

ATOM-USB

USER GUIDE

REV03



A division of Evertz

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Introduction

Thank you for purchasing EvertzAV's ATOM-USB multi-channel USB recorder. The ATOM-USB series of video recorders are based upon very high performance technology and built to high standards and together these factors combine to provide a very rugged and reliable video recording system. Before operating the unit, please read this manual thoroughly and retain it for future reference.

This document is designed to give users an overview of the system as well as video recording operation details. Should you need any further information pertaining to installation or operation of your product or have any reliability issues, please contact EvertzAV or your supplier.

Important Safety Information

1. Read all of these instructions.
2. Save these instructions for later use.
3. All warnings on the product and in the operating instructions should be adhered to.
4. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. This product is designed for indoor use only. Avoid using this product near water (e.g. near a bathtub, washbowl, sink, or laundry tub, in a wet basement, or near a swimming pool, etc...).
6. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your supplier or EvertzAV.
7. This product is equipped with a 3-wire grounding type plug (a plug having a third [grounding] pin). This plug will only fit into a grounding-type power outlet. This is a safety feature.
8. For added protection, during a lightning storm or when it is left unattended and unused for long periods of time, unplug this product from the wall outlet and disconnect the cables. This will prevent damage to the product due to lightning and power-line surges.
9. Do not allow anything to rest on the power cord. Do not place this product where the cord could be exposed to damage by persons walking on it, or similar hazards.
10. Follow all warnings and instructions marked on the product.
11. Never push objects of any kind through the slots/ports of this product as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.
12. Never spill liquid of any kind on the product.

13. Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.
14. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power cord or plug is damaged or frayed.
 - b. If liquid has been spilled on or into the product.
 - c. If the product has been exposed to rain or water.
 - d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - e. If the product has been dropped or the chassis has been damaged.
 - f. When the product exhibits a distinct change in performance this indicates a need for service.
15. When replacement parts are required, be sure the service technician has used replacement parts specified by EvertzAV that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
16. Upon completion of any service or repairs to this product, ask the service technician to perform routine safety checks to determine that the product is in safe operating condition.

General Overview

ATOM-USB is a high definition digital video and audio USB recorder that can record up to five individual 3G/HD/SD-SDI video signals on to five individual USB drives. It has been designed in co-operation with users to provide a simple and convenient way of capturing HD video and embedded audio to MPEG4 files for such applications as television production, music, events, compliance, sports analysis, medical, and security applications.

Figure 1. ATOM-USB-5



Flexibility and Capability

ATOM-USB is the most flexible USB recorder in the industry. It has multi-channel capability in a modular 1RU chassis that can accommodate up to five video recorders. When used for sports production, for example, simply press the record buttons to record five different versions of a feed (such as a clean feed, a dirty feed, a director's feed, a coach's feed and an official's feed). Simply press the stop button when you're done and your recordings are ready within seconds.

The auto sensing inputs allow you to record 3G/HD/SD-SDI with embedded audio directly to a USB drive while the looping 3G/HD/SD-SDI output allows users to make up to five copies of the recording by inter-connecting a (looped) output digital video cable between each record channel. The H.264 codec ensures high-quality recordings that are encoded as MP4 files incorporating both video and audio. You can also connect to the native Web UI and adjust the bitrate to optimize the recording to suit the capacity of the USB drive and quality of recording.

Connecting Power

Connect the 2.5mm 12V DC power adapter to the bulkhead power socket labeled **PSU1** located on the left rear of the unit (indicated in red in the figure below). If you have an additional power adapter, you can connect it to the power socket labeled **PSU2** for redundancy. Having the one power adapter connected is a requirement while having a secondary power adapter connected for redundancy purposes is optional.

Figure 2. ATOM-USB PSU Sockets



When power is connected, the unit will start its boot up sequence, which takes approximately 60 to 90 seconds. During the boot up sequence the front green LED for each respective USB port will light up and turn off sequentially multiple times. After all the USB ports have finished the boot process successfully, all the LEDs for all USB ports will stay lit. This indicates the ATOM-USB is now functional.

Figure 3. ATOM-USB Standby Mode



Connecting Video Signals

The ATOM-USB is designed to accept HD-SDI signals with embedded audio. 2.97 GHz and 1.475 GHz HD-SDI signals (Level A) are supported. Using 75ohm BNC video cables connect your source to the respective input(s) located at the rear of the unit. Outputs are provided allowing you to send the signal to a monitor or loop out to another input.

Figure 4. ATOM-USB SDI Inputs and Outputs



Operation

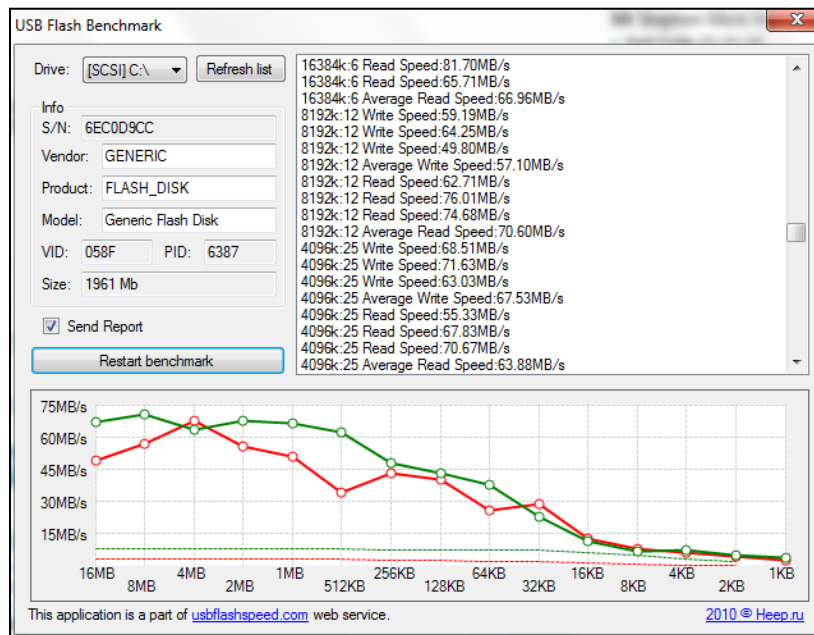
ATOM-USB encompasses front panel push buttons that are used to operate the unit. ATOM-USB is designed to be very simple to operate and will provide very reliable recordings when the correct button operation is used. Incorrect operation may compromise the unit's reliability.

USB Drives

Depending on your unit's model, ATOM-USB can be equipped with up to five USB 2.0 ports allowing for the connection of high quality, high speed USB 2.0 flash drives. It is essential that the USB 2.0 flash drives have the ability to sustain record data rates of 20MB/s or faster. Using slower USB flash drives will compromise the recordings with the possibility of dropped frames and/or asynchronous audio.

Please verify your USB 2.0 flash drive's performance before using the USB. While manufacturer's performance data is widely available, it is recommended that you check the performance by visiting a USB benchmark website or run your own test using a USB speed test application such as *FlashBench*.

Figure 5. FlashBench – USB Flash Benchmark Application

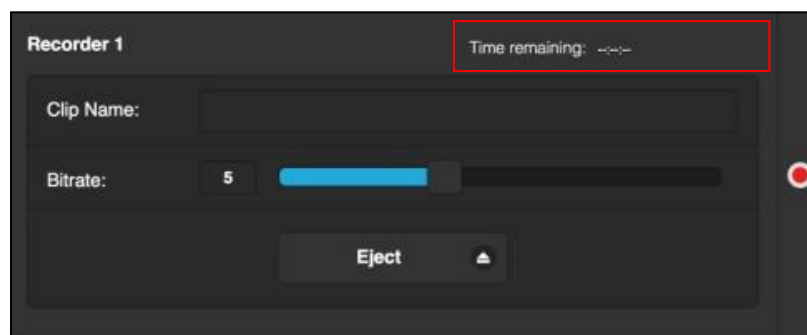


Recording to a USB 2.0 Flash Drive

When the unit has completed its boot sequence, it will go into standby mode, which is indicated by dim green (Mount/Eject) and red (Rec/Stop) LED buttons beside the USB ports. When in standby mode, insert a USB 2.0 drive (with sufficient storage capacity) into the respective USB port found on the front of the unit that corresponds to the AV source connected to the SDI port found at the rear of the unit. The unit will read the drive and calculate available capacity.

Note: When using the Web UI control panel the time remaining indicator will show the time remaining before the USB drive reaches its capacity, based upon the configured codec and bitrate.

Figure 6. ATOM-USB Web UI Time Remaining Field



The unit automatically recognizes the USB flash drive and the green (Mount/Eject) LED will flash while the unit checks the drive. When the USB flash drive is mounted and ready to record, the flashing will stop and the green (Mount/Eject) LED will be dimly lit, indicating that the USB flash drive is ready for recording.

Recording

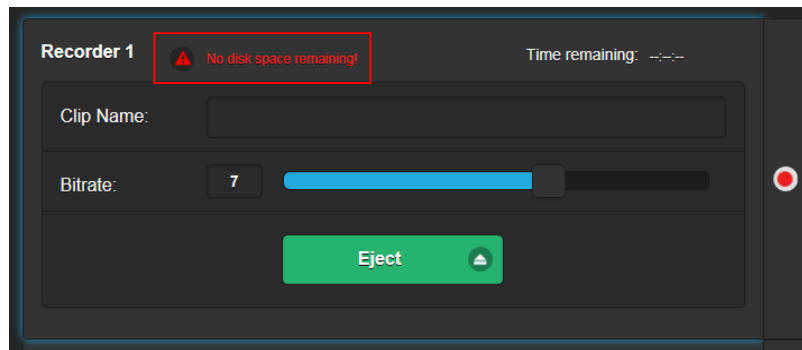
Press the dimly lit red (Rec/Stop) button once to record. This LED will flash brightly every second indicating that recording is in progress. To stop the recording, press the red (Rec/Stop) button again. The red (Rec/Stop) button will dim indicating that the drive is ready for further recordings. For additional recordings, repeat the above sequence.

Drive Limit Warning and Auto-Stop

The unit will automatically stop a recording when the USB flash drive is full. Before this happens (during the recording) in addition to the flashing red (recording) LED, the green (Mount/Eject) light will flash when the recording is 200MB from the end of the USB flash drive's capacity. When the drive is 20MB from the end of the USB flash drive's capacity, the recording will automatically stop and the red LED will extinguish indicating that recording has stopped. The green (Mount/Eject) LED will revert to a solid green status after the red light has extinguished.

Note: When using the Web UI, record status warnings are displayed on screen for the respective USB flash drive.

Figure 7. ATOM-USB Web UI Record Status Warnings



Closing the Last Recorded File and Ejecting the Drive

To safely eject the drive, press the brightly lit green (Mount/Eject) button once. The green LED will flash continuously indicating that the unit is closing the last recorded file. When the green LED dims, the USB flash drive has safely been ejected and the drive may be removed.

Recording Formats

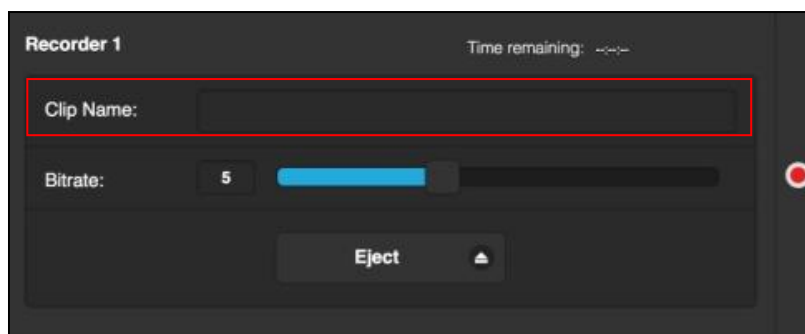
By default, recordings are encoded using the H.264 codec and formatted as .mp4 files which include AAC audio at 48 kHz. These files can be played back using most modern media players. It is recommended to use a media player such as VideoLAN's VLC as it is more interoperable on a wider variety of computer configurations.


Recordings can be made using a user configurable (via the Web UI) bitrate of 2MB/s to 10MB/s. The maximum size for any recording is 3.99GB. Typically, at a bitrate of 5MB/s, 2GBs of capacity are required for every hour of recording. For long duration recordings the unit automatically closes the file when 3.99GB is reached and creates a new separate but adjoining file with its respective time and date stamp. Multiple files are utilized for large capacity drives and long recordings. There should be no data loss even though multiple files are created.

Filenames

The default filename follows the syntax of “_[DD]-[MM]-[YY]_[HH].[MM].[SS].mp4” and increments by one digit upon each recording. User defined filenames can be set up using the Web UI selecting the channel and typing in the name in the **Clip Name** field.

Figure 8. ATOM-USB Web UI Clip Name Field



Every recording is time and date stamped based on the unit's system clock. The system clock is set at factory default unless it is defined from the Web UI. To set the time and date, click on the  icon located at the top right corner of the Web UI and click on the **Set Date/Time** button.

Note: See the [Configuration Menu](#) section on [page 12](#) for more information regarding the **Set Date/Time** setting.

IP Address and Web UI

ATOM-USB is addressable across a network via the Ethernet port located at the rear of the unit. The default IP address is **192.168.1.168** and the default username/password is **"admin/evertzav"**. You may set up your own static IP address or change the unit to use DHCP via the Settings menu on the Web UI.

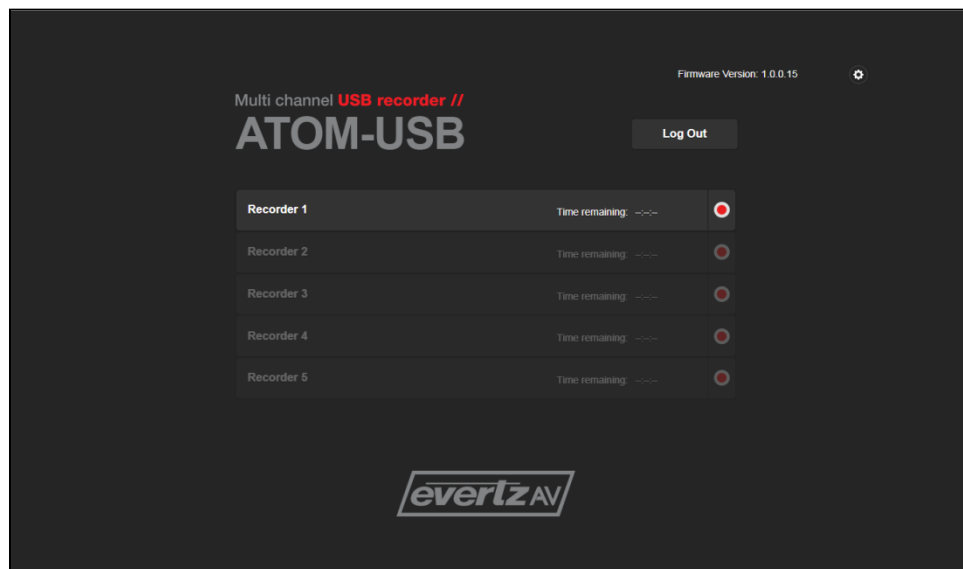
Figure 9. ATOM-USB Ethernet Port



The main functions of the Web UI include:

- Stop and start recordings.
- View the firmware version (located on the top right corner of the Web UI – available with firmware version 1.0.0.15 and above).
- View error messages.
- View end of drive countdown duration/time.
- Configure network and system settings.
- Enable/disable debug tools.

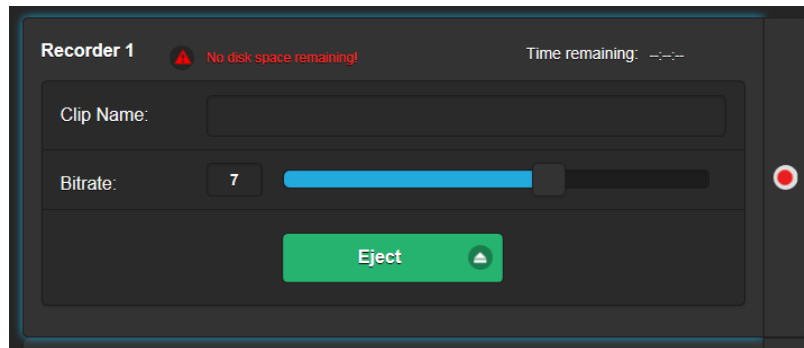
Figure 10. ATOM-USB Web UI Main Page



Channel Settings

The Web UI allows for the control and configuration of the device. Each available channel is presented on the main page and the respective channel can be selected to view additional settings.

Figure 11. ATOM-USB Web UI Recorder Channel Settings



When an individual channel is selected, the following is displayed and/or available to configure:

- **Warning/Error Messages:** Displays warnings/errors such as when there is no disk space remaining on the respective USB flash drive, when the USB flash drive is reaching capacity, when the recording has stopped, etc...
- **Time remaining:** Indicates the time remaining before the USB drive reaches its capacity, based upon the configured codec and bitrate.
- **Clip Name:** Input field allowing you to define a filename.
- **Bitrate:** Allows you to change the recording bitrate value.
- **Record Button:** Allows you to start and stop a recording.
- **Eject:** Allows you to safely eject the USB flash drive connected to the respective channel port.

Configuration Menu


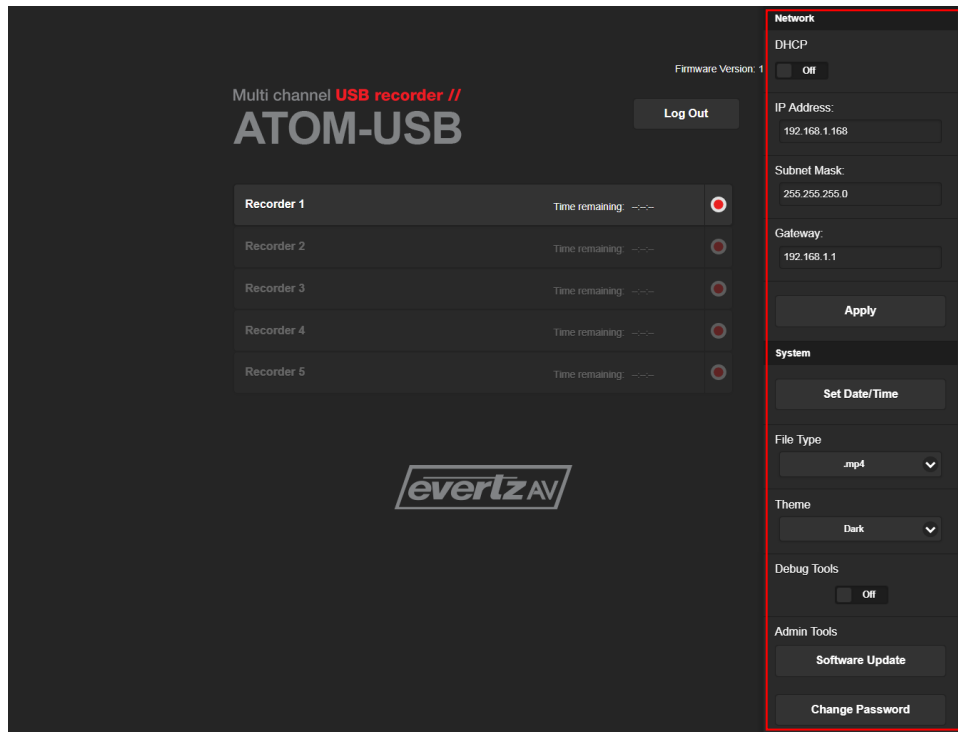
Clicking on the  icon located at the top right corner of the Web UI allows you to view the Configuration Menu.

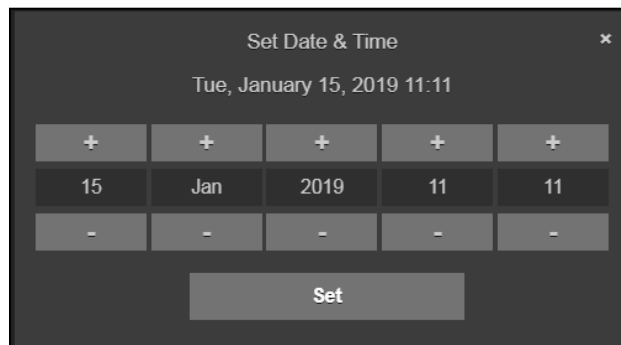
Figure 12. ATOM-USB Web UI Configuration Menu



The Configuration Menu allows for the configuration of the following settings:

- **DHCP:** Toggles DHCP functionality on/off. When enabled, the device will request and configure network settings from the DHCP server on the network.
- **IP Address/Subnet Mask/Gateway:** When DHCP is disabled, you manually configure a static IP address, subnet mask, and gateway by inputting the values into the respective input fields and then clicking **Apply**.
- **Set Date/Time:** Click on this button displays the **Set Date/Time Menu**. You can adjust the date and time using the + and – buttons to increase and decrease the values accordingly and then click on the **Set** button to apply the defined date and time.

Figure 13. ATOM-USB Web UI Set Date/Time Menu



- **File Type:** Allows you to select between .mp4 and .mov media container formats.
- **Theme:** Allows you to change between a dark background theme and a light background theme.
- **Debug Tools:** Toggles debug logging on/off. When enabled, debug logs are recorded to the respective USB flash drive as a .txt file. Logs are created per channel; therefore, a USB flash drive must be inserted into every channel you wish to debug.
- **Software Update:** Allows you to update the device's software to a different version. See the [Upgrading Your Device](#) section below for details on how to upgrade your device.
- **Change Password:** Allows you to change the Web UI log in password credential. Click on **Change Password**, enter the new password in the **New Password** and **Confirm Password** fields, and then click **Save** to apply the changes.

Upgrading Your Device

Upgrading your ATOM-USB encompasses a two step process: updating the software and updating the USB ports. To upgrade your unit:


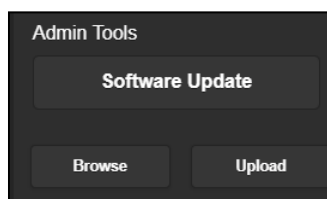
1. Click on the  icon located at the top right corner of the Web UI to access the Configuration Menu.
2. Click the **Software Update** button located under **Admin Tools**.

Figure 14. Configuration Menu Software Update Button



3. Click the **Browse** button and select the desired software update .bin file.
4. Click the **Upload** button to begin the software update process. All the LEDs on the unit will become brightly lit indicating the unit is upgrading. When the software update process has finished, a popup will be displayed on the Web UI stating the upgrade was successful, all LEDs on the unit will turn off, and the unit will automatically reboot. When the unit has finished rebooting, all the USB port LEDs will blink fast indicating that the USB ports need to be upgraded.
5. Power off the unit.
6. Copy the USB update .img file to the root of each of your USB drives.

Note: Each USB port on the unit needs to be updated, but can be updated simultaneously using a separate USB drive for each port. For example, if you want to update all five USB ports on an ATOM-USB-5 at once, you will need five USB drives. You can update each USB port one at a time, but it will take much longer updating each USB port individually.

7. Insert each USB drive containing the USB update .img file into the respective USB ports on the ATOM-USB and then power on the unit. The red (Rec/Stop) and green (Mount/Eject) LEDs for the respective USB ports that have been chosen to be upgraded will flash in tandem from dim to bright with a 500ms cadence. When the update process has finished for a USB port, the red (Rec/Stop) and green (Mount/Eject) LEDs for the respective USB port will turn off.

Note: Updating a USB port is dependent on the read speed of the USB drive you are using and can take up to 10 minutes.

8. When all the LEDs for all the respective USB ports that have been chosen to be upgraded turn off, power off the unit.
9. Power on the unit to reboot the device. Your ATOM-USB should now be fully upgraded.

Note: After rebooting your unit, if a USB port's red (Rec/Stop) and green (Mount/Eject) LEDs blink quickly, the USB port will not be functional. Fast blinking indicates a firmware error. A message will also be displayed on the Web UI indicating which USB port possesses a firmware error. In such instances, repeat Steps 5 to 9 above for the affected USB port(s).

Factory Defaulting Your Device

To reset the unit to its factory default settings, hold down the first USB port's red (Rec/Stop) and green (Mount/Eject) buttons simultaneously for 10 seconds until all the LEDs turn bright. When all the LEDs turn bright, release the buttons and the factory default process will start, which is indicated by the LEDs turning off for up to 20 seconds, followed by the unit rebooting. Once the device has finished the boot up process, the device will have reverted its IP address back to **192.168.1.168** along with this factory default settings.

Formatting USB Drives

All USB drives should be FAT32 formatted to ensure correct operation. Factory testing indicates that recordings of up to 3.99GB can be made per file. This is roughly equivalent to a 2 ½ hour recording at 5MB/s bitrate.

Specifications

USB	USB 2.0, high speed, ≥20MB/s sustained data rate
Codec	H.264
Bitrate	Preset for 5 Mb/s, user adjustable from 2-10Mb/s via Web UI
File Format	MOV and MPEG-4 with AAC audio
Video Inputs (up to 5)	1x 3G/HD/SD-SDI with looping output
Control Ethernet	1x RJ-45
Power Input	10V-24VDC on 2.5mm connector with screw lock
Power Consumption	11-20W, subject to model
Case Finish	Silver/Grey
Dimensions (W x H x D)	17.3in x 1.7in x 13.8in (440mm x 44mm x 350mm)
Weight	2.86-4.41lbs (1.3-2.0kg, subject to model)

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