - Panavision DXL
- **EPIC RS** - EPIC (Run/Stop)
- **RED RS** - RED (Run/Stop)
- **LANC** - Camera with LANC support
- **HOLD LOW** - Cameras that record while trigger is "held low"

## LIMIT (CTRL.1/CTRL.3 only)

The Limits menu allows you to configure the motor's movements to a specific range for Focus, Iris, or zoom axes. Setting limits restricts the motor from adjusting the lens past a defined range. That range can also be configured to span the entire knob's rotation.

- **NO LIMITS** - The motor has no set limits and moves according to the lens ring's measurements
- **CLIP RANGE** - Create a specific range between two points on the lens. Once set, the motor will move only within that range
- **EXPAND RANGE** - Create a specific range between two points on the lens that spans the entire knob's rotation

## SCREEN

Use the Screen menu to adjust the OLED's brightness

- **DAY** - Full brightness for daytime
- **NIGHT** - Low brightness for night/indoor
- **OFF** - OLED is disabled

---

## BUTTONS

Assign specific functions to the physical buttons on the controller. Below are the different functions:

### BUTTON ASSIGNMENT

- |                           |   |
|---------------------------|---|
| <b>BT. 1</b> - ▲ button   | <b>BT. 4</b> - POWER + ▲ button combination   |
| <b>BT. 2</b> - ▼ button   | <b>BT. 5</b> - POWER + ▼ button combination   |
| <b>BT. 3</b> - SET button | <b>BT. 6</b> - POWER + SET button combination |

### BUTTON OPTIONS

- **OLED** - Shortcut to the Screen menu
- **LINK** - Shortcut to the wireless menu
- **AXIS** - Assign a specific axis to the knob
- **MOTS** - Shortcut to the Motors menu
- **CAL** - Perform auto calibration
- **PRER** - Prerecording
- **LIMIT** (CTRL.1 only) - Shortcut to the Limits menu
- **DISP** (CTRL.3 only) - Change the display format
- **ZAP** (CTRL.3 only) - Select for rapid zooming
- **CINE** - Activate Cinetape communications

## AUX/RX CONFIGURATION

Assign a specific function (**MODE**) or class (**AXIS**) to the receiver's auxiliary ports (**AUX** or **IN-1/IN-2**).

### MODE OPTIONS

- **OFF** - Disable the AUX port(s)
- **WIRED** - Configure IN1 port for WIRED MODE (wired from **Controller** or **Smartknob** to **Receiver** to bypass radio)
- **KNOB** - Thumbwheel is attached to AUX port
- **ROCKER** - Zoomrocker is attached to AUX port
- **FORCE** - Force Sensor is attached to AUX port

### AXIS OPTIONS

- **FOCUS** - Focus axis
- **IRIS** - Aperture axis
- **ZOOM** - Zoom lens
- **ISO** - Light sensitivity
- **SHUTR** - Shutter speed
- **PAN** - Move focal plane horizontally
- **TILT** - Move focal plane vertically
- **ROLL** - Move focal plane side to side
- **Z-SPD** - Zoom speed

---

## IO CONFIGURATION (CTRL.1/CTRL.3 only)

Assign a communication mode (**SmallHD/Wired**) to the controller's AUX input.

## STATUS (CTRL.1/CTRL.3 only)

The Status menu lists all devices that are connected to the controller along with their serial numbers. This is useful for determining which devices are paired to the controller, especially when multiple devices and cameras are within range.

## ADVANCED (ADV) SETTINGS

Use the **ADV** menu to obtain information about the controller, activate licenses, and perform minor system functions (**options vary depending on the type of controller**).

- **ABOUT** - Information about the controller such as firmware version, UID, and serial number
- **LICENSES** - Enter license for additional functionality
- **LEDS** - Adjust the LED brightness
- **BLUETOOTH** - Activate Bluetooth
- **DEBUG** - Used for diagnostic purposes. Identify any issues with the controls such as buttons and inputs.
- **FAC. RESET** - Restore controller to original settings
- **SMALLHD** - Activate SMALLHD communications

## LENS MAPPING

CTRL.1 and CTRL.3 both feature built-in lens mapping, which allows users to auto-calibrate lenses to pre-marked focus rings with the touch of a button. **Lens Mapping** is a standard feature on the CTRL.3. For CTRL.1, Lens Mapping is included when you purchase the CTRL.1 Lens Mapping Package, or available for purchase as a separate upgrade. After purchasing the Lens Mapping Package, use the following steps to activate this feature.



### ACTIVATE LENS MAPPING (CTRL.1 only)

- 1 Press the **MENU** button, then use the ▼ button to navigate to the **ADV** (Advanced) menu. Press the **SET** button to access the menu.
- 2 Navigate to the **LICENSES** menu. Press **SET** to display the UID number.
- 3 To generate a license key, visit [activate.teradek.com](https://activate.teradek.com) and enter the controller's UID, upgrade code, and your email address.
- 4 On the same screen displaying the UID number, select **YES** to enter the license key. After entering the license key, you can now map the lens to the controller.

### CREATING A LENS MAP

- 1 Navigate to **LENS>LENSMAP>CREATE**.
- 2 Select the lens brand, then create a name to identify the lens map.
- 3 Select **Yes** to map a prime lens, then enter the lens' fixed focal length (e.g. 35mm, 85mm). Select **No** if mapping a zoom lens, then create a focal length (zoom) table (e.g. 24-70mm, 70-200mm).
- 4 After setting the focal length, you will be prompted to create an Iris table. Make sure a motor is attached to the corresponding ring, and both the motor and controller are set to the same class (Focus, Iris, Zoom).
- 5 Move the controller knob so that the motor adjusts the lens ring to the minimum stop.
- 6 Using the Up and Down buttons on the controller, enter the corresponding mark, then select **OK**.  
**NOTE: Entering every lens mark is not required, but it is recommended in order for the Lens Map to be more accurate.**
- 7 Press the **MENU** button, then select **TABLE DONE**.
- 8 You will then be prompted to create an iris or focus distance table, depending on the type of lens. Select **YES**, then repeat steps 5 through 7 for each motor you want to map.
- 9 Attach a lens ring to the controller's knob.
- 10 Navigate to **LENS>LENSRING>SELECT** and select the corresponding lens ring size.

---

## LENS DATA OVERLAY

SmallHD monitors include a Lens Data Overlay feature that displays your controller's lens map position. Before activating the Lens Data Overlay feature, you will need the following:

- **LENS MAPPING LICENSE** - If you have a CTRL.1, you need to purchase a Lens Mapping License. If you have a CTRL.3, the license is already included.
- **SMALLHD/TERADEK RT INTERFACE CABLE** - Be sure you purchase the appropriate cable for your monitor.



## ACTIVATE LENS DATA OVERLAY

- 1 Update your CTRL.3/CTRL.1 controller and SmallHD monitor to the latest firmware.  
For more instructions on how to integrate your controller and monitor, visit:  
<https://support.teradek.com/hc/en-us/articles/360020392513-Teradek-RT-SmallHD-Integration>
- 2 From the controller, navigate to **LENS>LENSMAP** and select one of the configured lens maps.
- 3 Press the **MENU** button to return to the main menu, then navigate to **MENU>IO CONFIG>SMALLHD**.
- 4 Select **YES** to activate SmallHD communications (**SMALLHD COMMS**).
- 5 Connect a cable from the controller's wired mode connector to the monitor's USB port.
- 6 Tap the screen on the SmallHD and navigate to **ADD NEW TOOL>ADD ONS**.
- 7 Select **TERADEK RT**.
- 8 The Lens Map Overlay will appear on the right of the SmallHD screen and move according to controller's knob movements.

## ACI/MDR-ACI

The Teradek RT ACI (Assistant Camera Interface) module simplifies camera control and management by combining a smartly-designed software UI with physical controls. The hardware attaches seamlessly to the side of RED DSMC2 cameras and can operate with any DSMC2 I/O module with a CTRL port. The MDR.ACI includes a 3-channel Teradek RT wireless lens control receiver, 2.4GHz FHSS radio, and Bluetooth capabilities.



## BUTTON OPERATION



### HOME SCREEN BUTTONS

Access primary camera capture parameters.

### RECORD BUTTON

Start or stop recording.

### MENU JOG WHEEL

Navigate the menus and configure the user menu options. Push the jog wheel to confirm or open selection.

### CONTROL/MENU BUTTONS

**USER:** Access/configure user menu options

**BACK:** Return to the previous screen

**HOME:** Return to the home screen

**PLAY:** Replay footage

**MENU:** Access advanced menus

**LOCK:** Activate/deactivate all buttons

## HOME SCREEN OPERATION

The Home screen allows the user to access and configure the most critical camera parameters. Press any of the six arrow buttons to display its corresponding menu, then use the jog wheel to select and configure the settings.

### HOME SCREEN BUTTONS

**FPS (Frame Rate):** Configure the number of frames per second being recorded.

**SENSOR:** Adjust the recording resolution along with the REDCODE compression setting.

**EI (Exposure Index/ISO):** Manage the light sensitivity of the sensor.

**SHUTTER:** Adjust the shutter speed.

**COLOR:** Manage color space, 3D LUTs, and Gamma curve settings.

**WB (White Balance):** Adjust the color temperature based on current lighting conditions.



### STATUS DISPLAY

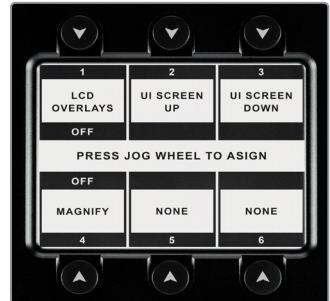
The center of the display shows critical camera parameters, number of recorded clips, media and power status, recording format, timecode/genlock/sync indicators, sensor calibration meter and RGB channel clipping indicators.

## USER MENU CONFIGURATION

ACI is equipped with a configurable user menu interface. Press the USER button to display the user menu, then use the Jog wheel to assign camera functions to any of the six menu buttons.

### TO CONFIGURE THE USER MENU:

- 1 Press the **USER** button to open the User menu.
- 2 Press the Jog wheel to display the command buttons and corresponding functions
- 3 To configure or change a button command, use the jog wheel to scroll through the list of buttons, then select the highlighted option by pressing the jog wheel.



---

## MOTORS

Teradek RT motors are compatible with all Teradek RT wireless FI+Z systems. The MOTR.X includes a selector button used to assign a specific axis (Focus, Iris, or Zoom) to the motor, LEDs to indicate the selected axis, and features new in/out motor ports for data and power, allowing MOTR.X units to be daisy-chained from one unit to the next. The MK 3.1 motor features electronic backlash-compensation, a high-resolution encoder, and an integrated heat sink.



## WARNING

- MOTR.X and MK3.1 are powerful devices which are capable of causing injury or damage. Use caution when touching the drive gear if the device is powered on.
- The motor is not to be used on extremely stiff or damaged lenses.
- The motor requires no user maintenance. Opening the motor can affect its internal calibration and voids the warranty.
- The motor body is used as a heatsink for the brushless windings. It may get warmer than a brush-type motor.

## POWER AND CONNECT

- 1 Attach the motor to the camera support rod.
- 2 Rotate the lens ring so that it's not too close to either end stop, then mesh the motor's drive gear with the lens ring gear.
- 3 Tighten the rod clamp knob.
- 4 Connect power from the receiver to either motor input using a 4-pin connector. If connecting multiple motors:

**MOTR.X** - use a 4-pin connector to "daisy-chain" the other motors together.

**MK3.1** - use a 4-pin connector to connect each motor to the receiver's motor ports, or if using and MDR.M or MB, use a Y-cable 4-pin connector to connect to both motors.

The motor(s) will then begin calibrating.

- 5 If you see evidence of backlash affecting accuracy, make sure that your mount, rails, and camera are extremely rigid, as mounting flex is the main cause of inaccuracy.



---

## FOCUS/IRIS/ZOOM ASSIGNMENT (MOTR.X only)

To manually assign an axis (Focus, Iris, Zoom) to the motor(s), press and hold the Axis Button (B) for one second, then release once the correct class indicator is illuminated.

To assign or change the motor's axis from the controller, select **SET CLASS** from the controller's **MOTORS** menu. The motors will be listed according to the last four digits of the motor's serial number (found at the bottom of the motor).



## CONTROLLER MOTOR MENU

Other performance parameters (performance mode, direction of rotation, etc.), can also be modified from the controller's **MOTORS** menu. Below is a list of available motor specific menu items.

- **RECALIB** - Calibrate end stops for motors
- **RESPONSE** - Adjust the motor's response time
- **SET CLASS** - Assign or change a motor(s) particular class
- **SET SERIAL** - Change the motor(s) serial number
- **ACCURACY** - Alter the motor's backlash compensation

## SMARTKNOB

The Smartknob is a standalone wired lens controller (no receiver required) for Canon EF and Nikon AF lenses attached to RED DSMC or DSMC2 cameras. The Smartknob allows user to control EF/AF lenses using their internal motors, and map RED camera commands to several buttons located along the side of the knob.



## STANDALONE MODE

Connect the Smartknob to the camera and power source using the included 6-pin Y-cable.

## ACCESSORY MODE

Connect the Smartknob to the MDR receiver using a 5-pin Wired Mode Cable.

**NOTE: Only the Focus Knob and the record button (R) will function in Accessory Mode.**

---

## DEFAULT CONFIGURATION

**Knob** - Focus (forward)

**R (Red button)** - Record/Stop

**A (Teal button)** - Iris Close

**B (Teal button)** - Iris Open

**W (Grey button)** - Magnify

**X (Orange button)** - Exposure Check

**Y (Orange button)** - Lens Motor Reset

## KNOB/BUTTON CONFIGURATION

The Smartknob buttons can be configured in RTFW (see page 39), available for download from [www.teradek.com](http://www.teradek.com). Connect the Smartknob to your computer via the mini USB, then open RTFW, go to **Tools>Smartknob Config**. Options for mapping internal DSMC functions will be displayed.

## KNOB CONFIGURATION OPTIONS

- **FOCUS FORWARD/REVERSE** - Use the knob to focus on the image
- **IRIS OPEN/CLOSE** - Open or close the iris to adjust the exposure

## BUTTON CONFIGURATION OPTIONS

- **RECORD STOP** - End recording
- **MAGNIFY** - Enlarge the central region of the camera's LCD monitor
- **LENS MOTOR RESET** - Reboot the lens motor
- **EXPOSURE CHECK** - Analyze the RAW sensor data's exposure levels
- **IRIS OPEN/CLOSE** - Open or close the iris to adjust the exposure
- **PRE RECORD** - Continuously capture cache of footage before recording starts
- **FOCUS CHECK** - Analyze the video and apply color to the highlighted edges
- **RAW CHECK** - Displays images unaffected by the RGB settings
- **VIDEO CHECK** - Check the video level of the RGB monitor path and any outputs driven from that path, such as HD-SDI or HDMI.
- **LIMIT MODE** - Hold down assigned button, turn the knob to whichever two points, then release. Limits will be set to the full rotation of the knob between the manually set points. To clear this limit, hold down the assigned button for 3 seconds
- **ISO INCREMENT/DECREMENT** - Increase or decrease the ISO settings.
- **2ND FUNCTION** - Assign a second function to an already configured button.

---

## SLAVE CONTROLLERS

The Zoomrocker and Thumbwheel are both ergonomic slave controller options that offer highly flexible thumb/finger control, along with a recording (REC) trigger.

### POWER AND CONNECT

Connect either slave controller to the MK3.1 receiver's **AUX** port.

For MDR receivers, connect either slave controller to the **IN-1** or **IN-2** port. By default, IN-1 is **FOCUS** and IN-2 is **IRIS**.

### CONFIGURATION

To manually configure from a CTRL.1 or CTRL.3 controller, navigate to **RX CONFIG>IN1/IN2 MODE**, then select either **KNOB** for Thumbweel or **ROCKER** for Zoomrocker.

To manually configure from an MK3.1 controller, navigate to **AUX>IN1/IN2 MODE**, then select either **KNOB** for Thumbweel or **ROCKER** for Zoomrocker.

### THUMBWHEEL

To **flip** the direction of the Thumbwheel, hold down the button for 10 seconds.

To set **limits** on the Thumbwheel, hold down the button and move the knob to your chosen points on the lens. After releasing the button, the Thumbwheel will configure itself to the points you have selected.

Thumbwheel



Zoomrocker



# TERADEK RT APP


The Teradek RT App allows users to configure all of the major functions via Bluetooth such as motor axis selection, creating lens maps, start/stop, and includes virtual sliders for calibrating FIZ controls on the MDR.X.

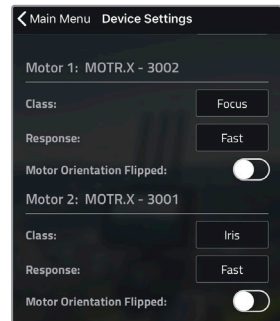


## CONNECT VIA BLUETOOTH


- 1 Download the Teradek RT App from the App Store.
- 2 Navigate to **ADV>BLUETOOTH** on the CTRL.3 controller and/or MDR.X receiver, then select **Yes** to enable.
- 3 Enable Bluetooth on your iOS device, then open the Teradek RT app. Your iOS device will automatically detect any MDR.X or CTRL.3 within range.
- 4 Select the RT device(s) you want to configure.

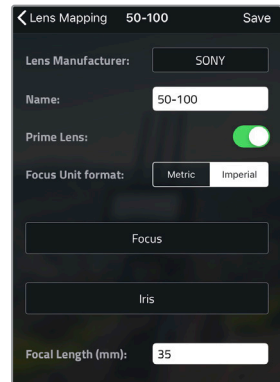
## ASSIGN AN AXIS TO A MOTOR

- 1 Open the RT app, then select the device (receiver, controller, or ACI) the motor(s) are configured to.
- 2 Tap the  icon on the top-right corner, select **Device Settings**, then scroll down to the motor you want to assign a specific axis to.
- 3 Tap the **Class** button to select an axis. From this menu, you can also configure the motor's response speed and orientation.

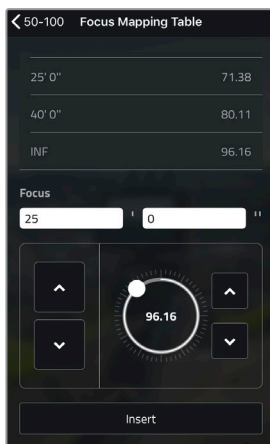


## CREATE A LENS MAP (MDR.X)

- 1 Select an MDR.X receiver from the main screen.
- 2 Tap the  icon on the top-right corner, select **Lens Mapping**, then tap the **Create new Lens Map** button at the bottom of the screen.
- 3 Select the lens manufacturer, then create a name to identify the lens map.
- 4 If the lens is a prime lens, tap the **Prime Lens** switch, then enter the **Focal Length** (e.g. 35mm, 85mm) below.

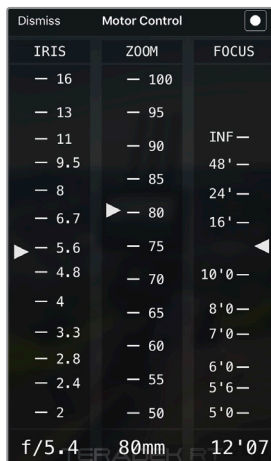


- 5 Select the axis you want to map (**Focus, Iris, Zoom**). Make sure a motor is attached to the corresponding ring, and that both the motor and receiver are set to the same axis.
- 6 Move the virtual knob so that the motor adjusts the lens ring to the smallest mark.
- 7 Using the Up and Down buttons on the right, enter the corresponding mark, then select **Insert**. Repeat this step for all marks until they have all been mapped.
- 8 Press the **Back** button to select another axis to map. Repeat steps 5 and 6 for each axis you want to map.
- 9 Press the **Back** button again, then tap **Save** at the top right corner. You will then be prompted whether or not to apply the Lens Map.




## ACCESS VIRTUAL SLIDERS

- 1 Open the RT app, then select a receiver from the main screen.
- 2 Tap the **Motor Control** button at the bottom of the user interface.
- 3 Select an axis, then use your finger to move the slider up and down. The motor will adjust the lens ring according to the slider's movements.



## IMPORT/EXPORT LENS MAPS (CTRL.3)

- 1 Select a CTRL.3 controller from the main screen.
- 2 Tap the  icon on the top-right corner, then select **Lens Mapping**.

- 3 **To import specific Lens Maps:**  
Tap the **List CTRL.3 Maps** button to display all the lens maps stored on the controller. Select the specific lens map(s) you want to import to your iOS device, then tap **Download to iOS**.

### **To import all Lens Maps:**

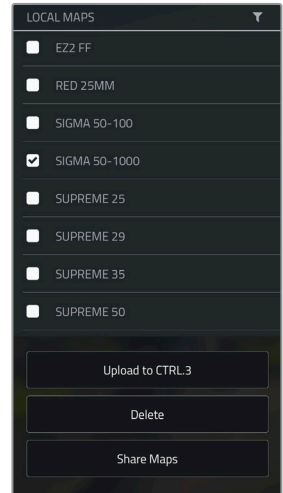
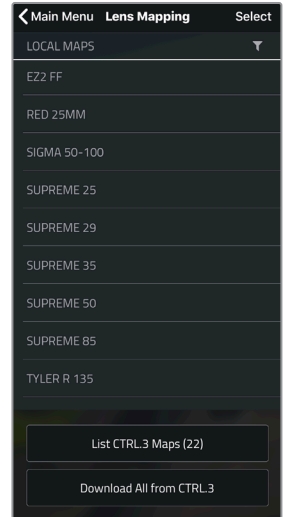
Tap the **Download All from CTRL.3** button to import all the lens maps. To view all the lens maps before importing them to your iOS device, tap the **List CTRL.3 Maps** button, tap the **Select All** button on the top right corner, then tap **Download to iOS**.

- 4 To edit a lens map configuration, select the lens map from the list. After making changes, tap **Save** on the top-right corner.

- 5 **To export the lens map(s) to the controller:**  
Tap **Select** on the top-right corner, select the lens map(s) you want to export, then tap **Upload to CTRL.3**.

**To export the lens map(s) to another controller:**  
Navigate back to the **Available Devices** screen to select a different controller, then return to the Lens Mapping menu (see step 2). Tap **Select** on the top-right corner, select the lens map(s) you want to export, then tap **Upload to CTRL.3**.

If the RT app determines the lens map is already stored on the controller, you will be prompted to **Skip**, **Keep**, **Override**, or **Cancel** your selection.



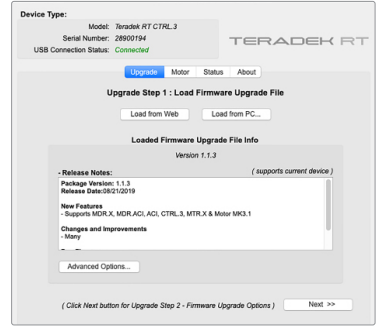
# TERADEK RT MANAGER

Teradek regularly releases new firmware versions to improve performance, add new features, or to fix vulnerabilities. Teradek RT Manager allows you to upgrade your RT device's firmware and is available as software for Mac or Windows.

## RT MANAGER SOFTWARE

### MENU OPTIONS

- **Upgrade** - Update your RT controller, receiver, or ACI with the latest firmware.
- **Motors** - Update your RT motors with the latest firmware.
- **Status** - Displays detailed information about configuration and update statuses.
- **About** - Displays the software version and License Agreement.

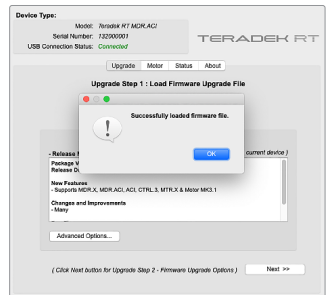


## UPGRADE CTRL.3, MDR.X, OR ACI/MDR.AC1

To upgrade *CTRL.1* and *MK3.1* controllers, or *LATITUDE* and *MK3.1* receivers, you must use *RTFW* (see page 39).

- 1 Connect external power to your controller or receiver, then connect it to your computer via USB.
- 2 Open **RT Manager**, then load the firmware file from either your computer or the web.

- **Load from Web** - If you have an Internet connection, click **Load from Web** to download the latest firmware package from Teradek's servers.
- **Load from PC** - Click **Load from PC** if you have already downloaded the firmware package you wish to use. For the latest firmware, visit:  
<http://www.teradek.com/pages/downloads#teradekrt>

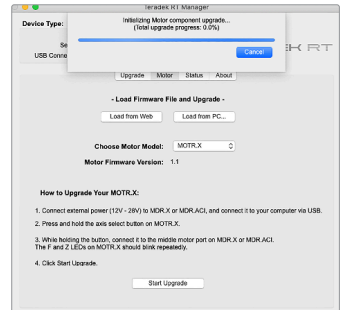


- 3 Once the firmware is loaded, click **Next** to proceed with the upgrade. You will then be presented with a list of device components and whether or not they are scheduled to be updated, along with two options:
- **Start Upgrade** - Update your RT controller or receiver with the latest firmware version.
  - **Advanced Options** - View detailed version information for each component and the firmware upgrade package components. The **Advanced** screen also allows users to select which components to upgrade.



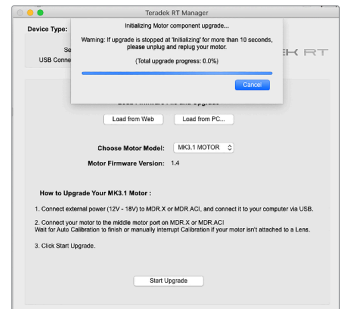
## UPGRADE MOTR.X

- 1 Connect external power (12V-18V) to your MDR.X or MDR.ACI, then connect it via USB to your computer.
- 2 Press and hold the axis select button on MOTR.X until the **F** and **Z** LEDs on MOTR.X begin to blink repeatedly.
- 3 While holding down the button, connect the motor to the middle port on your MDR.X or MDR.ACI.
- 4 Open **RT Manager**, then load the firmware file from either your computer or the web (see step 2 on page 36).
- 5 Select **MOTR.X** as the motor model, then click **Start Upgrade**.



## UPGRADE MK3.1 MOTOR

- 1 Connect external power (12V-18V) to your MDR.X or MDR.ACI, then connect it via USB to your computer.
- 2 Connect your motor to the middle motor port. Wait for Auto Calibration to finish, or if the motor is not attached to a lens, you can manually interrupt the calibration process.
- 3 Open **RT Manager**, then load the firmware file from either your computer or the web (see step 2 on page 36).
- 4 Select **MK3.1** as the motor model, then click **Start Upgrade**.





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## RTFW

**RTFW** allows you to upgrade older RT devices' firmware, and is available as software for Mac or Windows.



### UPDATE FIRMWARE

- 1 Visit <https://www.teradek.com/pages/downloads> and download **RTFW**. Run the app, and make sure the device you intend to update is turned off.
- 2 Using the included USB cable, connect the device to your computer.
  - **MK3.1 CONTROLLER** - In order for RTFW to detect and connect to the controller, you need to hold down the **SET** and **POWER** buttons simultaneously for about two seconds to set the device to **PC MODE**.
  - **CTRL.1 CONTROLLER** - In order for RTFW to detect and connect to the controller, it must first be turned **OFF** before connecting to your computer. Once connected, turn **ON** the device. Your controller is now in **PC Mode**.
  - **LATITUDE** or **MK3.1 RECEIVERS** - Connect your receiver to your computer. RTFW will automatically detect and connect to the receiver.

RTFW will display **Connected to Device** at the top, indicating that the app has detected and connected to the device.

- 3 Under **Which Device to Update**, select the corresponding device from the drop down menu.
- 4 Under **Firmware**, use the drop down menu to select a firmware version for your device.
  - MK3.1 CONTROLLER ONLY** - Under **Firmware**, use the drop down menu to select a firmware version that matches your controller type:
    - a. Select **Controller... S** for Controller without Force-Zoom
    - b. Select **Controller... Z** for Controller with Force-Zoom (red joystick)
- 5 Tap the **Update Device** button.

# TECHNICAL SPECIFICATIONS

## MK3.1 RECEIVER

### SUPPORT

RF Handset Support	MK3.1 Controller, CTRL.1 Controller
Camera Run/Stop Support	RED (Epic, Scarlet, Weapon, Raven, etc.), ARRI (Alexa, Amira, etc.), Phantom, Sony F55, LANC (Blackmagic, Canon C100/300/500, Sony FS7)
RT Accessory Support	MK3.1 Motor, Thumbwheel, Smartknob
App Support	Foolcontrol for iOS devices, RT App

### WIRELESS

Integrated Radios	<b>Teradek RT FHSS:</b> 2.4GHz, <b>WiFi:</b> 2.4GHz
FHSS	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode), Up to 500 ft (150 m) indoors
Wi-Fi	N/A

### PHYSICAL ATTRIBUTES

Dimensions	3.9"W x 1.3"D x 1"H [100mm x 32mm x 25mm]
Weight	3.9 oz (111g)
Construction	Aluminum alloy base
Temperature	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)

### INTERFACES

Micro-USB	Configuration and Firmware upgrade
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### CONNECTORS

Power input (PWR)	4-pin locking connector, 7-17 VDC
Motors	3x Teradek RT Motor ports
Auxiliary input (AUX)	5-pin locking connector
Camera input (CAM)	4-pin locking connector
USB	Micro-USB connector

### NETWORK

Teradek RT Lens Control RF Channel Selection	Configurable to specific channels
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### POWER

Power Input	4-pin Circular-locking connector (7-17V DC)
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## MDR RECEIVERS

	MDR-M	MDR-MB
<b>SUPPORT</b>		
RF Handset Support	MK3.1 Controller, CTRL.1 Controller	MK3.1 Controller, CTRL.1 Controller
Camera Run/Stop Support	RED (Epic, Scarlet, Weapon, Raven, etc.) ARRI (Alexa, Amira, etc.) Phantom Sony F55	RED (Epic, Scarlet, Weapon, Raven, etc.) ARRI (Alexa, Amira, etc.) Phantom Sony F55
Full Control	RED (Epic, Scarlet, Weapon, Raven, etc.)	RED (Epic, Scarlet, Weapon, Raven, etc.)
Teradek RT Accessory Support	MK3.1 Motor Thumbwheel Smartknob	MK3.1 Motor Thumbwheel Smartknob
App Support	FoolControl for iOS devices, RT App	FoolControl for iOS devices, RT App
<b>WIRELESS</b>		
Integrated Radios	Teradek RT FHSS: 2.4GHz WiFi: 2.4GHz	Teradek RT FHSS: 2.4GHz WiFi: 2.4GHz
FHSS	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode) Up to 500 ft (150 m) indoors	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode) Up to 500 ft (150 m) indoors
Wi-Fi (iOS devices)	Up to 330 ft (100 m) outdoors	Up to 330 ft (100 m) outdoors
<b>PHYSICAL ATTRIBUTES</b>		
Dimensions	3.9"W x 1.73"D x 0.86"H [100mm x 48mm x 22mm]	3.5"W x 1.9"D x 1.14"H [90mm x 48mm x 29mm]
Weight	3.7 oz (104g)	3.8 oz (110g)
Construction	Milled aluminum	Aluminum alloy
Temperature	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)
<b>INTERFACES</b>		
Mini-USB	Configuration and Firmware upgrade	Configuration and Firmware upgrade
Teradek RT	Firmware Configuration via Mini-USB, Configuration with RF or 5-pin to "RT-IN 1" Connector, Control with RF, "RT-IN 1 or RT-IN 2" Connectors	Firmware Configuration via Mini-USB, Configuration with RF or 5-pin to "RT-IN 1" Connector, Control with RF, "RT-IN 1 or RT-IN 2" Connectors

	MDR-M	MDR- MB
<b>CONNECTORS</b>		
Power Input	Power-In: 2-pin LEMO 0B, 7-17 VDC	Power-In: 2-pin LEMO 0B, 7-17 VDC
Camera Input (CTRL)	CTRL (Camera): 4-pin LEMO 00B, RS-232 for RED control, programmable line driver for select cameras	CTRL (Camera): 4-pin LEMO 00B, RS-232 for RED control, programmable line driver for select cameras
Motor Inputs	1x Motor port	1x Motor port
Auxiliary Inputs	2 x 5-pin locking connector	2 x 5-pin locking connector
Mini-USB	Configuration and Firmware upgrade	Configuration and Firmware upgrade
<b>NETWORK</b>		
Wireless	WiFi: 2.4GHz 802.11b/g/n	WiFi: 2.4GHz 802.11b/g/n
<b>POWER</b>		
Power Input	2-Pin Circular-locking connector (7-17V DC) or DSMC2 Battery Module	2-Pin Circular-locking connector (7-17V DC) or DSMC2 Battery Module
Battery	N/A	LP-E6 Battery
<b>GENERAL</b>		
Mountability	1 x 1/4"-20 mounting hole	1 x 1/4"-20 mounting hole

## MDR.X RECEIVER

### SUPPORT

RF Handset Support	MK3.1 Controller, CTRL.1 controller, or CTRL.3 Controller
Camera Run/Stop Support	RED (Epic, Scarlet, Weapon, Raven, etc.), ARRI (Alexa, Amira, etc), Phantom, Sony F55, LANC (Blackmagic, Canon C100/300/500 Sony FS7)
RT Accessory Support	MOTR.X, MK3.1 Motor, Thumbwheel, Zoomrockler,
App Support	RT app

### WIRELESS

Integrated Radios	Teradek RT FHSS 2.4GHz, WiFi 2.4GHz
FHSS	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode) Up to 500 ft (150 m) indoors
Wi-Fi	N/A

### PHYSICAL ATTRIBUTES

Dimensions	3.9"W x 1.3"D x 1"H [100mm x 32mm x 25mm]
Weight	3.9 oz (111g)
Construction	Aluminum alloy base
Temperature	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)

### INTERFACES

Front Panel Interface	OLED Screen with menu system and button navigation
Camera Control Support	<b>RED DSMC2, RED DSMC control:</b> EF/AF Focus/Iris, Shutter, ISO <b>Button features:</b> 2x Magnification, Edge, Focus Assist
Desktop App	Teradek RT Settings Manager, Teradek RT Firmware Configuration App
Mini-USB	Configuration and firmware upgrade

### CONNECTORS

Power Input	2-pin locking connector 0B, 7-17 VDC
Camera Input (CAM)	6-pin locking connector 0B, RS-232 for RED control, programmable line driver for select cameras
Motor Inputs	3x 4-pin locking connector
Auxiliary Inputs	2x 5-pin locking connector
Mini-USB	Configuration and Firmware upgrade

### POWER

Power Input	4-pin Circular-locking connector (7-17V DC)
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## MK3.1 CONTROLLER

### SUPPORT

Camera Run/Stop Support RED (Epic, Scarlet, Weapon, Raven, etc.), ARRI (Alexa, Amira, etc.), Phantom, Sony F55, LANC (Blackmagic, Canon C100/300/500 Sony FS7)

Teradek RT Accessory Support MK3.1 Motor, Thumbwheel, MDR Receivers, MK3.1 Receiver

App Support foolcontrol for iOS devices

### NETWORK

Wireless **Teradek RT FHSS:** 2.4GHz  
**WiFi:** 2.4GHz

Wireless Range Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode),  
Up to 500 ft (150 m) indoors

Wi-Fi N/A

### PHYSICAL ATTRIBUTES

Dimensions 3"W x 1.3"D x 6.1"H [76.2mm x 33mm x 154.9mm]

Weight **4-Axis:** 21.2 oz (597g), **6-Axis:** 21.5 oz (612g)

Construction Aerospace-grade aluminum billet

Temperature **Operating:** -4 to 122°F (-10 to 50°C)  
**Storage:** -40 to 185°F (-40 to 85°C)

### CONNECTORS

AUX input 5-pin locking connector for Wired-mode

USB Micro USB to USB 2.0 connector

### INTERFACES

Front Panel Interface OLED Screen with menu system and button navigation

Inputs Main focus knob with removable lens ring,  
Iris slider, 2 x multi-function knobs,  
2-axis Zoom Force Joystick (6-axis),  
On/Off button

Desktop App Teradek RT Settings Manager, Teradek RT Firmware Configuration App

Micro-USB Configuration and firmware upgrade

### POWER

Power Input LP-E6 Battery: 6.2 to 8.4 V  
USB Port: 4.75 to 9 V (maximum)

### GENERAL

Mountability 3 x 1/4"-20 UNC mounting holes

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## CTRL.3 CONTROLLER

### SUPPORT

Camera Run/Stop Support	RED (Epic, Scarlet, Weapon, Raven, etc.), ARRI (Alexa, Amira, etc.), Phantom, Sony F55, LANC (Blackmagic, Canon C100/300/500 Sony FS7)
RT Accessory Support	MOTR.X, MK3.1 Motor/Receiver, Thumbwheel, MDR Receivers, MDR.X
App Support	Foolcontrol for iOS devices, RT App

### NETWORK

Wireless	Teradek RT FHSS 2.4GHz
Wireless Range	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode), Up to 500 ft (150 m) indoors
Latency	2ms

### PHYSICAL ATTRIBUTES

Dimensions	5.1"W x 3.3"D x 6.2"H (130mm x 84mm x 157mm)
Weight	1lb 11oz (754g)
Construction	Aerospace-grade aluminum billet
Temperature	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)

### CONNECTORS

AUX input	1x 5-pin locking connector for Wired Mode, 5-pin serial + USB for monitor interface and wired control
USB	Mini B USB to connector

### INTERFACES

Front Panel Interface	OLED Screen with menu system and button navigation
Axes	<b>Up to 6 total:</b> knob, slider, zoom x/y rollers (A and B)
Desktop App	Teradek RT Settings Manager, Teradek RT Firmware Configuration App
Micro-USB	Configuration and firmware upgrade
Bluetooth Compatibility	MDR.X, MDR.ACI, RT iOS App

### POWER

Power Input	LP-E6 Battery: 6.2 to 8.4 V USB Port: 4.75 to 9 V (maximum)
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### GENERAL

Mountability	3 x 1/4"-20 UNC mounting holes
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## CTRL.1 CONTROLLER

### SUPPORT

Camera Run/Stop Support	RED (Epic, Scarlet, Weapon, Raven, etc.), ARRI (Alexa, Amira, etc.), Phantom, Sony F55, LANC (Blackmagic, Canon C100/300/500 Sony FS7)
RT Accessory Support	MOTR.X, MK3.1 Motor/Receiver, Thumbwheel, MDR Receivers, MDR.X
App Support	Foolcontrol for iOS devices, RT App

### NETWORK

Wireless	Teradek RT FHSS 2.4GHz, Bluetooth 2.4GHz
Wireless Range	Up to 5000 ft (1500 m) line-of-sight (in USA/FCC mode), Up to 500 ft (150 m) indoors

### PHYSICAL ATTRIBUTES

Dimensions	3.6"W x 3.1"D x 5.9"H (91mm x 81mm x 150mm)
Weight	17 oz (482g)
Construction	Aerospace-grade aluminum billet
Temperature	<b>Operating:</b> -4 to 122°F (-10 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C)

### CONNECTORS

AUX input	5-pin locking connector for Wired-mode
USB	Mini-USB to connector

### INTERFACES

Front Panel Interface	OLED Screen with menu system and button navigation
Inputs	Main focus knob with removable lens ring, On/Off button
Desktop App	Teradek RT Settings Manager
Mini-USB	Configuration and firmware upgrade

### POWER

Power Input	LP-E6 Battery: 6.2 to 8.4 V USB Port: 4.75 to 9 V (maximum)
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### GENERAL

Mountability	3 x 1/4"-20 UNC mounting holes
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# ACI/MDR-ACI

	ACI	MDR.ACI
<b>SUPPORT</b>		
Network Protocols	RED Command Protocol (RCP)	RED Command Protocol (RCP)
RF Handset Support	N/A	MK3.1 Controller, CTRL.1 Controller
Camera Run/Stop Support	RED DSMC2 Cameras	RED DSMC2 Cameras
Full Control	RED DSMC2 Cameras	RED DSMC2 Cameras
Teradek RT Accessory Support	N/A	MK3.1 Motor, Thumbwheel, Smartknob, MK3.1 Controller, CTRL.1 Controller
<b>WIRELESS</b>		
Integrated Radios	N/A	Teradek RT FHSS 2.4GHz
FHSS	N/A	Up to 5000ft (1500m) line-of-sight (in USA/FCC mode) Up to 500ft (150m) indoors
Bluetooth Compatibility	N/A	Bluetooth BLE 5.0
<b>PHYSICAL ATTRIBUTES</b>		
Dimensions	0.9" x 3.1" x 5.7" (23.7mm x 79.6mm x 143.9mm)	0.9" x 3.1" x 5.7" (23.7mm x 79.6mm x 143.9mm)
Weight	8.8oz (250g)	9.6oz (272g)
Construction	Milled Aluminum(Chassis) and regulation-compliant PCB	Milled Aluminum(Chassis) and regulation-compliant PCB
Mountability	Mount to DSMC2 bracket (included) with M4 screws.	Mount to DSMC2 bracket (included) with M4 screws.
Operating Temperature	-4 to 122°F (-20 to 50°C)	-4 to 122°F (-20 to 50°C)
<b>INTERFACES</b>		
Configuration Interface	13 menu function buttons and jog wheel controller	13 menu function buttons and jog wheel controller
Connectors	1x Power & Control input	1x Power & Control input, 3x Motor ports, 2x Slave controller inputs
USB Interface Functionality	Upgrade via Micro-USB	Upgrade via Micro-USB

	ACI	MDR.ACI
<b>CONNECTORS</b>		
Power and Camera Input (CTRL)	<b>Power:</b> 4-pin circular-locking connector, 7-17V DC, <b>CTRL (Camera):</b> 4-pin circular-locking connector, RS-232 for RED control, programmable line driver for select cameras	<b>Power:</b> 4-pin circular-locking connector, 7-24V DC, <b>CTRL (Camera):</b> 4-pin circular-locking connector, RS-232 for RED control, programmable line driver for select cameras
Motor Inputs	N/A	3x 4-pin motor ports
Auxiliary Inputs	N/A	2x 4-pin locking connector
Micro-USB	Configuration and Firmware upgrade	Configuration and Firmware upgrade
<b>POWER</b>		
Power Input	4-Pin Circular-locking connector (+11.5 to +17V DC) or DSMC2 Battery Module	4-Pin Circular-locking connector (7-24V DC) or DSMC2 Battery Module
Nominal Power Consumption	2 W	3 W + Motors
<b>GENERAL</b>		
Mountability	1 x 1/4"-20 mounting hole	1 x 1/4"-20 mounting hole

## MOTORS

	MK3.1	MOTR.X
<b>PHYSICAL</b>		
Gear Pitch	0.8 Mod standard (others available)	0.8 Mod standard (others available)
Max Torque	2.2Nm	3Nm peak, 2Nm continuous
Max Speed	3.0 revs /second	6.2 revs /second
Construction	Aluminum alloy base	Aluminum alloy base
Mountability	Compatible with 19, 15 mm Rods	Compatible with 19, 15 mm Rods
Dimensions	4.5 x 1.6 x 1" (115 x 40 x 26 mm)	4.3 x 2 x 1.1" (109 x 51 x 26 mm)
Weight	7.5 oz (212 g)	8.9 oz (252 g)
<b>POWER</b>		
Operating Voltage	7-17V	7-17V
Power Input	<1W idle. 40W peak	<1W idle. 80W peak
<b>INTERFACE</b>		
Connectors	1x 0B.4	2x 0B.4 (chainable)
<b>ENVIRONMENTAL</b>		
Operating Temperature	-20°C TO 50°C	-20°C TO 50°C

### NEED MORE HELP?

**Support:** <http://support.teradek.com> → Contains tips, information and all the latest firmware & software updates.

**TERADEK SUPPORT STAFF:** [support@teradek.com](mailto:support@teradek.com) or call 888-941-2111 ext. 2 (Mon-Fri 6am to 6pm PST)

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## SUPPORT RESOURCES

In addition to this Reference Guide, there are a number of resources available for more information on Teradek RT devices' features and operation. For online information, visit [www.teradek.com](http://www.teradek.com). If you are unable to find what you need online, please contact Teradek's support staff: E-mail: [support@teradek.com](mailto:support@teradek.com) | Phone: (888) 941-2111 ext. 2 (available M-F 7AM-6PM PST)

## DISCLAIMER

This manual is intended for user information only. Every effort has been made to ensure that the contents within are accurate at the time of printing, and that updates are made in a timely manner. Teradek cannot be held responsible for inaccuracies, typographical errors, or out-of-date information contained within this manual.

## WARNING

Teradek RT devices contain sensitive electronic components that can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the device is not damaged. Damage due to inappropriate handling is not covered by the warranty. For complete warranty information, please see the warranty card that arrived with the device, or visit [www.teradek.com/pages/warranty-information](http://www.teradek.com/pages/warranty-information).

## FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class A 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 the 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 or television technician for help

Teradek RT devices comply with Part 15 of the FCC rules and also with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

## EC DECLARATION OF CONFORMITY



Teradek LLC hereby declares that the Teradek RT devices are in compliance with Directive 1999/5/EC. The full text of the EC Declaration of Conformity is available at the following Internet address:  
<https://support.teradek.com/hc/en-us/articles/233429747-EC-Declaration-of-Conformity-for-CE-mark>