# TERADEK RT





# **Table of Contents**

Quick Start Guides	
CTRL.5 Quick Start Guide	4
CTRL.3 Quick Start Guide	23
CTRL.1 Quick Start Guide	34
MDR.S Quick Start Guide	43
MDR.X Quick Start Guide	52
MOTR.S Quick Start Guide	61
MOTR.X Quick Start Guide	70
TOF.1 Quick Start Guide	77
Physical Properties	
CTRL.5 Controller	83
CTRL.3 Controller	84
CTRL.1 Controller	85
MDR.S Receiver	86
MDR.X Receiver	87
MOTR.S Motor	88
MOTR.X Motor	89
TOF.1 Rangefinder	90
Getting Started	
Connect and Power	90
Pairing	91
Camera Run/Stop	92
Operation	
Controllers	92
Receivers	120
Motors	123
TOF.1 Rangefinder	127
Lens Mapping and Lens Data Overlay	132

### Teradek User Manual

RT App	
Teradek RT App	136
RT Manager/RTFW	
RT Manager	141
CTRL.1 update to enable RT Manager compatibility	145
Technical Specifications	
CTRL.5 Controller	146
CTRL.3 Controller	148
CTRL.1 Controller	150
MDR.S Receiver	152
MDR.X Receiver	154
MOTR.S/MOTR.S MAX	156
MOTR.X	157

### **CTRL.5 Quick Start Guide**

The CTRL.5 sets a new standard for wireless FIZ (Focus, Iris, Zoom) lens-control handsets, featuring a 5-inch SmallHD ultra-bright touchscreen powered by CTRL.0S—an evolution of SmallHD's PageOS designed specifically for lens control. It allows you to view critical lens data overlays while pulling focus without looking away from the video feed. Lenses can be calibrated to pre-marked focus rings, and configurations are easily accessible via the touchscreen or any of the eleven programmable function buttons. The hand unit offers numerous mounting points for accessories and is fully compatible with the Teradek RT Lens Control Ecosystem.



# **TABLE OF CONTENTS**

- 1. WHAT'S INCLUDED
- 2. PHYSICAL PROPERTIES
- 3. **GETTING STARTED** 
  - Power and Connect
  - **Default Axis Operations**
  - · Connecting to MDR.X/S
  - · Lens Mapping
  - Limits and Markers
  - CTRL.5 Connections and Pin-Out Descriptions
- 4. CTRL.5 HOME SCREEN
- 5. CTRL.5 MENU OPTIONS
  - Settings
  - **Lens Maps**
  - Devices
- 6. FIZ LIMIT BUTTONS AND MARKERS

### WHAT'S INCLUDED

- CTRL.5 Controller
- White Disc (Type B)
- 2x 2.4GHz Antennas

### PHYSICAL PROPERTIES



- A: 2.4/5GHz WiFi Antenna
- B: FHSS 2.4GHz RF Antenna
- C: User Button (A, B, C, D) D: REC/PWR Button
- E: Force Rocker F: Slider
- G: Thumbwheel
- H: Ultra-Bright Display I: User Buttons 1-4
- J: User Buttons 5-8
- K: Lens Ring
- L: Knob M: 5-Pin USB
- N: 4-Pin AUX: 6-28 V, 15W O: Battery Attachment: L-Series Battery: 6-28 V



### **GETTING STARTED**

The **Teradek CTRL.5 Controller** is designed to provide precise wireless control of camera lenses. When paired with the MDR.X or MDR.S receiver, it ensures smooth operation on set or in the field. This section explains the default functions of the CTRL.5, such as axis operations, connectivity, lens mapping, and advanced customization options such as input/axis flipping and setting limits and markers. By understanding these features, users can optimize their workflow.

#### **Power and Connect**

- 1. Attach a Sony NP-F970 battery to the back of the CTRL.5 controller, then press the REC/PWR (C) button to turn it on.
- 2. Connect power to the MDR.X/S Receiver's PWR port.
- 3. Attach motor(s) to the camera rods and lens.
- 4. Connect power from the MDR.X/S to either motor input using a 4-pin connector. The motor(s) will then begin calibrating. **NOTE: Power input must not exceed 17V. If connecting multiple motors, use a separate 4-pin connector to "daisy-chain" the other units together.**
- 5. Follow the steps in Connect to MDR.X/MDR.S below to connect your CTRL.5 to a receiver.

### **Default Axis Operations**

The Knob, Rocker, and Slider on the CTRL.5 operate as follows:

KNOB

Default Operation: Focus

The Knob provides precise control over the lens focus ring, ensuring smooth and accurate focus pulls.

ROCKER

Default Operation: **Zoom** 

The Rocker adjusts the zoom, allowing the operator to zoom in or out on the subject smoothly.

SLIDER

Default Operation: Iris

The slider maps to the iris, providing quick and precise adjustments to the aperture for controlling exposure.

THUMB WHEEL

**Default Operation: Zoom Speed** 

The thumb wheel adjusts the zoom speed, allowing operators to fine-tune the rate at which the lens zooms in or out.



### Connecting to MDR.X/MDR.S

The CTRL.5 simplifies connecting to an MDR.X or MDR.S receiver by utilizing RF channels to deliver efficient and reliable performance. If your controller is not yet connected to a receiver, follow these steps to complete the setup and ensure proper functionality.

- 1. Press the **MENU** button on the controller, then tap the **SETTINGS** tab.
- 2. Scroll down to the **SYSTEM** list and tap the **RF** tab.
- 3. Tap the Scan for Receiver tab. Ensure that the CTRL.5 and the receiver are on the same RF channel.
- 4. Confirm that the **RF Connection Status** has changed to **Connected** on the main screen and that the connected channel on the home screen has also turned from white to green.

### **Lens Mapping**

The CTRL.5 offers advanced built-in lens mapping as a standard feature, enhancing precision and efficiency. Users can seamlessly auto-calibrate their lenses to pre-marked focus rings, achieving highly accurate and repeatable control over focus, iris, and zoom operations. This feature streamlines setup and optimizes performance, making it ideal for professional workflows with both prime and zoom lenses. For steps on how to create a lens map, refer to the <u>LENS MAPS</u> section

### **Limits and Markers**

Limits and markers are essential features of the CTRL.5 controller, which enhances precision and efficiency in lens control operations. **Limits** allow operators to define specific start and end points for lens movements, restricting the focus, iris, or zoom controls to a set range. **Markers** provide reference points on the lens control interface, helping operators quickly return to predefined positions or settings. These features prove especially useful for repetitive movements or when operators need to recall specific lens positions quickly and accurately. For steps on how to set Limits and Digital markers, refer to the **FIZ LIMITS AND MARKERS** section.



### **CTRL.5 Connections**

CTRL.5 CONNECTIONS				
AUX	4-Pin OB (AUX port)	Pin Description		
		1	GND	
	2 3	2	Data+	
		3	Data-	
		4	VCC	
USB	5-Pin OB (USB port)	Pin Description		
		1	VCC	
	1	2	USB D-	
	3 4 USB 5	USB D+		
		4 USB ID (Tied to Pin	USB ID (Tied to Pin 5)	
		5	GND	

### **CTRL.5 Status LEDs**

The CTRL.5 status LED indicates when the system is ON and provides the system's current status during operation.

- **OFF** Unit is powered off
- WHITE Booting
- ORANGE Not connected
- GREEN Connected
- RED Camera is recording

### Camera Run/Stop

- 1. Connect a camera cable from the CAM/Control port on the receiver to the camera
- 2. Press the MENU button on the controller, then tap the SETTINGS tab.
- 3. Scroll down the PAGE VIEW list and tap the CAMERA tab.
- 4. Select the correct camera brand.
- 5. Press the **REC/PWR** button on the controller to start/stop recording on the camera.





**NOTE:** If using a RED camera, the camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

### CTRL.5 HOME SCREEN

**The CTRL.5 Home Screen** displays the iris, zoom, and focus scales and current value, along with the **Markers**, **Limits**, and **Menu** buttons, giving operators a clear view of their lens positions. This intuitive layout lets users monitor and adjust settings in real time.



### **HOME SCREEN OPERATION NOTES**

- 1. Focus and Iris markers can be added at the current position using buttons 1 and 14. When a marker is enabled it can be removed by moving to the marker position and pressing either the Iris or Focus marker button again. See the Markers section for more details.
- 2. When a zoom lens map is enabled, tapping the iris or zoom value in the center of the screen switches the left onscreen scale between iris and zoom.
- 3. You can cycle through different Focus scale options using the Focus Scale button (7). Long pressing the Focus Scale button allows you to adjust the scale using a slider. Additionally, the scale can be adjusted using a pinch-to-zoom gesture.



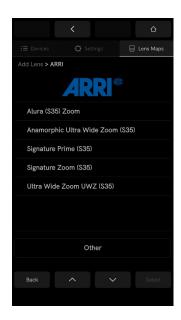
### **CTRL.5 MENU OPTIONS**

The CTRL.5 Menu Options provide users quick access to essential tools like the Lens Maps, Settings, and Devices menus. These menus allow users to calibrate lenses, adjust controller preferences, and manage device connections. To access the menus, press the Home screen's Menu tab (11), then select Lens Maps, Settings, or Devices.

### **Lens Maps**

### **Create a Lens Map**

- 1. Navigate to Menu > Lens Maps, then tap the Create New Lens Map button. Ensure
- 2. Select the lens manufacturer.
- 3. Select a lens type from the preset list. If your lens type is not listed, tap **Other** to create a name to identify the lens map.



4. Select the lens according to the focal length (e.g. 35mm, 85mm), then tap the **Create Lens Map** tab. 5. You will be prompted to create a **Focal Length (Zoom)** map and an **Iris** map before creating the **Lens Map**. Select **Yes** or **No**, then tap **Confirm** to proceed. Ensure a motor is attached to the corresponding ring, and the motor and controller are set to the same class (Focus, Iris, Zoom).





- FOCUS Knob
- IRIS Slider
- **ZOOM** Rocker
- ZOOM SPEED Wheel

You can program the inputs to use a different user control element in the **Settings** menu.

6. Move the controller knob, zoom rocker, or slider so that the motor adjusts the lens ring to the corresponding mark, then tap **Confirm**. Continue until you have programmed all the lens marks. Repeat this step for every control input, then click **Confirm** when you're done. **NOTE: Entering every lens mark** is not required, but it is recommended for the Lens Map to be more accurate.



7. When prompted, tap the Use this Lens Map to add it to the Mapped Lenses list and begin using it.



8. Attach a lens ring to the controller's knob, then navigate to **Settings > Lens > Lensring** and select the corresponding lens ring size.

### **Settings**

### **Page Views - Home Screen Configuration**



#### FOCUS

 Show Current Value - Enable/Disable the display of the current Focus position on the home screen

- Show Focus Meter Enable/Disable the display of the Focus Meter on the home screen
  - Meter Scaling Slider Adjust the scale of the Focus Meter

#### DEPTH OF FIELD (Focus Meter must be enabled)

The depth-of-field indicator on the focus scale shows the distance range between the closest and farthest objects that appear in focus according to the Lens Map's focus, iris, and/or zoom settings.

- Show on Focus Meter Enable/Disable Depth of Field indicator
- Meter Color Change the color of the Depth of Field meter
- · Circle of Confusion slider Adjust the size of the Circle of Confusion (CoC) indicator

#### IRIS

- Show Current Value Enable/Disable the display of the current aperture position on the home screen
- Show Meter Enable/Disable the display of the Iris Meter on the home screen

#### ZOOM

- Show Current Value Enable/Disable the display of the current zoom position on the home screen
- Show Meter Enable/Disable the display of the Zoom Meter on the home screen. NOTE: This
  option is hidden if a lens map without zoom is enabled

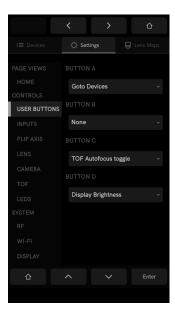
### **Controls**

#### **USER BUTTONS (A to D)**

Assign specific functions to the physical buttons on the controller.

- Assigned Functions
  - None
  - Start/Stop Rec
  - Goto Devices
  - Goto Settings
  - Goto Lens Maps
  - Display Brightness
  - TOF Autofocus Toggle
  - Lens Ring
  - Camera
  - Screen Capture





#### **INPUTS**

Assign a specific control element to the **Focus**, **Iris**, **Zoom**, and **Zoom Speed** axes, and recalibrate the controller's knob or slider.

#### Control Elements

- Knob
- Slider
- Wheel
- Rocker
- Off

#### Recalibrate Knob

The knob is pre-calibrated from the factory but can be recalibrated if needed. Follow the on-screen prompt to recalibrate the knob.

#### · Recalibrate Slider

The slider is pre-calibrated from the factory but can be recalibrated if needed. Follow the on-screen prompt to recalibrate the knob.

#### **FLIP AXIS**

Reverse the direction of the motor gear for each axis (Focus, Iris, Zoom, and Zoom Speed).

#### **LENS**

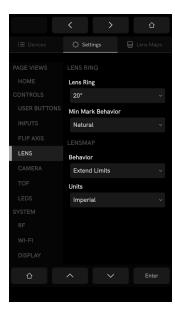
The Lens Menu contains lens map configurations and lens ring options.

#### · LENS RING

- Lens Ring Select the appropriate lens ring size.
- Min Mark Behavior Select whether the knob stops at the first mark of the lens ring (Min Stop),
   or if it continues past the first mark of the lens map (Natural)

#### LENS MAP

- Behavior Extend or maintain current lensmap limits
- Units Select how units are displayed for the lensmap
  - Metric
  - Imperial
  - Auto
  - Match Map
  - Match Ring



#### **CAMERA**

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 (all models)
- 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)
- Panavision DXL Panavision DXL
- RED Epic EPIC (Run/Stop)
- RED RS RED (Run/Stop)
- LANC Camera with LANC support
- Hold Low Cameras that record while the trigger is "held low"

#### DIST

Use the **DIST** menu to configure a **TOF.1** Rangefinder.

- Autofocus Enable or disable Autofocus on the TOF.1
- Offset Adjust the offset value according to the distance measured between the camera's film plane and the subject (see <u>CALIBRATE TOF.1</u>)
- Autofocus Speed Adjust the Autofocus speed (Slow, Medium, or Fast)

#### **LEDS**

Adjust the knob's backlight and status LEDs.

- POINTER LED
  - Pointer LED Brightness Adjust the intensity of the knob pointer's LED
  - Pointer LED Color Change the color of the knob pointer's LED
- BACKLIGHT LED
  - Backlight LED Brightness Adjust the brightness of the knob's backlight
  - Status LED Brightness Adjust the intensity of the Status LED



### **System**

#### **RF**

- RF Connection Status Indicates whether a receiver is Connected to or Disconnected from the CTRL.5.
- **RF Channel** Select a specific channel to pair the CTRL.5 with a receiver and avoid clashing with other devices. The default channel is 23.
- RF Power Level Select the strength of the radio frequency (RF) signal used to communicate with connected devices.
  - Low When working close to the MDR
  - **Medium** General working power level for mid-distance operation
  - EU max European max distance RF configuration
  - US Max US based max distance RF configuration
- RF Reset Button Reset the RF settings to default
- Scan for receiver Scans all RF channels and auto-connects to any discovered MDR units.

#### WI-FI

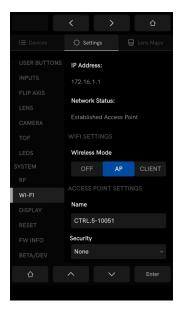
CTRL.5 supports both AP (Access Point) and Client Mode. Use the Wi-Fi menu to connect to a network or confirm a connection.

#### WIFI SETTINGS

- · Wireless Mode Select a wireless mode
  - OFF
  - AP
    - Name Enter the network name
    - Security Select the appropriate security protocol (WPA, WPA2, WPA/WPA2)
    - Region Select your region from the list
    - Channel Select a frequency or frequency range

#### CLIENT

- Connect Saved Networks Toggle on to automatically connect to a saved network
- IP Mode Select DHCP for automatic IP configuration or Static for manual IP configuration)
- · WiFi Scan Scan for available networks
- Saved Networks Select a previously saved network
- Reset WiFi Settings Reset your WiFi settings



#### **DISPLAY**

#### DISPLAY SETTINGS

- Brightness Use the Brightness toggle switch to increase or decrease the display's brightness
- Dim Display After Select a time between 30 seconds to 2 hours for the display to dim automatically.
- Turn Off Display after Select a time between 30 seconds to 2 hours for the display to automatically turn off.

 Sleep Mode - Tap the Sleep Display tab to fully dim the display. Press any shortcut button to wake your device.

#### **RESET**

- CONTROLLER
  - Factory Reset Controller -Performs a full factory reset of all CTRL.5 settings, including input axis selections, lens ring selection and lens mapping
  - Reboot Controller Force reboots the internal controller

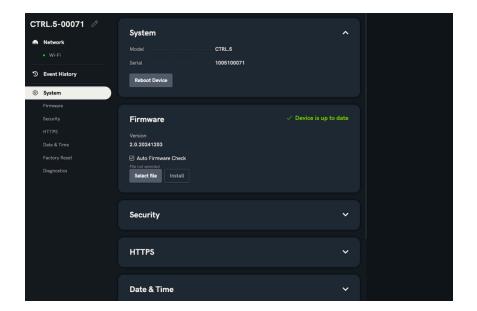
#### FIRMWARE INFO (FW INFO)

The **FW Info** section displays the current firmware version and serial number of the CTRL.5

• Check for new FW - Press this tab to check if new firmware is available

### Perform a Firmware Upgrade

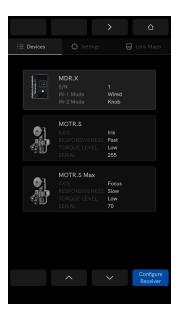
- 1. Download the firmware file. **NOTE: DO NOT UNZIP!**
- 2. Go to Settings > Wi-Fi > Wireless Mode and select AP (Access Point).
- 3. Open Access Point Settings and note the network name (e.g., CTRL.5-XXXX).
- 4. On your computer, search the available Wi-Fi networks and connect to the CTRL.5-XXXX network.
- 5. Open Chrome and Enter the IP address 172.16.1.1 in the address bar to open the CTRL.5 Web UI.
- 6. Navigate to the **Firmware** section in the Web UI.
- 7. Click **Select File** and choose the .zip file from your downloads folder.
- 8. Click **Install** to start the firmware update process. The CTRL.5 will complete the update over Wi-Fi.
- 9. Power cycle the controller to apply the new firmware.





#### **Devices**

The **Devices** menu lists all the devices, such as the receiver, motors, and rangefinder, connected to your CTRL.5. Connected devices' parameters can also be configured from the CTRL.5. Tap on any of the devices, then tap the **Configure** button below.



### **Configuration Options**

	RECEIV	'ER			MOTORS	
IN - 1	I/2 Mode	IN - 1,	/2 Axis	Axis	Responsiveness	Torque Level
<ul><li>Off</li><li>Wired</li><li>Knob</li><li>Rocker</li></ul>	<ul><li>Force</li><li>Cinetape</li><li>Focus Bug</li><li>Feedback</li></ul>	<ul><li>Zoom</li><li>Focus</li><li>Iris</li><li>Zoom</li></ul>	<ul><li>ISO</li><li>Shutter</li><li>Pan</li><li>Tilt</li><li>Roll</li></ul>	<ul><li>Focus</li><li>Iris</li><li>Zoom</li></ul>	<ul><li>Normal</li><li>Slow</li><li>Fast</li></ul>	· Low · Medium · High

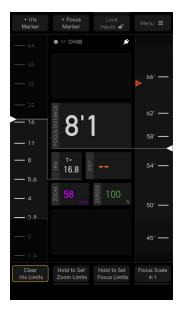
### **FIZ LIMIT BUTTONS AND MARKERS**

CTRL.5 **Limits** buttons allow you to set a limit range for the Focus, Iris, or Zoom controls. Setting limits restricts the motor from adjusting the lens past a set limit. **Markers** serve as reference points on the CTRL.5 interface. Markers are particularly useful in scenarios requiring repetitive movements or when specific lens positions need to be recalled swiftly and accurately



#### Limits

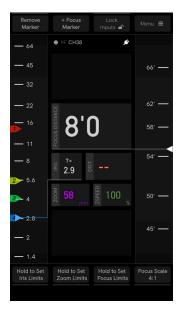
- 1. Move the slider, knob, or rocker to the high or low end of the desired limit.
- 2. Hold the limit button for the corresponding axis (Focus, Iris, or Zoom).
- 3. Continue holding the limit button, move the input to the opposite end of the desired limit, and then release the button to set the limit range.



- 4. Press the **Clear Limits** tab to remove the limit range.
- 5. To completely lock the motor, hold the limit button for 1 second, then release it without moving the corresponding input.

### **Markers**

- 1. Move the slider or knob to the desired position.
- 2. **To add a marker**, press the **+ Iris Marker** or **+ Focus Marker** button to create a virtual marker at that position.
- 3. **To add additional markers**, move the slider or knob to the next position and press the **Marker** button again. Repeat this process until you have mapped all your reference points.
- 4. **To reposition a marker**, first align the focus or iris scale with the marker you want to move. Press and hold the **+ Marker** button to "grab" the marker, then drag it to the desired location. Release the **+ Marker** button to place the marker in its new position.
- 5. **To remove a marker**, move the slider or knob to the position of a specific marker and press the **Remove Marker** button.
- 6. **To delete all markers**, press and hold the **Focus Marker** or **Iris Marker** button for about 1 second until a prompt appears. Confirm the prompt to remove all markers.



### **CTRL.3 Quick Start Guide**

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.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. WHAT'S INCLUDED
- 3. PHYSICAL PROPERTIES
- 4. POWER AND CONNECT
  - Pin-Out Connection
  - · Pin Descriptions
- 5. PAIR CONTROLLER AND RECEIVER
  - Wireless Pairing
  - Wired Pairing
- 6. CAMERA RUN/STOP
- 7. CTRL.3 MENU OPERATION
- 8. TERADEK RT APP
- 9. LENS MAPPING
  - Create a Lens Map (Controller)
  - Create a Lens Map (RT App)
- 10. FIZ LIMITS BUTTONS
- 11. LENS DATA OVERLAY
- 12. OTHER RESOURCES

### **RESOURCES**

- **FIRMWARE UPGRADE:** Click **here** to update your product to the latest firmware before use.
- **PRODUCT REGISTRATION:** Click **here** to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click <a href="here">here</a> (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

### WHAT'S INCLUDED

- CTRL.3 Controller
- 5x White Disc (Type B)
- · Micro-USB to USB 3 ft Cable

- SmallHD Monitor Interface Cable
- Pre-Marked Focus Ring 20" min. focus
- Pre-Marked Focus Ring 3'6" min. focus
- · Pre-Marked focus Ring 6" min. focus
- Pre-Marked focus Ring 10" min. focus
- Pre-Marked Iris Ring 1-32
- · Iris Strip Slider 0
- Iris Strip Slider 10
- · Iris Strip Slider 20
- Iris Strip Slider 30

### PHYSICAL PROPERTIES



### **POWER AND CONNECT**

- 1. Connect power to the receiver's PWR port.
- 2. Attach the motor(s) to the rods/lens.
- 3. Connect the motor(s) to the receiver using a 4-pin connector. If connecting two or more motors, use a 4-pin to 4-pin connector to daisy-chain them together. The motor(s) will then begin calibrating.
- Insert an LP-E6 battery in the controller, then press the REC/PWR (C) button to turn on the controller.
- 5. Use one of two methods to pair your controller with the receiver.



### **CTRL.3 Connections**

CTRL.3 CONNECTIONS					
	5-Pin 0B (AUX port)		Pin Description		
AUX		1	VCC		
		2	USB D-		
		3	USB D+		
	3 4	4	USB ID (Tied to Pin 5)		
		5	GND		
USB	USB-C (For firmware updates)				

### PAIR CONTROLLER AND RECEIVER

If the controller you are using has not been paired with the receiver, you can use one of the following methods to pair both devices.

### **Wireless Pairing**

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

### **Wired Pairing**

Connect a 5-pin connector from the controller's wired-mode input to the **IN-1** input on the receiver. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The LEDs on the controller and receiver will turn blue once paired.



### **CAMERA RUN/STOP**

- 1. Connect a camera cable from the **CAM/Control** port on the receiver to the camera, then navigate to **MENU>CAMERA** on the CTRL.3 to indicate which camera you have connected.
- 2. Press the **REC/PWR** button on the controller to start/stop recording on the camera.



**NOTE:** If using a RED camera, the camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

### CTRL.3 MENU OPERATION

Press the **MENU** button, then use the **UP**, **DOWN**, and **SET** button to navigate through the different menu options.

- · POWER OFF Turn OFF the controller
- LENS Configure lens mapping function
- RANGE FNDR Configure/Calibrate TOF.1
- MOTORS Configure the attached motor(s)
- INPUTS Configure the controller's knob
- WIRELESS Configure the wireless settings
- · CAMERA Select the make of the camera
- SCREEN Change display settings
- BUTTONS Assign functions to the buttons
- RX CONFIG Configure auxiliary controllers
- · IO CONFIG Configure communication mode
- STATUS Contains a list of connected devices
- ADV Contains device info menu, licenses, and advanced functions for debugging
- FACTORY Reset licensing and/or serial number



### CTRL.3 STATUS LEDS

The CTRL.3 status LED indicates when the system is ON and provides the system's current status during operation.

- · OFF Unit is powered off
- YELLOW No wireless connection
- RED Camera is recording
- ORANGE PC/Bootloader mode
- WHITE Checking RF module status
- · GREEN Wireless is synched
- BLUE Wired-mode connection

### **TERADEK RT APP**

The Teradek RT App for iOS devices 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.S.

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Teradek RT App.
- 2. Navigate to ADV>BLUETOOTH on the CTRL.3, then select YES to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your CTRL.3 if it is within range.
- 4. Select the RT device(s) you want to configure.



### LENS MAPPING

CTRL.3 features 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 included as a standard feature with the CTRL.3.

### **Create a Lens Map (Controller)**

- 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 ▲ and ▼ buttons on the controller, enter the corresponding mark, then select OK.



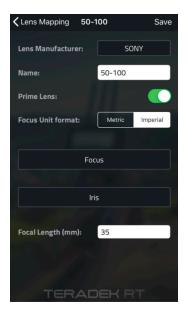
**NOTE:** Entering every lens mark is not required, but it is recommended in order for the Lens Map to be more accurate.

- 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.



### **Create a Lens Map (RT APP)**

- 1. Open the RT app, then select your CTRL.3 from the main screen.
- 2. Tap the **Settings** 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).
- 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 CTRL.3 are set to the same axis.



- 6. Move the virtual knob for the motor to adjust 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 additional axis to map. Repeat steps 5 and 6 for each axis you want to map.
- 9. Press the **Back** button once more, then tap **Save** at the top right corner. You will then be prompted whether or not to apply the Lens Map.





### **FIZ LIMIT BUTTONS**

CTRL.3 limit buttons allow you to set a limit range for either the Focus, Iris, or Zoom controls. Setting limits restricts the motor from adjusting the lens past a set limit.

- 1. Move the input to the high or low end of the limit you want to set.
- 2. Press and hold down the limit button for the corresponding axis (H).
- 3. While continuing to hold down the limit button, move the input to the other end of the limit you want to set, then release. The limit range is now set.
- 4. To remove the limit range, press the limit button.
- 5. To completely lock the motor, press and release the limit button without moving the corresponding input.

### **LENS DATA OVERLAY**

SmallHD monitors include a Lens Data Overlay feature that displays your CTRL.3 lens map on the monitor. Below are steps to enable Lens Data Overlay.

# TERADEK Teradek User Manual

- 1. Update your CTRL.3 controller and SmallHD monitor with the latest firmware.
- 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 **IO CONFIG>SMALLHD**.
- 4. Select **YES** to activate SmallHD Comms.
- 5. Connect a cable from the controller's wired mode connector to the monitor's USB port.
- 6. Tap the SmallHD monitor's screen and navigate to ADD NEW TOOL>ADD ONS.
- 7. Select **TERADEK RT**. The Lens Map Overlay will appear to the right and move according to the controller's knob movements.

### **CTRL.1 Quick Start Guide**

The CTRL.1 is a powerful, single-axis wireless controller with lens mapping support and data storage, saving time on calibration during lens swaps. When paired with a compatible SmallHD monitor, the CTRL.1 can overlay lens map information 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 cameras such as ARRI, RED, Sony, and LANC-compatible models.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. WHAT'S INCLUDED
- 3. PHYSICAL PROPERTIES
- 4. POWER AND CONNECT
  - Pin-Out Connection
  - Pin Description
- 5. PAIR CONTROLLER AND RECEIVER
- 6. CAMERA RUN/STOP
- 7. CTRL.1 MENU OPERATION
- 8. CTRL.1 STATUS LEDS
- 9. **LENS MAPPING**
- 10. LENS DATA OVERLAY
- 11. OTHER RESOURCES

### **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- PRODUCT REGISTRATION: Click <u>here</u> to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click here (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

### WHAT'S INCLUDED

- CTRL.1 Controller
- 1x Mini-USB (5pin) to USB 18 in Cable
- 1x Controller Neckstrap



### PHYSICAL PROPERTIES



#### POWER AND CONNECT

- 1. Connect power to the receiver's PWR port.
- 2. Attach the motor(s) to the rods/lens.
- 3. Connect the motor(s) to the receiver using a 4-pin connector. If connecting two or more motors, use a 4-pin to 4-pin connector to daisy-chain them together. The motor(s) will then begin calibrating.
- 4. Insert an LP-E6 battery in the controller, then press the REC/PWR (C) button to turn on the controller.
- 5. Use one of two methods to pair your controller with the receiver.



#### **CTRL.1 Connections**

CTRL.1 CONNECTIONS					
	5-Pin OB (AUX port)	Pin Description			
AUX	2 5 5 3 4	1	VCC		
		2	USB D-		
		3	USB D+		
		4	USB ID (Tied to Pin 5)		
		5	GND		
USB	Mini USB (For firmware updates)				

### PAIR CONTROLLER AND RECEIVER

If the controller you are using has not been paired with the receiver, you can use one of the following methods to pair both devices.

## **Wireless Pairing**

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

## **Wired Pairing**

Connect a 5-pin connector from the controller's wired-mode input (H) to the IN-1 input on the receiver. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The LEDs on the controller and receiver will turn blue once paired.



### **CAMERA RUN/STOP**

- 1. Connect a camera cable from the **CAM/Control** port on the receiver to the camera, then navigate to **MENU>CAMERA** on the CTRL.1 to indicate which camera you have connected.
- Press the REC/PWR button on the controller (C) to start/stop recording on the camera.



**NOTE:** If using a RED camera, the camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

#### **CTRL.1 MENU OPERATION**

Press the **MENU** button, then use the **UP**, **DOWN**, and **SET** button to navigate through the different menu options.

- POWER OFF Turn OFF the controller
- LENS Configure lens mapping function
- RANGE FNDR Configure/Calibrate TOF.1
- MOTORS Configure the attached motor(s)
- INPUTS Configure the controller's knob
- WIRELESS Configure the wireless settings
- · CAMERA Select the make of the camera
- LIMIT Configure the limit range for either the Focus, Iris, or Zoom controls
- · SCREEN Change display settings
- · BUTTONS Assign functions to the buttons
- RX CONFIG Configure auxiliary controllers
- IO CONFIG Configure communication mode
- STATUS Contains a list of connected devices
- ADV Contains device info menu, licenses, and advanced functions for debugging



#### CTRL.1 STATUS LEDS

The CTRL.1 status LED indicates when the system is ON and provides the system's current status during operation.

- **OFF** Unit is powered off
- YELLOW No wireless connection
- RED Camera is recording
- ORANGE PC/Bootloader mode
- WHITE Checking RF module status
- · GREEN Wireless is synched
- BLUE Wired-mode connection

### **LENS MAPPING**

CTRL.1 features 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 included when you purchase the CTRL.1 Lens Mapping Package, or available for purchase as a separate upgrade. After purchasing the Lens Mapping Package, the LENSMAP menu on the controller lets you create your own lens map(s) according to lens manufacturer and lens type.

## **Activate Lens Mapping License**

- 1. Press the **MENU** button, then use the τ button to navigate to the **ADV** 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, enter the controller's UID, the upgrade code, and your email address on <a href="activate.teradek.com">activate.teradek.com</a>.
- 4. On the same screen displaying the UID number, select YES to enter the license key.

### **Create a Lens Map (Controller)**

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. Ensure a motor is attached to the corresponding ring, and 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 ▲ and ▼ buttons on the controller, enter the corresponding mark, then select OK. NOTE: Entering every lens mark is not required, but it is recommended for the Lens Map to be more accurate.
- 7. Press the **MENU** button, then select **TABLE DONE**.
- 8. Depending on the lens type, You will then be prompted to create an iris or focus distance table. 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 CTRL.1 lens map on the monitor. Below are steps to enable Lens Data Overlay.

- 1. Update your CTRL.1 controller and SmallHD monitor with the latest firmware.
- 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 IO CONFIG>SMALLHD.
- 4. Select **SMALLHD** to activate SmallHD Comms.
- 5. Connect a cable from the controller's wired mode connector to the monitor's USB port.

- 6. Tap the SmallHD monitor's screen and navigate to ADD NEW TOOL>ADD ONS.
- 7. Select **TERADEK RT**. The Lens Map Overlay will appear to the right and move according to the controller's knob movements.

## **MDR.S Quick Start Guide**

Teradek's MDR.S is a modular receiver with integrated Bluetooth for reliable smart device connections. MDR.S can command up to three daisy-chained motors for FI+Z control (Focus, Iris, and/or Zoom), offers camera control for ARRI, RED, Sony, and LANC-compatible models, supports all current Latitude functions and integrations, and features several configurable options accessible via the built-in OLED display.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. PHYSICAL PROPERTIES
- 3. POWER AND CONNECT
- 4. PAIR MDR.S AND CONTROLLER
- 5. CAMERA RUN/STOP
- 6. MDR.S MENU OPERATION
- 7. TERADEK RT APP
- 8. OTHER RESOURCES

#### **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- **PRODUCT REGISTRATION:** Click **here** to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click here (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

### PHYSICAL PROPERTIES





#### **POWER AND CONNECT**

- 1. Connect power to the MDR.S's power input (**F**).
- 2. Attach the motor(s) to the rods/lens.
- 3. Connect the motor to MDR.S motor input using a 4-pin to 4-pin cable. To connect multiple motors (up to three motors), use additional 4-pin to 4-pin cables to "daisy-chain" the other motors together. The motor(s) will then begin calibrating.
- 4. Use one of two methods to pair your controller with MDR.S

#### **MDR.S Connections**

MDR.S CONNECTIONS					
POWER	3-Pin OB (Power Input)	Pin Description			
		1	GND		
		2	VCC		
		3	Camera Out EXT		
	6-Pin 0B (Trigger Output)	Pin Description			
		1	USB D-		
		2	USB D+		
		3	GND		
		4	RS232 Out		
		5	Camera Out		
		6	RS232 Out		
MOTORS	4-Pin 0B (Motor ports)	Pin Description			
		1	GND		
		2	Data+		
		3	Data-		
		4	VCC		
USB	USB-C (For firmware updates)				

### PAIR MDR.S AND CONTROLLER

If the controller you are using has not been paired with MDR.S, you can use one of the following methods to pair both devices.



### Wireless Pairing via MDR.S

Press the **MENU** button on the MDR.S, then navigate to **WIRELESS>CHANNEL** and select the same channel number as the controller to begin pairing. The LED on both the controller and MDR.S will turn green once paired.

## **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 LED on both the controller and MDR.S will turn green once paired.

### **CAMERA RUN/STOP**

- 1. Connect a camera cable from the **CAM** port on the MDR.S to the camera, then navigate to **MENU>CAMERA** on the MDR.S and select which camera you have connected.
- 2. Press the **REC/PWR** button on the controller to start/stop recording on the camera.



**NOTE:** If using a RED camera, the camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

### MDR.S MENU OPERATION

Press the **MENU** button, then use the **UP**, **DOWN**, and **SET** button to navigate through the different menu options.

- MOTORS Configure the attached motor(s)
- CAMERA Select the make of the camera
- WIRELESS Configure the wireless settings
- SCREEN Change display settings
- **BUTTONS** Assign functions to the buttons
- STATUS Contains list of connected devices
- ADV Contains device info menu, licenses, and advanced functions for debugging.



#### MDR.S STATUS LEDS

The MDR.S status LED indicates when the system is ON and provides the system's current status during operation.

- · OFF Unit is powered off
- · YELLOW Pre-Record
- · RED Camera is recording
- ORANGE Idle/No wireless connection
- WHITE booting
- **GREEN** Wireless is synched
- BLUE Wired-mode connection

### **TERADEK RT APP**

The Teradek RT App for iOS devices 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.S.

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Bolt App.
- 2. Navigate to ADV>BLUETOOTH on the MDR.S, then select YES to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your MDR.S if it is 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 (MDR.S or controller) the motor(s) are configured to.
- 2. Tap the Settings 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.

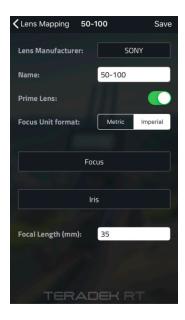


#### **CREATE A LENS MAP**

- Settings (Descriptions listed in <u>Receiver Menu</u> section) Tap the settings button on the top-right corner of the display to customize the receiver's various settings such as the output format, audio, display, and OSD.
- Signal Quality Determine the quality and reliability of the signal being received.
- SNR (Signal to Noise Ratio) Compare the signal power level to the noise power level from the attached antennas.
- Range Analyzer Displays the transmission distance between the transmitter and receiver.
- Status Displays the current status of:
- Network Status

## TERADEK Teradek User Manual

- Current Frequency
- Range
- Quality
- Bandwidth
- OSD name



- 6. Move the virtual knob for the motor to adjust 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 additional axis to map. Repeat steps 5 and 6 for each axis you want to map.
- 9. Press the **Back** button once more, then tap **Save** at the top right corner. You will then be prompted whether or not to apply the Lens Map.



## **MDR.X Quick Start Guide**

Teradek's MDR.X is a modular receiver with integrated Bluetooth for reliable smart device connections. MDR.X can command up to three motors for FI+Z control (Focus, Iris, and/or Zoom), offers RED camera control, supports all current Latitude functions and integrations, and features several configurable options accessible via the built-in OLED display.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. PHYSICAL PROPERTIES
- 3. POWER AND CONNECT
- 4. PAIR MDR.X AND CONTROLLER
- 5. CAMERA RUN/STOP
- 6. MDR.X MENU OPERATION
- 7. TERADEK RT APP
- 8. OTHER RESOURCES

#### **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- **PRODUCT REGISTRATION:** Click **here** to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click here (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

### **PHYSICAL PROPERTIES**



A: Motor ports
B: IN-2 port
C: IN-1 port
D: Power input
E: Status LED
F: CAM input
G: Menu display
H: Menu buttons

#### COMPATIBLE DEVICES

The MDR.X is compatible with Teradek RT devices and SmallHD monitors.

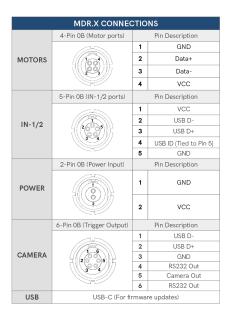




### **POWER AND CONNECT**

- 1. Connect power to the MDR.X's PWR port.
- 2. Attach the motor(s) to the rods/lens.
- 3. Connect the motor(s) to MDR.X motor inputs using a 4-pin to 4-pin cable. The motor(s) will then begin calibrating.
- 4. Use one of three methods to pair your controller with MDR.X.

#### **Pin-Out Connections**



### PAIR MDR.X AND CONTROLLER

If the controller has not been paired to the MDR.X, you can use one of the following methods to pair both devices.



### Wireless Pairing via MDR.X

Press the **MENU** button on the MDR.X, then navigate to **WIRELESS>CHANNEL** and select the same channel number as the controller to begin 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 LED on the controller will turn green once paired.

### **Wired Pairing**

Connect a 5-pin connector from the controller's wired-mode input to the **IN-1** input on the receiver. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The LEDs on the controller and receiver will turn blue once paired.

### **CAMERA RUN/STOP**

- 1. Connect a camera cable from the **CAM/Control** port on the MDR.X to the camera, then navigate to **MENU>CAMERA** on the MDR.X to indicate which camera you have connected.
- 2. Press the **REC/PWR** button on the controller to start/stop recording on the camera.



**NOTE:** If using a RED camera, the camera serial communication setting must be set to RCP (Redlink Command Protocol) for the unit to operate.

## MDR.X MENU OPERATION

Press the **MENU** button, then use the **UP**, **DOWN**, and **SET** button to navigate through the different menu options.

- MOTORS Configure the attached motor(s)
- · CAMERA Select the make of the camera

## TERADEK Teradek User Manual

- RANGE FNDR Configure/Calibrate TOF.1
- · WIRELESS Configure the wireless settings
- · SCREEN Change display settings
- BUTTONS Assign functions to the buttons
- RX CONFIG Assign a specific function or class to the receiver's auxiliary port(s)
- · STATUS Contains list of connected devices
- ADV Contains device info menu, licenses, and advanced functions for debugging.

#### MDR.X STATUS LEDS

The MDR.S status LED indicates when the system is ON and provides the system's current status during operation.

- **OFF** Unit is powered off
- YELLOW Pre-Record
- RED Camera is recording
- ORANGE PC/Bootloader mode
- WHITE Checking RF module status
- · GREEN Wireless is synched
- BLUE Wired-mode connection

### **AUX PORT MODES**

#### **WIRED MODE**

A compatible controller is connected directly to the MDR.X **IN-1** port, disabling the wireless functionality. The Status LED on both devices will turn blue to indicate that a connection has been established.

## **KNOB OR ROCKER MODE (SLAVE CONTROLLERS)**

A compatible Slave controller (thumbwheel, zoomrocker, or Smartknob) is connected directly to one of the MDR.X AUX ports and can be configured to control any available axis (Focus, Iris, etc.).



### **AUX Port Configuration**

- 1. Connect a 5-pin cable from the device (controller, smartknob, zoomrocker, or thumbwheel) to one of MDR.X AUX ports.
- 2. Navigate to RX CONFIG, and select the corresponding mode for the device (Wired, Knob, or Rocker).

#### TERADEK RT APP

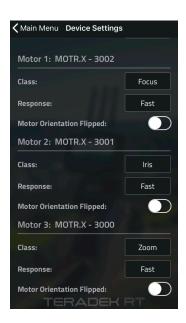
The Teradek RT App for iOS devices allows users to configure all of the major functions via Bluetooth such as motor axis selection, creating lens maps, start/stop, and includes virtual sliders for calibrating FIZ controls on the MDR.S.

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Bolt App.
- 2. Navigate to **ADV>BLUETOOTH** on the MDR.S, then select **YES** to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your MDR.S if it is within range.
- 4. Select the RT device(s) you want to configure.

#### **ASSIGN AN AXIS TO A MOTOR**

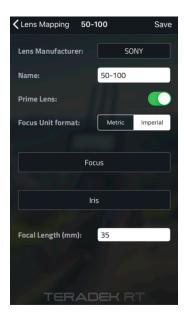
- 1. Open the RT app, then select the device (MDR.S or controller) the motor(s) are configured to.
- 2. Tap the Settings icon on the top-right corner, select **Device Settings**, then scroll down to the motor you want to assign a specific axis to.
- 3. Tap the **Class** button to select an axis. From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



#### **CREATE A LENS MAP**

- 1. Open the RT app, then select your MDR.S from the main screen.
- 2. Tap the **Settings** 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).
- 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 MDR.S are set to the same axis.





- 6. Move the virtual knob for the motor to adjust 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 additional axis to map. Repeat steps 5 and 6 for each axis you want to map.
- 9. Press the **Back** button once more, then tap **Save** at the top right corner. You will then be prompted whether or not to apply the Lens Map.



## **MOTR.S Quick Start Guide**

Completely redesigned from the ground up, **MOTR.S** Lens Motors set a new standard in lens control technology. MOTR.S Motors are ultra-lightweight, compact, and blazing fast at up to 297 teeth per second. MOTR.S delivers 0.3Nm peak torque and boasts durable, all-aluminum construction and reinforced sockets, and a revolutionary quick-release gear system for intuitive setup and quick transitions. They are compatible with all previous RT handsets, receivers, and daisy-chainable motors.



# **TABLE OF CONTENTS**

- 1. RESOURCES
- 2. PHYSICAL PROPERTIES
- 3. **WARNING**
- 4. POWER AND CONNECT
- 5. FOCUS/IRIS/ZOOM ASSIGNMENT
- 6. SWITCH MOTOR DRIVE GEAR
- 7. CONTROLLER MOTOR MENU
- 8. TERADEK RT APP
- 9. OTHER RESOURCES

### **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- **PRODUCT REGISTRATION:** Click **here** to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click here (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.



### PHYSICAL PROPERTIES



- A: Motor drive gear
- **B:** Motor class indicators (Focus, Iris, Zoom)
- C: Axis button
- D: Data/Power inputs
- E: MOTR.S bracket

#### **WARNING**

- MOTR.S is a powerful device that is capable of causing injury or damage. Use caution when touching the drive gear if the device is powered on.
- MOTR.S is not to be used on extremely stiff or damaged lenses.
- MOTR.S requires no user maintenance. Opening the motor can affect its internal calibration and void the warranty.
- The motor body is used as a heatsink for the brushless windings. It may get warmer than a brush-type motor.
- Power input must not exceed 32V. Ensure that the power source's voltage is between 7-32V. Exceeding 32V can damage the motor and void the warranty.

## **POWER AND CONNECT**

MOTR.S powers up once it is connected to a Teradek RT device.

- 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 (**E**).
- 4. Connect power from the receiver to either motor input (**D**) using a 4-pin connector. The motor(s) will then begin calibrating. **NOTE: Power input must not exceed 17V. If connecting multiple motors, use a separate 4-pin connector to "daisy-chain" the other units together.**
- 5. If you see evidence of backlash affecting accuracy, ensure that your mount, rails, and camera are extremely rigid, as mounting flex is the main cause of inaccuracy.

## **Pin-Out Connections**

MOTR.S CONNECTIONS						
4-Pin OB (Motor ports)	Pin Description					
	1	GND				
1 4	2	Data+				
2 3	3	Data-				
	4	VCC				

## FOCUS/IRIS/ZOOM ASSIGNMENT



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

#### **SWITCH MOTOR DRIVE GEAR**

- 1. Disconnect the power from the motor.
- 2. Remove the MOTR.S from the support rod.
- 3. Use a flat-head screwdriver to remove the gear screw that secures the motor drive gear.
- 4. Carefully remove the gear and affix it to the opposite wheel. Ensure that the pins on the wheel are aligned with the holes in the gear.
- 5. Insert and secure the gear screw.
- 6. Attach the motor to the rod support by realigning and positioning the gear to reach the lens gear, then tighten the rod clamp knob.
- 7. Connect power from the receiver to either motor input (**D**) using a 4-pin connector. The motor(s) will then begin calibrating.

### **CONTROLLER MOTOR MENU**

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

Navigate to the **MOTORS** menu on the controller or the receiver to adjust the following menu options:

- RECALIB Calibrate end stops for the motors
- RESPONSE Press SET to adjust the motor's response time (Normal, Slow, or Fast)
- SET SERIAL Press OK to change the motor(s) serial number
- ACCURACY Press OK to alter the motor's backlash compensation, then SET to make your selection
- TORQUE Adjust the motor torque settings (Low, Medium, or High)

## **TERADEK RT APP**

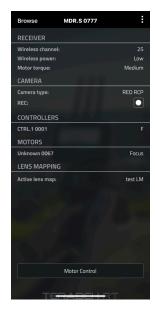
The Teradek RT App for iOS devices allows users to configure all of the major functions via Bluetooth such as motor axis selection, creating lens maps, start/stop, and includes virtual sliders for calibrating FIZ controls on the MDR.X and MDR.S.

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Bolt App.
- 2. Navigate to ADV>BLUETOOTH on the MDR.S, then select YES to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your MDR.S if it is within range.
- 4. Select the RT device(s) you want to configure (Receivers, Controllers, or ACI).



## **Receiver Status Display**

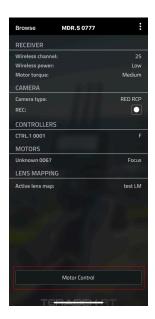


 SETTINGS - Tap the settings button (three dots) on the top right corner of the screen to view or customize the following settings:

- Device Info Displays the serial number and current firmware versions of the receiver and the serial numbers for the connected controller and motor(s).
- Device Settings Adjust the Wireless Channel, Wireless Power, Camera Type, and Motor Torque settings.
- Firmware Upgrade Displays the current firmware versions of the receiver and allows you to
  perform a firmware upgrade if an update is available. NOTE: Tap the Advanced button at the top
  right corner to re-download the firmware package, upgrade only certain firmware package
  contents, or force a firmware upgrade.
- RECEIVER Displays the current wireless channel, wireless power, and the motor torque.
- CAMERA Displays the camera type and Recording button. NOTE: To begin recording, tap the button.
- CONTROLLER Displays the paired controller and assigned motor classes.
- MOTORS Displays the connected motor(s) and corresponding class.
- LENS MAPPING Displays the assigned lens map.
- MOTOR CONTROL BUTTON Allows you to control the motor(s) from the RT app (see below).

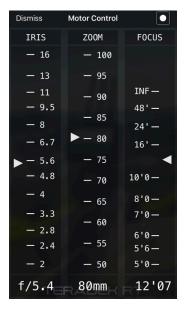
#### CONTROL MOTOR FROM RT APP

- 1. Launch the RT app, then select the receiver to which the motor(s) are configured to.
- 2. Tap the **Motor Control** button at the bottom of the screen.



3. Select an axis, then use your finger to move the displayed slider up and down. The motor will adjust the lens ring according to the slider's movements.

# TERADEK Teradek User Manual



# **MOTR.X Quick Start Guide**

MOTR.X provides six times the service life of conventional brushed motors 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. MOTR.X is compatible with all Teradek RT wireless FI+Z systems and perfectly balances size, weight, and torque.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. PHYSICAL PROPERTIES
- 3. **WARNING**
- 4. POWER AND CONNECT
- 5. FOCUS/IRIS/ZOOM ASSIGNMENT
- 6. **CONTROLLER MOTOR MENU**
- 7. TERADEK RT APP
- 8. OTHER RESOURCES

#### **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- PRODUCT REGISTRATION: Click <u>here</u> to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click here (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

### **PHYSICAL PROPERTIES**



- A: Motor drive gear
- **B:** Motor class indicators (Focus, Iris, Zoom)
- C: Axis button
- **D:** Data/Power inputs
- E: Rod clamp



### **WARNING**

- MOTR.X is a powerful device that is capable of causing injury or damage. Use caution when touching the drive gear if the device is powered on.
- MOTR.X is not to be used on extremely stiff or damaged lenses.
- MOTR.X requires no user maintenance. Opening the motor can affect its internal calibration and void the warranty.
- The motor body is used as a heatsink for the brushless windings. It may get warmer than a brushtype motor.
- Power input must not exceed 32V. Ensure that the power source's voltage is between 7-17V.
   Exceeding 17V can damage the motor and void the warranty.

## **POWER AND CONNECT**

MOTR.X powers up once it is connected to a Teradek RT device.

- 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 (E).
- 4. Connect power from the receiver to either motor input (D) using a 4-pin connector. The motor(s) will then begin calibrating. NOTE: Power input must not exceed 17V. If connecting multiple motors, use a separate 4-pin connector to "daisy-chain" the other units together.
- 5. If you see evidence of backlash affecting accuracy, ensure that your mount, rails, and camera are extremely rigid, as mounting flex is the main cause of inaccuracy.



### **Pin-Out Connections**

MOTR.X CONNECTIONS						
4-Pin OB (Motor ports)	Pin Description					
	1	GND				
	2	Data+				
	3	Data-				
	4	VCC				

## FOCUS/IRIS/ZOOM ASSIGNMENT



- 1. To manually assign an axis (Focus, Iris, Zoom) to the motor(s), press and hold the Axis Button (C) for one second, then release it once the correct class indicator is illuminated (B).
- 2. 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, the direction of rotation, etc.) can also be modified from any 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
- TORQUE Configure the motor torque settings and power consumption

### TERADEK RT APP

The Teradek RT App for iOS devices 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.S.

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Bolt App.
- 2. Navigate to **ADV>BLUETOOTH** on the MDR.S, then select **YES** to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your MDR.S if it is 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 (MDR.S or controller) the motor(s) are configured to.
- 2. Tap the Settings 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.



## **TOF.1 Quick Start Guide**

TOF.1 is a compact, affordable, and lightweight distance measurement device that is designed to work with Teradek RT devices. TOF.1 can be plugged into an MDR.X unit, which communicates measured distance information to either a Teradek RT CTRL.1 or CTRL.3 controller. The distance information can also be displayed on a compatible SmallHD monitor via a serial connection.



# **TABLE OF CONTENTS**



- 1. RESOURCES
- 2. WHAT'S INCLUDED
- 3. PHYSICAL PROPERTIES
- 4. LASER POINTER ASSEMBLY AND INSTALLATION
- 5. POWER AND CONNECT
- 6. **CONFIGURE AUTO-FOCUS**
- 7. OTHER RESOURCES

## **RESOURCES**

- FIRMWARE UPGRADE: Click here to update your product to the latest firmware before use.
- **PRODUCT REGISTRATION:** Click **here** to register your eligible products and gain access to premium technical support.
- TERADEK RT APP: Click <a href="here">here</a> (only available on iOS) to download the Teradek RT App.
- RT MANAGER DESKTOP APP: Click <u>here</u> (Windows/Mac OSX) to download the RT Manager Desktop App.

## WHAT'S INCLUDED

- 1x TOF.1 Rangefinder Module
- 1x 4-pin to 4-pin Teradek RT Motor Cable
- 1x Laser Pointer
- 1x Allen Key

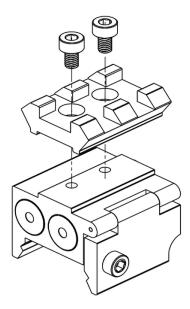


# **PHYSICAL PROPERTIES**

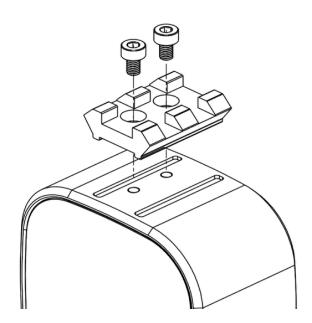


## LASER POINTER ASSEMBLY AND INSTALLATION

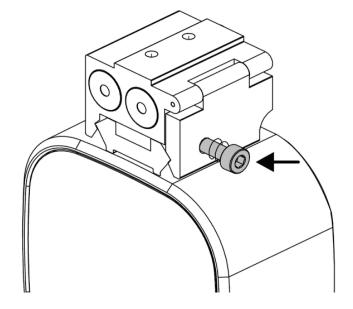
- 1. Remove the battery cap using the included Allen key, then insert three batteries with the positive (+) side facing out.
- 2. Unscrew the two top hex screws to remove the NATO rail mounting hardware from the laser pointer (see image below).



3. Attach the mounting hardware to the top of the TOF.1 using the same hex screws (see image below).



- 4. Loosen the spring-loaded rail mount screw to attach the laser pointer to the mount, then tighten the rail mount screw (**see image below**).
- 5. Attach the TOF.1 Rangefinder to the appropriate rod or bracket.





### POWER AND CONNECT

The TOF.1 will power up when connected to an MDR.S or MDR.X receiver.

- 1. Connect power to the receiver's PWR port.
- 2. Connect (daisy-chain) TOF.1 to one of the inputs on the connected motor using a 4-pin to 4-pin motor cable.
- 3. From the receiver, navigate to the **RX CONFIG > RANGE FNDR** menu, then select **OFF**. The rangefinder will begin communicating with the receiver.
- 4. If you haven't done so already, pair your controller with the receiver. Ensure that both devices are on the same channel and using the same units of measurement.
- 5. On both the controller (CTRL.3 only) and receiver, navigate to the **BUTTONS** menu and assign the Display option (**DISP**) to one of the six buttons.
- 6. Return to the main screen and press the **DISP** button until the Rangefinder information is displayed on both devices.

## **CONFIGURE AUTOFOCUS**



**NOTE:** Before enabling the Auto-Focus feature, you must create a lens map for the lens you are currently using, then select it for use with your controller. Refer to your controller quick start guide for instructions on how to configure a lens map.

- 1. Point your camera and TOF.1 towards the measured distance you want in focus.
- 2. From the CTRL.3 controller, navigate to **RANGE FNDR> AUTOFOCUS**.
- 3. Select **YES** to enable Auto-focus. The motors will adjust the focus according to the measured distance.

## **OTHER RESOURCES**

- USER GUIDE: <a href="https://guide.teradek.com/m/103512">https://guide.teradek.com/m/103512</a>
- ARTICLE: <a href="https://guide.teradek.com/a/1716654-tof-1-rangefinder">https://guide.teradek.com/a/1716654-tof-1-rangefinder</a>

• FIRMWARE UPGRADE: https://teradek.com/pages/downloads#teradekrt

## **CTRL.5 Controller**



A: 2.4/5GHz WiFi Antenna F: Slider K: Lens Ring

**B:** FHSS 2.4GHz RF Antenna **G:** Thumbwheel **L:** Knob

C: User Button (A, B, C, D)

H: Ultra-Bright
Display

M: 5-Pin USB

D: REC/PWR Button I: User Buttons 1-4 N: 4-Pin AUX: 6-28 V, 15W

E: Force Rocker J: User Buttons 5-8 O: Battery Attachment: L-Series Battery: 6-28

# **CTRL.3 Controller**



A: AUX Input

B: REC/PWR Button

**C:** Force Joystick

D: Status LED

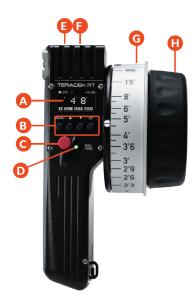
E: A/B Thumbwheels I: Slider

F: OLED Menu Screen J: Mini-USB

**G:** Menu Buttons **K:** Lens Ring

H: Limit Buttons L: Knob

# **CTRL.1 Controller**



A: OLED Display

B: Menu Buttons

C: Record/Power Button

D: Controller Status LED

E: Mini-B USB (not shown)

F: AUX input

G: Lens Ring

H: Control Knob



# **MDR.S Receiver**



A: External Antenna

**B:** OLED Display

C: Command Buttons

D: Status LED

E: USB-C Port

**F:** Power Input

**G:** Camera Port

H: Motor Port

# **MDR.X Receiver**



A: Motor Ports

B: IN-2 Port

C: IN-1 Port

**D:** Power Input

E: Status LED

F: CAM Input

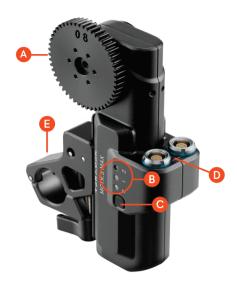
**G:** OLED Display

**H:** Menu Buttons

Teradek RT



# **MOTR.S Motor**



A: Motor Drive Gear

**B**: Motor Class Indicators (Focus, Iris, Zoom)

C: Axis Button

**D:** Data/Power inputs

E: MOTR.S Rod Clamp



# **MOTR.X Motor**



A: Motor Drive Gear

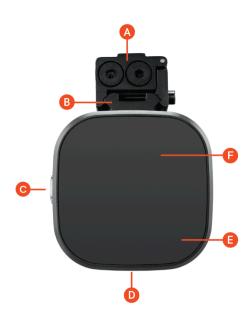
**B**: Motor Class Indicators (Focus, Iris, Zoom)

C: Axis Button

**D:** Data/Power inputs

E: Rod Clamp

## **TOF.1 Rangefinder**



A: Laser Pointer D: 1/4"-20 mounting hole

**B:** NATO Rail Mount **E:** Infrared LEDs

**C**: 9-20V DC Input **F**: Sensor

## **Connect and Power**

1. Insert or attach a Sony NP-F970 battery to the controller, then press the **REC/PWR (C)** button to turn it on.

- 2. Mount the receiver (MDR.S or MDR.X) to your camera and connect power to the receiver's power input.
- 3. Attach the motors (MOTR.X or MOTR.S) to the camera rods and/or lens.
- 4. Rotate the lens ring so it's not too close to either end stop, then mesh the motor's drive gear with the lens ring gear.
- 5. Connect the motors to any available motor port on the receiver using a 4-pin connector. If connecting two or more motors, use a 4-pin to 4-pin connector to combine (daisy-chain) them. The motors will begin calibrating. NOTE: Power input must not exceed 17V for MOTR.X and 32V for MOTR.S. 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.
- 6. Use a pairing method that applies to your controller to pair with the receiver (see Pairing).



## **Pairing**

If the controller you are using has not been paired with a receiver, you can use one of the following methods to pair both devices.

## Connecting CTRL.1 / CTRL.3 to MDR.X/MDR.S

## **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 LED on the controller will turn green once paired.

## **Wireless Pairing via Receiver**

Press the **MENU** button on the MDR.S, then navigate to **WIRELESS>CHANNEL** and select the same channel number as the controller to begin pairing. The LED on both the controller and receiver will turn green once paired.

## **Wired Pairing**

Connect a 5-pin connector from the controller's wired-mode input to the **IN-1** input on the receiver. The controller and receiver will remain paired even after disconnecting the 5-pin connector. The LEDs on the controller and receiver will turn blue once paired.

## Connecting CTRL.5 to MDR.X/MDR.S

The CTRL.5 simplifies connecting to an MDR.X or MDR.S receiver by utilizing RF channels to deliver efficient and reliable performance. If your controller is not yet connected to a receiver, follow these steps to complete the setup and ensure proper functionality.

- 1. Press the **MENU** button on the controller, then tap the **SETTINGS** tab.
- 2. Scroll down to the **SYSTEM** list and tap the **RF** tab.
- 3. Tap the Scan for Receiver tab. Ensure that the CTRL.5 and the receiver are on the same RF channel.
- 4. Confirm that the **RF Connection Status** has changed to **Connected** on the main screen and that the connected channel on the home screen has also turned from white to green.

## Camera Run/Stop

Teradek RT products support record triggers for a number of different camera systems and remote control protocols. Follow the instructions below to enable run/stop with your camera.

- 1. Connect a camera cable from the **CAM** port on the receiver to the camera. Teradek sells a variety of cables to work with different camera types. Click here to view the available cables.
- 2. Navigate to **MENU>CAMERA** on the MDR.S or **MDR.X** receiver and select which camera you have connected. Options include the following:
  - RED RCP Compatible with DSMC2 cameras that support RCP2, note that some cameras have RCP disabled by default. Refer to your camera's user guide for instructions on how to enable RCP.
     Set your CAMERA setting to ARRI when using with newer cameras with a 3-pin R/S port
  - ARRI
  - SONY Compatible with Sony professional cameras with 8 pin REMOTE port
  - PH FLEX (Phantom Flex)
  - LANC LANC protocol is supported by a number of different cameras, including Sony, Canon, and more
- 3. Press the REC/PWR button on the controller to start/stop recording on the camera.

**NOTE**: When using ARRI, SONY, or Phantom FLEX cameras with 24v power, your MDR must be powered using the same voltage for the run/stop signaling to work properly.

## **Controllers**

- <u>CTRL.1</u> / <u>CTRL.3</u>
  - PIN-OUT CONNECTIONS
  - STATUS LEDS
- CTRL.1 / CTRL.3 MENU SETTINGS
- CTRL.5
  - PIN-OUT CONNECTIONS
  - STATUS LEDS
- CTRL.5 HOME SCREEN
- CTRL.5 MENU SETTINGS
  - LENS MAPS
  - SETTINGS
  - DEVICES



## 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.

## CTRL.3



# TERADEK Teradek User Manual

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.

CTRL.1/CTRL.3 CONNECTIONS				
	5-Pin OB (AUX port)	Pin Description		
AUX	2 5 5	1	VCC	
		2	USB D-	
		3	USB D+	
		4	USB ID (Tied to Pin 5)	
		5	GND	
USB	Mini USB (For firmware updates)			

## **PIN-OUT CONNECTIONS**

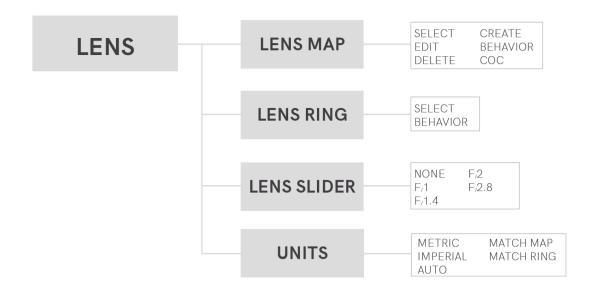
## **STATUS LEDS**

- **OFF** Unit is powered off
- WHITE Checking RF module status
- YELLOW No wireless connection
- GREEN Wireless is synced
- BLUE Wired-mode connection
- ORANGE PC/Bootloader mode
- · RED Camera recording



## CTRL.1 / CTRL.3 MENU SETTINGS

### **LENS**



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. **NOTE: For detailed instructions on how to activate the lens mapping and lens data overlay features...** 

#### **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.

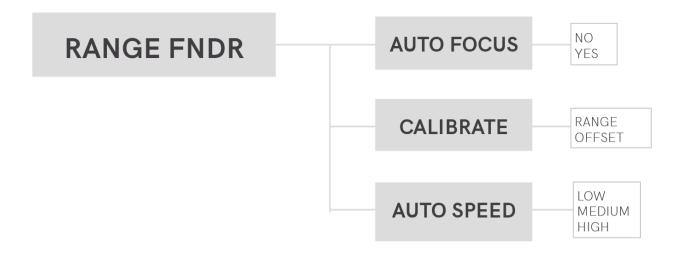
- F/1
- F/1.4

- 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

### **RANGE FINDER**

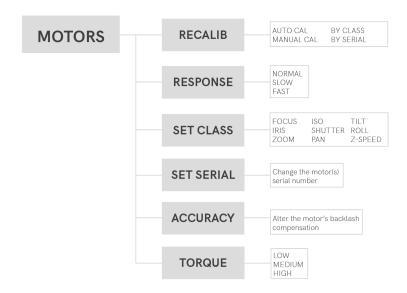


Use the RANGE FINDER menu to calibrate and configure the TOF.1 Rangefinder.

- AUTOFOCUS Enable or disable Autofocus on the TOF.1
- **CALIBRATE** Adjust the range and offset according to the distance measured between the camera's film plane and the subject (see **CALIBRATE TOF.1**)
- AUTOSPEED Adjust the Autofocus speed (Low, Medium, or High)



### **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

### **SET CLASS** (MOTR.X only)

- FOCUS Adjust 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 the focal plane horizontally
- TILT Move the focal plane vertically
- ROLL Move the focal plane from side to side

· Z-SPD - Zoom speed

#### **SET SERIAL**

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

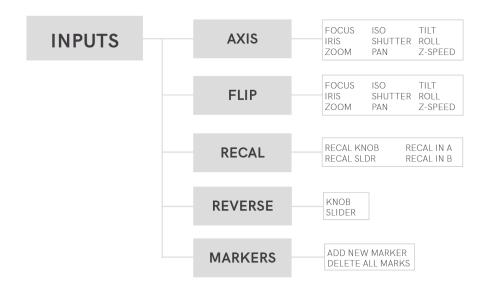
#### **ACCURACY**

Alter the motor's factory-calibrated backlash compensation.

#### **SET TORQUE**

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 the focal plane horizontally
- TILT Move the focal plane vertically
- · ROLL Rotate focal plane side to side
- Z-SPD Zoom speed

#### **FLIP**

Reverse the direction of the motor gear.

#### **RECAL SLDR (CTRL.3 only)**

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

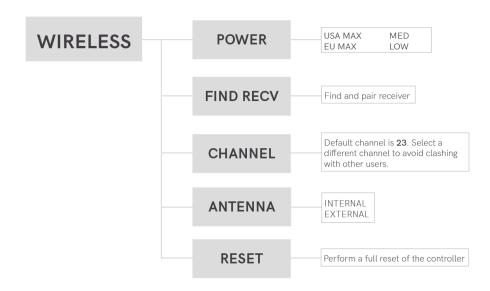
#### **REVERSE**

Reverse the direction of the controller's knob and/or slider

#### **MARKERS**

Add or delete overlay markers on your SmallHD screen. **NOTE:** You must first create a lens map and be connected to a compatible SmallHD monitor.

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

### **FIND RECV**

Find and pair a receiver within range.

#### **CHANNEL**

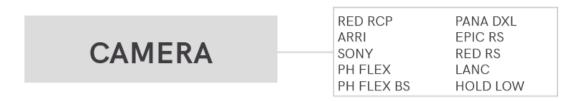
Select a specific channel to avoid clashing with other devices. The default channel is 23.

#### <u>RESET</u>

Perform a full reset of the controller.



### **CAMERA**

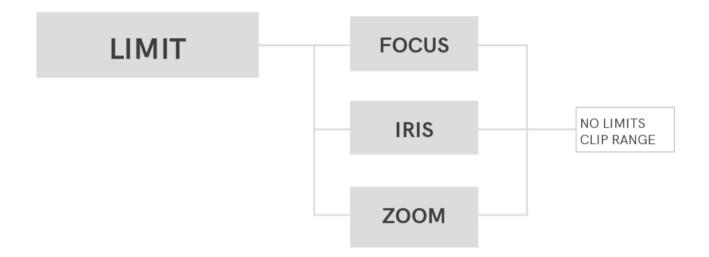


Use the **CAMERA** menu to select the type of camera the receiver is attached to. Specific cables for the different camera connections are available for purchase.

- RED RCP RED DSMC, DSMC2 (all models)
- ARRI Arri Alexa (all models)
- 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 the trigger is "held low"



#### LIMIT



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

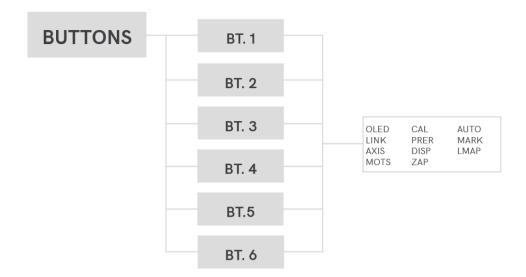
## **SCREEN**

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**

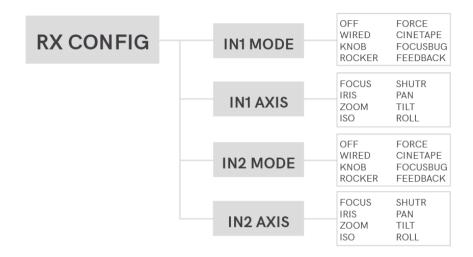
- **BT. 1 ▲** button
- **BT. 2 ▼** button
- BT. 3 SET button
- **BT. 4** POWER + ▲ button combination
- BT. 5 POWER + ▼ button combination
- BT. 6 POWER + SET button combination

#### **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
- · LIMT (CTRL.1 only) Shortcut to the Limits menu
- · ZAP (CTRL.3 only) Select for rapid zooming
- MARK (CTRL.3 only) Shortcut to add or select focus markers
- LMAP Shortcut to Lens maps



### **RX CONFIGURATION**



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

#### **MODE OPTIONS**

- **OFF** Disable the auxiliary 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 the focal plane horizontally
- · TILT Move the focal plane vertically
- ROLL Move the focal plane side to side
- Z-SPD Zoom speed



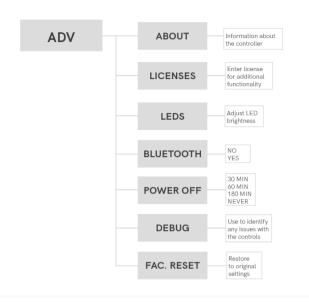
### **IO CONFIGURATION**

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

### **STATUS**

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



## CTRL.5



The CTRL.5 sets a new standard for wireless FIZ (Focus, Iris, Zoom) lens-control handsets, featuring a 5-inch SmallHD ultra-bright touchscreen powered by CTRL.0S—an evolution of SmallHD's PageOS designed specifically for lens control. It allows you to view critical lens data overlays while pulling focus without looking away from the video feed. Lenses can be calibrated to pre-marked focus rings, and configurations are easily accessible via the touchscreen or any of the eleven programmable function buttons. The hand unit offers numerous mounting points for accessories and is fully compatible with the Teradek RT Lens Control Ecosystem.



## **PIN-OUT CONNECTIONS**

CTRL.5 CONNECTIONS					
	4-Pin 0B (AUX port)	Pin Description			
AUX 2 3	100	1	GND		
		2	Data+		
	3	Data-			
		4	VCC		
	5-Pin OB (USB port)	Pin Description			
USB	2005	1	VCC		
		2	USB D-		
		3	USB D+		
		4	USB ID (Tied to Pin 5)		
		5	GND		

## **STATUS LEDS**

- **OFF** Unit is powered off
- WHITE Booting
- · ORANGE Not connected
- GREEN Connected
- RED Camera is recording

## **CTRL.5 HOME SCREEN**

The CTRL.5 Home Screen displays the iris, zoom, focus scales, current value, Markers, Limits, and Menu buttons.



1: Marker Buttons 9: Focus Position Indicator 16: Hyperfocal Indicator

2: Iris Scale 10: Depth of Field Indicator 17: Focus Distance

3: Iris Marker 11: Menu Button 18: Iris Value

4: Iris Position Indicator 12: Lock Inputs 19: DIST (Distance) value

**5:** Limits Buttons **13:** RF Connection Indicator **20:** Rangefinder Readout

Indicator

**6:** Focus Scale Adjustment **14:** RF Channel **21:** Zoom Speed

7: Focus Scale 15: Battery Percentage 22: Focal Length

Indicator 22.1 ocal Leng

8: Focus Marker

## HOME SCREEN OPERATION NOTES

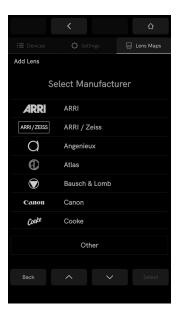
- 1. Focus and Iris markers can be added at the current position using buttons 1 and 14. When a marker is enabled it can be removed by moving to the marker position and pressing either the Iris or Focus marker button again. See the Markers section for more details.
- 2. When a zoom lens map is enabled, tapping the iris or zoom value in the center of the screen switches the left onscreen scale between iris and zoom.



3. You can cycle through different Focus scale options using the Focus Scale button (7). Long pressing the Focus Scale button allows you to adjust the scale using a slider. Additionally, the scale can be adjusted using a pinch-to-zoom gesture.

## **CTRL.5 MENU SETTINGS**

## **Lens Maps**



CTRL.5 includes built-in lens mapping, enabling users to automatically calibrate a manufacturer's lenses to pre-marked focus rings with a single button press. Once a lens map is configured, the calibrated values appear on the CTRL.5 controller's home screen. Lens mapping is a standard feature of the CTRL.5. For more detailed instructions on how to create a lens map, visit the <a href="Lens Mapping and Lens Data Overlay">Lens Mapping and Lens Data Overlay</a> section of this guide.



## **Settings**

## **Page Views - Home Screen Configuration**



### **FOCUS**

- Show Current Value Enable/Disable the display of the current Focus position on the home screen
- · Show Focus Meter Enable/Disable the display of the Focus Meter on the home screen
  - Meter Scaling Slider Adjust the scale of the Focus Meter

## **DEPTH OF FIELD (Focus Meter must be enabled)**

The depth-of-field indicator on the focus scale shows the distance range between the closest and farthest objects that appear in focus according to the Lens Map's focus, iris, and/or zoom settings.

- Show on Focus Meter Enable/Disable Depth of Field indicator
- Meter Color Change the color of the Depth of Field meter
- · Circle of Confusion slider Adjust the size of the Circle of Confusion (CoC) indicator

#### **IRIS**

- Show Current Value Enable/Disable the display of the current aperture position on the home screen
- Show Meter Enable/Disable the display of the Iris Meter on the home screen



#### **ZOOM**

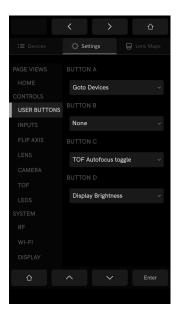
- Show Current Value Enable/Disable the display of the current zoom position on the home screen
- Show Meter Enable/Disable the display of the Zoom Meter on the home screen. NOTE: This option is hidden if a lens map without zoom is enabled

#### **Controls**

#### **USER BUTTONS (A to D)**

Assign specific functions to the physical buttons on the controller.

- Assigned Functions
  - None
  - Start/Stop Rec
  - Goto Devices
  - Goto Settings
  - Goto Lens Maps
  - Display Brightness
  - TOF Autofocus Toggle
  - Lens Ring
  - Camera
  - Screen Capture



#### **INPUTS**

Assign a specific control element to the **Focus**, **Iris**, **Zoom**, and **Zoom Speed** axes, and recalibrate the controller's knob or slider.

#### · Control Elements

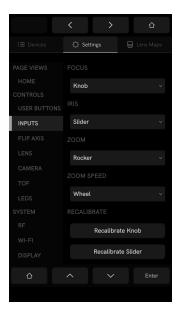
- Knob
- Slider
- Wheel
- Rocker
- Off

#### Recalibrate Knob

The knob is pre-calibrated from the factory but can be recalibrated if needed. Follow the on-screen prompt to recalibrate the knob.

#### · Recalibrate Slider

The slider is pre-calibrated from the factory but can be recalibrated if needed. Follow the on-screen prompt to recalibrate the knob.



### **FLIP AXIS**

Reverse the direction of the motor gear for each axis (Focus, Iris, Zoom, and Zoom Speed).

#### **LENS**

The Lens Menu contains lens map configurations and lens ring options.

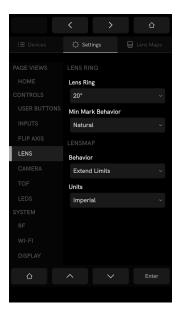
#### · LENS RING

- Lens Ring Select the appropriate lens ring size.
- Min Mark Behavior Select whether the knob stops at the first mark of the lens ring (Min Stop),
   or if it continues past the first mark of the lens map (Natural)

#### LENS MAP

- Behavior Extend or maintain current lensmap limits
- Units Select how units are displayed for the lensmap
  - Metric
  - Imperial

- Auto
- Match Map
- Match Ring



#### **CAMERA**

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 (all models)
- 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)
- · Panavision DXL Panavision DXL
- RED Epic EPIC (Run/Stop)
- RED RS RED (Run/Stop)
- · LANC Camera with LANC support
- Hold Low Cameras that record while the trigger is "held low"

#### DIST

Use the **DIST** menu to configure a **TOF.1 Rangefinder**.

- Autofocus Enable or disable Autofocus on the TOF.1
- Offset Adjust the offset value according to the distance measured between the camera's film plane and the subject (see <u>CALIBRATE TOF.1</u>)
- Autofocus Speed Adjust the Autofocus speed (Slow, Medium, or Fast)

#### **LEDS**

Adjust the knob's backlight and status LEDs.

POINTER LED

- Pointer LED Brightness Adjust the intensity of the knob pointer's LED
- Pointer LED Color Change the color of the knob pointer's LED
- BACKLIGHT LED
  - Backlight LED Brightness Adjust the brightness of the knob's backlight
  - Status LED Brightness Adjust the intensity of the Status LED

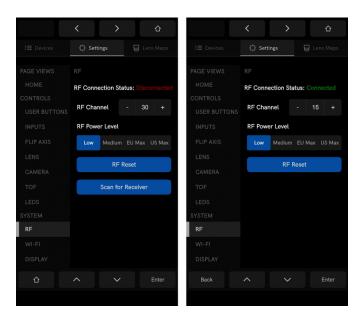


### **System**

#### **RF**

- RF Connection Status Indicates whether a receiver is Connected to or Disconnected from the CTRL.5.
- **RF Channel** Select a specific channel to pair the CTRL.5 with a receiver and avoid clashing with other devices. The default channel is 23.
- **RF Power Level** Select the strength of the radio frequency (**RF**) signal used to communicate with connected devices.
  - · Low When working close to the MDR
  - **Medium** General working power level for mid-distance operation
  - EU max European max distance RF configuration
  - US Max US-based max distance RF configuration
- RF Reset Button Reset the RF settings to default
- Scan for receiver Scans all RF channels and auto-connects to any discovered MDR units.



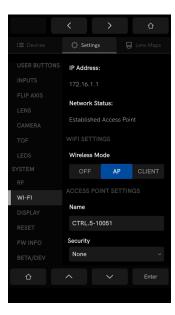


#### WI-FI

a

CTRL.5 supports both AP (Access Point) and Client Mode. Use the Wi-Fi menu to connect to a network or confirm a connection.

- WIFI SETTINGS
  - Wireless Mode Select a wireless mode
    - OFF
    - AP
      - Name Enter the network name
      - Security Select the appropriate security protocol (WPA, WPA2, WPA/WPA2)
      - Region Select your region from the list
      - Channel Select a frequency or frequency range
    - CLIENT
      - Connect Saved Networks Toggle on to automatically connect to a saved network
      - IP Mode Select DHCP for automatic IP configuration or Static for manual IP configuration)
      - · WiFi Scan Scan for available networks
      - Saved Networks Select a previously saved network
  - Reset WiFi Settings Reset your WiFi settings



#### **DISPLAY**

#### DISPLAY SETTINGS

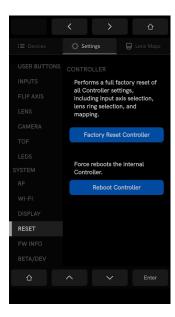
- Brightness Use the Brightness toggle switch to increase or decrease the display's brightness
- Dim Display After Select a time between 30 seconds to 2 hours for the display to dim automatically.
- **Turn Off Display after** Select a time between 30 seconds to 2 hours for the display to automatically turn off.
- Sleep Mode Tap the Sleep Display tab to fully dim the display. Press any shortcut button to wake your device.

#### **RESET**

#### CONTROLLER

- Factory Reset Controller -Performs a full factory reset of all CTRL.5 settings, including input axis selections, lens ring selection and lens mapping
- Reboot Controller Force reboots the internal controller





## FIRMWARE INFO (FW INFO)

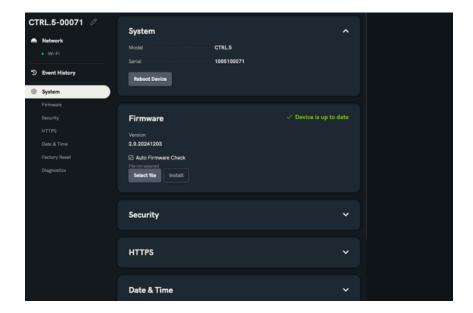
The FW Info section displays the current firmware version and serial number of the CTRL.5

Check for new FW - Press this tab to check if new firmware is available

#### PERFORM A FIRMWARE UPGRADE

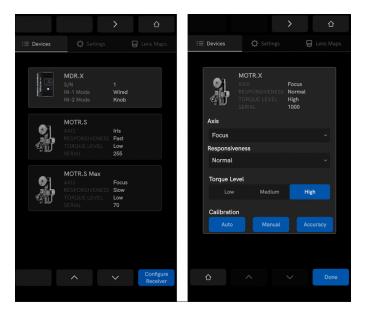
- Download the firmware file from teradek.com. NOTE: DO NOT UNZIP!
- 2. Go to Settings > Wi-Fi > Wireless Mode and select AP (Access Point).
- 3. Open Access Point Settings and note the network name (e.g., CTRL.5-XXXX).
- 4. Search the available Wi-Fi networks on your computer and connect to the CTRL.5-XXXX network.
- 5. Open Chrome and Enter the IP address 172.16.1.1 in the address bar to open the CTRL.5 Web UI.
- 6. Navigate to the **Firmware** section in the Web UI.
- 7. Click **Select File** and choose the .zip file from your downloads folder.
- 8. Click Install to start the firmware update process. The CTRL.5 will complete the update over Wi-Fi.
- 9. Power cycle the controller to apply the new firmware.





## **Devices**

The **Devices** menu lists all the devices, such as the receiver, motors, and rangefinder, connected to your CTRL.5. Connected devices' parameters can also be configured from the CTRL.5. Tap on any of the devices, then tap the **Configure** button below.







						Level
<ul><li>Off</li><li>Wired</li><li>Knob</li><li>Rocker</li></ul>	<ul><li>Force</li><li>Cinetape</li><li>Focus</li><li>Bug</li><li>Feedback</li></ul>	<ul><li>Zoom</li><li>Focus</li><li>Iris</li><li>Zoom</li></ul>	<ul><li>ISO</li><li>Shutter</li><li>Pan</li><li>Tilt</li><li>Roll</li></ul>	<ul><li>Focus</li><li>Iris</li><li>Zoom</li></ul>	<ul><li>Normal</li><li>Slow</li><li>Fast</li></ul>	<ul><li>Low</li><li>Medium</li><li>High</li></ul>

### **FIZ LIMIT BUTTONS AND MARKERS**

CTRL.5 **Limits** buttons allow you to set a limit range for the Focus, Iris, or Zoom controls. Setting limits restricts the motor from adjusting the lens past a set limit. **Markers** serve as reference points on the CTRL.5 interface. Markers are particularly useful in scenarios requiring repetitive movements or when specific lens positions need to be recalled swiftly and accurately.

#### **LIMITS**

- 1. Move the slider, knob, or rocker to the high or low end of the desired limit.
- 2. Hold the limit button for the corresponding axis (Focus, Iris, or Zoom).
- 3. Continue holding the limit button, move the input to the opposite end of the desired limit, and then release the button to set the limit range.



- 4. Press the **Clear Limits** tab to remove the limit range.
- 5. To completely lock the motor, hold the limit button for 1 second, then release it without moving the corresponding input.



#### **MARKERS**

- 1. Move the slider or knob to the desired position.
- 2. **To add a marker**, press the **+ Iris Marker** or **+ Focus Marker** button to create a virtual marker at that position.
- 3. **To add additional markers**, move the slider or knob to the next position and press the **Marker** button again. Repeat this process until you have mapped all your reference points.
- 4. **To reposition a marker**, first align the focus or iris scale with the marker you want to move. Press and hold the **+ Marker** button to "grab" the marker, then drag it to the desired location. Release the **+ Marker** button to place the marker in its new position.
- 5. **To remove a marker**, move the slider or knob to the position of a specific marker and press the **Remove Marker** button.
- 6. **To delete all markers**, press and hold the **Focus Marker** or **Iris Marker** button for about 1 second until a prompt appears. Confirm the prompt to remove all markers.





# **Receivers**

# MDR.X



Teradek's MDR.X is a modular receiver with integrated Bluetooth for reliable smart device connections. MDR.X can command up to three motors for FI+Z control (Focus, Iris, and/or Zoom), offers RED camera control, supports all current Latitude functions and integrations, and features several configurable options accessible via the built-in OLED display.

# MDR.S



Teradek's MDR.S is a modular receiver with integrated Bluetooth for reliable smart device connections. MDR.S can command up to three daisy-chained motors for FI+Z control (Focus, Iris, and/or Zoom), offers camera control for ARRI, RED, Sony, and LANC-compatible models, supports all current Latitude functions and integrations, and features several configurable options accessible via the built-in OLED display.

## **MDR.X Connections**

MDR.X CONNECTIONS				
	4-Pin OB (Motor ports)	Pin Description		
MOTORS		1	GND	
		2	Data+	
		3	Data-	
			VCC	
	5-Pin 0B (IN-1/2 ports)	Pin Description		
			VCC	
IN-1/2			USB D-	
114-1/2	3 4	3	USB D+	
		4	USB ID (Tied to Pin 5)	
			GND	
	2-Pin 0B (Power Input)	Pin Description		
POWER			GND	
		2	vcc	
	6-Pin 0B (Trigger Output)	Pin Description		
	26 0 6	1	USB D-	
		2	USB D+	
CAMERA		3	GND	
		4	RS232 Out	
		5	Camera Out	
	7/		RS232 Out	
USB	USB-C (For fir	rmware updates)		

## **MDR.S Connections**

MDR.S CONNECTIONS				
POWER	3-Pin OB (Power Input)	Pin Description		
		1	GND	
		2	VCC	
		3	Camera Out EXT	
	6-Pin OB (Trigger Output)		Pin Description	
		1	USB D-	
		2	USB D+	
CAMERA		3	GND	
		4	RS232 Out	
		5	Camera Out	
		6	RS232 Out	
	4-Pin OB (Motor ports)		Pin Description	
		1	GND	
MOTORS		2	Data+	
		3	Data-	
		4	VCC	
USB	USB-C (For fir	rmware updates)		



### MDR.X Status LEDs

• GREEN - Power On/Wireless Synced	O WHITE - Checking RF module status
ORANGE - Not Connected/PC Mode	• RED - Camera running
BLUE - Wired Mode Connection	• YELLOW - Pre-Record

## MDR.S Status LEDs

• GREEN - Power On/Wireless Synced	O WHITE - Booting
• CYAN - Wired Mode	BLUE - Camera running

## **MENU SETTINGS**

Press the **MENU** button, then use the  $\triangle$ ,  $\nabla$  and **SET** button to navigate through the different menu options.

- 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.
- STATUS (MDR.S) Contains a list of connected devices
- RX CONFIG (MDR.X) 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.



## **Motors**

## **MOTR.S**



MOTR.S and MOTR.S MAX Lens Motors set a new standard in lens control technology. MOTR.S Motors are ultra-lightweight, compact, and blazing fast at up to 297 teeth per second. MOTR.S MAX Motors are the high-torque wireless lens-control solution specifically for heavy-duty lenses with stiff, grinding gears. MOTR.S delivers 0.3Nm peak torque while MOTR.S MAX delivers 0.8 Nm of continuous torque for precise focus-pulling on heavy-duty lenses. Both motors boast durable, all-aluminum construction and reinforced sockets, a revolutionary quick-release gear system for intuitive setup and quick transitions, and are compatible with all previous RT handsets, receivers, and daisy-chainable motors.



# **MOTR.X**



MOTR.X provides six times the service life of conventional brushed motors 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. MOTR.X is compatible with all Teradek RT wireless FI+Z systems and achieves the perfect balance between size, weight, and torque.

### **Pin-Out Connections**

MOTR.X/MOTR.S CONNECTIONS				
4-Pin OB (Motor ports)	Pin Description			
	1	GND		
1 4	2	Data+		
2 3	3	Data-		
	4	VCC		





#### **WARNING**

- MOTR.X and MOTR.S are powerful devices that 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 void the warranty.
- The motor body is used as a heatsink for the brushless windings. It may get warmer than a brush-type motor.

## FOCUS/IRIS/ZOOM ASSIGNMENT

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



MOTR.X



MOTR.S

To assign or change the motor's axis from the controller (MOTR.X only), 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**

- 1
- 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 (MOTR.X only) Assign or change a motor(s) particular class
- SET SERIAL Change the motor(s) serial number
- ACCURACY Alter the motor's backlash compensation
- TORQUE Configure the motor torque settings and power consumption



# **TOF.1 Rangefinder**

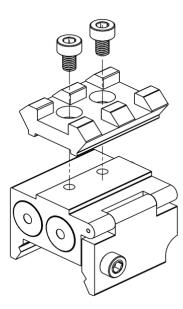
TOF.1 is a compact, affordable, and lightweight distance measurement device that is designed to work with Teradek RT devices. TOF.1 can be plugged into an MDR.X unit, communicating measured distance information to a Teradek RT CTRL.1 or CTRL.3 controller. The distance information can also be displayed on a compatible SmallHD monitor via a serial connection.



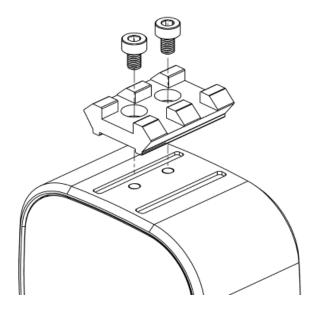
# LASER POINTER INSTALLATION

- 1. Remove the battery cap using the included Allen key, then insert three batteries with the positive (+) side facing out.
- 2. Unscrew the two top hex screws to remove the NATO rail mounting hardware from the laser pointer (see image below).

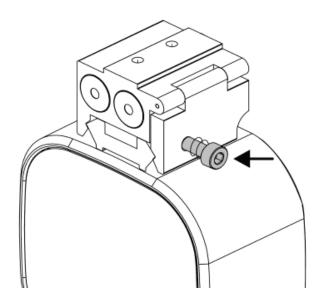




3. Attach the mounting hardware to the top of TOF.1 using the same hex screws (see image below).



- 4. Loosen the spring-loaded rail mount screw.
- 5. Attach the laser pointer to the mount, then tighten the rail mount screw (see image below).



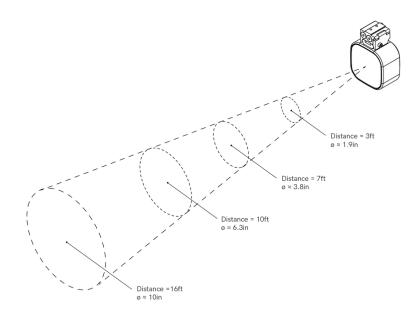
5. Attach the TOF.1 Rangefinder to the appropriate rod or bracket.

### **POWER AND CONNECT**

- 1. Connect power to MDR.X's **PWR** port.
- 2. Connect TOF.1 to MDR.X's middle motor input using a motor cable.
- 3. From the MDR.X, navigate to the **RX CONFIG>RANGE FNDR** menu, then select **MID MOTOR**. The rangefinder will begin communicating with the MDR.X.
- 4. If you haven't done so already, pair your controller with the MDR.X. Ensure that both devices are on the same channel and using the same units of measurement.
- 5. From both the controller (CTRL.3 only) and MDR.X, navigate to the **BUTTONS** menu and assign the Display option (**DISP**) to one of the six buttons.
- 6. Return to the main screen and press the **DISP** button until the Rangefinder information is displayed on both devices.

## **SENSOR DETECTION ANGLE**

TOF.1's sensor has a 3° detection angle that determines how big the detection circle is at any given range. As your target moves back and forth, the size of the detection circle increases and decreases. For example, if your target is 16ft (5m) away, the detection circle is approximately 10in (26cm) in diameter. **NOTE: The illustration below is not to scale and is for reference only.** 



## **CALIBRATE TOF.1**

- 1. Before beginning the calibration process, ensure that your controller and MDR.X are paired, using the same units of measurement, and the **AUTOFOCUS** feature is disabled on the controller.
- 2. Navigate to RANGE FNDR> CALIBRATE from either the controller or MDR.X.
- 3. Point your camera and TOF.1 toward a flat object such as a gray target card or a wall.
- 4. Use a measuring tape to determine the distance between your camera's film plane and the object you're using to calibrate.
- 5. After measuring the distance, use the up and down menu buttons to adjust the offset so that the displayed distance matches the distance measured in step 4.

## **AUTOFOCUS**



**NOTE:** Before enabling the Auto-Focus feature, you must create a lens map for the lens you are currently using, then select it for use with your controller. Refer to your controller quick start guide for instructions on how to configure a lens map.

- 1. Point your camera and TOF.1 towards the measured distance you want in focus.
- 2. From the CTRL.3 controller, navigate to **RANGE FNDR> AUTOFOCUS**.
- Select YES to enable Auto-focus. The motors will adjust the focus according to the measured distance.



### RANGEFINDER OVERLAY

SmallHD monitors include a Rangefinder Overlay feature that displays your TOF.1's measured distance on the monitor. All you need is a SmallHD/Teradek RT interface cable. Below are steps to enable the Rangefinder Overlay.



- 1. Connect a cable from the controller's wired mode connector to one of the monitor's AUX ports.
- 2. Tap the screen and navigate to **ADD NEW TOOL>OVERLAYS >Teradek RT**, then select whether to add the rangefinder overlay to the current custom page or all custom pages.
- 3. To configure the size of the overlay, tap the screen and select **Teradek RT** from the top left corner.
- 4. Select Enable, then scroll down and select RANGEFINDER SIZE.
- 5. Use your finger to move the slider left and right to adjust the size of the overlay.
- 6. Tap **Teradek RT** on the top left corner to return to the custom page. The Rangefinder overlay will display on the right side of the screen and will adjust according to the measured distance.



# **Lens Mapping and Lens Data Overlay**



CTRL.1, CTRL.3, and CTRL.5 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.5 and 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)
- CREATE A LENS MAP (CTRL.1 / CTRL.3)
- CREATE A LENS MAP (CTRL.5)
- LENS DATA OVERLAY (CTRL.1 / CTRL.3)

# **ACTIVATE LENS MAPPING (CTRL.1 ONLY)**

- 1. Press the **MENU** button, then use the τ 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 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.

# **CREATE A LENS MAP (CTRL.1 / CTRL.3)**

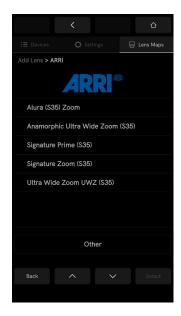
1. Navigate to **LENS>LENSMAP>CREATE**.

- 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. Ensure a motor is attached to the corresponding ring, and 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.

# **CREATE A LENS MAP (CTRL.5)**

- 1. Navigate to Menu > Lens Maps, then tap the Create New Lens Map button. Ensure
- 2. Select the lens manufacturer.
- 3. Select a lens type from the preset list. If your lens type is not listed, tap **Other** to create a name to identify the lens map.



- 4. Select the lens according to the focal length (e.g. 35mm, 85mm), then tap the Create Lens Map tab.
- 5. You will be prompted to create a **Focal Length (Zoom)** map and an **Iris** map before creating the **Lens Map**. Select **Yes** or **No**, then tap **Confirm** to proceed. Ensure a motor is attached to the corresponding ring, and the motor and controller are set to the same class (Focus, Iris, Zoom).





#### **CTRL.5 DEFAULT INPUTS**

- FOCUS Knob
- IRIS Slider
- · ZOOM Rocker
- · ZOOM SPEED Wheel

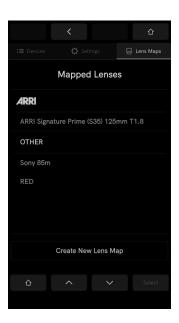
You can program the inputs to use a different user control element in the **Settings** menu.

6. Move the controller knob, zoom rocker, or slider so that the motor adjusts the lens ring to the corresponding mark, then tap **Confirm**. Continue until you have programmed all the lens marks. Repeat this step for every control input, then click **Confirm** when you're done. **NOTE: Entering every lens mark** is not required, but it is recommended for the Lens Map to be more accurate.



7. When prompted, tap the Use this Lens Map to add it to the Mapped Lenses list and begin using it.





8. Attach a lens ring to the controller's knob, then navigate to **Settings > Lens > Lensring** and select the corresponding lens ring size.

# LENS DATA OVERLAY (CTRL.1 / CTRL.3)



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 must 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**

- 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: <a href="https://support.cs.inc/s/article/360020392513-Teradek-RT-SmallHD-Integration">https://support.cs.inc/s/article/360020392513-Teradek-RT-SmallHD-Integration</a>
- 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 the controller's knob movements.

# Teradek RT App



**NOTE:** The Teradek RT App is not compatible with the CTRL.5 Controller. For external configuration on the CTRL.5, use the CTRL.5 web UI.

The Teradek RT App for iOS devices 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.S.

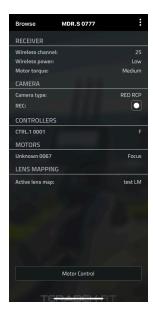
## **CONNECT VIA BLUETOOTH**

#### **CONNECT VIA BLUETOOTH**

- 1. Download the Bolt App.
- 2. Navigate to **ADV>BLUETOOTH** on the MDR.S, then select **YES** to enable.
- 3. Enable Bluetooth on your cellular device, then open the Teradek RT app. Your device will automatically detect your MDR.S if it is within range.
- 4. Select the RT device(s) you want to configure.



### RECEIVER STATUS DISPLAY



- SETTINGS Tap the settings button (three dots) on the top right corner of the screen to view or customize the following settings:
  - **Device Info** Displays the serial number and current firmware versions of the receiver and the serial numbers for the connected controller and motor(s).
  - Device Settings Adjust the Wireless Channel, Wireless Power, Camera Type, and Motor Torque settings.
  - Firmware Upgrade Displays the current firmware versions of the receiver and allows you to
    perform a firmware upgrade if an update is available. NOTE: Tap the Advanced button at the top
    right corner to re-download the firmware package, upgrade only certain firmware package
    contents, or force a firmware upgrade.
- **RECEIVER** Displays the current wireless channel, wireless power, and the motor torque.
- CAMERA Displays the camera type and Recording button. NOTE: To begin recording, tap the button.
- CONTROLLER Displays the paired controller and assigned motor classes.
- MOTORS Displays the connected motor(s) and corresponding class.
- LENS MAPPING Displays the assigned lens map.
- MOTOR CONTROL BUTTON Allows you to control the motor(s) from the RT app.

## **ASSIGN AN AXIS TO A MOTOR**

1. Open the RT app, then select the device (MDR.S or controller) the motor(s) are configured to.

- 2. Tap the Settings 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**

- 1. Open the RT app, then select your receiver from the main screen.
- 2. Tap the **Settings** 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).
- 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 MDR.S are set to the same axis.





- 6. Move the virtual knob for the motor to adjust 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 additional axis to map. Repeat steps 5 and 6 for each axis you want to map.
- 9. Press the **Back** button once more, then tap **Save** at the top right corner. You will then be prompted whether or not to apply the Lens Map.



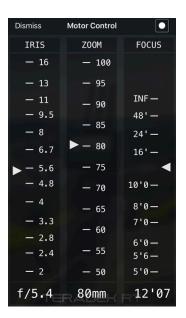


# **CONTROL MOTOR FROM RT APP**

- 1. Launch the RT app, then select the receiver to which the motor(s) are configured to.
- 2. Tap the **Motor Control** button at the bottom of the screen.



3. Select an axis, then use your finger to move the displayed slider up and down. The motor will adjust the lens ring according to the slider's movements.



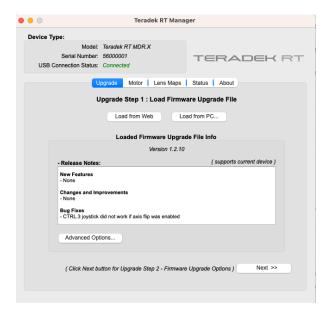


# **RT Manager**



**NOTE:** The Teradek RT Manager is not compatible with the CTRL.5 Controller. For external configuration on the CTRL.5, use the CTRL.5 web UI.

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



## **CONFIGURATION OPTIONS**

- **Upgrade** Update your RT controller, receiver, or ACI with the latest firmware.
- Motors Update your RT motors with the latest firmware.
- Lens Maps Retrieve lens maps from the controller or upload lens maps to the controller.
- Status Displays detailed information about configuration and update status.
- · About Displays the software version and License Agreement.

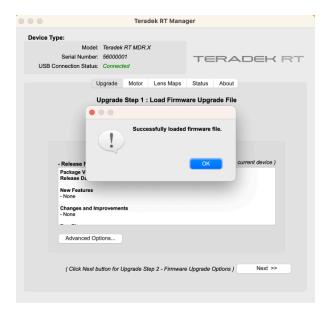
# Upgrade CTRL.3, MDR.X, or MDR.S



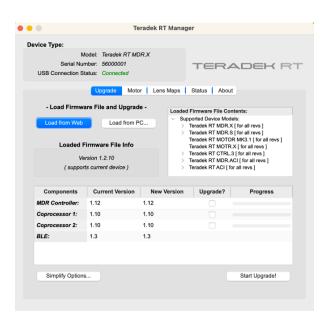
To upgrade **CTRL.1** or any legacy product like the MK3.1 controller and Latitude or MK3.1 receivers, you must use RTFW (see **Upgrade CTRL.1 with RTFW**).

# TERADEK Teradek User Manual

- 1. Connect power to your controller or receiver, then connect it to your computer via USB (Mini-USB for CTRL.3 or MDR.X, USB-C for MDR.S).
- 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: <a href="http://www.teradek.com/pages/downloads#teradekrt">http://www.teradek.com/pages/downloads#teradekrt</a>



- 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.



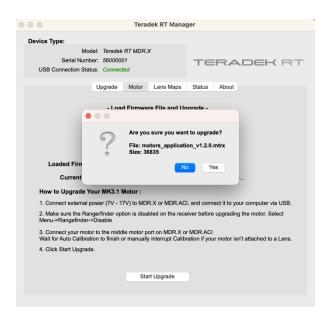
# **Upgrade MOTR.S or MOTR.X**

- To upgrade your MOTR.S or MOTR.X, you must connect to your computer from a receiver.
- 1. Connect power to your MDR.X or MDR.S receiver, then connect it via USB to your computer.
- 2. Press and hold the axis select button on the motor until the **F** and **Z** LEDs begin to blink repeatedly, then connect your motor to the receiver. **If using the MDR.X**: Connect the motor to the middle port on your MDR.X, while holding down the axis select button.





- 3. Open RT Manager, then load the firmware file from either your computer or the web.
- 4. Select the motor model, then click Start Upgrade. When prompted, click Yes.



# **Upgrade CTRL.1 with RTFW**

**RTFW** allows you to upgrade the CTRL.1 controller or other older RT devices' firmware and is available as software for Mac or Windows. Visit <a href="https://teradek.com/pages/downloads#teradekrt">https://teradek.com/pages/downloads#teradekrt</a> and download **RTFW**.

- 1. Launch RTFW, and make sure the device you intend to update is turned off.
- 2. Using the included USB cable, connect the CTRL.1 to your computer. Once connected, turn **ON CTRL.1**. Your controller is now in **PC Mode**. RTFW will display **Connected to Device** at the top, indicating that the app has detected and connected to the controller.
- 3. Under Which Device to Update, select CTRL.1 from the drop-down menu.
- 4. Under **Firmware**, use the drop-down menu to select a firmware version for your device, then click **Update Device**.



#### CTRL.1 update to enable RT Manager compatibility

#### **Updating CTRL.1 for compatibility with RT Manager**

Updating CTRL.1 for compatibility with RT Manager

The latest 1.16 update for CTRL.1 adds support for a PC Mode to allow it to connect with RT Manager for future updates. Until now, the older RTFW application had to be used for all CTRL.1 updates.

Before your CTRL.1 can talk to RT Manager, you'll need to do one last update using RTFW. Follow these steps to update your CTRL.1 and allow it to connect to RT Manager for future updates and lens map transfers.

Visit <a href="https://teradek.com/pages/downloads#teradekrt">https://teradek.com/pages/downloads#teradekrt</a> to download the latest firmware package and applications.

- Download the latest RTFW application, version 1.3.21. The application installer contains all of the latest firmware files, including for CTRL.1
- 2. Install RTFW, steps will vary between MacOS and Windows computers
- 3. Open RTFW.
- 4. Connect CTRL.1 to your computer via mini-B USB cable
- 5. Press the REC/PWR button on CTRL.1 to turn it on. RTFW should detect CTRL.1 and display it in the 'Which Device to Update? drop down



- 6. Select CTRL.1\_v1.16.3.sc from the Firmware Version drop down
- 7. Click Update Device, after about 2 minutes your CTRL.1 will finish the update and power off.
- 8. Disconnect CTRL.1 from your computer before powering on to complete the next steps.



### **Connecting to RT Manager**

Now that CTRL.1 has been updated, you can connect to the latest Bolt Manager (2.0.0) for all future updates, and take advantage of the lens map transfer feature previously available only on CTRL.3.

To enable RT Manager control on CTRL.1, do the following:

- 1. Enter the Menu
- 2. Select and open the IO CONFIG menu
- 3. Set the mode to PC.
- 4. Connect CTRL.1 to your computer via mini-B USB cable
- 5. Open RT Manager

#### **CTRL.5 Controller**

SUPPORT		
Axis	4-Axis (Knob, Slider, Rocker, Wheel)	
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)	
Rangefinder Compatibility	TOF.1, CineRT, CineTape, Moon Focus, Qinematiq	
PHYSICAL ATTRIBUTES		
Dimensions	6.6" x 6.6" x 3.3" (168.28 x 168.29 x 82.90 mm)	
Weight	1.825 lbs (.83 kg)	
Construction	Aerospace-grade aluminum billet	
Mountability	23x 1/4-20s with anti-twist 3mm locking Pins	
Operating Temperature	14°F - 140°F (-10°C to 60°C)	
WIRELESS		
RF Channels (FHSS: 2.4GHz)	30	
RF Range	Up to 5000 ft (1500 m) line-of-sight	
WiFi (2.4 and 5 GHz)	FW Updates, Third-Party Integrations (coming soon)	

Bluetooth (2.4GHz)	Features Coming soon	
CONNECTORS		
Wired-Mode Input	1x 4-pin AUX port	
USB	1x 5-pin USB port	
INTERFACES		
Panel Type	5" SmallHD ultra-bright LCD	
POWER		
Battery Input	Sony NP-F970 Battery	
Operational Voltage	6-28V	
Current Draw at MAX LCD Brightness	2A @7.5V	

## **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, MOTR.S and MK3.1 Motors, Thumbwheel, MDR.S, MDR.X and Latitude Receivers, TOF.1	
App Support	Teradek RT iOS App, FoolControl for iOS devices	
PHYSICAL ATTRIBUTES		
Dimensions	Excluding Knob & Antenna: 3 x 1.5 x 5.5" (76 x 38 x 127 mm) Including Knob & Antenna: 5.1 x 3.3 x 6.2" (130 x 84 x 157mm)	
Weight	1 lb 11oz (754g)	
Construction	Aerospace-grade aluminum billet	
Mountability	4x 1/4-20 threads, 1x Arri rosette w/ M6 thread, 1x Lanyard mount	
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	
Latency	2 ms	
CONNECTORS		
Wired-Mode 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 Manager, and Teradek RT Firmware Configuration App	
Micro-USB	Configuration and firmware upgrade	
Bluetooth Compatibility	MDR.X, MDR.S, RT iOS App	
POWER		
Power Input	Canon LP-E6 Battery: 6.2 to 8.4V USB Port: 4.75 to 9V (maximum)	

## **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, MOTR.S and MK3.1 Motors, Thumbwheel, MDR.S, MDR.X and Latitude Receivers, TOF.1	
App Support	Teradek RT iOS App, FoolControl for iOS devices	
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	
Mountability	4x M3 mounting threads, 1x Arri rosette w/ M6 thread	
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	
Latency	2 ms	
CONNECTORS		
Wired-Mode 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	
Inputs	Main focus knob with removable lens ring, On/Off button	
Desktop App	Teradek RT Manager, and Teradek RT Firmware Configuration App	
Micro-USB	Configuration and firmware upgrade	

**↓** TERADEK

Teradek User Manual

**Bluetooth Compatibility** N/A

**POWER** 

Canon LP-E6 Battery: 6.2 to 8.4V Power Input

USB Port: 4.75 to 9V (maximum)

### **MDR.S Receiver**

SUPPORT		
RF Handset Support	CTRL.1 Controller, CTRL.3 Controller, and MK3.1 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	MOTR.X, MOTR.S and MK3.1 Motors, Thumbwheel, MDR.S, MDR.X and Latitude Receivers, TOF.1	
App Support	Teradek RT iOS App, FoolControl for iOS devices	
PHYSICAL ATTRIBUTES		
Dimensions	2.3"W x 1.7"D x 0.9"H [57.9 x 42 x 24mm]	
Weight	Without antenna: 2.4 oz (68g) With antenna: 2.54 oz (72g)	
Construction	Milled Aluminum 6061 T6 (Chassis) and regulation-compliant PCB	
Temperature	<b>Operating:</b> -4 to 122°F (-20 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C	
Mountability	1x 1/4-20 mounting thread	
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	
Latency	2 ms	
CONNECTORS		
Power Input	3-pin LEMO 0B (5-28V)	
Camera Input (CAM)	6-pin LEMO 0B, RS-232 for RED control, programmable line driver for select cameras	
Motor Inputs	4-pin LEMO 0B	
USB-C Input	Firmware Upgrade	

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 Manager, and Teradek RT Firmware Configuration App	
USB-C	Firmware Upgrade	
Bluetooth Compatibility	CTRL.1, CTRL.3, RT App	
POWER		
Power Input	3-Pin LEMO 0B 5-28V DC	

### **MDR.X Receiver**

SUPPORT		
RF Handset Support	CTRL.1 Controller, CTRL.3 Controller, and MK3.1 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	MOTR.X, MOTR.S and MK3.1 Motors, Thumbwheel, MDR.S, MDR.X and Latitude Receivers, TOF.1	
App Support	Teradek RT iOS App, FoolControl for iOS devices	
PHYSICAL ATTRIBUTES		
Dimensions	2.3"W x 0.7"D x 3.7"H [58mm x 18mm x 94mm]	
Weight	4.8 oz (136g)	
Construction	Aluminum alloy base	
Temperature	<b>Operating:</b> -4 to 122°F (-20 to 50°C) <b>Storage:</b> -40 to 185°F (-40 to 85°C	
Mountability	1x 1/4-20 mounting thread	
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	
Latency	2 ms	
CONNECTORS		
Power Input	2-pin connector 7-17V DC	
Camera Input (CAM)	6-pin connector, 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	
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 Manager, and Teradek RT Firmware Configuration App	
Mini-USB	Configuration and firmware upgrade	
Bluetooth Compatibility	CTRL.1, CTRL.3, RT App	
POWER		
Power Input	2-pin connector 7-17V DC	



### MOTR.S/MOTR.S MAX

	MOTR.S	MOTR.S MAX
PHYSICAL ATTRIBUTES		
Gear Pitch	0.8 Mod standard (others available)	0.8 Mod standard (others available)
Max Torque	0.95 Nm peak, 0.3 Nm continuous	1.2 Nm peak, 0.8 Nm continuous
Max Speed	297 teeth/second	275 teeth/second
Construction	All Aluminum	All Aluminum
Mountability	Compatible with 19mm and 15 mm rods	Compatible with 19mm and 15 mm rods
Dimensions	4.1 x 2.2 x 1.2" (106 x 56 x 31 mm)	4.6 x 2.4 x 1.2" (117.5 x 59 x 31 mm)
Weight	6.5 oz (184 g)	7.8 oz (222 g)
POWER		
Operating Voltage	7-32V	7-32V
Power Input	0.1A idle. 2.5A peak	0.1A idle. 3.0A peak
INTERFACE		
Connectors	2x 0B.4 (chainable)	2x 0B.4 (chainable)
ENVIRONMENTAL		
Operating Temperature	−20°C to 50°C	−20°C to 50°C

## MOTR.X

PHYSICAL ATTRIBUTES		
Gear Pitch	0.8 Mod standard(others available)	
Max Torque	3Nm continuous	
Max Speed	6.2 revs /second	
Construction	All Aluminum	
Mountability	Compatible with 19mm and 15 mm rods	
Dimensions	4.3 x 2 x 1.1" (109 x 51 x 26 mm)	
Weight	8.9 oz (252 g)	
POWER		
Operating Voltage	7-17V	
Power Input	<1W idle, 80W peak	
INTERFACE		
Connectors	2x 0B.4 (chainable)	
ENVIRONMENTAL		
Operating Temperature	−20°C to 50°C	

# **TOF.1 Rangefinder**

PHYSICAL ATTRIBUTES	
Dimensions	2.3" W x 2.3" D x 1.3" H (58 x 58 x 34 mm)
Weight	4.4oz [125g]
Construction	Machined aluminum and IR Plastic
Mountability	2x 1/4-20, 1x Nato Rail
MEASUREMENT	
Range	0 to 80 feet
Angle	2.9°
INTERFACES	
Configuration Interface	Teradek RT CTRL.3 and CTRL.1
POWER	
Power Input	4-pin connector (7-20V)
Nominal Power Consumption	2.5W