



Atomos Samurai Blade

User Manual

AtomOS

EDITION 1: JUNE 2013



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Safety Instructions

The Samurai Blade is designed to a high standard but there are some things you should be aware of to prolong the life of the unit and for your own safety.

Batteries and power supplies

The battery supplied with the Samurai Blade is a powerful professional device, designed to retain enough energy to supply the Samurai Blade for hours. You should avoid short-circuiting the battery connections because this can cause a high current to flow which can damage the cells and even pose a fire hazard. For example, you should not carry batteries in a bag or pocket where they may contact other metal objects such as coins.

The power supply and battery charger included are intended for use with the Samurai Blade only. Keep the power supply, plug and cable away from water and unplug from the mains electricity socket when not in use.

Disconnect power supplies before cleaning the Samurai Blade or its components.

Using the Samurai Blade safely

Although the Samurai Blade is very lightweight compared to all the devices it replaces, it is still a solid object that could cause injury if misused.

- Always make sure that the Samurai Blade is mounted securely and is unable to fall onto anyone nearby. This is especially important when there are children present who might be tempted to pull on cables.
- Always ensure that cable runs to the Samurai Blade are clearly visible and do not present a trip hazard.
- Do not place on uneven or unstable surfaces.
- Do not insert anything but Samurai Blade Master Disk caddies in the Master Disk slot on the side of the Samurai Blade.
- Do not touch the Samurai Blade's screen with sharp, metallic or abrasive objects.
- The Samurai Blade can become warm or hot with prolonged use. Do not place it in contact with your lap or any part of your body where such warning could cause discomfort or injury.
- Do not expose to strong electrical or magnetic fields.
- Do not expose to or use near liquids, rain or moisture.
- Do not dispose of the Samurai Blade or its batteries in municipal waste and do not incinerate it or its batteries, but follow local regulations for safe disposal

Care of disk drives

Spinning disks and SSDs are very sensitive to damage from static electricity. Please observe all the usual precautions when handling them.

Please see the section Mechanical shock and vibration later in this manual for information about how to handle and care for your disk drives.

SDI Cables

Please remember that SDI cables use locking connectors and will not simply pull out if they are jerked or tripped over. They are therefore a significant trip hazard, and also a hazard to your equipment, which may be damaged if the cables are misused.

User Manual Conventions

To keep things simple but clear, we've only adopted two conventions in this manual:



A helpful tip, suggestion or something to note because it's not obvious at first

Menu **Monospaced text** indicates a menu or touch action

Warranty & Conditions

Notice

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International Hardware Limited Warranty

ATOMOS warrants that:

- the main product, not including TFT/LCD, or any external accessories, will be free from defects in materials and workmanship for a period of 1 years from the date of purchase, **the user may upgrade to a 3 year warranty upon registering their product at www.atomos.com**
- the TFT/LCD, batteries, battery charger, HDD/SSD docking station, Master Caddy and Carry Case will be free from defects in materials and workmanship for a period of 1 year from the date of purchase.

This warranty is exclusively for the benefit of the original purchaser and is not assignable or transferable.

If during the warranty period the product is shown to be defective ATOMOS may at its option:

- a) replace the goods or supply equivalent ones, b) repair the goods, c) pay the cost of replacing the goods or of acquiring equivalent ones and d) paying the cost of having the goods repaired;

The customer must notify ATOMOS of any defect in the goods in writing prior to the expiry of the warranty periods set out above. The customer will be solely responsible for returning the goods to ATOMOS or its authorized distributor. Upon acceptance of a warranty claim by ATOMOS, where ATOMOS repairs or replaces the goods, it will be responsible for reasonable shipping costs incurred in sending the goods to the Customer, provided that customer is located in a country in which ATOMOS has an authorized distributor or repair centre or agent.

Warranty Exclusions

This warranty applies only to defects in workmanship and does not cover defects caused by:

- Neglect;
- Improper or negligent acts or omissions;
- Unauthorised repairs or attempted repairs;
- Tampering with or modification of the goods;
- Connection to incompatible equipment or power sources;
- Exposure to water or weather;
- Exposure to magnetic fields or corrosive liquids or substances;
- Physical damage

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Introduction



Thank you for choosing the Atomos Samurai Blade: your 10-bit HD-SDI Recorder/Monitor/Player. It's the most compact portable recorder available, with extremely long battery life, a high-resolution screen, waveform monitor and vectorscope.

Samurai Blade preserves the pristine uncompressed video quality from your camera's sensor by directly encoding it into Apple ProRes® or (optionally) Avid DNxHD® as it records to HDD/SSD, making it instantly compatible with your NLE timeline. The Samurai Blade's revolutionary 'Sensor-to-NLE' workflow is the fastest and best quality available today!

With the plummeting price of hard disk storage, the 2½" disks used by the Samurai Blade are very cheap; the cost of storage is no longer an issue. Buying a disk for the Samurai Blade is just like buying a tape – except that with a disk you will have instant "non-linear" access to your video.

The Samurai Blade's one-touch IPS 'SuperAtom' screen interface is intuitive and simple to use. There are no complicated menus or difficult to find functions – everything you need is instantly accessible from the home screen. Refer to 'Using your Samurai Blade' for more information.

Software updates for your Samurai Blade will be issued regularly. Registering your Samurai Blade now will ensure you are kept abreast of any updates.

Software updates and information will also be available at:
www.atomos.com/support

We hope you enjoy your Samurai Blade!

*Your Samurai Blade comes with a standard 1 year warranty on all parts and accessories. **You can upgrade to a 3 year warranty** on the main Samurai Blade Unit alone (excluding IPS screen) by registering your Samurai Blade online at **www.atomos.com/registration** This will enable us to let you know about updates to the product and other important information surrounding your purchase.*

Special thanks to Atomos user Dave Newton for kindly giving us permission to use his footage for the screenshots.

AtomOS

HD-SDI

HDD | SSD

ProRes

Avid DNxHD

1. What's included

We try to provide you with as complete a package as possible: you don't have to add anything except 2.5" storage media (you can buy additional packs of empty Master Disk Caddies from your Atomos Reseller) and some accessories to suit your set-up, like HD-SDI cables and tripod screws. All other parts necessary to use the Samurai Blade are included.

 *Atomos does not sell storage and your package will not contain any spinning disks or SSDs. You can buy these locally to keep running costs as low as possible.*

We recommend drives, please refer to Part 16 (Technical Specifications) of this manual. For the most up-to-date information please visit:

<http://www.atomos.com/discovery-what-drives/>

Here's the complete list

- Samurai Blade recorder/monitor
- 2 x empty Master Disk Caddies + 8 screws for fixing disks
- Master Caddy Docking Station with USB 2 & 3 Cable (not pictured here - see page 31)
- AC Adaptor for Samurai Blade
- Single Battery Charger including AC power adaptor
- 9V AC Adaptor for Battery Charger (110-240V for AC operation)
- 1 x Atomos 7.4 V 2600mAh Battery
- 1 x D-Tap Adaptor
- 1 x 2.5mm 'Y' adaptor cable for LANC loop-through
- Samurai Blade QuickStart Guide (not pictured)



Contents may differ from those shown here.

2. What you also need

Spinning Disk Drives (HDD)

These are the raw storage medium for Samurai Blade. You can use either traditional “spinning” disks, or the new solid state ones. Choose 2 ½” spinning drives if your Samurai Blade is going to be attached to a tripod or if it is not going to be subject to excessive vibration. For harsher conditions, choose a solid state drive.



 HDD |  SSD

Which drives should you use?

There are so many drives available, and newer models appear all the time. We are not able to test all drives but here are some guidelines.

Speed and reliability are the main factors. Here are a few things to bear in mind:

- Disk drive data rates tend to be given in megaBYTES per second, and codec data rates are normally given in megaBITS per second. It's very easy to get confused. But there's no need to be, because all you have to do to convert megabits to megabytes is divide by 8. So if you're recording at 220 megaBITS per second, that's going to result in 220/8 megaBYTES per second, which is 27.5 megaBYTES per second.
- We recommend at least 7200 RPM drives. Just remember that the higher the bitrate of the codec you're using, the faster the drive needs to be.

Atomos regularly test hard drives – please check this link before purchasing drives: <http://www.atomos.com/discovery-what-drives/>

Solid State Drives (SSDs)

These are Flash memory devices that come in the same form-factor as 2 ½” disk drives, and they are fully supported by the Samurai Blade. See the section below about when you should consider using SSDs.

Mechanical Shock and Vibration

Hard disks are precision mechanical devices that need to be handled carefully. You will be using the same type of drives that are normally used in notebook computers, and you can use this as a guide to whether you need to use mechanical drives or Solid State ones for any proposed projects. If you think a particular usage scenario would be suitable for a notebook computer, then it will probably be OK for a mechanical drive inside a Samurai Blade. If you think the drive inside your notebook might suffer damage, then don't use a mechanical drive.

We can't give rigid guidelines because there are so many different kinds of drives, each with different mechanical properties. You may even find variations between drives of the same type.

What we have found is that mechanical drives are suitable for most purposes that don't involve harsh vibration or mechanical shocks. They will be perfect for tripod-mounting, and also for the majority of hand-held work. We would advise against hard-mounting them on moving vehicles

(but they would probably be OK if cushioned against the body of the camera operator) and we would not advise using mechanical disks if there is a likelihood that they might be dropped onto a hard surface.

Here are some things that you should bear in mind when using spinning disks:

- Even though spinning drives can withstand substantial shocks when they are not in use, they are more vulnerable when running. Harsh treatment that may not actually damage the drive may interrupt recordings at a much lower level of severity. We recommend that you experiment with your drives by testing them in the conditions that you normally work in.
- Spinning drives have a gyroscopic effect that you will feel faintly if you rotate the Samurai Blade up or down or from side to side. They are particularly sensitive to this type of motion. If you do this too quickly while the drive is spinning, you may get a small gap in your recording.
- Be very gentle when changing batteries if you are recording. Practise this manoeuvre so that you are able to do it smoothly. It is always better to do this in-between takes.
- Do not bang or jolt the Samurai Blade while recording. Gentle and cushioned movement may be OK.
- You will find noticeable differences in the ability of drives to withstand shock and to continue recording during vibration and movement. As we receive reports of drive durability and reliability, we will post them on www.atomos.com
- Your Samurai Blade is able to detect when the drive is under stress and it will recover from any break in a recording by waiting until the drive is ready to continue, and then resuming from that point. If frames have been dropped because of shock or vibration, a “**Skip**” Kangaroo symbol will appear on the home screen on the Samurai Blade, just above the disk capacity indicator. This means that you will not normally have to restart the Samurai Blade, even if a recording has been interrupted by mechanical disruption to the disk drive. (see *Recording and Monitoring: Atomos Anti-shock Technology* for more information)

Taking into account most usage scenarios, we think that mechanical disks will be suitable in the majority of cases. Spinning disks are most sensitive when they are rotating. It is obviously best to avoid dropping them but many disks now have a “drop detector” that will lock the most fragile mechanical parts in place and protect them from surprisingly hard knocks. We recommend that if you want to experiment with this, you do so with a drive that doesn't contain the day's shoot!

Backing up and archiving

Remember that no storage medium, including tape, optical disks, spinning disks and flash memory, is completely immune from failure. You should bear this in mind when deciding how to manage your recorded content. At the very least, you should consider the consequences for you and your business if your storage medium were to suffer from a sudden failure, and you should back up your content accordingly. Hard drives that you can use for archiving are becoming increasingly affordable. You may find that it is completely feasible for you to keep your master Samurai Blade disks on a shelf (just like tapes!), and, as a backup, store copies on large hard drives, RAID arrays or Network Attached Storage (NAS).

2. What you also need

HD-SDI cables (not included)

HD-SDI cables are robust physically and electrically: you should rarely have problems with signal transmission unless your cables are either damaged or too long. Please remember that HD-SDI cables use locking connectors and will not simply pull out if they are jerked or tripped over. They are therefore a significant trip hazard, and also a hazard to your equipment, which may be damaged if the cables are mishandled.



If the HD-SDI cable is removed while recording the “Skippy” image will also be displayed. To remove touch Skippy and he will disappear ready for his next notification.



*Refer to page 25: **Atomos Anti-skip Technology** for more information about “Skippy”.*

Standard 1/4” Camcorder Mount

This must fit a standard 1/4” screw mount. Select the type that best suits your application and conditions.



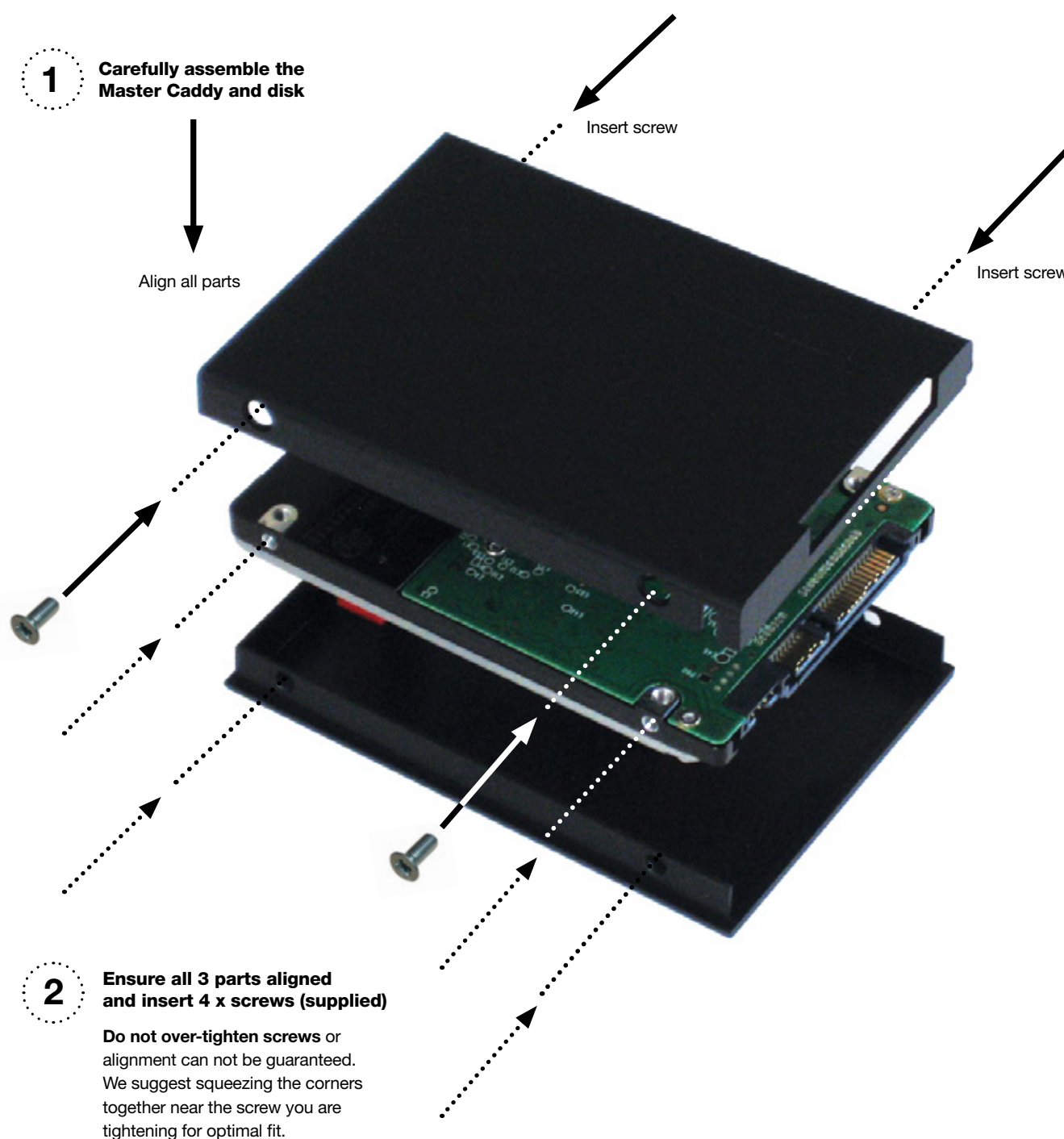
3. Mounting disks in the Master Caddy

Mounting drives in the Master Caddy

This is simplicity itself. Just insert the disk into the caddy, and secure with four screws. The caddy is light and the disk just needs to be held securely. Don't over-tighten the screws. There are no connections to make because pushing the caddy into the Samurai Blade or the Docking station makes all the connections for you.

The Master Caddy can't be inserted the wrong way round. Always make sure that the disk connector faces the slot in the Samurai Blade. You have to be quite firm to push the Master Caddy into place, but don't push too hard, just in case something isn't set up or aligned properly. There is very little that can cause problems and the most likely thing is that the Master Caddy isn't properly flush with the drive inside. A quick visual check will confirm this.

! Spinning disks and SSDs are very sensitive to damage from static electricity. Please observe all the usual precautions when handling them, especially **DO NOT EVER touch the exposed SATA connector** as static electricity may be harmful to your disk.



4. Connecting the Samurai Blade and powering up

Battery



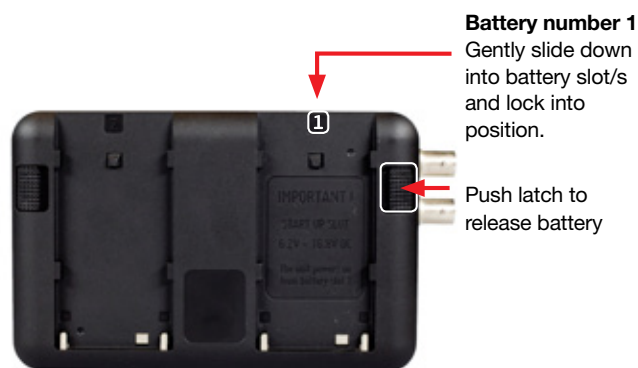
The Samurai Blade is a battery powered device, and has a special feature to ensure that you never have to interrupt a recording to change a battery. We will come to this shortly.

Like all batteries, you will need to take care of them. Make sure that you don't short circuit the connections because this can result in very high currents that can damage the cells and could pose a fire hazard.

Charge new batteries before using them, using the battery charger supplied.

❏ Batteries do not charge in a linear way. At first they charge very quickly, and then the rate slows down to a trickle. While charging, one or more red lights will blink. When 90% charge is reached, all the lights will flash. It is perfectly OK to use the batteries at this point and **we recommend stopping at this stage for the longest battery life**. If you leave the batteries on charge after all four lights are flashing, the charger goes into trickle charging mode for the final 10%. Eventually, when trickle charging is complete, and the batteries are at 100% charge, all the lights will go out.

❏ Before any type of disposal the battery should be discharged completely. Tape the contacts with electrical tape and package so as to prevent contacts accidentally coming together at any time. Incineration must be performed by an approved and permitted waste treatment facility that handles lithium ion batteries. If you are not sure if your waste facility can handle lithium ion batteries, contact them and verify if they are permitted or not.



Always use battery slot **1** for the first battery. This is effectively your primary battery and the Samurai Blade will not start without it.

Battery slot No.2 is the secondary or back-up battery and is not marked. Once the Samurai Blade has been started from battery slot No. 1, it will operate on battery slot No. 2 alone. No. 1 is only required for start up.

To attach the battery, gently slide it down into the slot and lock into position. To remove a battery, push the latch to release it. Each battery has its own latch, which is located to the right of battery No. 1 and to the left of battery No. 2 as you look at the back of the Samurai Blade. Pull the latches towards the batteries to release them.

❏ Samurai Blade batteries and modular accessories (Connect Converters, etc) are held in place very tightly because they are on the outside of the device and there has to be no possibility whatsoever that they could work loose, so you will have to be quite firm with the battery latches. We suggest that you familiarise yourself with the force required to remove the batteries and accessories so that you can do this quickly in the field. Make sure that you hold the top and the bottom of the battery or accessory module when sliding it off to avoid dropping it when it is released from the main unit.

The Samurai Blade features an Atomos technology called Continuous Power which used battery looping. When power is running low on one battery, the Samurai Blade will automatically switch to the second battery, you can remove one of the batteries and replace it with a fully charged one. Samurai Blade will continue to operate as you do this. You can continue this process indefinitely.

❏ The Samurai Blade may be powered from NiMH & Li Ion 14.4V battery systems. Battery adaptor required.

4. Connecting the Samurai Blade and powering up

Turning ON power to the Samurai Blade

The start button is located on the right hand side of the unit (as you look at the screen). Momentarily press the circular button on the right side of the Samurai Blade as you look at the screen to power up the unit. After a couple of seconds you will see the Atomos logo, and then the Samurai Blade Home Screen.

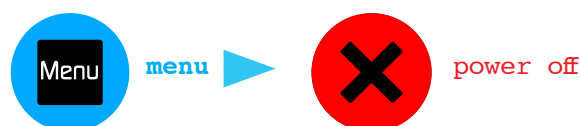
Turning OFF power to the Samurai Blade

To turn the unit off, touch **menu** on the home screen, and then **press the red Power off icon for 4 seconds** the icon will go white when touched to indicate activation of the button. The unit will then power off. You can also do a forced power down by **depressing the on/off button for four seconds**.

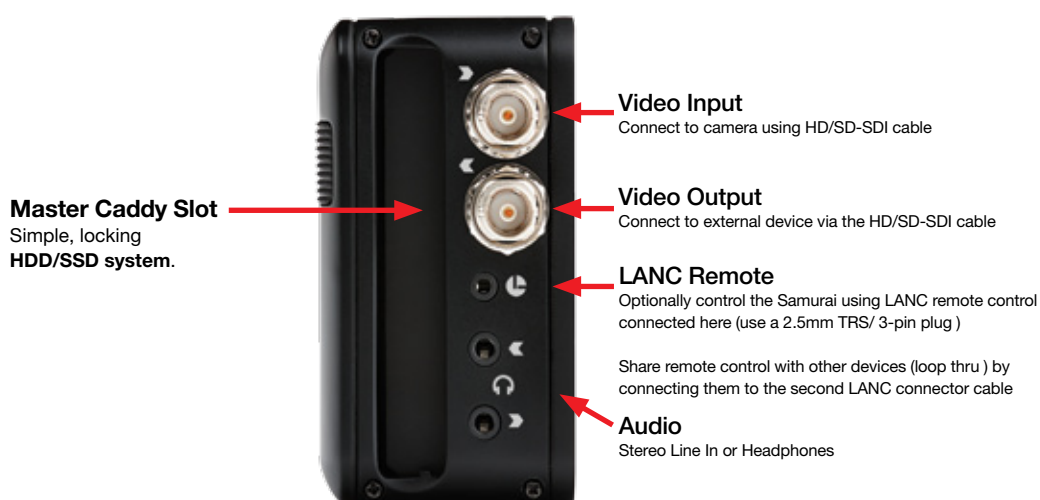
 **Four seconds** can seem like a long time! We've made it this way to make absolutely certain that the Samurai Blade can't be turned off accidentally.



Turning OFF power via touchscreen (preferred)



5. Samurai Blade connections



HD-SDI in: The video input to the Samurai Blade is HD-SDI. This is the connection that is used to record to the Samurai Blade's storage media.

HD-SDI out: This is for connection to an external monitor or other device with an HD-SDI input. It carries a delay-free loop-through of the incoming signal in record and standby mode, and the playout signal when the Samurai Blade is in playout mode.

LANC Remote: In addition to direct control through HD-SDI, you have the option of controlling the Samurai Blade remotely using the LANC remote control protocol. The Samurai Blade has a LANC input and a 2.5mm 'Y' adaptor cable is included to allow you to connect LANC-controllable devices.

Audio: The Samurai Blade can record 12 channels of digital audio embedded in the HD-SDI signal. There is a 3.5mm Stereo Line-in socket for recording audio in sync with incoming video. Depending on your set-up, you may find that this gives you better results than the microphone on the camera.

You can switch between Analogue Audio Line In and HD-SDI as your audio sources in the user interface, where you can also adjust the analogue audio input level.

There is also a 3.5mm output that doubles as a Line Out or Headphone Out, which has its own independent level control in the user interface.

6. Master Caddy and Screw Mounts

Master Caddy Slot

On the left hand side of the unit (as you face the screen) is a slot for Samurai Blade Master Disk Caddies. To insert a caddy, gently push until it clicks into position.

Formatting disks - see page 12



Master Caddy

The Master Caddy is hot-swappable, so you can do this at any time – even while the unit is turned on. But don't do it while recording or you will get a corrupted file that may be unplayable.

🚩 *Unlike the Ninja-2/Samurai recorders, the Samurai Blade does NOT have a release latch - it is friction-fit. Simply pull the Master Caddy out using the top and bottom tabs on the caddy itself.*

Screw Mounts

The Samurai Blade features standard tripod 1/4" screw mounts on the top and bottom of the unit, allowing you to configure your recording setup various ways (1/4" camcorder mount not included in Samurai Blade kit).



Samurai Blade Modularity

The Samurai Blade was designed to be a flexible and modular system. It doesn't need any drivers to connect to a computer, you have a choice of spinning hard disk storage or solid state, and it will work with any battery system as long as it connects to the Samurai Blade's NP-type slots, or via the D-Tap Adaptor.

The Samurai Blade's battery slots are the key to it's modularity. They provide secure attachment and continuous power, through Atomos' loop-through power system.

The first of the modular add-ons to be announced by Atomos are the Connect converters (pictured). More on this in page 34.

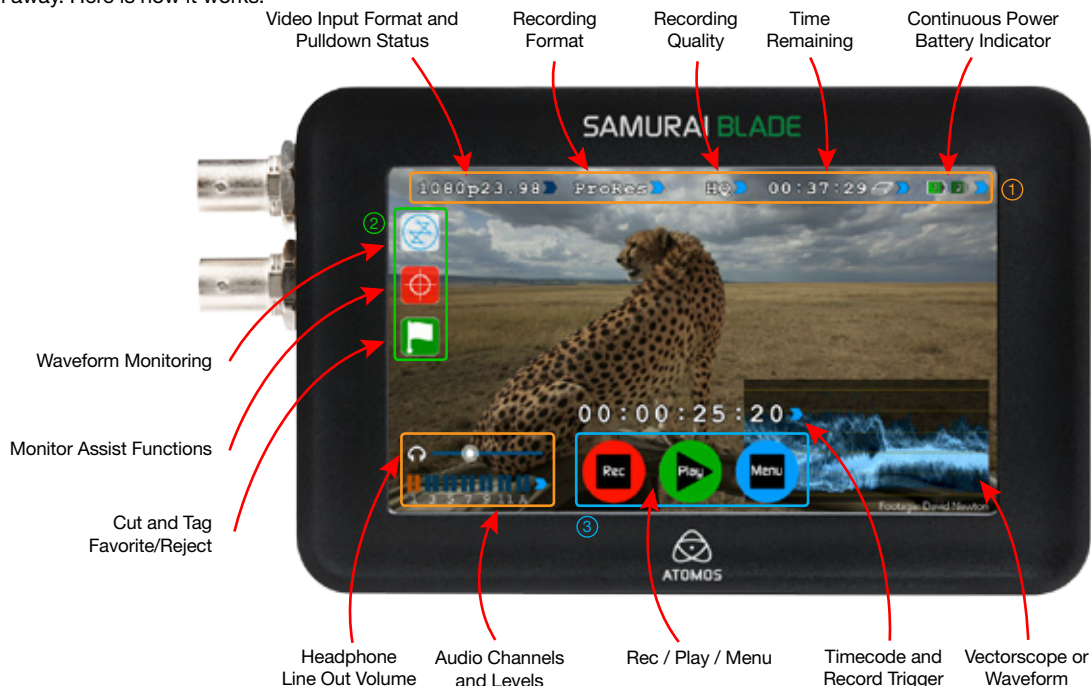


7. Using the Samurai Blade

Using the Samurai Blade

The Samurai Blade is controlled via an intuitive touchscreen interface. Icons and buttons have been designed and laid out in a specific way to ensure operation is simple and fast.

The HOME SCREEN displays all necessary technical and functional information. Everything important for operation and adjustment is no more than one touch away. Here is how it works:



Touching the center of the screen at any time removes all overlays except any active Shot Setup or Monitor assist functions that are enabled. This is to allow you to use the Shot Setup and Monitor assist functions at all times while shooting.

① Category 1 – Operating Settings

This list of real-time operating settings can be adjusted or toggled WHEN a BLUE ARROW is present. If the Blue arrow is disabled, the setting cannot be adjusted.

- | | | | |
|---------------------|----------------------|-----------------------|--|
| 1. Video Input | 3. Recording Quality | 5. Battery Indicator | 7. Audio Channels and Levels |
| 2. Recording Format | 4. Time Remaining | 6. Time Code & Record | 8. Headphone/Line Out Volume (Slider only) |

② Category 2 – Shot Setup & Monitor Assist Tools

This list represents the icons and functions available for Shot Setup and Monitor Assist Tools:



Waveform Monitoring Functions
See page 17



Monitor Assist Functions
See page 19



Smart Log Cut and Tagging
See page 22

Touch these icons to reveal more functional options in a sub-category. Touch the sub category icons to toggle the functions on or off. When a Shot Setup or Monitor Assist function is active, touch the settings icon (as seen below) to reveal detailed settings for each Shot Setup tool. Touch the Home icon (as seen below) to go back to the Home Screen at any time.



Settings icon



Home icon

③ Category 3 – Main Controls REC, PLAY & MENU

The Main Controls of the unit are indicated by large round icons.



To enable recording
See page 15



For instant playback and review
See page 28



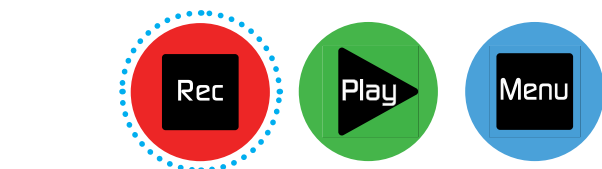
To make settings changes
See page 11

7. Using the Samurai Blade cont.

Home Screen and Menu Functions

Rec (Record)

This is the icon you touch to begin a recording. Touch it again to stop a recording. While recording the Rec icon changes to a Stop icon. Once your recording has started you have the option to touch the Mon icon to view the signal you are recording.



STANDBY

RECORDING



NO INPUT

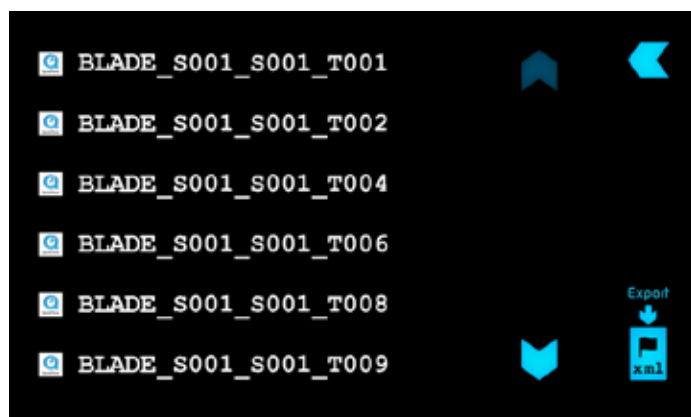
 The **Rec** icon is dimmed and disabled if there is no valid video input OR, the disk is not formatted, or the disk is full. The button is dimmed because you cannot record.

Play

Touch this icon to play previously recorded clips. When you press the green Play button you will be taken to the navigation screen.



STANDBY



NAVIGATION

Samurai Blade uses a unit name, scene, shot and take convention to name the clips. Select the clip you want to play by touching the file name and this will start to playback.



NO DISK

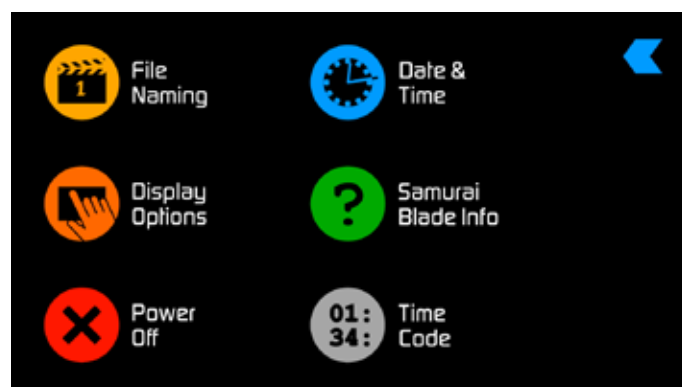
 The **Play** button will be dimmed and disabled if there is no disk or the disk is not formatted. See page 13 - Formatting disks

Menu

Pressing this takes you into a number of options which will be explained next.



MENU

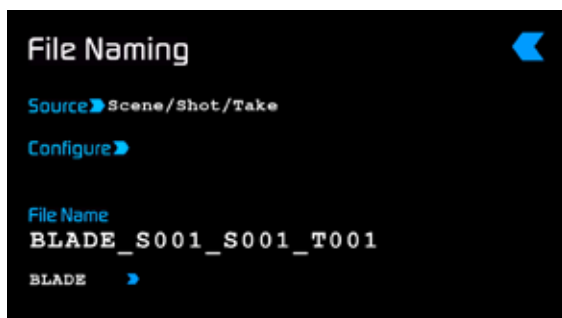


7. Using the Samurai Blade cont.



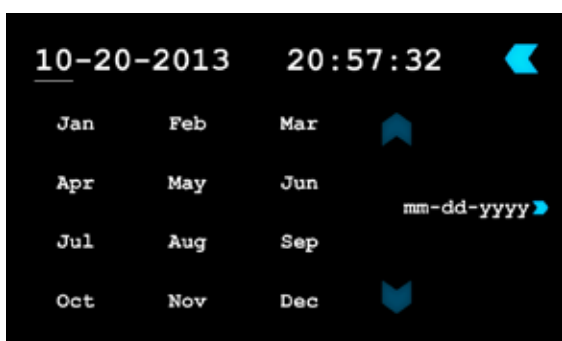
File Naming

Allows you to select the scene and shot number that will be recorded next. To select press **scene** or **shot** at the top and the number you wish to use from the list below (up to 999). The number you choose will then be shown underneath the word **Scene** or **Shot** in a larger font and will be underlined. The take number is automatically increased with each take.



Date & Time

Allows you to adjust the date and time shown by the clock and calendar in the Samurai Blade. This will also change the time of day timecode. Touching the **Date & Time** takes you into the Date and Time Screen. At the top of the screen is the date and the time of day. The month, day and year are selectable by touching them, at which point a scrollable list of dates, months or years will show below, depending on which option has been selected.



To enter a date, for example, begin by touching the month at the top of the screen, and then select the required month from the list below. Then touch the day, and then the year, selecting the required value from the list below.

Setting the time is done in exactly the same way.

Date formats (i.e. dd-mm-yyyy or mm-dd-yyyy) are selectable on the right of the screen. Just keep touching the **date format** icon until it shows the format you want to use.



Display Options / Screen Lock

Allows you to modify the brightness of the screen. You are presented with a horizontal slider. Touch it anywhere on its length to increase or decrease the brightness of the display or you can slide up and down the blue bar. The option to toggle the Tally light is under this menu.

SCREEN LOCK

A new feature for the Samurai Blade is the ability to Lock the screen so no changes can be made by mistakenly touching the screen. To Lock the screen press the start button located on the side of the Samurai Blade once quickly.

You will see **Locked** will flash on the screen. Press again to **Unlock**.



When you access the Display Icons you can choose to disable your screen but only when the screen is locked. While Locked, Display is > On/off



Samurai Blade Info

Shows the software (firmware) version and unique device ID (DID) of your Samurai Blade device. This will be required to activate the Avid DNxHD codec.

You can also check on the Atomos website to ensure you are running the latest firmware:

<http://www.atomos.com/support>



Power Off

Turns the Samurai Blade off. You need to press Power Off for four seconds. Alternatively, you can press the physical On/Off button on the right side of the Samurai Blade for four seconds to force shutdown. Atomos recommends using the touchscreen **Power Off** function.



Timecode

Takes you to the dedicated timecode configuration page.

Refer to Part 7 of this manual for more information.

 Remember that pressing a large blue arrowhead will always take you back to the previous menu you were in.

Smaller controls and indicators around the Home Screen

There are a number of smaller controls that double-up as indicators around the Home Screen.

Input

1080i59.94 ➤

At the top left of the screen is not actually a control but will change to display information about the signal being input to the Samurai Blade at the time. If there is no input, it will say No Input. When a valid signal source is connected, the display will change to (for example) 1080i50.

Video Compression Format

ProRes ➤

ProRes

Avid DNxHD®

At the top middle of the screen shows which version of ProRes® you are using. You can change between versions (LT, HQ and 422) by repeatedly touching the indicator. Avid DNxHD options will be shown here if the codec has been activated.

7. Using the Samurai Blade cont.

Battery Indicator



Shows whether you've got one or two batteries connected. If there is no battery connected a number will not be displayed in the appropriate slot. Touching the **Battery Indicator** takes you to the **Batteries** screen where you can closely monitor the status of the Batteries.

 When a battery is running low its icon will flash.

BATTERIES SCREEN

The Batteries screen indicator is made up of two Battery icons, the active battery is shown in orange and the level of each battery is shaded in 1/4 increments with a voltage level shown on top.



In the picture above we see Battery 1 is full and active and Battery 2 is currently inactive and 1/4 depleted. If no battery is present it will show an X in the picture and will be Black in colour as pictured right.

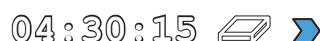


 **Warning:** If both of the batteries are fully depleted, the unit will turn itself off. The Samurai Blade will switch to the battery screen for the last 5 seconds of available power before shutting down, alerting you that shutdown is about to occur.

AUTO SWITCHING/MANUAL SWITCHING

The Samurai Blade will automatically switch to a new battery when the current battery is depleted. You may also switch between batteries at any time by pressing on that battery icon. The new active battery will then turn orange. You may need to use this if you have for example 3 hours recording but only 2.5 hours of battery in one battery, in which case you would change to a freshly charged one.

Storage Capacity Indicator



Located in the bottom right of the screen. When a disk is inserted, the **Storage Capacity Indicator** will show the recording capacity of the drive in hours minutes and seconds, based on the currently selected video compression, which of course, will determine the recording bitrate.

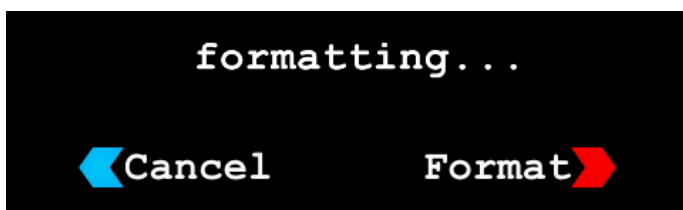
FORMATTING HDD/SSD

Touching the **Storage Capacity Indicator** on the home screen will take you to the **Media Information and Format** screen. Media Information indicates the drive you have present, in this case a Hitachi 500GB spinning disk.

Touching **Format HDD/SSD** will format the drive inside the Samurai Blade. A confirmation screen will give you the choice to continue or cancel the process.

If you do not see your hard drive information, there may be a problem with your connection. Try ejecting the drive and trying again.

Also check the drive compatibility list: <http://atomos.activehosted.com/kb/article/what-drives-do-we-recommend>



 The Samurai Blade file system is exFAT. We recommend that you format each disk with the Samurai Blade and not your computer.

Unit Name

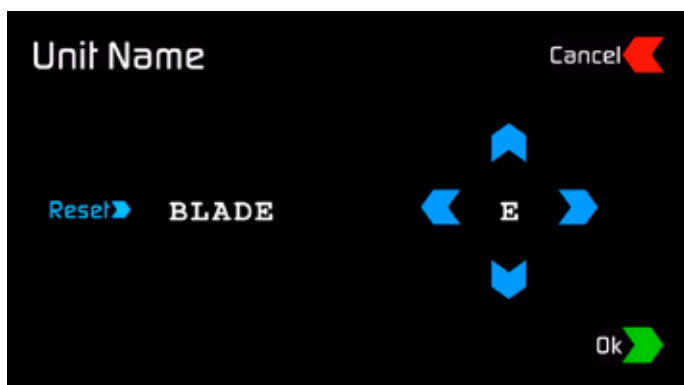


 To access the unit name click on **Menu**, then **File Naming** or on the **Media** icon on the home screen.

The unit name serves two main purposes:

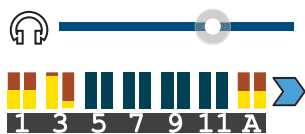
- **HDD Naming:** Naming the unit names the drive if the drive is formatted after the unit name has been set
- **File Naming:** File name is the current unit name as the start of the recorded clip name; BLADE_S001_S002_T003

To access the unit name screen simply touch the blue arrow to the right of the unit name. Creating your own unit name is simple. Pressing OK will allocate the new unit name and return you to the menu screen.



7. Using the Samurai Blade cont.

Audio In



Located in the bottom left corner of the main screen you can see the Audio Monitoring Levels, with access to Audio in.

You can see 12 digital channels (via SDI input) and 2 analogue audio channels (via the Stereo Line in). Each channel has a small rectangle assigned to it; when there is active sound coming in you will see the level indicator moving.

Any rectangle shown in orange is set to be recorded. To change the record settings, adjust the gain of Analogue audio in or headphone output levels and monitor selection access the menu

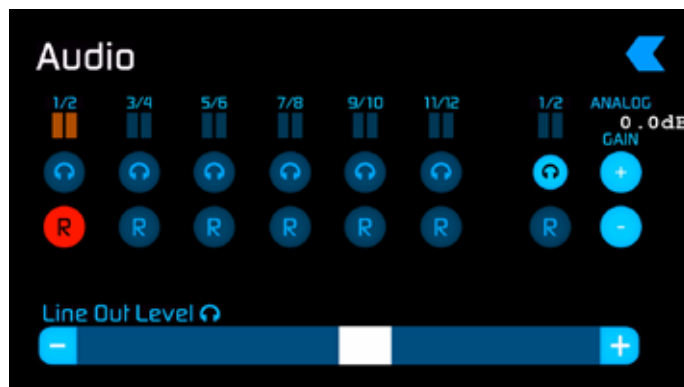
When you touch the Audio in access icon you are taken to the Audio In Page, where you can choose to record from any or all of the digital (SDI) and analogue inputs. Underneath each pair of audio channels you can see the R record button, when this is shown in red it is set to record, simply select all you want to record.

You can adjust the analogue audio gain by pressing the + and - buttons next to the channel pair. There is also a slider to control the line out level. Press any point along the line or slide your finger to the left or right to adjust.

 It is not possible to vary the gain if the signal input is from the SDI connection because this is digital and is embedded in the signal. You can usually adjust this from the camera, please see your camera manual for operational details.

AUDIO DURING PLAYBACK MODE

When you enter into Playback mode on the Samurai Blade it will only output channels 1/2 on the headphones, please bear this in mind when you select the audio channels for recording.



8. Monitoring and Recording

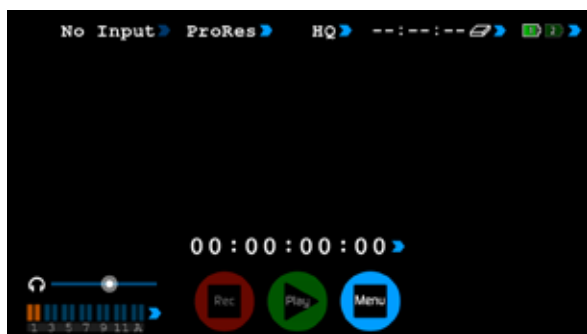
Connect to input

As soon as you connect a supported input to the Samurai Blade's HD-SDI input and have inserted a formatted drive:

- Rec and Mon icons will go solid and colourful
- The input format will be shown in the top left corner
- Audio inputs will show levels in bottom left corner



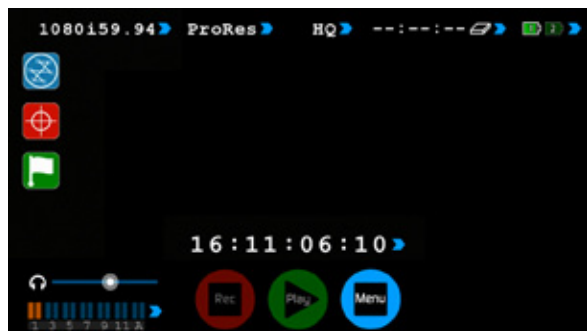
READY-TO-RECORD



NO INPUT / NO DISK / NO DISK FORMATTED



NO INPUT / DISK PRESENT



INPUT PRESENT / NO DISK

 The Samurai Blade has a high-quality screen that adjusts to the scan frequency of the incoming signal, for a smooth, accurate display.

Before recording

- Check there is a valid signal by looking at the main screen, ensuring it looks like the 'ready-to-record' screen
- Check the input signal is set to what you would like:
 - Progressive with 2:2 or 3:2 pulldown or
 - Interlaced
- If you see No Input for any reason please check your camera settings match a supported format for Samurai Blade. See technical specifications on page 36.
- Check you have your audio in record set as you require.
- Connect any additional Analogue audio inputs and adjust gain accordingly.
- Connect headphones and monitor the Audio channels to make sure the sound is as expected
- Enter monitor mode to ensure the video is coming in as expected.
- Check you have the correct Scene & Shot number selected. (see page 24 – Organising Material on disk)
- Check your drive is inserted and has been formatted
- Check your timecode settings are as required
- Choose how you will start/stop your recording
- Check for clean input:

By touching the screen in Monitor mode, you can remove the Atomos overlays to give you a clean screen. If any overlay graphics remain, these will be coming from your camera. Please check the settings on your camera to switch these off.

Choosing your recording format

You can select the recording format by touching the top middle of the touch screen where the format is indicated.

1080i59.94 ➤

 **IMPORTANT:** You need to match the format you are recording internally on the camera with the format recorded on the Samurai Blade.

If you are recording 24p internally on the camera you need to record 24p on the Samurai Blade so the recordings match. To adjust the recording format simply touch the format icon repeatedly and the Samurai Blade will cycle through the options available. The basic rule is match the format of the internal recording on the camera (not the external output of the camera). For more explanation on choosing the correct format on the Samurai Blade and the relationship to camera internal format and output format refer to Section 10 – Pulldown.

8. Monitoring and Recording cont.

SmartControl

SmartControl is a versatile set of functions used to control the starting and stopping of recording by automatic or external means. This section outlines the different methods to start and stop recording.

Samurai Blade Start and Stop record control can be triggered by the following methods:

1. Home Page Touch Screen
2. Monitor Page
3. HD-SDI Rolling Timecode trigger
4. HD-SDI Camera trigger
5. Via LANC for Sony and Canon Cameras
6. Via LANC serial port

1. Home page Touch Screen

By pressing Rec (Record)



2. From the Monitor Page

By pressing Rec (Record)



3. HD-SDI Rolling Timecode Trigger record



If HD-SDI timecode is selected and the camera is in Record run mode, the user has the choice to start and stop recording remotely from the moving SD-SDI timecode.

To enable this arm the TC icon.

Set the Timecode to HD-SDI

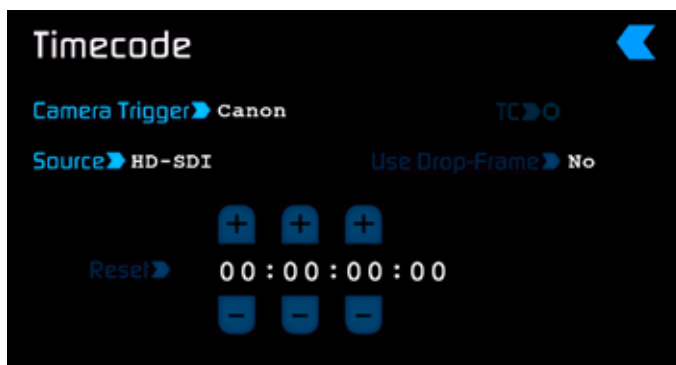
Set Camera trigger to None/Timecode.

When enabled the camera and the Samurai Blade will start and stop recording simultaneously.

NOTE: Rolling timecode trigger is for use when the camera is in REC RUN timecode mode only. If your camera is set to FREE RUN this trigger will start recording immediately and cannot be stopped until the input is removed. Please be that aware not all cameras have Start/Stop flags for triggering record, especially older cameras. In such cases rolling trigger in REC RUN will need to be used to trigger recording automatically at the same time as the camera starts recording.

4. HD-SDI Camera trigger record

The HD-SDI Camera trigger is manufacturer-specific, you will need to select the appropriate manufacturer for your camera. There is a flag within the SDI signal that lets the Samurai know the start/stop record has been pressed on the camera; in turn this will trigger the Samurai to start/stop recording at the same time as the camera.



To enable this set Timecode to HD-SDI then set the camera manufacture in the timecode menu.

When the manufacturer is selected in Camera trigger, this will disable the Timecode trigger.

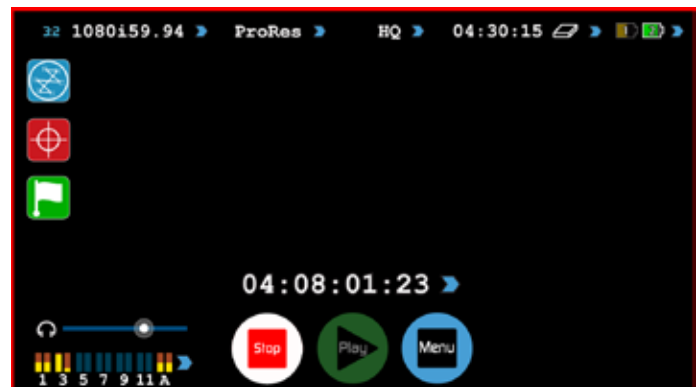
5. via LANC for Sony and Canon Cameras

6. via the LANC serial port

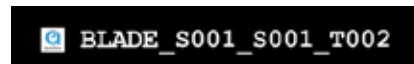
Controlled by a third party computer or controller. For system and OEM integration, contact support@atomos.com

Once you are recording you will see:

- The Rec button has now changed to Stop on the main screen
- Play button has been disabled
- A transparent red boarder appears around the entire screen



Your files will be recorded to your drive with the `unitname`, `scene` and `shot` you have set up.

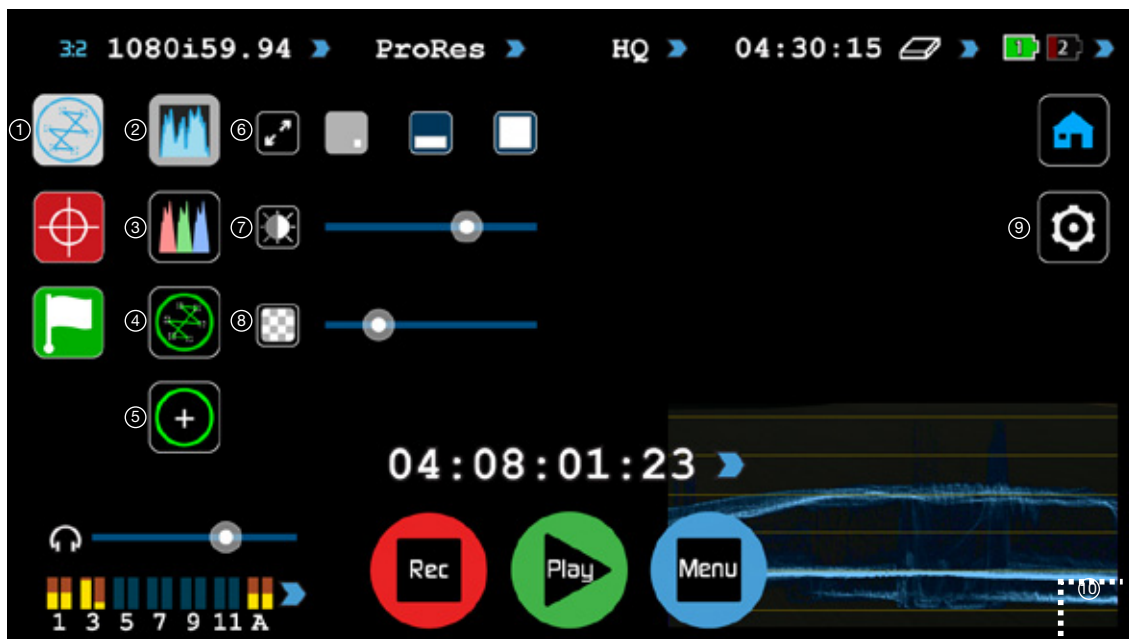


To stop, press the **stop** button on the Samurai Blade monitor or the camera record button for either HD-SDI trigger.

8. Monitoring and Recording cont.

Waveform Monitoring

New to AtomOS5 and the Samurai Blade is **Waveform Monitoring** which can be enabled with only a few button presses.



Waveform Monitoring Overview

- | | |
|-----------------------|---|
| ① Waveform Monitoring | ⑥ Waveform Size (1/4, 1/3 and Full Screen view) |
| ② Luma Overlay | ⑦ Dynamic Range |
| ③ RGB Parade Display | ⑧ Transparency |
| ④ Vectorscope | ⑨ Waveform Monitoring settings |
| ⑤ Vectorscope Zoom | ⑩ Waveform Size touch zone |

What is Waveform Monitoring?

Waveform Monitoring is used for measuring the brightness, luminance or chroma values from a video input signal. This feature has several benefits to the production workflow including:

- Ensuring camera to camera matching accuracy when shooting multicam.
- Returning to locations for additional pick-up shots.
- Assisting with colour correction.
- Camera white and black balance

How to use

To enable the Waveform Monitor, press the Waveform Monitoring icon on the home screen.



Waveform Monitoring icon



The Waveform Monitoring icon will only be visible if there is an input signal detected.

8. Monitoring and Recording cont.

Waveform Monitor Types

Inside the Waveform Monitoring menu, two types of Waveform Monitors are available for use:



Luma Overlay



Vectorscope



RGB Parade

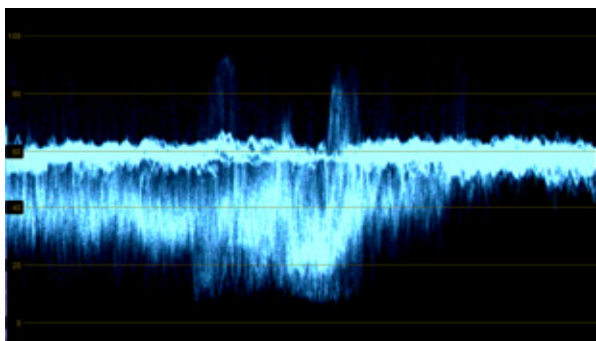


Vectorscope Zoom

Luma Parade, RGB Parade, Vectorscope and Vectorscope Zoom are enabled simply by touching the corresponding icon and will be by default displayed at the bottom right hand corner.

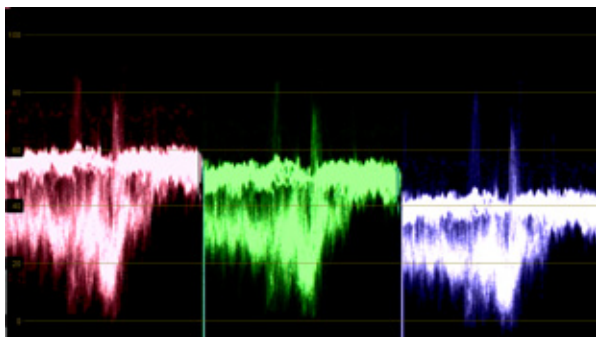
Luma Overlay

Luma Overlay shows the levels of brightness from an input source and makes it clear where overexposed or dark areas are on an image. Low values indicate an underexposed area, while high values indicate overexposed areas.



RGB Parade

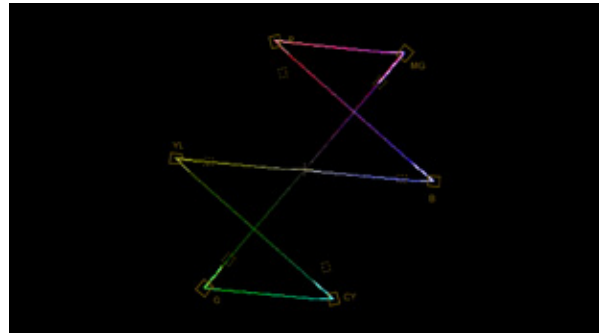
RGB Parade will monitor the level of Red, Green and Blue from an input source. The RGB channels are displayed side by side. Each colour channel is measured from -6 to 108.



 The Waveform Monitor will remain on screen when hiding the overlays ensuring the focus remains on calibrating your image.

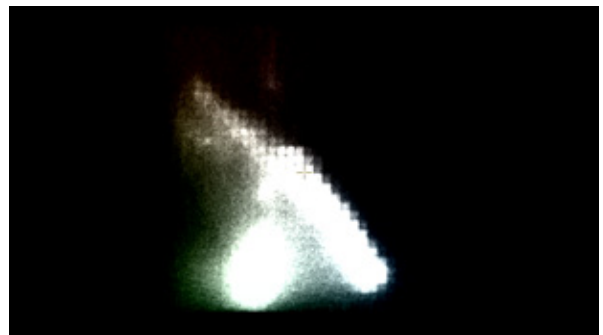
Vectorscope

The Vectorscope display shows empirical colour information of hue (shown as a phase vector), vector and color strength (measured by outward distance from the centre). It is invaluable for setting camera white and black points, identifying areas that are desaturated and for determining if your shot requires color balancing. You can also use this function to colour match previous scenes and shots..



Vectorscope Zoom

The Vectorscope Zoom shows an accurate scaled up view of 8:1.



Waveform Monitor Settings

From within the Waveform Monitoring menu, press the Settings icon to access the display settings for the waveform.



Settings icon

To change the size of the waveform, press on the 1/4, 1/3 or Full Screen icons and the display will update immediately.



Waveform Size settings

 To toggle between Waveform Monitor sizes of 1/4, 1/3 and Full Screen from the Home Screen, press the bottom corner of the waveform.



Dynamic Range



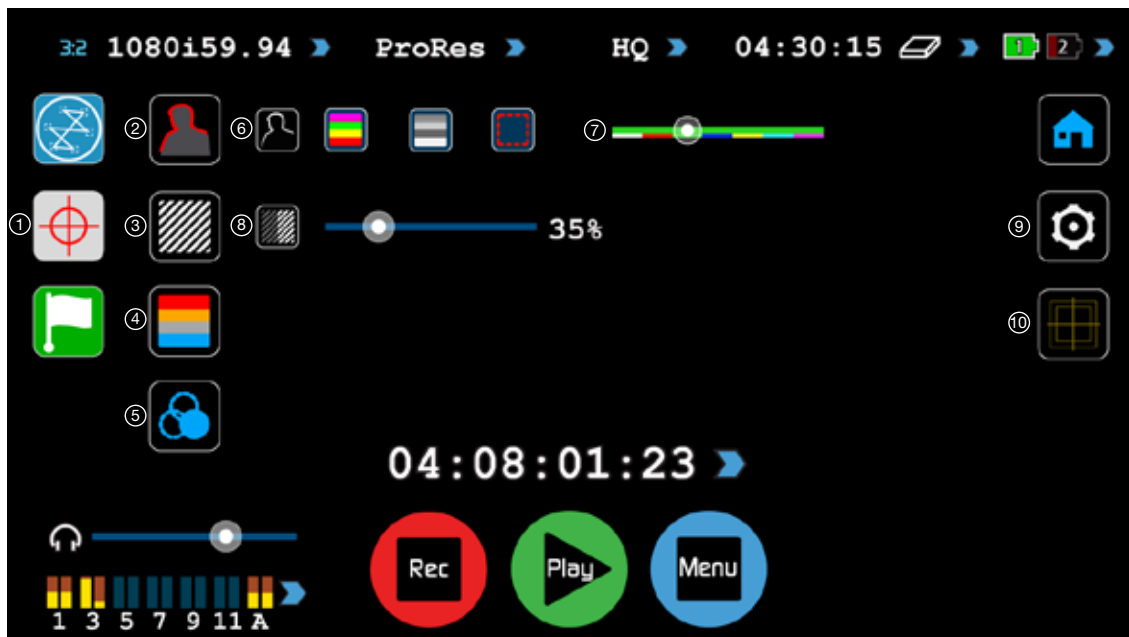
Transparency

The Dynamic Range slider directly controls the intensity of the waveform while the Transparency slider adjusts the transparency values of the waveform display on screen.

8. Monitoring and Recording cont.

Monitor Assist

AtomOS5 features SmartMonitor tools that help with making your shot picture perfect. Easily access Zebra bars, Focus Peaking, False Colour and Blue Only Exposure.



Monitor Assist Overview

- ① Monitor Assist
- ② Focus Assist
- ③ Zebra Pattern
- ④ False Colour
- ⑤ Blue Only Exposure
- ⑥ Focus Peaking Mode (Colour, Monochrome, Outline)
- ⑦ Focus Peaking colour options
- ⑧ Zebra Threshold
- ⑨ Monitor Assist settings
- ⑩ Safe Area/Grid Lines

Using the Samurai Blade as a field monitor and viewfinder

With its 5" high-resolution color 1280x720pixel screen, the Samurai Blade makes a great field monitor. So good, in fact, that you don't need any separate monitoring equipment. You could even say that the Samurai Blade is a "Recording Monitor".

How to use

To enable the Monitor Assist functions, press the Monitor Assist icon on the home screen.



Monitor Assist icon

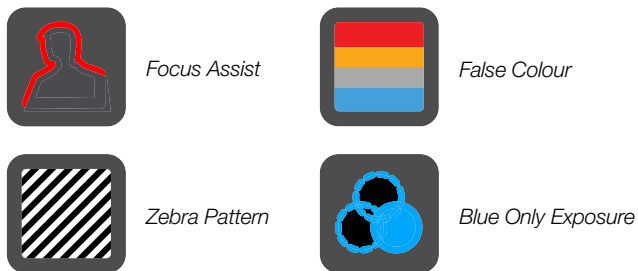


The Waveform Monitoring icon will only be visible if there is an input signal detected.

8. Monitoring and Recording cont.

Focus Assist Types

Inside the Focus Assist menu, four types of focusing tools are available for use:

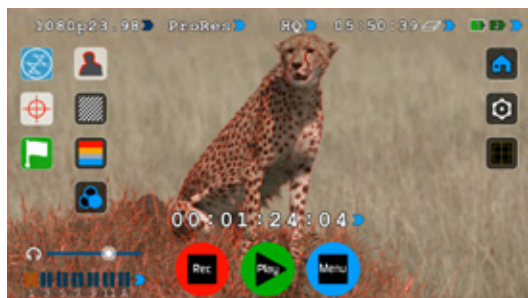


Focus Assist, False Colour, Zebra Pattern and Blue Only Exposure are enabled simply by touching the corresponding icon in the menu.

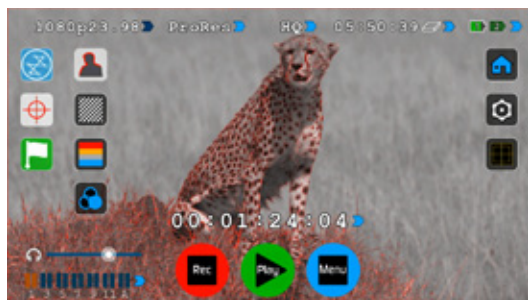
You can apply all filters to your monitor at the same time, however can be set up individually for your needs

Focus Assist

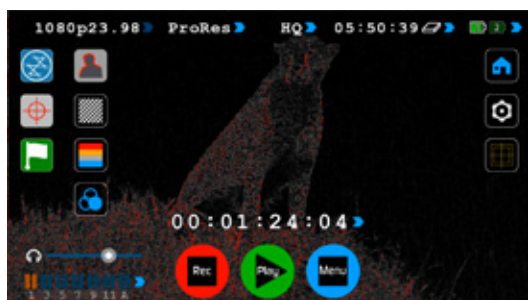
Focus peaking allows the user to ensure their recordings are always in focus. The parts of the image in focus are indicated by the selected colour. This tool is very accurate.



FOCUS ASSIST COLOUR



FOCUS ASSIST MONO

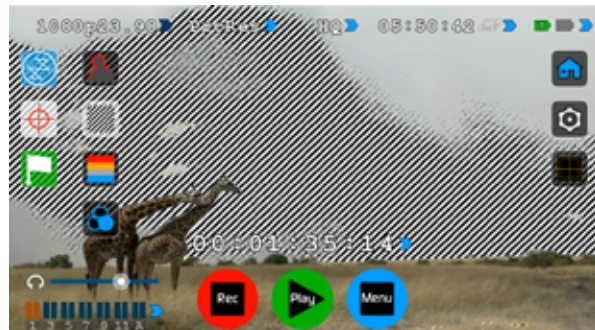


FOCUS ASSIST MONO

You can change the focus peaking colors and modes in the settings.

Zebra

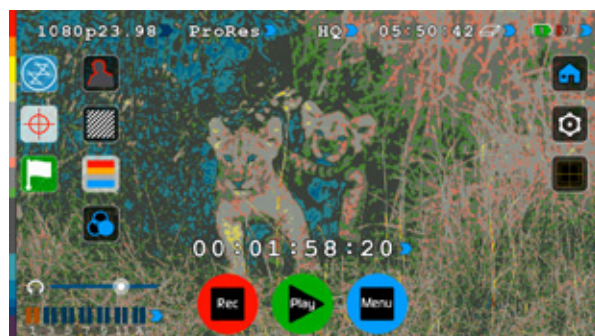
Zebra lines show the parts of the image that are over exposed relevant to the % level set. 95% is usually used for objects, windows and surfaces. 75% is used for checking over exposure of human faces this will indicate reflective or shiny areas on the face.



False Colour

False Colour assigns different colors to areas of different exposure in the image. Instead of just showing what parts of the image are overexposed, it gives a more complete picture of what is going on in the image by using a range of exposure values. Generally speaking, overexposed elements will display as red, and underexposed elements will display as blue.

The gradient between colour levels can be adjusted to have a gradient or not. If gradient is not selected, the colour levels will change instantly to the next colour level.



False Colour Scale:

To help you determine the exposure range with more accuracy, please use the scale below:

110%	100 to 109 IRE
100%	93 to 100 IRE
90%	84 to 93 IRE
80%	77 to 84 IRE
70%	58 to 77 IRE
60%	54 to 58 IRE
50%	47 to 54 IRE
40%	43 to 47 IRE
30%	24 to 43 IRE
20%	15 to 24 IRE
10%	8 to 15 IRE
0%	2 to 8 IRE
-10%	-7 to 2 IRE

8. Monitoring and Recording cont.

Blue Only Exposure

Displays a black-and-white image that is based on the blue channel of the input signal. Used to observe the noise content of a video image and the judge the overall exposure quality.



Safe/Areas/Grid Lines

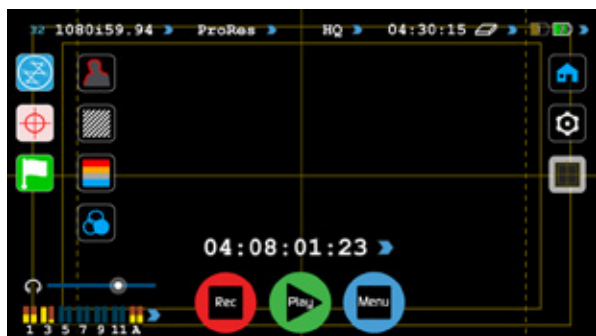
AtomOS5 now includes Safe Area/Grid Lines overlay to help frame for Safe Areas, Titles Safe, Centreing and 4:3 Framing.

How to use

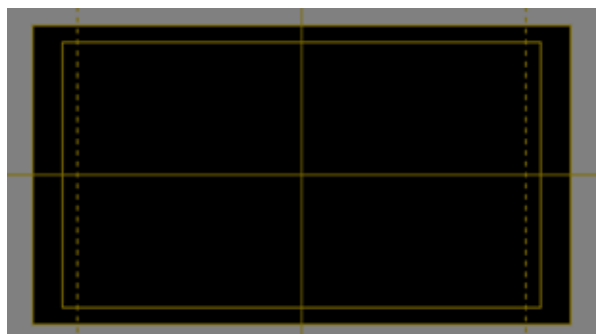
To enable the Safe Area/Grid Lines, press the Monitor Assist icon on the home screen, then select the Safe Area/Grid Lines icon below the settings icon.



Safe Area/Grid Line icon



SAFE AREA/GRID LINES SHOWN WITH MENU OVERLAYS



SAFE AREA/GRID LINES SHOWN WITHOUT MENU OVERLAYS

 The Safe Area/Grid Lines will still be visible when tapping the centre of the screen to hide the overlays.

Focus Assist Settings

From within the Waveform Monitoring menu, press the Settings icon to access the display settings for for Focus Peaking, Zebra, False Colour and Blue Only Exposure.



Settings icon

To change the Focus Assist modes, press on the Colour, Mono or Outline icons and the display will update immediately.



The color of the Focus Assist can be changed by dragging the slider, the color selected will be reflected in the top line.



The Zebra threshold value can be adjusted by moving the slider left or right. The threshold percentage will be shown on the right of the slider.



 All of these settings will update without the need to close the settings.

8. Monitoring and Recording cont.

SmartLog

SmartLog gives you the ability to tag your clips during recording (or playback, more on this later).

By the pressing the **Favourite** and **Reject** icons you can assign a “good clip” or “bad clip”. This information can then be imported into a non-linear editing system to speed up the edit process, as you can easily see which parts of your recording you have marked to keep or reject.

 *SmartLog currently only works with Apple FCP X.*

How to use in Record and Monitor mode

To access tagging press the **Cut** and **Tag** on the home screen.



Cut and Tag icon

You can now see your monitor in the background and the **Favourite** and **Reject** icons for marking clips while recording.

When you have selected **Favourite**, the icon colours will invert (Green background with white text) and the **Reject** Icon will disappear. When **Reject** is selected the icon colours will invert (red background with white text) and favourite will disappear.



MONITORING MODE: CUT AND TAGGING FOR EASY CLIP SELECTION WHEN EDITING



MONITORING MODE: CLIP MARKED AS A GOOD TAKE

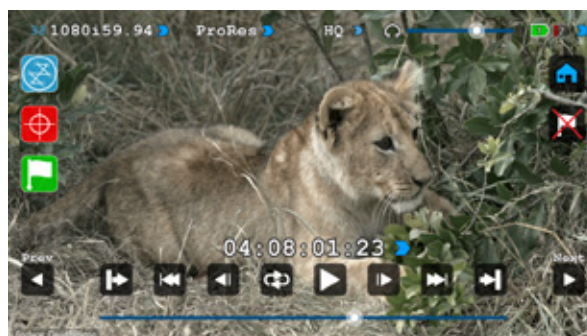
How to use in Playback mode

To review and use the **Cut** and **Tag** feature in playback mode, press on the **Play** icon on the bottom of the screen.



Playback icon

From the Playback screen, select a clip from the Media source page by directly pressing it and it will become available for marking.



To access tagging press the **Cut** and **Tag** on the home screen.



Cut and Tag icon

The **Favourite** and **Reject** icons will appear on screen.



Press **Play** and when you see the section of the footage you would like to mark as good or bad, press **Favourite** or **Reject** and then press again to stop marking that section.



 A green or red line will appear in the timeline scrubbing bar so you can identify the region that has been selected.

Removing tagged clips

To clear all marking point clips, press on the **Clear Tagging** icon below the Home screen icon.

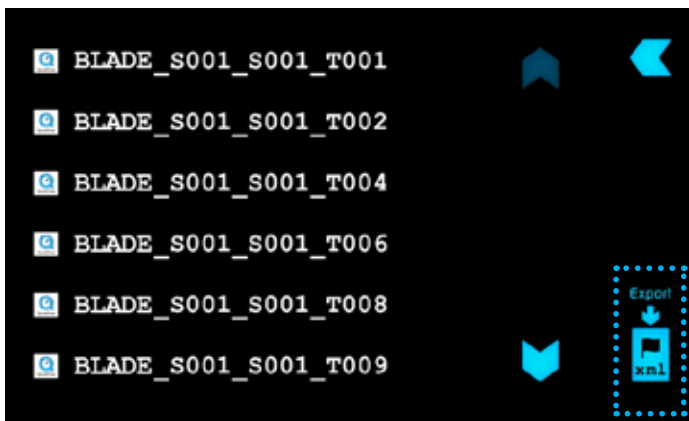


Clear Tagging icon

8. Monitoring and Recording cont.

Your final stage is to Export the XML flag:

- Enter Play or Media Information
- On the bottom right hand side there is an icon Export XML
- Press this once
- You will be shown a please wait screen (the length of time will vary depending on your recording time and amount of flags applied)
- Then it will return you to the previous screen



 You can carry on recording but please remember before you eject the drive to export your XML files.

8. Monitoring and Recording cont.

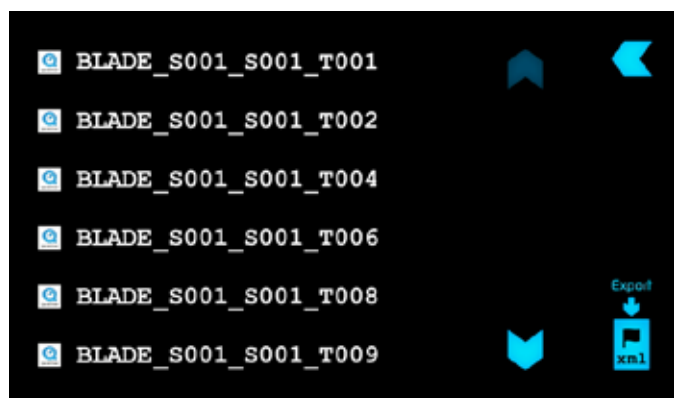
Organising material on the disk

Samurai Blade uses a **unitname**, **scene**, **shot** and **take** naming convention:

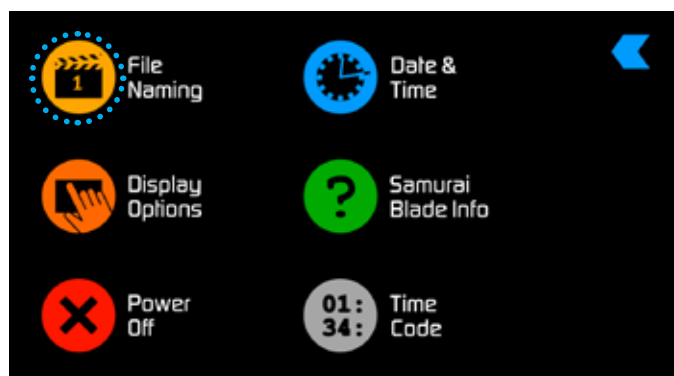
BLADE_S001_S001_T001

This was recorded on a Samurai Blade unit called **BLADE**, the **scene** selected was 1, the **shot** selected was 1 and it was **take** 1.

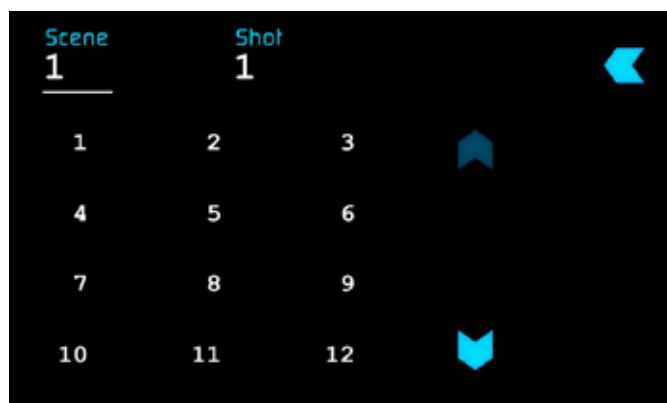
Below is an example of your playback browser window showing file names.



To organise your clips you need to access the Scene & Shot. To navigate press **Menu** on the main screen and then press **Scene & Shot** on the menu screen.



You can see along the top you have **scene** and **Shot** with a large underlined number, this is the current selection.



To change them press **scene** or **shot** (depending on the one you wish to change) then the number you wish it to set as. In each selection this goes up to 999.

Once selected you will see the underlined number at the top will have changed. You can now go back to the Main screen and start your record.

 *If you do not set this up Samurai Blade will start recording from Scene 1 and Shot 1 automatically.*

 *The Samurai Blade uses the exFAT file system. This is recognised natively by both PCs and Macs, without any need to install driver software. It is a 64-bit file system that will let you record to the full capacity of your storage medium without any need to "segment" the files. The maximum file size is so large that you do never need to worry about exceeding it.*

 *For Windows XP, service pack 3 and a special exFAT patch are required. Both are available on the Microsoft® website.*

For MAC OS Snow Leopard 10.6.5 or higher is required.

8. Monitoring and Recording cont.

Atomos Anti-Shock Technology

Spinning disks are very reliable in a controlled environment where movement and vibration are minimal and within the capabilities of the devices. They are ideal for low-cost recording, but will suffer reduced performance if they are jolted or receive a sudden impact.

Should one of these events occur, the Samurai Blade will sense the hard disk slowdown. If there is a break in the recording it will detect the number of frames involved and will then continue to record when it is safe to do so.

This means that even if you suffer a momentary break in your recording, the video capture will continue without any intervention from you, the user.

It is obviously important for you to know that you have suffered from an interrupted recording and the user interface will display a warning (in the form of a Kangaroo sign) clearly above the disk-capacity display on the main screen.

If you find you are working on a very active project where you are seeing a lot of “Skippys” then you probably need to switch to SSDs, and only use spinning disks for gentler environments.



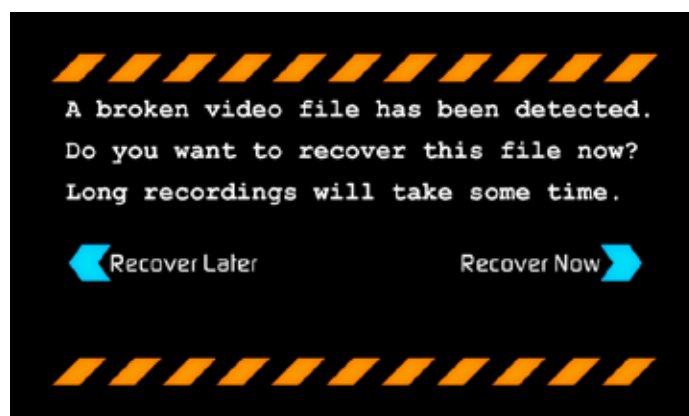
 To remove “Skippy” warning, simply touch the icon and it will disappear.

File Recovery

The Samurai Blade saves the file every 8 seconds while in recording mode, so if the recording is stopped suddenly, without closing the file properly, you will only ever lose 8 seconds of material.

In the event of an interrupted recording, when you restart the Samurai Blade, or enter playback mode, you will be presented with a menu that gives you the option to recover immediately, or recover it later.

If you recover later, every time you put the disk in, or start up the Samurai Blade, the same menu will appear to prompt you to recover the file that did not close properly.



 If the drive is broken, or has become corrupted, then we will not be able to recover the file and we recommend that you try third-party hard disk recovery software.

9. Timecode

Using Timecode

Touching the timecode display on the home screen, just above the three main coloured controls, will take you to the Timecode setup screen (this is also accessible by touching Menu and then Timecode)

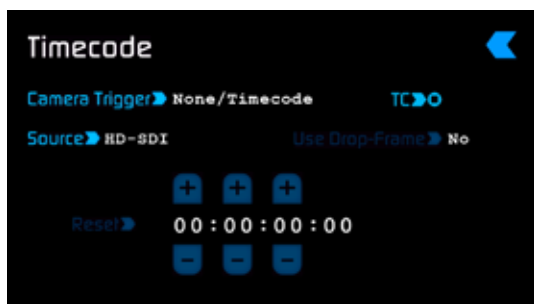
04:08:01:23 ➤ OR 01:34:

Occupying the lower-centre part of the screen is the timecode display with controls to set the start-time of the timecode.

The four timecode modes supported are:

- HD-SDI
- Time of Day
- Record Run
- Auto Restart

Cycle through these modes by touching the timecode Source Selector.



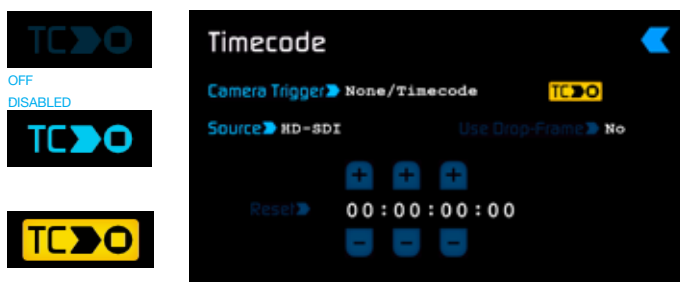
HD-SDI embedded timecode

With this setting, the SDI input will set the timecode (as long as the source SDI device supports this). The controls to adjust the timecode value are disabled in this setting because the embedded timecode in the SDI signal sets the Timecode value of the recording. If you want to adjust this please, refer to the manual of your SDI input device.

Trigger from HD-SDI time code

If HD-SDI timecode is selected and the camera is in REC RUN mode, the user has the choice to start and stop recording remotely from the source camera HD-SDI timecode.

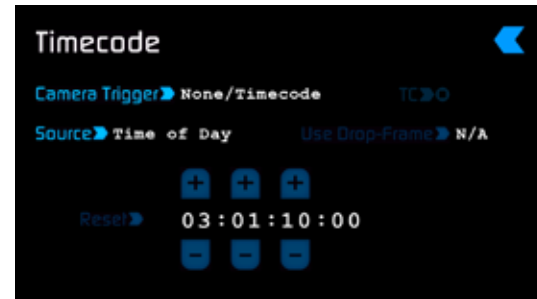
To enable rolling Timecode Start/Stop functions, simply press the TC icon shown here. When enabled, pressing the camera Record Stop/Start button will make the Samurai Blade start and stop record simultaneously as the timecode starts and stops.



When using the camera in Free Run timecode, the rolling timecode trigger might not work as expected. However, depending on the camera, you can trigger record function by the embedded flag/trigger in the HD-SDI signal. Most higher end cameras have this functionality; if unsure contact us at support@atomos.com

Time of Day

With this selected, each new clip that is created will contain embedded timecode accurately showing the time of day that it was recorded, based on the internal Samurai Blade Time of Day clock. This can be set in Menu > Date & Time



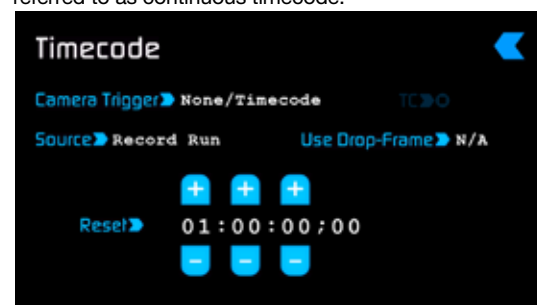
If recording is stopped and then restarted while in this mode, there will be a time gap between the last clip and the next one, equal to the length of time the Samurai Blade has been out of record. The start timecode of each clip will be the exact time of day when recording started.

Time of Day timecode is useful as a reminder of the time that clips were recorded. It can also help with syncing-up of multiple cameras, but remember that the accuracy of the correlation of Time of Day timecode between Samurai Blades will depend on how closely their internal clocks are synchronised.

In Time Of Day mode, the controls on the Timecode Setup Screen for adjusting the start-point of the Samurai Blade timecode are not available, as the timecode is set by the Samurai Blade's internal clock.

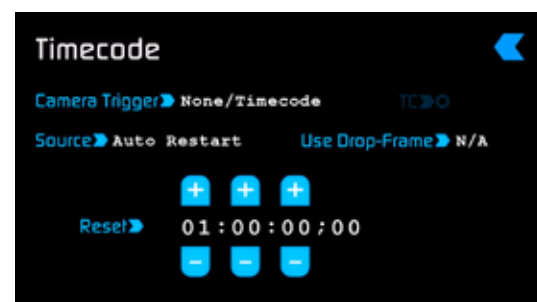
Record Run

With this setting you set the start timecode of the first clip and the following clip will start at the frame immediately after the out point of the preceding clip. This will continue for all clips that follow. This is often referred to as continuous timecode.



Auto Restart

With this setting, the timecode will be reset to the timecode you define here whenever you press record. All your clips will start at this timecode.



To adjust the timecode use the "+" and "-" above and below the hour:minute:seconds sections

10. Pulldown

What is Pulldown?

3:2 Many professional and consumer cameras available today do not send true 1080p24, 1080p23.98, 1080p25, 1080p29.97 or 1080p30 signals down their SDI or HDMI outputs.

2:2

Instead they send 1080i59.94 in NTSC regions (eg USA, Japan), and 1080i50 in PAL regions (eg Europe)

In order to convert the signal from the internal recording format to 1080i5994 or 1080i50, they use a process called 3:2 or 2:2 pulldown.

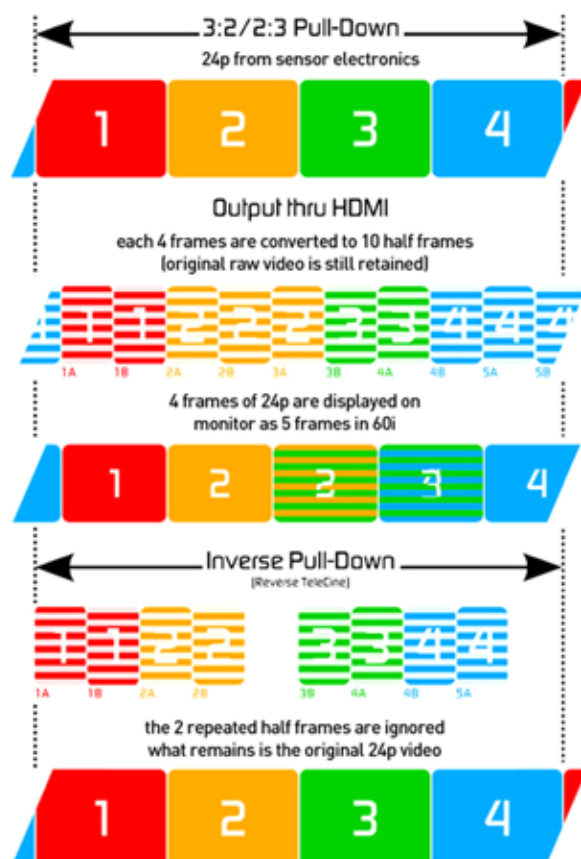
Camera Setting	Pulldown	Samurai Blade Receives
1080p23.98	3:2	1080i59.94
1080p24	3:2	1080i60
1080p25	2:2	1080i50
1080p29.97	2:2	1080i59.94
1080p30	2:2	1080i60

You will, of course, want the Samurai Blade to record eg 1080p24, not 1080i60 to the disk. In many cases, it is not easy for the Samurai Blade to detect the pulldown operation in the video, so you will have to set the correct mode in the Samurai Blade as well as setting it on your camera.

With some cameras, the Samurai Blade can detect and remove the pulldown automatically, in which case the mode you expect (eg 1080p23.98) will display on the Samurai Blade and you will not have to do anything further.

If there is no input detected, then toggle the input by pressing the screen until you see the input you wish to record.

Atomos is adding auto-detection support for more cameras, please check for firmware updates regularly at www.atomos.com



1080p23.98 or 1080p24



1080p23.98 ➤

1080p24 ➤

If you have set 1080p23.98 or 1080p24 in your camera and your Samurai Blade displays 1080i59.94 or 1080i60, then you can easily remove the pulldown by following these steps:

- Press the **blue arrow** next to the **video format** repeatedly until you see 1080p23.98 (or 1080p24) displayed. You will see that the **MON** button is dimmed. Your Samurai Blade needs to analyse the video for about 1 second, in order to detect the pulldown sequence and remove it.
- If it is not automatically detected after 1 second, wave your hand from side to side in front of the lens, or wave the camera from side to side for a few seconds. The Samurai Blade will detect the pulldown in the movement, the input video format will show 1080p24 and the **Mon/Rec** button will highlight.

3:2 pulldown detection is difficult, if not impossible to detect on completely still video. This is why you should wave your hand in front of the lens.

If you lose the input detection – for example you unplug the SDI cable or go to Playback mode, you will need to wave your hand or the camera again, when the signal is restored to the Samurai Blade.

Some cameras use a variant of pulldown removal, for example Panasonic Advanced pulldown. The Samurai Blade does NOT support this format, and it will not be detected.

Standard Panasonic pulldown is supported, ensure in the Panasonic camera settings that pulldown is not set to Advanced.

1080p25, 1080p29.97 or 1080p30

For these modes, simply press the **blue arrow** repeatedly until your 1080p desired format is displayed. There is no need to wave your hand or the camera, as 2:2 pulldown removal does not require moving video.



1080p25 ➤

1080p29.97 ➤

1080p30 ➤

11. Playback & Playout

Using the Playback and Playout features

The Samurai Blade has a powerful playback function that allows you to playback pristine Apple ProRes or (optionally) DNxHD recordings in real-time with controls to navigate quickly to any part of a clip, the ability to play recorded content faster than normal playback speed or step through the clip frame-by-frame to check your footage very accurately.

Playback makes the Samurai Blade a fully-functional portable HD Deck with quality visually identical to uncompressed!

Whenever a clip plays on the Samurai Blade's screen, it will also be presented as an HD-SDI signal through the Samurai Blade's HD-SDI output. You can view this on an SDI monitor, or, using an optional Atomos S2H Connect Converter, on an HDMI monitor.

To play back a clip, first touch the green Play control on the home screen. There will be a short pause while clips are made available for playback. You will then be taken to the Play Navigation screen.

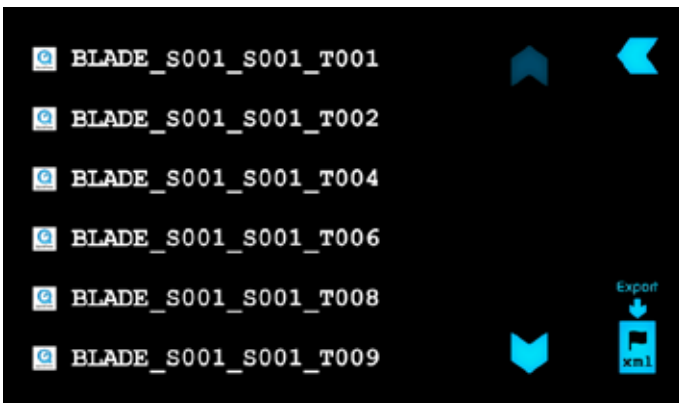


exFAT Disks

If the disk has been formatted on Samurai Blade it will use the ExFat file system. The Play navigation screen will display a list of files that have been recorded. The naming convention used includes the unit's name, Scene number, shot number and take number, e.g.

BLADE_S001_S001_T001.mov

This list is ordered in the same order it was recorded in. To navigate the list use the up and down arrows to scroll through. If you edit the XML in playback this will put the file to the top of the list. To play the item touch the file you want to play and this will start the playback.



FAT32 Disks

If the disk has been formatted on a Mac/PC as FAT32, it will use the FAT32 file system.

 As a general rule, we do not recommend FAT32 for recording video.

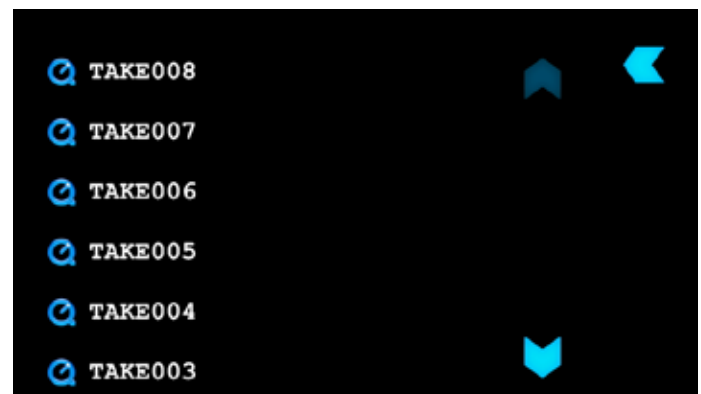
The Play navigation screen will display the Scene and Shot folder structure.

The first screen will show you all the Scene folders. In the picture below we can see Scene001) within the Scene Folder are any Shot folders. In the picture below you will see the 5 different shot folders. Within each Shot folder will be the list of takes.

Fat 32 has a file size limitation of approx 4GB, when you recorded on the Samurai Blade it would generate a new take each time the recording exceeded this limit.

You will notice the take has a different icon, this indicates the file can be played back.

You can navigate the files and folders using the blue up and down arrows. Once you see the take you would like to playback, touch the take icon you want to play and this will start the playback.



11. Playback & Playout cont.

Once a file has been selected for playback, you will see the following options:

Scrub Bar

This is the thick blue line along the bottom of the playback screen. A vertical white “now” line shows the current playback position. You can think of the scrub bar as representing the length of the clip. If you touch the scrub bar, playback will start from that position.

Simply by running your finger along the scrub bar, you can move forwards or backwards through any clip - even if it is eight hours long - at any speed.

Play/Pause



This is the master playback start/stop control and is found to the right of the scrub bar. It toggles between play and stop.

The remaining play controls have two modes depending on whether the Samurai Blade is in Play or Pause.

Play mode



Fast Reverse/Fast Forward



Plays the clip at 8x normal speed

Fast Fast Reverse/Fast Fast Forward



Plays the clip at 64x normal speed

Pause mode



Frame Reverse/Frame Forward



Moves the clip forward/backward by a single frame

Go to end/Go to start



Goes directly to the beginning/end of the current clip

Note that you can jump between any of the controls while in playback: you do not have to press Stop first.

Previous/Next Clip



Move between the previous and next clips for playback.

11. Playback & Playout cont.

Loop Mode



The Samurai Blade has the ability to play back a single clip in loop mode via the HD-SDI output. This can be performed with captured clips at full broadcast quality or the final edited clips from your hard drive.

To do this:

- Go into Playback mode
- Pick the clip you want to loop

 Note that when you first select a clip for playback, longer clips will take slightly more time before they start playing. All subsequent navigation within clips of any size will be instantaneous.

- Use the scrub bar to locate the point you wish to start from (In point) and select the **In point** icon on the top left hand side of the playback screen. This will turn red to confirm that it is active.



- Repeat this for the desired Out point by selecting the **Out point** icon on the top right hand side. Again this will change to red.



- Now select the **Loop** icon in the top middle of the screen - that will also turn red to indicate that it is active.



- Press the **Play** button. The segment of the clip you have selected will now loop until you press the **Stop** button.

To change the In and Out points, just stop playback and adjust the start and stop points. Press **Loop/Play** again.

 You can loop the playback of the entire clip by simply pressing **Loop**, then **play**.



 At any time, you can hide all the visible controls by simply touching the screen (away from any controls) once. Touch it again to bring back the controls.

Headphone volume



Allows you to adjust the headphone volume while in the playback page

Timecode

04 : 08 : 01 : 23

This shows the timecode of the 'Now' line

Interlaced playback

Samurai Blade playback shows a frame at a time. If the video footage is interlaced (ie with two fields, each separated by 1/50th or 1/60th of a second) it will play back perfectly well, but when playback is stopped, the frame showing on the screen will flicker between the two fields.

This is a useful and accurate method to determine whether your originally captured footage is progressive (even if it is delivered via an interlaced signal) or genuinely interlaced.

12. Connecting and Editing

Connect

To access and edit your recorded material, connect the Master Caddy Docking Station to a Mac® or Windows® editing workstation via USB 2.0 or USB 3.0.

Eject the Master Caddy from your Samurai Blade and insert it into the Docking Station. After a short wait, the recorded video will be accessible to the target computer via a standard disk (exFAT) file system.

NLE supported

We have chosen the Apple ProRes® and Avid DNxHD® codecs as they are both not only visually lossless, but also edit-ready formats. All major NLEs support ProRes and DNxHD.

- Final Cut Pro (version 7)
- Final Cut X
- Adobe CS5 (with 5.51 update)
- EDIUS 6
- Sony Vegas 10
- Lightworks
- Avid Media Composer 6

Avid DNxHD® support requires online activation.

ExFAT compatibility

The Samurai Blade formats your disk as exFAT. We have chosen this file system to overcome the 4GB file limitation of FAT32 and keep compatibility on both Windows and MAC OS.

The Operating Systems that support exFAT are:

- Windows XP - install the following update :
<http://www.microsoft.com/download/en/details.aspx?id=19364>
- Windows Vista - install SP1 or higher
- Windows 7 (32/64bit)
- Snow Leopard 10.6.5 or higher
- Lion 10.7
- Mountain Lion 10.8



The Master Caddy Docking Station is a sophisticated device supporting two different data interfaces: USB 2 and USB 3. Note that when using the Master Caddy Docking Station you may need to connect an additional USB cable to the 5v power input. This is because when it has to power a disk drive and its interface electronics, the Docking Station may consume more power than is available from a single USB port. We supply you with a USB to 5v Power Supply socket for this purpose .

Transferring Files

Now your docking station is connected and your disk is recognised by your operating system, you can edit directly from the drive or copy the files to your own storage.

Windows

Open the disk in My Computer > Select all the files or just the ones you wish to transfer, copy and paste them to your desired location. (ctrl+c copy, ctrl+v paste).

Mac OS

Your Samurai Blade disk will show in Finder. Select the files you wish to transfer, drag the files to your desired location or use the copy and paste commands.(⌘+c copy, ⌘+v paste).



If you have used a FAT32 formatted disk in the Samurai Blade this will have a folder structure Scene, Shot, Take. This will mean you either transfer all the folders or utilise the Windows Search or MACs automate program to transfer just the .mov files. There are instructions on this in our knowledge base; visit www.atomos.com/support for more info.



12. Connecting and Editing cont.

Importing

Final Cut Pro (version 7), Final Cut X, Adobe CS5 (with 5.51 update), EDIUS 6, Sony Vegas 10, Lightworks and Avid Media Composer 6 support imported files from your Samurai Blade disk.

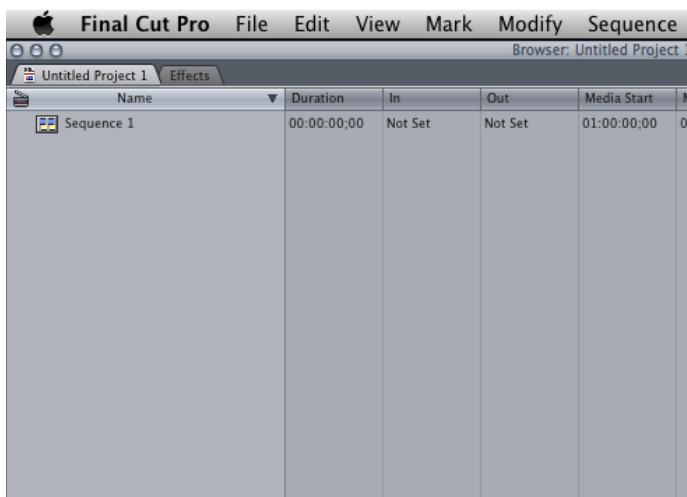
Importing Samurai Blade footage into Final Cut Pro

You can import Samurai Blade footage into Final Cut Pro (FCP) in just a few simple steps.

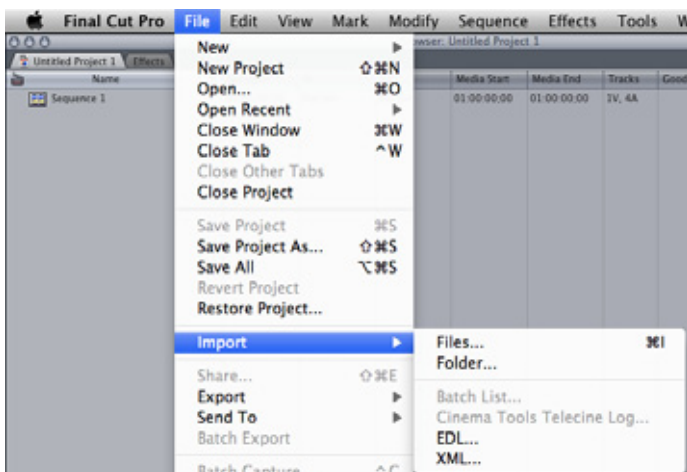
First, connect the Samurai Blade Docking Station to your Apple Mac using the USB 2.0 or USB 3.0 port. Insert the Samurai Blade Master Caddy containing the disk with your footage into the Docking Station and you will see the drive appear in your Finder window.

Start FCP and open your project (or start a new one).

The screen will look like this:

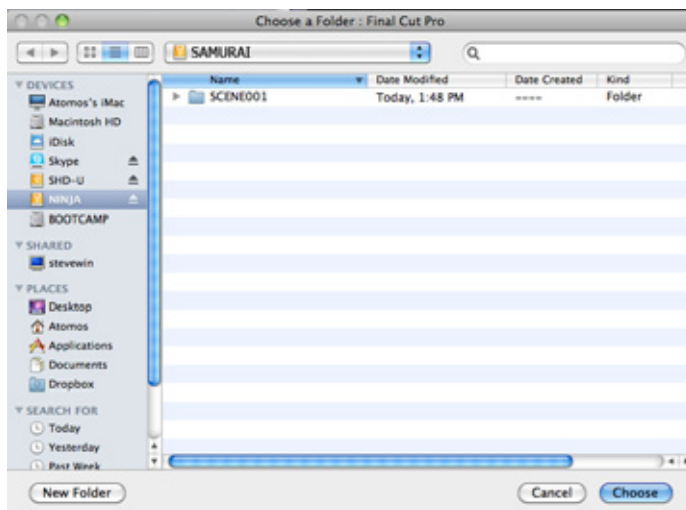


Go to the File menu and select Import > folder:

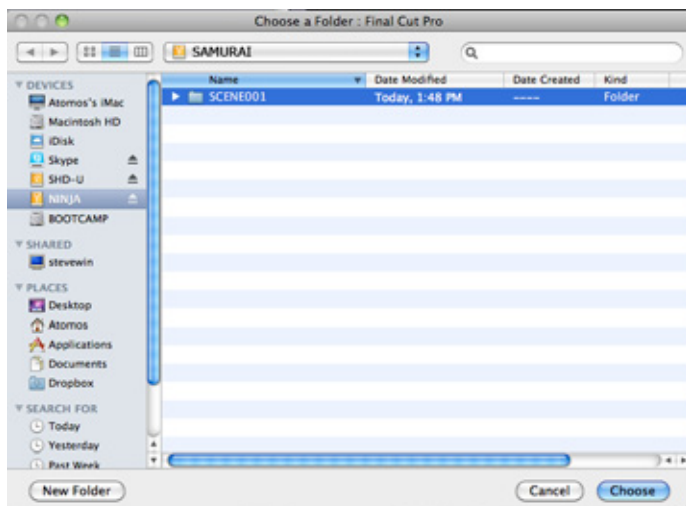


FCP will show you a “browse” window. Look for the Samurai Blade drive, and click on it.

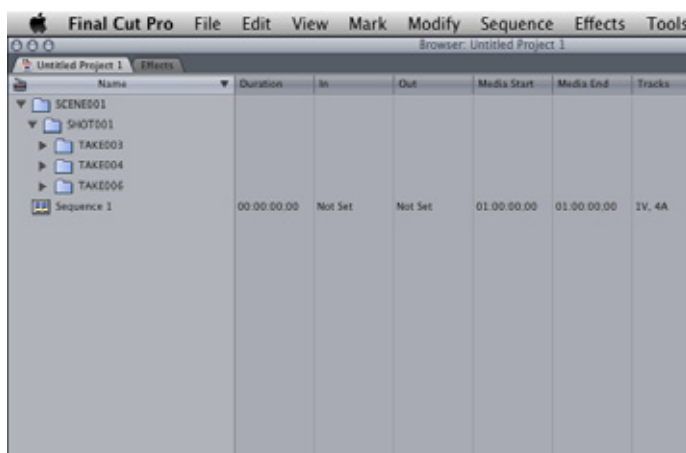
You’ll see the folders in the Samurai Blade drive. **Select the folder containing the footage you want to import:**



Click on **Choose** and go back to your FCP project window:



Your Scene, Shot and Take folders now appear in the project window, ready for use in your FCP project.



12. Connecting and Editing

SmartLog with FCP X

Prior to importing the XML files into FCP X, ensure that:

- You have exported XML whilst the drive is in your Samurai Blade
- You have connected your Master Caddy Docking Station and inserted your Master Caddy into the Dock
- You are using an operating system that supports ExFAT
- Your QuickTime version is up to date
- FCP X is the latest version

There are 2 ways to import the XML file:

1. Directly from the docked hard drive
2. Manually into FCP X

1. Automatic Import

- Open Finder
- Select the drive (in this example it is EXCVIDEO)
- Double-click the unitname.FCPXML file
- This will open FCP X and import the .xml file

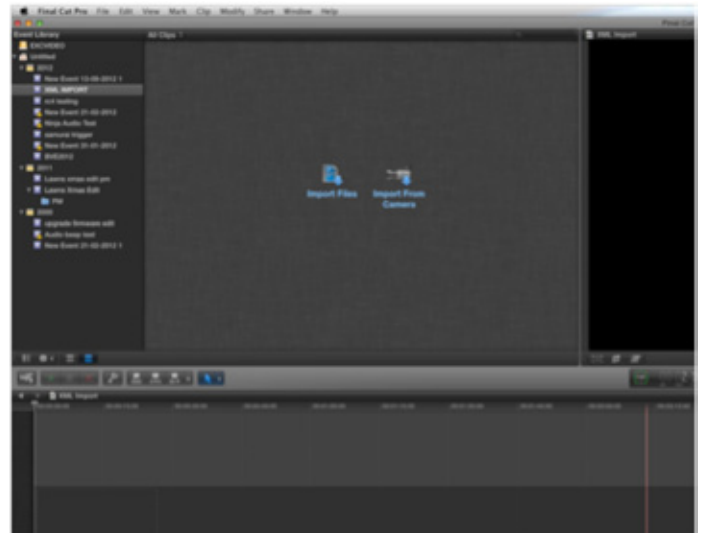
FCP X will make a event of the disk name and reference all the footage in that event.

You will notice that on the clips you have added Smart Tags too, with Green and Red indicating Favorite and Reject.

You can sort these by using the pull-down menu to show favorites. This will show all the individual favorites as separate clips in the Event Viewer.

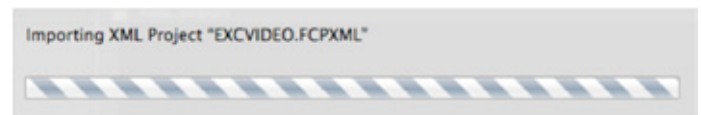
2. Manual

- Open FCP X
- Create a New Project (or you can use an existing project); in this example it is called XML Import
- Select File, Import, XML

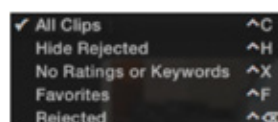
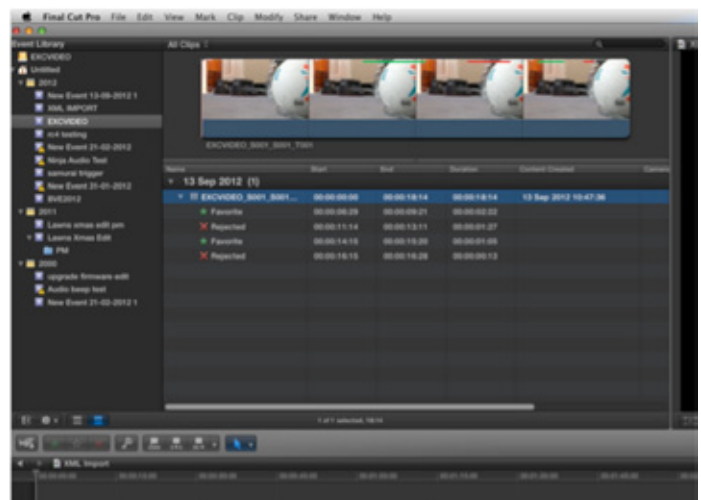


- Select the Samurai Blade drive under Devices (in this example it is called EXCVIDEO)
- Choose the unitname.FCPXML, select Import

The XML will import



Once imported you can expand the clip and you will see the Favourite and Reject tags. You can also filter the view to only see Favourite, etc.



13. Using Samurai Blade with external power supplies

AC Adaptor (included)

This connects on the battery slot on the back of the Samurai Blade. Please ensure it is connected to slot 1. The end of the adaptor will connect to a mains plug.

Alternatively you can use any NP-Compatible Charger or power supply, as long as they use a “Dummy Battery”.

D-Tap Adaptor (included)

This adaptor allows you to take the power supply from any source that has a D-Tap connection such as V-Lock

The D-Tap also connects to the battery slot of the Samurai Blade, please ensure it is in slot 1. You will need a D-Tap to D-Tap cable (sold separately). Voltages 7.2 to 16.8 volts. Please refer to Atomos D-Tap document on the Atomos Knowledge Base.



14. Using Samurai Blade with Atomos Connect Converters

CONNECT

You can think of Atomos Connect Converters as stand-alone devices or as specially designed modules to give the Samurai Blade additional capabilities. With them you can:

- Add an HDMI input to the Samurai Blade for connection to non-HD-SDI devices using Connect H2S
- Add an HDMI output to the Samurai Blade for playout to HDMI monitors using Connect S2H

There is nothing to set up when you use a Connect Converter. Just secure the device in a battery slot (in Slot 1 if you only have a single battery) and place the battery that previously occupied that slot in the battery slot on the converter.



15. Software updates

Updating AtomOS (Firmware)

From time to time we will issue software updates for your Samurai Blade. To update the firmware (that's the software that runs inside your Samurai Blade), there is a simple procedure you have to follow.

- Go to www.atomos.com/samurai-blade-firmware/
 - Locate and download the firmware upgrade
1. Extract the file **ATOMBLD.FW** from the firmware zip file.
 2. Copy ATOMBLD.FW onto a drive in a Master Caddy.
 - a. Atomos recommends you use a freshly formatted known good disk.
 - b. Always format your drives in the Samurai Blade. The Samurai Blade formats the drive for optimal performance for Video.
 - c. Ensure that the firmware update file is on the root of the drive, and not in a folder on the drive.
 3. Put 2 freshly charged batteries on your Samurai Blade. It is very important that your Samurai Blade does not lose power during a firmware upgrade.
 4. Power down your Samurai Blade.
 5. Insert the Master Caddy with the ATOMBLD.FW file.
 6. Power up your Samurai Blade with a short press of the Power Button.
 7. Watch the screen. The Atomos logo will appear, and then be replaced with a Please Wait logo and after a few seconds the firmware upgrade will start.
 8. While the firmware upgrade is happening, there will be flashing coloured lines above and below the Please Wait Logo.
 9. The firmware upgrade will take up to a few minutes.
 10. When the firmware upgrade is finished, the Samurai Blade will:
 - a. delete ATOMBLD.FW from the drive.
 - b. Power itself down.
 11. Turn on your Samurai Blade again with a short press of the Power Button located on the side.
 12. When the Samurai Blade has booted, Press "MENU" and then "Samurai Blade Info" and check that the version number is the version expected.

 Please ensure your batteries have plenty of charge and that you do not interrupt your Samurai Blade while its firmware is upgrading. You will see a randomised colour-bar display on the screen top and bottom of the screen while updating is taking place. When it is finished, the Samurai Blade will restart and you will be able to use the device as normal.

Problems when installing AtomOS

Very occasionally, the firmware update process can go wrong. This might be because of an incomplete or corrupted download.

In the unlikely event of your Samurai Blade becoming unresponsive, there is a built-in recovery mechanism.

All you have to do is press and **hold the on/off button for 10 seconds**. If you do this your Samurai Blade will revert to its factory condition, and you will be able to retry the firmware update later (taking due precautions to identify and remove possible reasons for the failure of the previous attempt).

16. Samurai Blade Technical Specifications

Samurai Blade Main Unit		
Lightweight	12oz (without batteries & HDD) 22oz (with batteries & HDD)	
Dimensions (without batteries)	140mm (W) x 87mm (H) x 41mm (D)	
Construction	Aircraft-grade aluminium for durability + portability. Fanless for silent operation.	
Operating Power	3.3W (Monitoring Only) / 6.8W (Rec, Mon & Play)	
Batteries 7.2V-14.4V Battery System Compatible NP Series D-Tap and supporting accessories	All 7.4v 1. 2600mAh - Up to 4hrs 2. 5200mAh - Up to 8hrs 3. 7800mAh - Up to 12hrs 4. AC Power via adaptor plate (included) 5. D-Tap Adaptor (included - cables sold separately)	
Continuous Power* *Patent Pending	Primary-Secondary battery system. Change batteries without losing power. Loop batteries continuously.	
Touchscreen	Size: 5" diagonal. Resolution: 1280 x 720 Aspect Ratio: 16:9 native/4:3 Letterbox. Rec.709 HDTV Colour Spec Native Frame Rate Playback (24-60Hz) SuperAtom IPS (in-Plane Switching) panel	
Video Input Uncompressed 10/8-bit 4:2:2 Simultaneously displayed on 5" Samurai screen	HD/SD-SDI x 1 (HDMI x 1 with optional H2S Connect HDMI -> SDI converter)	SDI SMPTE 259/292/296 HDMI v1.4
Video Output Uncompressed 10-bit 4:2:2 Simultaneously displayed on internal 5" Samurai screen Mini BNC to BNC cables provided	HD/SD-SDI x 1 (HDMI x 1 with optional S2H Connect SDI -> HDMI converter)	SDI SMPTE 259/292/296 BNC HDMI v1.4
Supported Formats (In/Out)	HD 1080i60, 1080i59.94, 1080i50, 1080p30, 1080p25, 1080p24, 1080p23.98, 1080pSF23.98, 1080pSF24, 1080pSF25, 1080pSF29.97, 720p60, 720p59.94, 720p50, SD 486i59.94, 576i50 pSF - Progressive Segmented Frame modes are recorded to Progressive rates	
Realtime Hardware Encoding 1920x1080 8/10-bit 4:2:2 to:	→ Apple ProRes® → Avid DNxHD® (Online Activation Required)	HQ - 220Mbps 422 - 150Mbps LT - 100Mbps Avid DNxHD-220/220x - 220Mbps (8/10-bit) Avid DNxHD-185/185x - 185Mbps (8/10-bit) Avid DNxHD-145 - 145 Mbps (8-bit) Avid DNxHD-36 - 36 Mbps (proxy)
Onboard Processing Auto detect and remove or insert pull down	25pSF (50i) → 25p 29.97pSF (59.94i) → 29.97p 24p (3:2-59.94i) → 24p 23.98p (3:2-59.94i) → 23.98p	
Audio input 48kHz PCM audio	SDI 12 channels + 2 analog channels 2 Vpeak with gain controls	
Waveform & Monitor Assist Function	WFM Luma/RGB Parade with size, dynamic range & opacity controls. Monitor Assist: Focus Peaking - Color/B&W/Outline, Zebra (0-100%), False Color, Blue Only & Grid Lines (Centre, Active Safe, Title Safe, 4:3)	
Audio output 48kHz PCM audio	SDI 12 channels + headphone/line-out 2 Vpeak for onboard review. (Select any pair of channels)	
Remote Start and Stop	Via SDI trigger / Via SDI timecode / Via LANC controller	

Master Caddy & Accessories	
Master Caddy Case for HDD or SSD 2.5" SSD or HDD minimum 5400rpm to 10,000rpm Standard 9.5mm height	75x105x12mm For recommended drives visit: www.atomos.com
Master Caddy Dock	2.5" internal drive SATA to USB2.0/3.0 including USB cable
Accessories included	• Universal Battery Charger 110-240V • AC Adaptor & Car Charger • Master Caddy • 2 x Master Caddy Cases • 1 x Atomos 2600mAh battery • D-Tap Adaptor
Optional extras	• 5 x Master Caddy Cases • Sun Hood • Carry Case • Canon®/Nikon® battery plates • Connect H2S converter • Connect S2H converter

* SmartLog currently only supported by FCP X. ⁵ Certain Canon and Sony models only. Avid DNxHD is HD only, not SD.

Construction note:

Your Samurai Blade is designed to operate in ambient temperatures up to 40°C/105°F. It features a fanless design which dissipates internal heat through the aluminium chassis.

If you wish to extend the temperature of operation in high temperature conditions, you can choose an SSD drive, and set the TFT brightness to a minimum.

The top and bottom aluminium surfaces next to the tripod screws are the heat sinks. Under warm or extended operating conditions, these surfaces may get hot to the touch. This is normal part of the design, and shows that your Samurai Blade is dissipating heat successfully.



 Do not be alarmed if the top and bottom surfaces seem hot to touch. This is normal part of the design, and shows that your Samurai Blade is dissipating heat successfully.

SSD/HDD usage:

With spinning drives, you need to be careful in handling when recording. The drives will generally stand light/medium occasional bumps without problems, and the Samurai Blade has an anti-shock buffer. However, spinning drives are not suitable for use in high vibration or movement environments, for example if the Samurai Blade is strapped to the side of a motor bike.

With spinning hard drives, use a new drive, or one that has very little usage. Do not use old drives. Do not use drives that have been dropped. On all drives, when handling, keep fingers away from the SATA connector at all times, as static electricity can damage the electronics inside.

⁵ 'A Kenyan Odyssey Safari' footage © David Newton 2013

Have you registered your Samurai Blade yet? Upgrade to 3 year warranty now.



Website: www.atomos.com | Sales: sales@atomos.com | Support: support@atomos.com