TERADEK

Bolt 4K

750/1500/ MAX

Reference Guide

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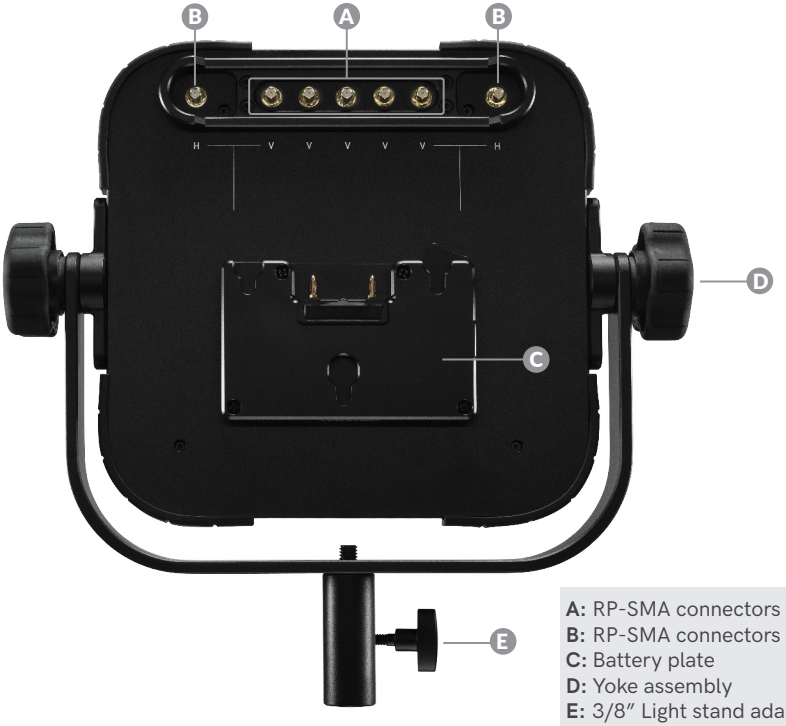
PHYSICAL PROPERTIES

BOLT 4K TRANSMITTER

BOLT 4K RECEIVER

A: RP-SMA connectors
B: 6-28V DC power input
C: HDMI input
D: 12G-SDI output
E: 12G-SDI input
F: OLED display
G: Menu joystick
H: Network status
I: Video status
J: Power switch
K: Mini-USB (not shown)
L: HDMI output

BOLT 4K ARRAY PANEL ANTENNA



A: RP-SMA connectors (vertical)
B: RP-SMA connectors (horizontal)
C: Battery plate
D: Yoke assembly
E: 3/8″ Light stand adapter

ANTENNA CONFIGURATION

The Array Panel Antenna has both vertical **(A)** and horizontal **(B)** antenna connectors. The transmitter's antenna configuration will determine which Array Panel RP-SMA connectors you use with the receiver. For more information, go to **Vertical and Horizontal Antennas** on page 8.

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GETTING STARTED

Bolt 4K is the first visually lossless, zero delay 4K wireless video transmission system. Bolt 4K transmits 10-bit, 4:2:2 HDR video at a range of up to 750/1500 feet line-of-sight over the unlicensed 5GHz band, and can multicast to six receivers simultaneously.

For HDR workflows, Bolt 4K supports the HDR-10, PQ, and HLG standards and can transport extended camera metadata, timecode, and record triggers over the wireless link.

DEVICE OPERATION

- Keep the transmitter and receiver at close range for 60 seconds after powering on the devices. This allows them to scan for and select the best wireless frequency.
- For best results when using multiple Bolt systems in the same area, place the transmitters and receivers a few feet apart from each other.
- Operation of other wireless equipment may interfere with the Bolt. Try to separate other wireless transmitters and receivers as much as possible.

POWER AND CONNECT

1. Connect the output from your video source to either the SDI or HDMI input **(C or E)** on the Bolt transmitter. Connect either the SDI or HDMI output **(D or L)** from the Bolt receiver to the video input on your monitor.

   NOTE: If mounting the receiver upright on a stand above the monitor, use a right-angle SDI adapter to relieve any strain caused by the weight of the cable, and to avoid damaging the SDI output's internal connectors.

2. Connect power to the Bolt transmitter and receiver with the included A/C adapter, or if both devices are equipped with battery plate accessories, attach a compatible battery (Gold or V mount).

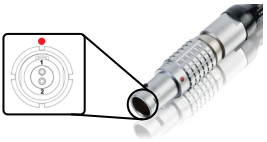
3. Attach the antennas to both the transmitter and the receiver. If using an **Array Antenna** with the receiver, mount the receiver to the back of the antenna, then connect the five RP-SMA connectors to the center connectors labeled **V** using the included extension cables. If the transmitter is using horizontal antennas, attach the receiver's two outward connectors to the antenna's two external connectors labeled **H** (see page 8).

4. Move the power switches on both the transmitter and receiver **(J)** to the **ON** position. Video appears within a few seconds.

POWER CONNECTOR/PIN OUT

Bolt devices use a locking 2-pin power connector similar to the 0B 302 series LEMO connector.

Pin	Description
1*	GND
2	+DC



* Pin 1 is closest to the red dot on the connector

CUSTOM/3RD PARTY POWER CABLES

- Test the power cable polarity with **ONLY** the power cable connected to Bolt. Do not connect video cables.
- Check the power cable for shorts and proper grounding.

CAUTION: Using a reverse polarity or improperly-constructed power cable can damage the product and is not covered under warranty.

12G-SDI CABLES

Bolt 4K devices require the use of 12G-SDI cables in order to reliably transport 12G video signals, and are included as a standard item. Ensure that your cables are rated for compatibility with your camera's output.

PAIRING

Bolt devices purchased as a set (TX and RX), are paired by default, requiring no additional configuration. Bolt devices purchased separately need to be paired using the device's front panel (OLED) menu, **Bolt Manager**, or the **Bolt App**.

NOTE: Before starting either pairing process, ensure that both the transmitter and receiver have the same firmware version and have Bluetooth enabled.

PAIRING VIA THE FRONT PANEL MENU

1. Using the Menu Joystick **(G)**, navigate to the Pairing menu on both the transmitter and the receiver.
2. Select **Pairing** to begin the pairing process. The transmitter will begin scanning for a receiver within range and automatically pair to the receiver.
3. Once paired, the front panel will indicate whether or not Pairing is successful.

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PAIRING TIPS

If you're having trouble getting units to pair, we recommend keeping the transmitter and receiver six feet apart when pairing (if antennas are connected). Without antennas, they can be closer. Keep all other RF devices nearby turned off or out of range to ensure the transmitter and receiver are only detecting each other. To eliminate any chance of interference, perform the **Wired Pairing** process via Bolt Manager.

WIRED PAIRING VIA BOLT MANAGER

1. Connect both the transmitter and receiver(s) to your computer (Windows/Mac) via USB.
2. Open Bolt Manager, select the **Pairing** tab, then tap the **Wired Pairing** button.
3. Select the devices you want to pair, then click the **Pair Devices** button. Bolt Manager will indicate whether or not Pairing is successful.

PAIRING VIA THE BOLT APP

1. Open the Bolt App from your iOS or Android device, then tap the **Pairing** button.
2. Select the transmitter you wish to pair, then tap the **Next** button.
3. Select the receiver(s) you wish to pair with the transmitter, then tap the **Pair!** button. The Bolt App will indicate when the pairing process is completed.

BOLT APP

Use the Bolt App to remotely manage and monitor every parameter of Bolt 4K including pairing, frequency selection, and 3D LUTs.

CONNECT VIA BLUETOOTH

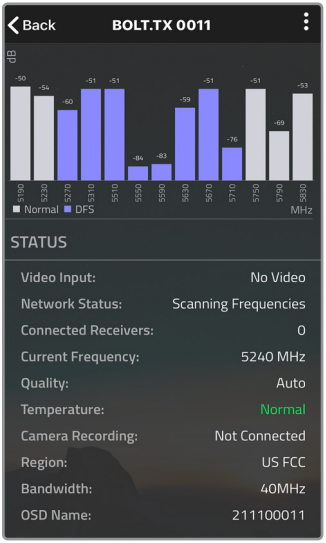
1. Download the Bolt App.
2. Enable Bluetooth on your iOS or Android device.
3. Navigate to the Bluetooth menu on both the transmitter and receiver, then select **Enable**.
4. Open the Bolt App from your iOS or Android device, then tap the **Bolt Devices** button.
5. Select the device(s) you want to pair or monitor.

TRANSMITTER STATUS DISPLAY

Settings (Menu descriptions listed on pg. 11) - Tap the ⋮ button at the top of the screen to customize the transmitter's various settings.

Spectrum Analyzer - Detects congestion in the area and determines which frequencies are available to use. Each bar represents a frequency, and the height represents the amount of congestion in that frequency.

Status - Displays the current status of your input, including frequency and frequency information, camera recording status, temperature, and amount of linked receivers.



RECEIVER STATUS DISPLAY

Settings (Menu descriptions listed on pg. 11) - Tap the ⋮ button at the top of the display to customize the receiver's various settings such as the output format, audio, display and OSD.

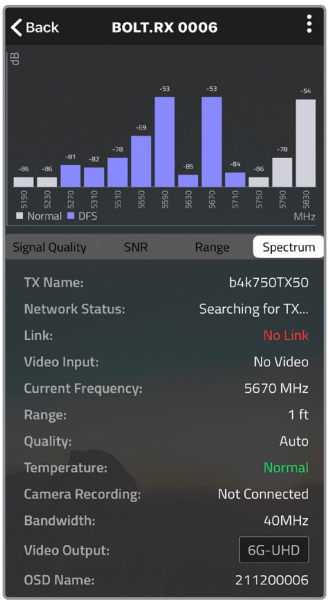
Signal Quality - Determine the quality and reliability of the signal being received.

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.

Spectrum Analyzer - Detects congestion in the area and determines which frequencies are available to use. Each bar represents a frequency, and the height represents the amount of congestion in that frequency.

Status - Displays the name, link quality, resolution and other of your video input.



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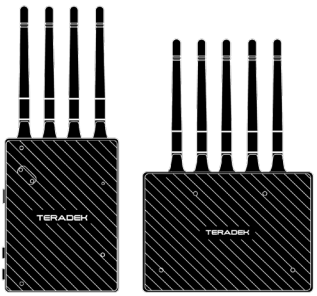
MOUNTING

Bolt 4K transmitters and receivers require the use of external antennas for basic operation. Different conditions will determine the type, orientation, and placement of the antennas.

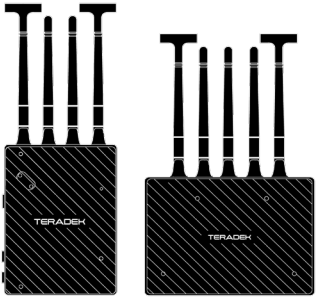
VERTICAL AND HORIZONTAL ANTENNAS

Vertical (V) antennas are included as a standard item with your Bolt 4K, offering good performance in a wide variety of short-to-medium range situations when quick setup and flexibility is key. V antennas are ideal for achieving diversity indoors. Once you move outdoors with the V antennas, the RF signals travel in a similar or identical manner towards the receiver, weakening diversity. **Horizontal (H) antennas** were designed for use with the V antennas. H antennas cause the RF signal from the transmitter to propagate in a perpendicular manner compared to the vertical signal from the V antenna. The H+V antenna configuration helps to maintain the quality and performance of your video transmission, especially when your signal would otherwise begin to deteriorate due to noise and/or longer ranges.

NOTE: H+V antennas must be attached to both the transmitter and receiver.



Bolt 4K system with vertically polarized antennas



Bolt 4K system with H+V antennas

RECOMMENDED ANTENNA ORIENTATION

For most setups, the ideal position for the four TX antennas and the five RX antennas is perpendicular to the ground/horizontal plane so that they point straight up and down. If the transmitter is mounted at an angle or on its side, the antennas must also be arranged so that they point up. Pointing the antennas in any other direction re-orients the radiation pattern and may reduce performance.

Examples of Bolt 4K TX in various mounted positions

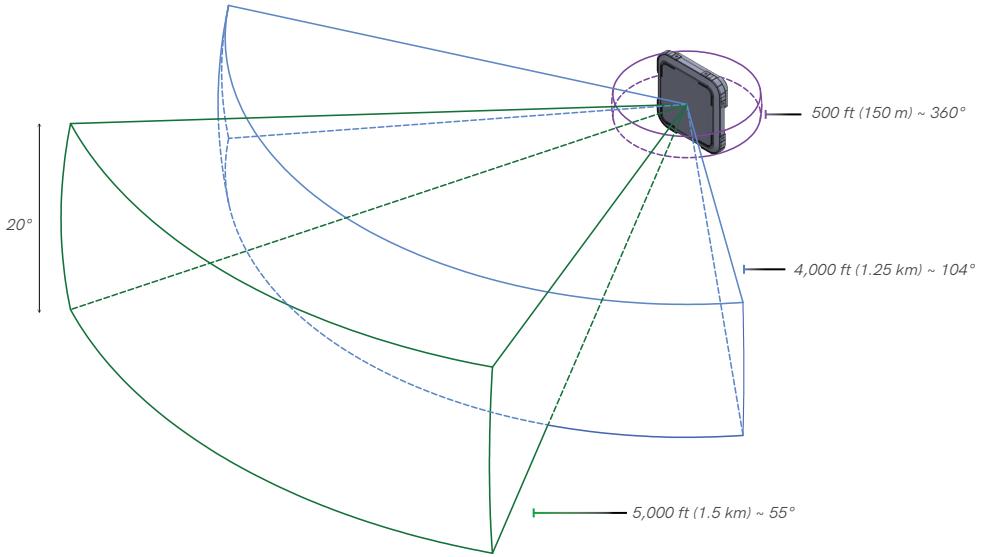
ARRAY PANEL ANTENNA

If using the **Array Panel Antenna** with your Bolt 4K 1500 or MAX receiver, you must connect the five RP-SMA connectors from the receiver to the back of the antenna (see below for connector placement), and position the antenna so that the front (with the Teradek logo) has a clear line of sight to the transmitter.

V antenna only

H+V configuration

The Array 4K panel has a built-in directional antenna with a receive pattern that varies based on its distance from the transmitter. The horizontal receive angle measures 55° at 5,000 ft (1.5 km), 104° at 4,000 ft (1.25 km), and is effectively omni-directional at up to 500 ft (150 m). The vertical receive angle measures 20° at any distance.



For more information about the different antenna configurations for Bolt 4K, please visit: **https://www.teradek.com/blogs/articles/what-antennas-should-i-use-with-bolt-4k**

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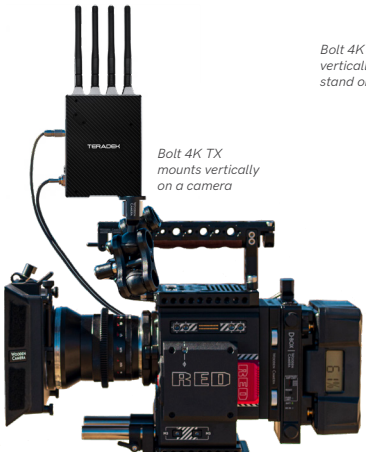
DEVICE PLACEMENT

WITHOUT DUAL MOUNT

Bolt 4K devices have a 1/4″-20 threaded hole (additional 3/8″-16 threaded hole on the receiver) on the bottom for mounting the included light stand adapter or any other mounting accessory.



Bolt 4K TX mounts vertically on a camera

Bolt 4K RX mounts vertically on a light stand or monitor

WITH DUAL MOUNT

Depending on the model, Bolt 4K devices are equipped with a dual mount battery plate that allows you to attach your device to either the back of a camera, monitor, or Array 4K Panel Antenna.

Bolt 4K TX (w/dual mount) attaches to the back of a camera

Bolt 4K RX (w/dual mount) mounts on the back of a monitor or Array Antenna

TRANSMITTER DISPLAY OPERATION

Bolt 4K's configuration menus can be accessed from either the transmitter's front panel display or from the Bolt app.

STATUS SCREENS

Press the menu joystick **(G)** to cycle through the status screens or to return from the menu.

- **MAIN STATUS** - Displays the status of the wireless receiver, along with the current video resolution, frequency, and link quality (if connected).
- **INFO** - Displays the current voltage and internal temperature of the unit.
- **HDMI STATUS** - Displays the current HDMI color output

CONFIGURATION OPTIONS

Most of the options listed in this section can also be configured using the Bolt app. Use the Menu joystick **(G)** to navigate the transmitter's configuration options.

WIRELESS SETTINGS

The transmitter's Wireless Settings menu contains several configurable options to optimize your transmitter's range, quality, and reliability.

***WIRELESS SETTINGS* - ENABLE BROADCAST MODE (BOLT 4K MAX)**

Broadcast Mode allows you to transmit to multiple receivers simultaneously (non-DFS frequencies only), while also extending Bolt 4K's transmission range.

- **Broadcast Mode Disabled** (Standard Multicast Mode) - Transmitter and connected receiver(s) coordinate with each other to establish which frequency to use; the transmitter communicates with the receiver via a downlink data channel, while the receiver maintains an uplink data channel to the transmitter.
- **Broadcast Mode Enabled** - Data uplink channel is disabled, allowing the transmitter to connect to an unlimited number of receivers, as long as they have already been paired. To achieve even better range performance, attach the receiver to your **4K Array Panel Antenna** while in Broadcast Mode.

NOTE: Bolt 4K 750 and 1500 receivers will not link to a Bolt 4K MAX transmitter in Broadcast Mode, even if they were previously paired.

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WIRELESS SETTINGS - ENABLE FIXED FREQUENCY

Fixed Frequency Mode bypasses any automatic frequency switching logic, allowing your Bolt 4K system to always attempt to connect on a specified frequency. Once a frequency is selected, the transmitter will only use that frequency. This allows your transmitter to link/reconnect to the receiver much faster. After enabling Fixed Frequency mode, navigate to **Frequencies** and select a frequency not in use (non-DFS frequencies only). For best results, ensure that both the transmitter and receiver have **Fixed Frequency Mode** enabled, and use the **Spectrum Analyzer** (on the receiver's front panel or the Bolt app) to search for the least congested frequency to use.

- **Fixed Frequency Mode Disabled** - Bolt 4K scans all available channels and repeatedly switches from one frequency to the next during transmission
- **Fixed Frequency Mode Enabled** - Bolt 4K connects to one specific frequency

NOTE: By default, Bolt 4K will select the lowest available frequency from the Frequencies list if one has not been selected beforehand.

WIRELESS SETTINGS - SELECT BANDWIDTH

The Bandwidth menu lets you choose between 40MHz (default) and 20MHz operating modes. Ensure that both the transmitter and receiver are set to the same bandwidth with a resolution of up to 1080p60. For all available frequencies, refer to the **FREQUENCIES BY REGION** chart on page 25.

- **20MHz** - Reduces the amount of bandwidth by half, effectively doubling the number of usable frequencies while decreasing interference
- **40MHz** - (*Default*) Increases the amount of bandwidth by bonding two 20MHz channels, allowing for faster transfer rates but increased interference

NOTE: 20MHz mode supports HD/3G resolutions up to 1080p60. Resolutions up to 4k30 are also supported, but downscaled to 1080p before transmission (4k50/59/60 is not supported).

WIRELESS SETTINGS - SELECT FREQUENCY

The Frequencies menu contains a list of all available frequencies. Bolt 4K will automatically select an operating frequency when multiple values are selected. If both the transmitter and receiver have **Fixed Frequency Mode** enabled, you can only select one frequency for Bolt 4K to use. Frequencies marked with (DFS) must be scanned for one minute before they can be used, but are typically less crowded. For all available frequencies, refer to the **FREQUENCIES BY REGION** chart on page 25.

WIRELESS SETTINGS - VIDEO QUALITY

The Video Quality menu lets you adjust the balance between your signal's maximum range and quality according to the number of antennas used to transmit fine information. Bolt 4K has three picture quality levels that vary based on the lowest quality link or the furthest receiver.

- **Auto Mode** - (*Default*) Transmitter automatically determines how many fine antennas are needed based on the range and signal quality
- **Longer Distance Mode** - (*One fine antenna*) Maintains the maximum range in situations where other sources of interference might be present, but will slightly reduce your video signal's maximum quality
- **Better Quality Mode** - (*Two fine antennas*) Maintains higher signal quality, but reduces the maximum range
- **Best Quality Mode** - (*Three fine antennas*) Ideal for complex, high contrast scenes that require the highest possible quality
- **Low Power Mode** - (*One fine antenna with shorter range*) Reduces the transmitter's total power consumption by about 1.5W, and may reduce any unwanted interference in multi-system environments

PAIR

Enable pairing on transmitters and receivers. Bolt 4K units purchased as a set (TX and RX) are paired by default, requiring no additional configuration. If the units were purchased separately, or if they have never been paired, you will need to complete the pairing process (page 5). Once **Pairing** is complete, there is no need to repeat the process unless the TX or RX's OSD name has been modified, or if the region has been changed. To confirm if your devices were paired successfully, open either the **Unpair** menu (TX) or the **Switch TX** menu (RX) and verify that the paired device is listed.

NOTE: Before starting the pairing process, ensure that both the transmitter and receiver have the same firmware version and have Bluetooth enabled.

UNPAIR

Unpair and remove devices from your unit's paired device registry. This feature is useful in situations when paired devices are no longer being used and need to either be removed from the registry, or replaced. Transmitters can store up to six paired receivers in its device registry.

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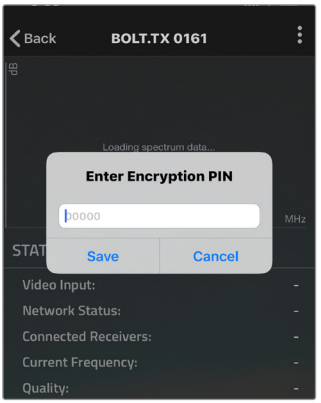
BLUETOOTH SETTINGS

Use the Bluetooth menu to enable or disable Bluetooth communication.

- **Enable Bluetooth** - Allows the transmitter and receiver to be paired and communicate with the Bolt App
- **Use Bluetooth PIN** - Enables the use of a PIN for authentication when using the Bolt App (*see image*)
- **Change PIN** - Press the Menu joystick towards the right to change the Bluetooth PIN



NOTE: Bluetooth is disabled by default. In order to configure your Bolt 4K devices via the Bolt App, you must first enable Bluetooth.

DISPLAY SETTINGS

Use the Display Settings to control the OLED display operation. By default, the OLED display will invert every 10 minutes. You can set the display to invert every 30 minutes (lengthens the display life), or it can dim or turn off after either 10 minutes or 10 seconds.

- Invert every 30 min
- Dim every 10 min
- Dim after 10 sec
- Dim after 10 min
- Off after 10 sec
- No BurnIn Prevention

RESET ALL SETTINGS

Reset all configurable options to their factory defaults.

DEVICE INFO

Displays the model and serial number.

FIRMWARE VERSIONS

Displays the device's current firmware versions.

RECEIVER DISPLAY/OSD OPERATION

Bolt 4K's configuration menus can be accessed from either the receiver's front panel display or from the Bolt app. When enabled, the receiver's configuration menus are also displayed via On-Screen Display (OSD) on a connected monitor.

RECEIVER STATUS SCREENS

Press the menu joystick **(G)** to cycle through the status screens or to return from the menu.

- **MAIN STATUS** - Displays the status of the wireless receiver, along with the current video resolution, frequency, and link quality (if connected).
- **TIME CODE** - Displays the current time code if received from the transmitter.
- **INFO** - Displays the current voltage and internal temperature of the unit.
- **TX INFO** - Displays the name of the transmitter it is paired to.
- **HDMI STATUS** - Displays the current HDMI color output

CONFIGURATION OPTIONS

Most of the options listed in this section can also be configured using the Bolt app. Use the Menu joystick **(G)** to navigate the configuration menus.

SWITCH TX

Bolt 4K receivers can pair with up to four transmitters at a time. Switch TX allows you to quickly switch from one paired transmitter's camera feed to another paired transmitter. This feature is especially useful in multi-camera situations when you need to switch to a different camera's view mid-shoot, without having to perform the pairing process every time.

NOTE: The transmitter(s) need to first be paired with the receiver.

WIRELESS SETTINGS

The transmitter's Wireless Settings menu contains several configurable options to optimize your receiver's range, quality, and reliability.

WIRELESS SETTINGS **- ENABLE FIXED FREQUENCY**

Fixed Frequency Mode bypasses any automatic frequency switching logic, allowing your Bolt 4K system to always attempt to connect on a specified frequency. Once a frequency is selected, the transmitter will only use that frequency. This allows your transmitter to link/reconnect to the receiver much faster. After enabling **Fixed**

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Frequency mode, navigate to **Frequencies** and select a frequency not in use (non-DFS frequencies only). For best results, ensure that both the transmitter and receiver have **Fixed Frequency Mode** enabled, and use the **Spectrum Analyzer** (on the receiver's front panel or the Bolt app) to search for the least congested frequency to use.

- **Fixed Frequency Mode Disabled** - Bolt 4K scans all available channels and repeatedly switches from one frequency to the next during transmission
- **Fixed Frequency Mode Enabled** - Bolt 4K connects to one specific frequency

NOTE: By default, Bolt 4K will select the lowest available frequency from the Frequencies list if one has not been selected beforehand.

WIRELESS SETTINGS - SELECT BANDWIDTH

The Bandwidth menu lets you choose between 40MHz (default) and 20MHz operating modes. Ensure that both the transmitter and receiver are set to the same bandwidth with a resolution of up to 1080p60. For all available frequencies, refer to the **FREQUENCIES BY REGION** chart on page 25.

- **20MHz** - Reduces the amount of bandwidth by half, effectively doubling the number of usable frequencies while decreasing interference
- **40MHz** - (*Default*) Increases the amount of bandwidth by bonding two 20MHz channels, allowing for faster transfer rates but increased interference

NOTE: 20MHz mode supports HD/3G resolutions up to 1080p60. Resolutions up to 4k30 are also supported, but downscaled to 1080p before transmission (4k50/59/60 is not supported).

WIRELESS SETTINGS - SELECT FREQUENCY

The Frequencies menu contains a list of all available frequencies. Bolt 4K will automatically select an operating frequency when multiple values are selected. If both the transmitter and receiver have **Fixed Frequency Mode** enabled, you can only select one frequency for Bolt 4K to use. Frequencies marked with (DFS) must be scanned for one minute before they can be used, but are typically less crowded. For all available frequencies, refer to the **FREQUENCIES BY REGION** chart on page 25.

SPECTRUM ANALYZER

The built-in Spectrum Analyzer provides a visual indication of channel noise and saturation across the entire available frequency range. Move the Menu joystick left and right to select a frequency, then up and down to enable or disable it.

Frequencies are represented by bars; the higher the bar, the more congested that frequency is. Bars without a dot **(1)** indicate the frequency is not as saturated and can be used. Bars with a dot **(2)** indicate the frequency is too saturated to connect to. Faded bars **(3)** represent a frequency that is unavailable for use due to restrictions in particular regions.

SIGNAL QUALITY GRAPH

The Signal Quality Graph indicates the quality and reliability of the signal being received according to the amount of interference that is present between the RX and TX. Signal Quality is represented in percentages:

- Figures below 30% indicate **poor** signal quality
- Figures between 30% and 45% indicate **fair** signal quality
- Figures above 45% indicate **good** signal quality

PAIR

Enable pairing on transmitters and receivers. Bolt 4K units purchased as a set (TX and RX) are paired by default, requiring no additional configuration. If the units were purchased separately, or if they have never been paired, you will need to complete the pairing process (page 5). Once **Pairing** is complete, there is no need to repeat the process unless the TX or RX's OSD name has been modified, or if the region has been changed. To confirm if your devices were paired successfully, open the either the **Unpair** menu (TX) or the **Switch TX** menu (RX) and verify that the paired device is listed.

NOTE: Before starting the pairing process, ensure that both the transmitter and receiver have the same firmware version and have Bluetooth enabled.

UNPAIR

Unpair and remove devices from your unit's paired device registry. This feature is useful in situations when paired devices are no longer being used and need to either be removed from the registry, or replaced. Receivers can store up to four transmitters in its device registry.

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HDMI/SDI OUT FORMAT

You can choose to match the video source's resolution (**Same As Input**), or choose from the resolutions listed. If using the receiver with a recorder or monitor that is sensitive to video signal changes, select **Continuous Output** to ensure the signal stays constant even if the link is interrupted. Keep in mind that selecting Continuous Output adds a small delay to the video output. Selecting **SD**, **HD**, or **6G-UHD** matches the video source's frame rate while adjusting the resolution. This is useful for when you need to down-convert a 4K video to display on an HD monitor.

- **Continuous Output** - Video signal output stays constant when using a monitor or recorder that is sensitive to video signal changes
- **Same As Input** - Matches the transmitter's video source resolution.
- **SD** - Matches the TX frame rate and outputs SD resolution
- **HD** - Matches the TX frame rate and outputs1920x1080p
- **6K-UHD** - Matches the TX frame rate and outputs 3840x2160
- **Resolutions List** - Select a specific output resolution:
  - 4K (DCI) - 23.98/24/25/29.97/30/50/59.94/60
  - 4K (UHD) - 23.98/24/25/29.97/30/50/59.94/60
  - 1080p - 23.98/24/25/29.97/30/50/59.94/60
  - 1080psf - 23.98/24/25/29.97/30
  - 1080i - 50/59.94/60
  - 720p - 50/59.94/60
  - 480p - 59.94/576p - 50 (via HDMI ports only)
  - 480i (NTSC)
  - 576i (PAL)

HDMI SETTINGS

Bolt 4K supports all HDMI output modes. You can select from one of the following options:

- Auto
- RGB 8bit
- RGB 10bit
- YCbCr 4:4:4 8bit
- YCbCr 4:4:4 10bit
- YCbCr 4:2:2 10bit
- YCbCr 4:2:0 8bit
- YCbCr 4:2:0 10bit

3D LUT SETTINGS

The 3D LUT settings menu contains specific looks that can be applied to your video output that either match or simulate how the video will appear after editing, along with options for how they are overlayed on your video output (**Full** or **Split** screen). Additional color preset files can be added and saved from your computer using **Bolt Manager** (page 21).

- **3D LUT Presets** - Select a specific look from the list of 3D LUT presets.
- **3D LUT Mode** - Select whether the look is applied to the entire video output (**Full Screen**) or half (**Split Screen**).

TEST PATTERN

The Test Pattern menu allows you to select a video resolution format to output a test pattern over HDMI or SDI.

- **Resolutions List** - Select a specific output resolution:
  - 4Kp - 23.98/24/25/29.97/30/50/59.94/60
  - 1080p - 23.98/24/25/29.97/30/50/59.94/60
  - 1080psf - 23.98/24/25/29.97/30
  - 1080i - 50/59.94/60
  - 720p - 50/59.94/60
  - 480p - 59.94/576p - 50 (via HDMI ports only)
  - 480i (NTSC)
  - 576i (PAL)

AUDIO SETTINGS

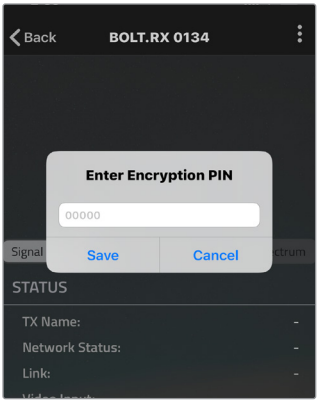
Configure Bolt's Audio settings. If **Beep on REC** is activated, you will hear a short tone whenever the camera begins or stops recording. The **Mute Settings** allow you to completely mute audio or only mute audio while recording.

- **Beep on REC** - Short tone when the camera begins or stops recording
- **Mute Settings** - Select an option:
  - Off
  - Mute while record
  - On

BLUETOOTH SETTINGS

Use the Bluetooth menu to enable or disable Bluetooth communication.

- **Enable Bluetooth** - Allows the transmitter and receiver to be paired and communicate with the Bolt App
- **Use Bluetooth PIN** - Enables the use of a PIN for authentication when using the Bolt App (*see image*)
- **Change PIN** - Press the Menu joystick towards the right to change the Bluetooth PIN



NOTE: Bluetooth is disabled by default. In order to configure your Bolt 4K devices via the Bolt App, you must first enable Bluetooth.

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VIDEO OSD SETTINGS

Choose when to display the On-Screen Display (OSD).

- **Never show** - Disable OSD
- **Show when operating** - Hide OSD until it is activated by the joystick.
- **Show when no video** - Display OSD when there is no video feed; hide OSD when video appears (default).
- **Always show** - Always display OSD unless temporarily deactivated by the joystick

DISPLAY SETTINGS

Use the Display Settings to control the OLED display operation. By default, the OLED display will invert every 10 minutes. You can set the display to invert every 30 minutes (lengthens the display life), or it can dim or turn off after either 10 minutes or 10 seconds.

- Invert every 30 min
- Dim every 10 min
- Dim after 10 sec
- Dim after 10 min
- Off after 10 sec
- No BurnIn Prevention

RESET ALL SETTINGS

Reset all configurable options to their factory defaults.

DEVICE INFO

Displays the model and serial number.

FIRMWARE VERSIONS

Displays the device's current firmware versions.

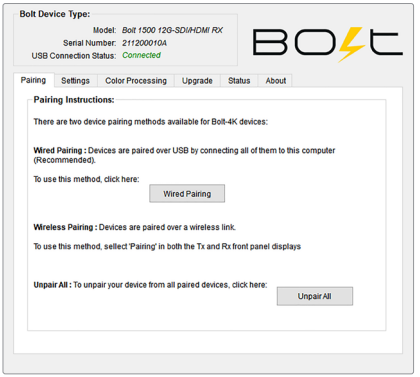
BOLT MANAGER

With Bolt Manager, you can configure all of your Bolt 4K devices at once. Available as software for Windows and Mac, Bolt Manager allows you to pair multiple receivers to your transmitter, select frequencies, load 3D LUTs, and perform firmware upgrades.

CONFIGURATION OPTIONS

NOTE: Available configuration settings will differ between Bolt models.

- **Pairing** - Pair or unpair your devices.
- **Settings -** Select the operating region (TX) and modify the RX/TX name.
- **Color Processing -** Allows you to apply 3D LUTS to the receiver's video output.
- **Upgrade -** Update your devices with the latest firmware.
- **Status -** Displays detailed information about configuration and update statuses.
- **About -** Displays the software version and License Agreement.



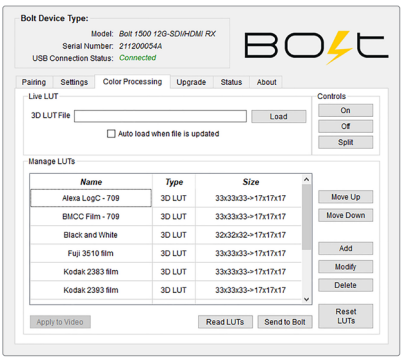
SETTINGS

The Settings menu allows you to configure Bolt 4K's operation parameters.

- **Select Region** - Configure Bolt 4K to comply with your region's regulations governing use of the 5GHz spectrum. Once a region is selected, all available frequencies are enabled by default, and Bolt 4K will automatically select an operating frequency. For all available frequencies, refer to the **FREQUENCIES BY REGION** chart on page 25. **NOTE: Pairing the TX and RX is required after a different region is selected.**
- **Select Name** - Modify the transmitter or receiver's name to make it easier to identify among other Bolt systems that are present.

COLOR PROCESSING

Color processing allows users to apply 3D LUTs directly to the receiver's video output or to add, remove, and modify up to 16 LUTs stored in Bolt 4K's memory.



Live LUT - Click **Load** and browse for a 3D LUT file to apply to the video output. The following file formats are supported:

- **.dat** (DaVinci Resolve)
- **.3dl** (Assimilate Scratch)
- **.cube** (DaVinci Resolve)
- **.lut** (Pomfort LiveGrade)
- **.mga** (Final Cut)

Select **Auto load when file is updated**. The LUT file will be to re-read and apply LUT files to the video automatically whenever it is updated on your computer.

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Manage LUTs - The LUT manager allows you to select up to 16 3D LUT files to store on Bolt. LUTs can be rearranged, renamed, added, and removed using the corresponding buttons.

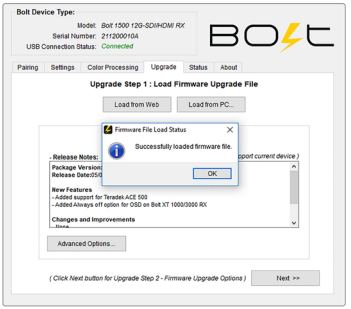
- **Sync** - Sync all currently loaded LUTs from the receiver's memory. After syncing, the LUTs will be displayed in the manager window.
- **Apply to Video** - Apply the selected 3D LUT file to the video output. Once applied, the LUT file can be turned **On**, **Off**, or applied to half the display using the **Split** option.
- **Read LUTs** - Read Bolt's storage and overwrite the contents of the LUT management window.
- **Send to Bolt** - Load your LUT presets to your device.
- **Reset LUTs** - Reset Bolt's storage to default values. A number of pre-defined LUTs are contained in the default configuration.

UPGRADE

Teradek releases firmware updates periodically that add new features, improve performance, and fix vulnerabilities. To update Bolt 4K, you'll need to load a firmware package into Bolt Manager.

Load from Web - If you have an Internet connection, click **Load from Web** to download the latest firmware package from Teradek's servers.

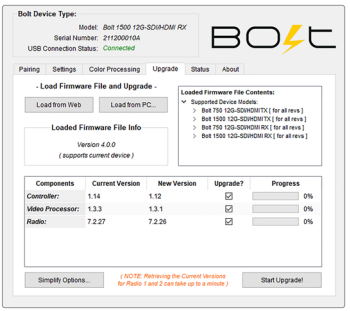
Load from PC - Click **Load from PC** if you have already downloaded the firmware package you wish to use. For latest firmware, visit: **https://www.teradek.com/pages/downloads#bolt4k**



Once the firmware is loaded, and information about the package is displayed, 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 Bolt 4K device(s) 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.



TROUBLESHOOTING/FAQ

CAN I DOWN-CONVERT FROM 4K TO HD IN ORDER TO DISPLAY VIDEO ON AN HD MONITOR?
Yes. Even if you feed the transmitter a 4K signal, you can output an HD signal from a paired receiver. Output settings are configured on the receiver (see page 14) or the Bolt app.

WILL BOLT 4K WORK WITH MY CURRENT BOLT?
No. Previous generation Bolts cannot communicate with Bolt 4K. Bolt 4K uses a different RF system along with a unique chipset not found in any of the previous generation Bolts.

DOES BOLT 4K SUPPORT SDI METADATA/ANCILLARY DATA PASSTHROUGH?
Bolt 4K supports a limited subset of SDI ancillary data (metadata) from certain cameras. The following data can be passed wirelessly from the transmitter to the receiver:

- Start/stop record flags
- Time code
- File/clip name (RED and ARRI cameras)
- Full metadata except for LUTs (ARRI cameras)

The following cameras are capable of transmitting SDI ancillary data, although any camera with time code embedded in the SDI signal should work:

- **RED Epic, Scarlet** - Supports time code, record start/stop, and file/clip name
- **ARRI** - Supports full metadata (except for LUTs)
- **Canon C300/C500/XF305/XF105** - Supports time code and record start/stop
- **Sony VENICE F3/F5/F55** - Supports time code and record start/stop
- **Panasonic** - Supports time code

THE BOLT APP DOES NOT DISPLAY MY BOLT 4K UNIT.
Ensure that both your Bolt 4K and cellular device have Bluetooth enabled (see page 6). By default, Bluetooth is disabled on your Bolt 4K device until you enable it.

CAN I USE ANY SDI OR HDMI CABLE WITH MY BOLT 4K UNITS?
No. You should make sure that your SDI or HDMI cable is capable of handling **6G** or **12G** video. If using HDMI cables, it is recommended that you use an HDMI 2.0 compatible cable, and regularly check if your cables are still functional. HDMI cables are extremely delicate and repeated bending can damage the internal wiring to the point where it will no longer send a signal (especially a 4K signal).

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HOW MANY RECEIVERS CAN I LINK TO ONE BOLT 4K TRANSMITTER?

You can link up to six Bolt 4K receivers to any one Bolt 4K transmitter.

WHAT ARE THE A/C POWER REQUIREMENTS FOR BOLT 4K?

Bolt 4K devices require more power than any of our previous products. When powering Bolt 4K from an A/C outlet, use only the included A/C adapter. This A/C adapter has a higher voltage capacity that meets Bolt 4K's increased power requirements. Lower rated A/C adapters are not supported, and using one will affect Bolt 4K's performance and capabilities.

NOTE: These requirements only apply if you are using an A/C outlet to power on Bolt 4K. Using a compatible battery and accessory cable as a power source will not affect Bolt 4K's performance.

Supported A/C adapters:

- 9V 2.0A (18W)
- 12V 1.5A (18W)
- 12V 3.0A (included with Bolt 4K)
- 12V 2.5A (30W)
- 24V 2.5A (60W)

Not supported:

- 12V 1.25A (15W)

CAN I INSTALL BATTERY PLATES ON MY BOLT 4K UNITS MYSELF?

Yes. Recent changes to the device's chassis allows the user to assemble and install battery plates on either the receiver or transmitter. Earlier Bolt 4k units required battery plates to be installed only by a trained technician at a Certified Teradek Repair Center. Contact Teradek to verify if your device's metal work is the latest.

FREQUENCIES BY REGION

NOTE: Pairing the TX and RX is required after a different region is selected.

	Freq Range		US (FCC)		EU		Canada		Japan		Australia/ New Zealand		China/India	
Bandwidth (MHz)	40	20	40	20	40	20	40	20	40	20	40	20	40	20
UNII1 (Non DFS)		5160		5160		5160						5160		
	5190	5180	5190	5180	5190	5180	5190	5180	5190	5180	5190	5180	5190	5180
		5200		5200		5200		5200		5200		5200		5200
	5230	5220	5230	5220	5230	5220	5230	5220	5230	5220	5230	5220	5230	5220
		5240		5240		5240		5240		5240		5240		5240
UNII2 (DFS)	5270	5260	5270	5260	5270	5260	5270	5260	5270	5260	5270	5260	5270	5260
		5280		5280		5280		5280		5280		5280		5280
	5310	5300	5310	5300	5310	5300	5310	5300	5310	5300	5310	5300	5310	5300
		5320		5320		5320		5320		5320		5320		5320
		5340				5340						5340		
	5510	5500	5510	5500	5510	5500	5510	5500	5510	5500	5510	5500		
		5520		5520		5520		5520		5520		5520		
	5550	5540	5550	5540	5550	5540	5550	5540	5550	5540	5550	5540		
		5560		5560		5560		5560		5560		5560		
	5590	5580	5590	5580	5590	5580		5580	5590	5580		5580		
		5600		5600		5600				5600				
	5630	5620	5630	5620	5630	5620			5630	5620				
		5640		5640		5640				5640				
	5670/ 5690/ 5710	5660	5670	5660		5660	5670	5660	5670	5660		5660		
		5680		5680	5690	5680		5680		5680	5690	5680		
		5700	5710	5700		5700		5700		5700		5700		
		5720		5720										
UNII3 (Non DFS)	5755	5745	5750	5740			5755	5745			5755	5745	5755	5745
		5765		5760				5765				5765		5765
	5795	5785	5790	5780			5795	5785			5795	5785	5795	5785
		5805		5800				5805				5805		5805
		5825	5830	5820								5825		5825
				5840										

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TECHNICAL SPECIFICATIONS

BOLT 4K SYSTEM

	BOLT 4K TX	BOLT 4K RX
VIDEO		
Video Inputs	12G-SDI SMPTE 2082-1 standard/75 Ω, 1x HDMI 2.0 Type-A receptacle	N/A
Video Outputs	1x Loopout 12G-SDI SMPTE 2082-1 standard/75 Ω	2x 12G-SDI SMPTE 2082-1 standard/75 Ω, 1x HDMI 2.0 Type-A receptacle
SDI Ancillary Data Support	Supports transmitting metadata, timecode, and start/stop flags from certain camera manufacturers.	
Color Sampling	**SDI**: YCbCr 4:2:2 **10-Bit/HDMI**: RGB 4:4:4, 8-bit	**SDI**: YCbCr 4:2:2 **10-Bit/HDMI**: RGB 4:4:4, 8-bit
Delay (TX to RX)	<0.001sec (without format conversions)	<0.001sec (without format conversions)
Supported Resolutions	4Kp23.98/24/25/29.97/30/50/59.94/60 1080p23.98/24/25/29.97/30/50/59.94/60 1080psf23.98/24/25/29.97/30 1080i50/59.94/60 720p50/59.94/60 480p59.94/576p50 (via HDMI ports only) 480i (NTSC)/576i (PAL)	4Kp23.98/24/25/29.97/30/50/59.94/60 1080p 23.98/24/25/29.97/30/50/59.94/60 1080psf23.98/24/25/29.97/30 1080i50/59.94/60 720p50/59.94/60 480p59.94/576p50 (via HDMI ports only) 480i (NTSC)/576i (PAL)
Input Cross Conversion	Yes, HDMI to SDI	N/A
Output Video Scaling	N/A	Yes, Framerate and Resolution Scaling
VIDEO PROCESSING		
Video Compression	Visually lossless	N/A
Test Pattern Generator	N/A	Yes
Video Format Conversion Support	Yes	Yes
Spectrum Analyzer	N/A	Yes
Color Correction	N/A	17x17x17 3D LUT
AUDIO		
Audio Compression	48kHz 24-bit PCM	48kHz 24-bit PCM
Audio Input	Embedded SDI/HDMI Audio Input (2 channel)	N/A
Audio Output	N/A	Embedded SDI/HDMI Audio Input (2 channel)

	BOLT 4K TX	BOLT 4K RX
PHYSICAL ATTRIBUTES		
Dimensions	5.2″ x 3.6″ x 1.1″ (132 x 91 x 27mm)	4.4″ x 5.5″ x 1.1″ (112 x 139 x 27mm)
Weight	12.7oz (360g)	15.3oz (434g)
Construction	Milled aluminum (chassis), regulation-compliant PCB	Milled aluminum (chassis), regulation-compliant PCB
INTERFACES		
Configuration Interface	OLED Screen with Menu Joystick Navigation	OLED Screen with Menu Joystick Navigation
Switches	On/Off Switch	On/Off Switch
Desktop App	Bolt Manager app (OSX and Windows)	Bolt Manager app (OSX and Windows)
Mobile App	Bolt App (iOS and Android)	Bolt App (iOS and Android)
USB Interface	Upgrade via Micro-USB	Upgrade via Micro-USB
Bluetooth Compatibility	Bolt App	Bolt App
NETWORK		
Wireless	**DFS Frequencies:** 5.270 ~ 5.670 GHz **Non-DFS Frequencies**: 5.190 ~ 5.230 GHz and 5.755 ~ 5.795 GHz	**DFS Frequencies:** 5.270 ~ 5.670 GHz **Non-DFS Frequencies**: 5.190 ~ 5.230 GHz and 5.755 ~ 5.795 GHz
Bluetooth	2.4 GHz	2.4 GHz
RF Channel Selection	Auto, Manual	Auto, Manual
Encryption	AES-256, RSA-1024 key exchange	AES-256, RSA-1024 key exchange
RF power	21 dbm EIRP (max power)	18 dbm EIRP (max power)
Antennas	**MAX:** 2x External 2dBi antennas, 2x H-V antennas **750/1500:** 4x External 2dBi antennas	**MAX:** 3x External 2dBi antennas, 2x H-V antennas **750/1500:** 5x External 2dBi antennas
Range	**MAX:** Up to 3000 ft line of sight (5000 ft with optional Bolt 4K Array Antenna) **1500:** Up to 1500 ft line of sight **750:** Up to 750 ft line of sight	
Multicast	Can connect one transmitter to up to 6 receivers	Can connect one transmitter to up to 6 receivers
Noise Rejection	Can coexist with Wi-Fi and 5GHz cordless phones, Can operate up to 6 sets in same location	Can coexist with Wi-Fi and 5GHz cordless phones, Can operate up to 6 sets in same location

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BOLT 4K SYSTEM (cont.)

	BOLT 4K TX	BOLT 4K RX
POWER		
Power Input	2-Pin Circular locking connector 7-28 VDC	2-Pin Circular locking connector 7-28 VDC
Nominal Power Consumption	19 Watts	15 Watts
Operating Temperature	0~40 deg-C	0~40 deg-C
GENERAL		
Mountability	**MAX:** Integrated Gold or V Battery Mount, Multiple mounting options with M3, 3/8″ and 1/4-20″ holes **750/1500:** Multiple mounting options with M3, 3/8″ and 1/4-20″ holes	**MAX:** Integrated Gold or V Battery Mount, Multiple mounting options with M3, 3/8″ and 1/4-20″ holes **750/1500:** Multiple mounting options with M3, 3/8″ and 1/4-20″ holes

BOLT 4K ARRAY ANTENNA

WIRELESS	
Frequency Range	5.1 - 5.8 GHz
Gain	14 and 16dBi
Protocol Support	802.11n MIMO standard
Polarization	2x Horizontal and 5x Vertical for polarization.
Beam-width deg horizontal	38°
Beam-width deg vertical	38°
VSWR	<1,8
Impedance	50 ohm
Front to back ratio	> 35 dB
PHYSICAL ATTRIBUTES	
Dimensions	13.78 x 13.78 x 1.25 in (35 x 35 x 3.18 cm)
Weight	39oz [1111.3g]
Construction	UV-protected plastic with aluminum alloy (construction grade)
Connectors	RP-SMA
Operating temperature	-40°C to 80°C

SUPPORT RESOURCES

In addition to this Reference Guide, you can find more information on Bolt 4K devices' features and operation by visiting **www.teradek.com**. If you are unable to find what you need online, please contact Teradek's support staff.
E-mail: **support@teradek.com** | Phone: (888) 941-2111 ext. 2 (available M-F 7am-6pm PST)

DISCLAIMER

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

WARNING

Bolt 4K devices contain sensitive electronic components that can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the device is not damaged. Damage due to inappropriate handling is not covered by the warranty. For complete warranty information, please see the warranty card that arrived with the device, or visit **www.teradek.com/pages/warranty-information.**

FCC STATEMENT

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

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

Bolt 4K devices comply with Part 15 of the FCC rules and also with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

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

EC DECLARATION OF CONFORMITY

CE

Teradek LLC hereby declares that Bolt 4K devices are in compliance with Directive 1999/5/EC. The full text of the EC Declaration of Conformity is available at the following Internet address:
https://support.teradek.com/hc/en-us/articles/233429747-EC-Declaration-of-Conformity-for-CE-mark

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