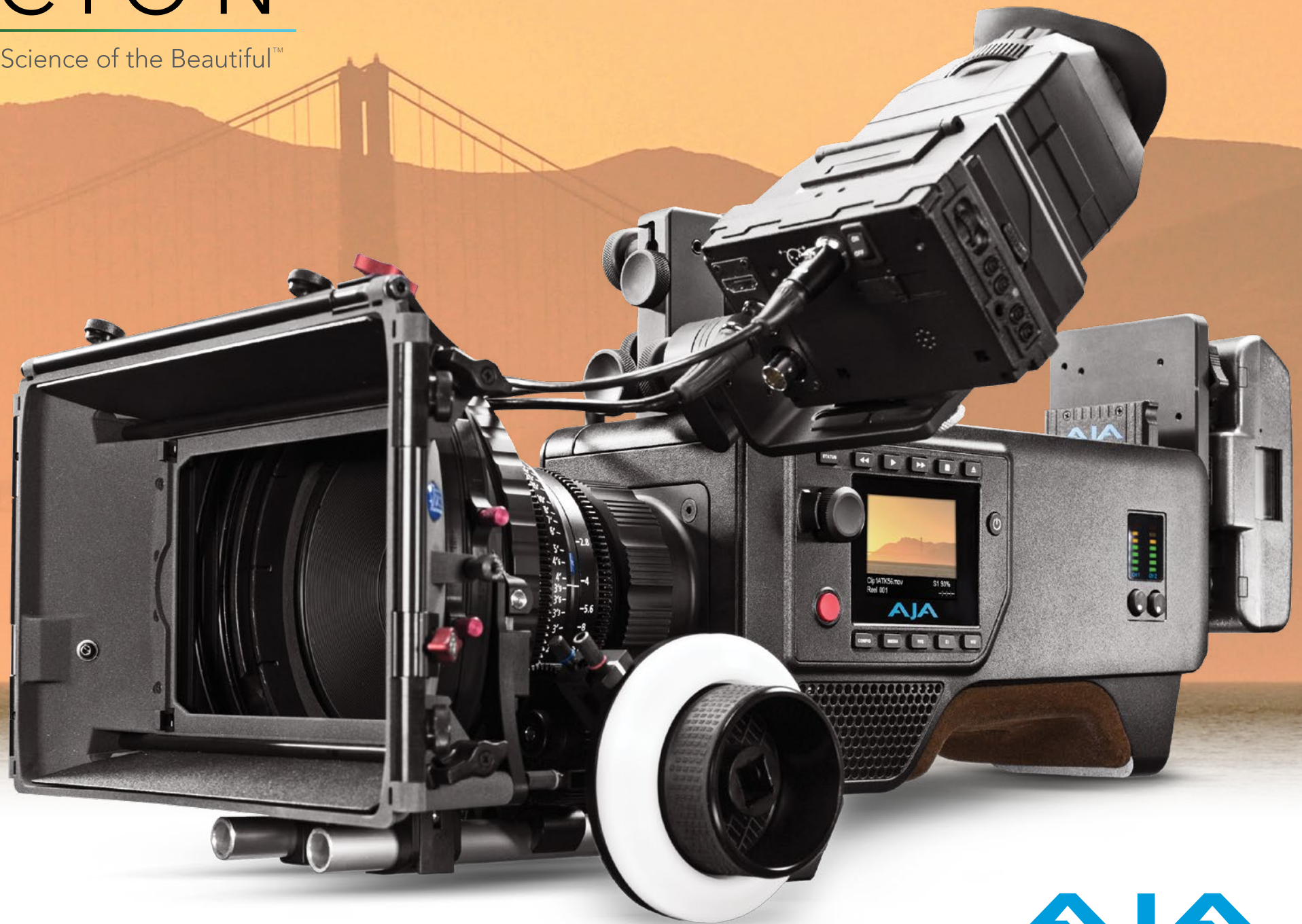# CION™

Science of the Beautiful™

Because it matters.®

AJA
VIDEO SYSTEMS

4K SIZED SENSOR

12 STOPS OF
DYNAMIC RANGE

PRORES 4444
RECORDING

ERGONOMIC AND
LIGHTWEIGHT

VIVID DETAIL
VIBRANT COLORS

Science of the Beautiful™

CION; definition – a descendant or offspring, especially of an illustrious family

Aesthetic; definition –
Science of the beautiful

CION is the lightweight and ergonomic 4K/UltraHD and 2K/HD production camera from AJA. The image recorded by CION can be defined as film-like; technically modern yet classic in look. A wealth of in-camera settings can be applied to create beautiful and distinct creative image styles on-set, or provide the widest postproduction control later.

Maximize production and minimize post by shooting Apple ProRes® 4444 at up to 4K 30fps, ProRes 422 at up to 4K 60p or output

AJA Raw at up to 4K 120fps. Record 59.94p directly as 23.98fps for cinematic slow motion effects in camera with on-set replay.

On-camera control is fast and intuitive, and LAN remote control functionality brings every feature plus live video feedback to any web browser.

CION is a union of great design and functionality, an engineered aesthetic that we are proud to describe as the Science of the Beautiful.

Features Overview

Sensor

CION features a 4K APS-C sized CMOS sensor with an electronic global shutter and 12 stops of dynamic range. Lenses designed for Super 35mm cover the sensor imaging area and the global shutter eliminates the undesirable qualities associated with rolling shutter-based sensors.

Recording Formats

CION can record at 4K (4096 x 2160), UltraHD (3840 x 2160), 2K (2048x1080) and HD (1920 x 1080). 2K and HD are hardware scaled from the full 4K sensor, resulting in beautiful oversampled images, which also retain the focal length of your lens at any desired resolution. Frame rates up to 50 and 60fps are supported - even at full 4K resolution. CION can also output up to 4K 120fps as AJA Raw.

Pak Media

Pak Media uses AJA's proven SSD based Pak storage which neatly mounts directly in-camera. Pak256, Pak512 or Pak 1000 allow recording of ProRes 4444, ProRes 422 (HQ), ProRes 422, ProRes 422 (LT) and ProRes (Proxy). Utilize the AJA Pak Dock (sold separately) and you can transfer your footage over high speed Thunderbolt™ or USB 3.0.
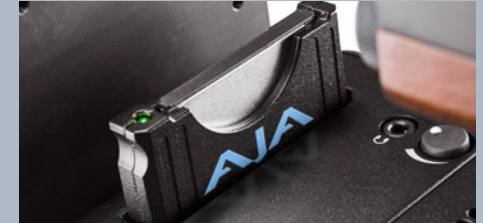
Pak-Adapt-CFast

Pak-Adapt-CFast allows you to use CFast media with CION. Simply insert the CFast card and once the green LED is lit, your media is mounted and can be formatted. You're then able to record direct to your media. Pak-Adapt-CFast requires qualified media to ensure you get the best results.

PL Lens Mount

PL mount lenses are the industry standard for cinema and professional production cameras and are widely available the world over. In addition, CION's lens mount is removable; third parties presently offer Canon® EF/FD, Nikon® F/G-Mount, Panavision® and ARRI® Bayonet, allowing even more creative choices and flexibility.
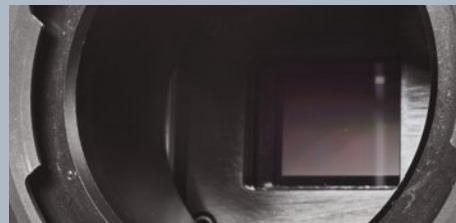
Optical Low Pass Filter and IR Cut Filter

An integrated OLPF (Optical Low Pass Filter) reduces unwanted moiré effects while still retaining vital image detail. The Infrared cut filter heightens color quality within the image by blocking unwanted light wavelengths.

Back Focus Adjustment

The inclusion of a mechanical back focus adjustment allows the proper calibration of the distance between lens and sensor. By making finely tuned adjustments, the sharpest image quality is assured.
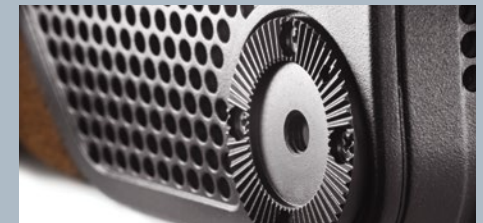
Chassis

CION's sleek chassis is formed of gravity molded magnesium which is lightweight but extremely strong. Integrated steel rosettes allow you to mount industry standard accessories including hand grips and handle extensions directly to the camera body. Aluminum cheese plates are fitted to both the top and the bottom of the chassis to provide easy mounting of accessories from both AJA and third party manufacturers.

Ergonomics

Comfortable and Convenient

CION was designed to be comfortable, convenient and totally flexible for any shooting environment. A contoured shoulder pad fits comfortably to your shoulder for hand held use. An included top handle made of high grade aluminum and wood features an integrated LANC start/stop button. The handle base itself uses a standard 15mm rod and through-hole to allow the additional mounting of third party accessories.

Interface Controls

UI Control

All interface controls are found on the side of the camera facing the operator to provide easy single user functionality. The menu structure itself is elegant and free of cumbersome sub-menu navigation. Confidently dial settings with a robust selection knob that gives clear mechanical feedback as you adjust.

Dedicated menu buttons offer direct access to vital camera settings including device status (STATUS), configuration (CONFIG), media management (MEDIA), format and frames per second (FPS), exposure index (EI) and white balance (WB). Key transport controls are easy to access, including play, fast forward, rewind and stop.

CION also offers powerful network based control. Via the LAN connection, a web browser UI allows for remote configuration and operation of the camera. Your CION is completely controllable whether it's on a crane, jib or car mount from virtually any web browser.

LED VU meters are placed for easy and accurate audio monitoring. Control knobs for each audio channel allow adjustment of the input level. A headphone monitoring output and a headphone volume control knob are also provided.

Open Connectivity

Designed as an Open Camera, without any Proprietary Connectors

LANC

2-pin Power Output Connector

HDMI Output

Mini TRS Headphone Jack
and Volume Control Knob

SDI OUT 1

SDI OUT 2

SDI OUT 3

SDI OUT 4

SDI MON

HDMI

LTC

USB

REF IN

CION

CH 1

CH 2

SDI MONITOR

PUSH

PUSH

LINE/MIC/+48V

LINE/MIC/+48V

LANC

2-pin Input
Power Connector

4-pin XLR
Power Connector

Thunderbolt™
Connector

LAN Connector

Conveniently Connected

CION uses industry standard audio and video connections which are conveniently located and unobtrusive to the operator.

3G-SDI and HDMI monitor outputs make monitor and viewfinder additions to CION easy to implement. A two-pin power output connector is positioned up front for ease of operation. Utilizing CION's high quality scaling capabilities, these dedicated monitoring outputs are always active when working with 4K or UltraHD. CION features more simultaneously live monitoring outputs than any other camera.

The Heart of Production

CION's considered design brings ease of operation to both field and studio based productions. For single users, set up and operation is intuitive and straightforward. For more complex productions, camera operators, camera assistants and digital imaging technicians may all interact with CION without conflict. In such a scenario, the camera operator can use one monitor output for framing, the camera assistant another monitor output for judging focus and the digital imaging technician can use yet another monitor output as well as the web UI to configure the unit.

Web Browser Remote Control
Simple to Setup and Easy to Configure

Connect and Configure

The LAN port at the rear of the CION camera brings a wealth of control to the field or studio; every feature is controllable remotely via a web browser with no proprietary software required. Using an easily set up IP address for the camera and utilizing a simple Ethernet cable, you can connect to any laptop on any platform and use a web browser to communicate directly with your CION camera. A video feed has also been included to assist with remote or multicam scenarios. Multicam wireless control can be easily achieved with a standard Wi-Fi access point, such as an Apple AirPort®.

Multicam Gang Control

CION multicam shoots are straightforward to implement and manage by using a laptop with a simple Ethernet switch and LAN cables. The web UI allows complete and independent set up of multiple CION cameras; you may name each camera and consolidate control of the cameras from within a web browser using the unique gang recording feature. The web UI will also allow realtime monitoring of the capacity of the Pak Media used in each CION.

File naming options are easily accessed in CION's menu structure. There is even an option to create custom names for clips as well.
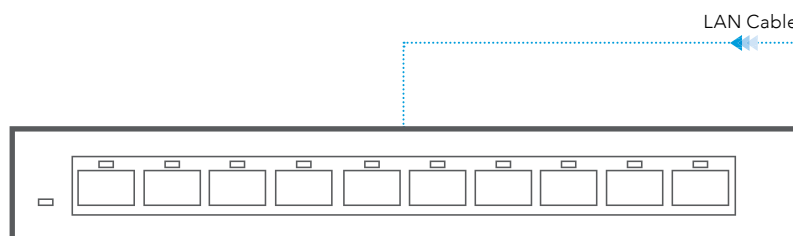
LAN Cable

Ethernet Switch –
Output to Multiple Cameras
via LAN Cables

Total Camera Control

You're able to adjust every camera parameter to suit your needs by either clicking on the section appropriate in the side bar of the browser or using the buttons in the window that reflect those found on the camera. You have the freedom to work either way. You can see clearly the options available to each section; navigation is intuitive at every step.

Centralized Preset Deployment

Having made adjustments, you are able to save these as a preset for use later: quickly and easily recall the preset you need. You can even save a preset and deploy it to other CION cameras that you have linked via a simple Ethernet switch. Up to twenty banks of presets can be saved bringing huge flexibility and time saving while shooting.
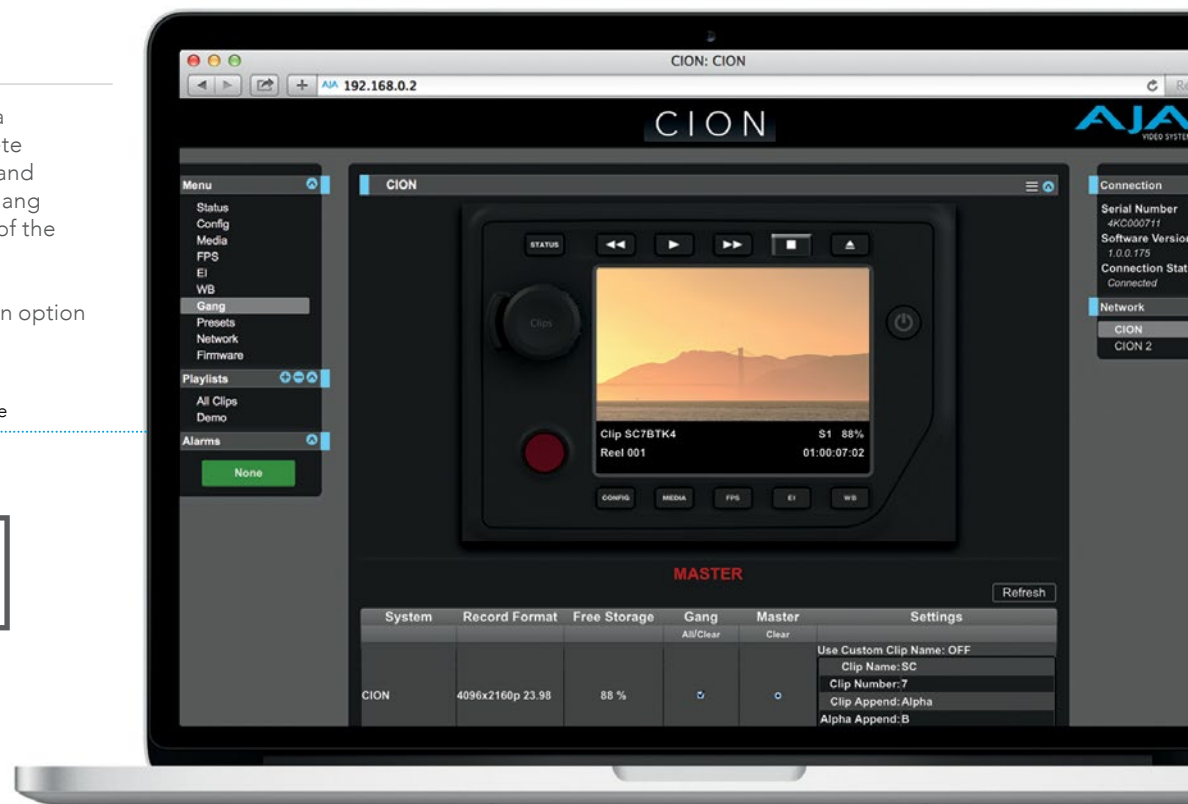
On-Set Backup and Monitoring

3G-SDI output from CION
(4K, 2K, UltraHD or HD)

Ethernet
to CION

CION provides unrivaled on-set monitoring options for 4K/UltraHD and 2K/HD including a dedicated hardware down-convert for 4K/UltraHD to 2K/HD. CION's outputs are simultaneously live allowing great flexibility in any scenario independent of resolution. When working in 4K or UltraHD, five outputs are always available with one each for 4K and UltraHD via 4 x 3G-SDI and HDMI as well as three dedicated down conversions via 2 x 3G-SDI and 1 x HDMI. If you are working in HD or 2K then every single output is live at that resolution giving you up to eight outputs to share on-set. The built-in confidence monitor also allows yet another way to see the image being captured.

The AJA Pak Dock and Pak Media are designed for field use, featuring a rugged and reliable form factor; unlike a bare SSD drive, AJA Pak Media features a multi-insertion rated connector. Connecting to CION via the LAN connector provides realtime information regarding the Pak currently in use, and by utilizing a Thunderbolt enabled RAID storage drive you can quickly back up your Pak Media as you shoot. Pak Media offers higher capacity at a lower cost per GB than XQD media.

ProRes® Workflow

The ProRes 4444 and 422 workflow for CION allows you to capture high quality images in an easily managed file format and size. The Pak Dock provides fast transfer of footage into your local media storage and directly into a wide range of NLEs and finishing tools of choice with no need for transcoding. Native file recording means you're able to better connect production to post, keeping the image quality at its highest throughout.

Raw Workflows

30fps AJA Raw

CION offers easy output of up to 4K 30fps AJA Raw via the Thunderbolt™ connector on the rear of the camera and by using AJA CamXchange and a Thunderbolt enabled fast RAID and laptop. Perfect for studio environments where complex, keyed shots require the most postproduction processing.

60fps AJA Raw

Although CION offers full 4K ProRes 4444 encoding at 12-bit internally to Pak media, you may also elect to output AJA Raw to other best in class products from AJA with our powerful but totally free AJA Control Room software and connected fast RAID storage. Use AJA Io® 4K to capture AJA Raw over SDI at up to 60fps at 4K to provide outstanding postproduction quality for even the most demanding grading or visual FX requirements.

120fps AJA Raw

You can also choose the unrivaled AJA KONA® 4 to unlock the power of up to 120fps at 4K via the 4 x 3G-SDI outputs to create beautiful and detailed slow motion with an engaging cinematic feel via AJA Control Room.

AJA TruZoom™ Raw Workflow

Combining CION and AJA TruZoom brings unprecedented power to sports and other live event broadcasting by utilizing realtime debayering at up to 4K 120fps with Region of Interest scaling and detailed slow motion replays.

Flexible Image Control

AJA's approach to the development of CION was not only towards the external aesthetic and its deliberate ergonomic styling; the image processing itself was considered throughout, with the result being a beautiful image which closely resembles film. CION is capable of capturing images at up to 4K 12-bit 4:4:4, allowing the broadest dynamic range possible and providing excellent latitude for postproduction finishing. To minimize the amount of post processing required CION also allows for great flexibility in controlling the image captured by using our intuitive menu system and its straightforward operation on set. A variety of gamma curves (None, Standard, Expanded, Video, Cine) are found within the Exposure Index menu to suit the highlights and shadows within a given scene. The images here are real frames from CION footage that show before and after.

In addition you can choose from a range of color temperatures within the White Balance menu providing standard values to suit your scene. You are also able to Auto White Balance any scene by simply holding down the 'WB' button on the operational side of CION for three seconds. For those situations where more precise color control is beneficial on set you can control both the Saturation and also Color Correction via their corresponding menu options. This additional control can save valuable time in post, especially on time limited projects which require speedy delivery for broadcast, allowing you to adapt to changing light in even the most demanding environments.

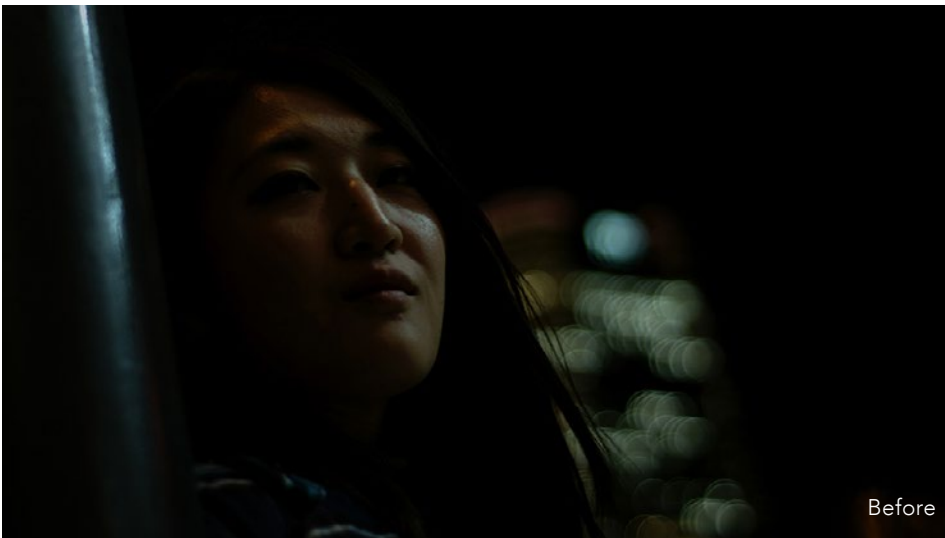Before

After
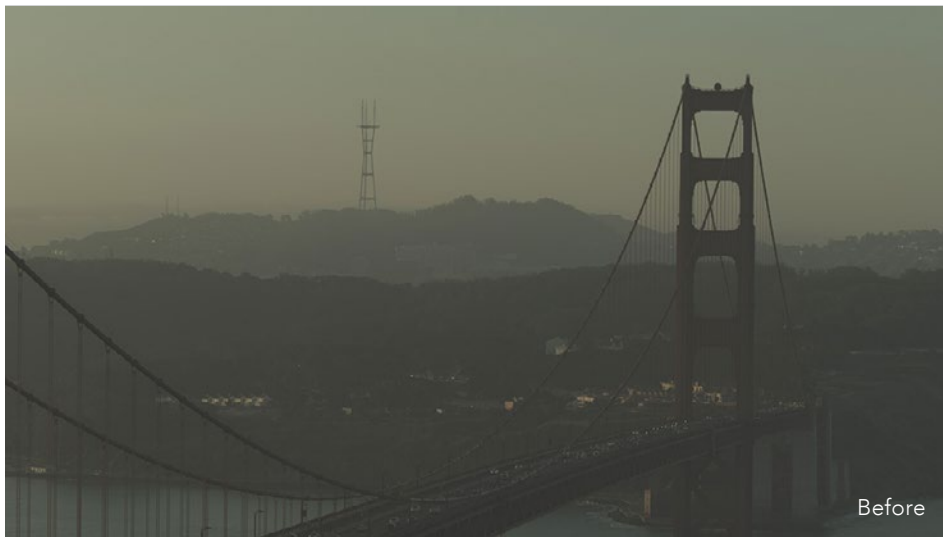
Cine Gamma mode in camera
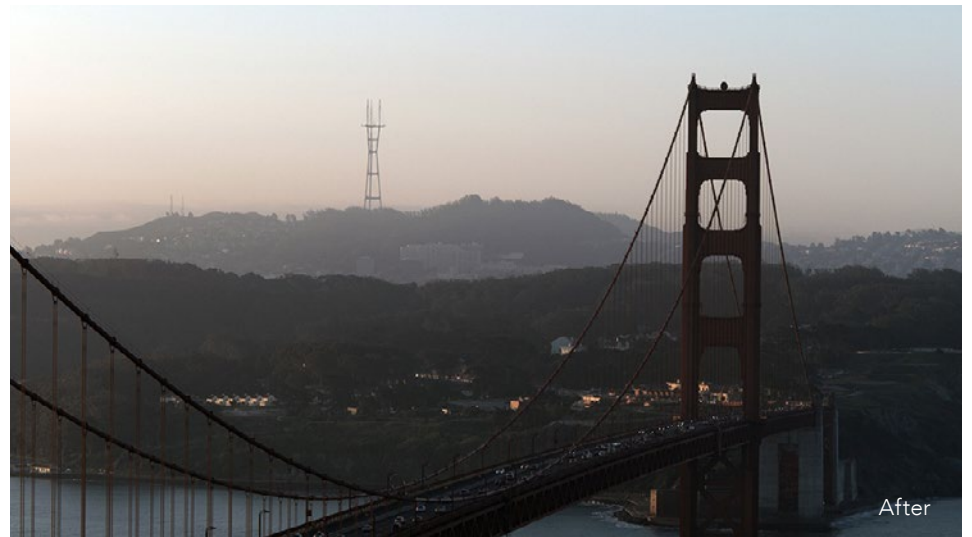
Cine Gamma mode with midtone and shadow lifts

Expanded Gamma mode in camera

Expanded Gamma mode with midtone and shadow lifts

'None' Gamma mode in camera

'None' Gamma mode with midtone and shadow lifts

Accessories
and Add-ons for CION

Battery Adapter Plate

Mount point with tap holes for popular third party battery systems; included with CION.

Upper Rod Clamps

In some situations, you may want to attach accessories to LWS spaced 15mm rods above the lens instead of below it. The Upper Rod Clamps accessory makes this possible.

ENG Plate Adapters

CION is easily fitted to ENG quick release tripod plates by using the Wedge and either additional Heel plate, depending on the base plates used. Move between tripod set ups and go directly to shoulder with ease. Each plate sold separately.

Rod to Rosette Adapter Mount

This adapter allows you to connect handles or other rosette attached accessories to 15mm rods.

Pak Media

Pak Media is a high capacity solid state drive encased in a protective housing with a rugged connection engineered to handle the rigors of repeated use in the field. It is available in 256GB, 512GB and 1TB as Pak256, Pak512 and Pak1000 respectively.

Pak-Adapt-CFast

Pak-Adapt-CFast allows you to use qualified CFast media with CION. For more information about qualified media, please see the AJA website.

Pak Dock

External Pak Dock with Thunderbolt and USB 3.0 connections for fast transfer of media to a host computer.

Front and Rear Baseplate

These accessories allow you to add standard 15mm rod accessories to CION, including matte boxes, lens supports and battery systems. Each sold separately.

LANC Collar

A simple start/stop trigger that may be connected to either of CION's two LANC ports. The LANC Collar attaches to AJA handles or any 15mm rod; one LANC Collar included with CION.

Rosette Extension Arm

Available in 9" and 6" lengths, the Rosette Extension Arm fits directly to Hirth tooth rosettes integrated to CION's chassis to allow you to configure CION to fit your needs.

7" 15mm Rod

CION utilizes standard 15mm rods; use these to connect matte boxes to the Front Baseplate or batteries to the Rear Baseplate if you are balancing a longer zoom lens.

Viewfinder Mount

You may configure this accessory to support electronic viewfinders or even lightweight onboard monitors. Nearly infinite adjustments are possible via sliding 15mm rods and the L-shaped bracket.

Coiled LANC Cable

If you are using extension arms in combination with the LANC collar and Handle Grip then the LANC cable is required to allow start/stop when recording in the field.

Handle Grip

Included with CION; additional Handle Grips are available for purchase.

Handle Grip Mount

If you wish to use the Handle Grip in conjunction with the top cheese plate on CION's chassis then the Handle Grip Mount is required. This mount also allows the addition of the Viewfinder Mount; included with CION.

Back Focus Adjustment Tool

The tool used to adjust the focal flange distance.

Open Up Your World

Designed to Create an Open Approach to Accessorizing the Camera

This open system gives you immense flexibility no matter the shooting environment, both indoors and outdoors. From shoulder to tripod and from dolly to crane, CION keeps all of your options open. The top accessory manufacturers in the world have also made accessories specifically for CION.

Lenses

PL mount lenses are widely offered in standard focal lengths as well as zoom options. Manufacturers continue to release new and improved lenses designed for the demands of 4K resolution. Because the PL mount system is firmly established in the highest quality production, you can choose the right lens to suit your creative needs. CION's lens mount was also designed to be easily removed to allow an even wider choice of lens system to suit your needs.

Third parties now offer alternative mounts to allow your use of Canon EF/FD, Nikon F/G mount and ARRI Bayonet lenses with ease. CION offers wider lens compatibility than any other 4K/UltraHD camera system

Electronic Viewfinders

The open system approach allows you to choose from a wide range of electronic viewfinders and connect them directly via CION's HDMI or 3G-SDI. Two dedicated monitoring outputs are even conveniently placed at the front of the camera. A power connector near the front can also provide power for many electronic viewfinders.

Monitors

Unrivaled monitoring options put CION at the heart of production. In addition to the front 3G-SDI and HDMI monitor outputs, additional rear 3G-SDI and HDMI outputs may also be used for monitoring. 4K and UltraHD monitoring is possible via the 4 x 3G-SDI main outputs and the rear HDMI output (when appropriately configured). You can configure CION so that everyone can see what's happening.

Microphones

Two balanced analog audio XLR inputs are built into CION allowing compatibility with a huge range of professional audio gear. You can choose to mount a shotgun microphone to the cold shoe found on the top handle or run longer cable from external mixers to CION. Independent switches for mic or line level as well as phantom power are provided, meaning you're ready for any audio situation.

Rods and On-Camera Rigging

Removable cheese plates on the top and bottom of the camera make attaching accessories easy. The bottom cheese plate features 1/4-20 and 3/8-16 threaded holes. The AJA provided top handle attaches to the top cheese plate via 1/4-20 screws. CION's top handle supports standard 15mm rods, allowing compatibility with third party accessories and endless possible configurations. Standard sized rosettes on either side of the camera allow easy and dependable mounting points for handles and grips. By design, it's incredibly easy to add a wealth of accessories to CION to enhance your shooting experience.

Postproduction

CION offers the easiest and fastest route to 4K/UltraHD post yet. Native codec handling enhances your editorial experience, resulting in fast and responsive playback with no compromise in quality. Apple ProRes offers pristine image quality at extremely manageable file sizes. Using the latest generation of Apple Mac Pro® and the AJA Io 4K along with Apple ProRes files from CION makes even 4K and UltraHD editing a smooth experience. CION can provide 59.94fps material ready conformed to 23.98fps for cinematic slow motion in your timeline with no post processing required.
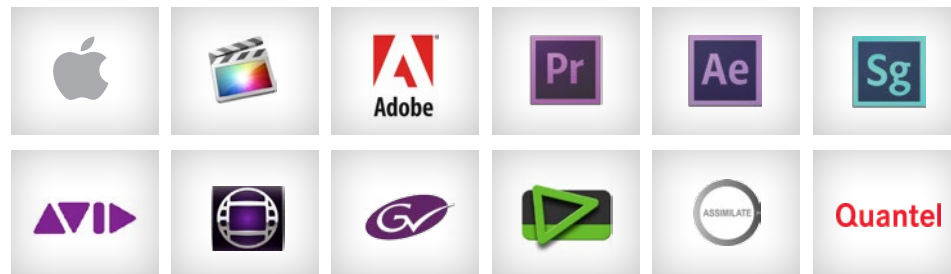
Tech Specs

User Interface

- 6 x Dedicated menu buttons
  (STATUS, CONFIG, MEDIA, FPS, EI and WB)
- 4 x Transport buttons
  (Play, Fast Forward, Reverse Playback, Stop)
- 1 x Media unmount button
- 1 x Record button
- 1 x User Interface control knob
- 1 x User Interface screen, 320x240 LCD

Sensor Type

- CMOS, electronic global shutter, 12 stops of dynamic range

Sensor Size

- 4K APS-C sized, 22.5mm x 11.9mm

Shutter Angles Available (by Format)

23.98 & 24	25	29.97 & 30	50	59.94 & 60	119.88 & 120
360	360	360	360	360	360
180 (def)	300	216	300	216	216
172.8 (def)	180 (def)	180 (def)	180 (def)	180 (def)	180 (def)
144	150	120	120	120	120
120	90	90	90	90	90
90	45	45	45	45	45
45	30	30	30	30	30
30	15	15	15	15	15
15					

Shutter Speeds Available (by Format)

23.98 & 24	25	29.97 & 30	50	59.94 & 60	119.88 & 120
1/24	1/25	1/30	1/50	1/60	1/120
1/48 (default)	1/30	1/50	1/60	1/100	1/200
1/50	1/50 (def)	1/60 (def)	1/100 (def)	1/120 (def)	1/240 (def)
1/60	1/60	1/90	1/150	1/180	1/360
1/72	1/100	1/120	1/200	1/240	1/480
1/96	1/200	1/240	1/400	1/480	1/960
1/192	1/300	1/360	1/600	1/720	1/1440
1/288	1/600	1/720	1/1200	1/1440	1/2880
1/576					

* (def) = Default

Exposure Index

- 320, 500, 800, 1000

Color Correction

- Normal, Flat, Skin Tones, Video

Gamma

- None, Standard, Expanded, Video, Cine

Lens Mount

- Removable PL (positive lock), third party EF, B4 and G-Mount mounts are available

Filtration

- Optical Low Pass Filter (OLPF) and IR Cut Filter (combined)

Removable Storage

- Pak Media, Pak-Adapt-CFast (only with qualified CFast media)

Video Output

- 4 x 3G-SDI main outputs
  (4 x BNC connectors, 3G/1.485 Gbps)
- 2 x 3G-SDI monitor outputs
  (1 x front mounted BNC connector,
  1 x rear mounted BNC connector, 3G/1.485 Gbps)
- 2 x HDMI outputs
  (1 x front mounted HDMI v1.3 Type A connector,
  1 x rear mounted HDMI v1.4 Type A connector)

Audio Inputs

- 2 x Balanced Analog audio inputs
  (2 x 3-pin XLR connectors with dedicated line/mic/48V selection switch per input)

Audio Output

- 1 x Headphone jack
  (3.5mm stereo mini TRS)

Format, Frame Rate, Encoding and Output

4K
- (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 119.88, 120
- Apple ProRes 4444 or Apple ProRes 422 (all versions) up to and including 30 fps
- Apple ProRes 422 (or a lower data rate ProRes version) for 50, 59.94, 60 fps
- SDI output support for 23.98, 24, 25, 29.97, 30 fps
  (SDI 1-4 YCbCr, SDI 1-4 RGB or SDI 1 Raw)
- SDI output support for 50, 59.94, 60 fps (SDI 1-4 YCbCr or SDI 1-2 Raw)
- SDI output support for 119.88, 120 fps (SDI 1-4 Raw)

UltraHD
- (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 119.88, 120
- Apple ProRes 4444 or Apple ProRes 422 (all versions) up to and including 30 fps
- Apple ProRes 422 (or a lower data rate ProRes version) for 50, 59.94, 60 fps
- SDI output support for 23.98, 24, 25, 29.97, 30 fps
  (SDI 1-4 YCbCr, SDI 1-4 RGB or SDI 1 Raw)
- SDI output support for 50, 59.94, 60 fps (SDI 1-4 YCbCr or SDI 1-2 RAW)
- SDI output support for 119.88, 120 fps (SDI 1-4 Raw)

2K
- (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- Apple ProRes 4444 or Apple ProRes 422 (all versions) up to and including 30 fps
- Apple ProRes 422 (all versions) for 50, 59.94, 60 fps
- SDI output support for 23.98, 24, 25, 29.97, 30 fps
  (SDI 1 YCbCr, SDI 1-2 RGB, or SDI 1 RGB)
- SDI output support for 50, 59.94, 60 fps (SDI 1-2 YCbCr or SDI 1 YCbCr)

HD
1080p
- (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- Apple ProRes 4444 or Apple ProRes 422 (all versions) up to and including 30 fps
- Apple ProRes 422 (all versions) for 50, 59.94, 60 fps
- SDI output support for 23.98, 24, 25, 29.97, 30 fps
  (SDI 1 YCbCr, SDI 1-2 RGB, or SDI 1 RGB)
- SDI output support for 50, 59.94, 60 fps (SDI 1-2 YCbCr or SDI 1 YCbCr)

1080i
- (HD) 1920 x 1080i 25, 29.97, 30
- Apple ProRes 422 (all versions) up to and including 30 fps
- SDI output up to and including 30 fps (SDI 1 YCbCr)

Tech Specs

Reference Input

- 1 x Reference input
  (BNC connector, analog color black)

Timecode

- 1 x LTC
  (BNC connector, 0.5 to 4.5Vpp)

Start/Stop Trigger

- 2 x LANC
  (1 x 2.5mm top connector and 1 x 2.5mm side connector)

Network Interface

- 1 x LAN connector (RJ-45 connector, 10/100/1000)

Data Output

- AJA Raw via 3G-SDI up to 120 fps or Thunderbolt™ up to 30 fps

Size (w x d x h)

- 4.4" x 12.5" x 5.5" (112mm x 318mm x 140mm)

Weight

- 6.4 lbs / 2.9 kg (without top handle attached)
- 7.4 lbs / 3.4 kg (with top handle attached)

Power

- AC Range: 100-240 VAC 50/60Hz (AC adapter)
- DC Range: 12-18Vdc, 5A maximum
  (4-pin XLR connector or 2-pin input connector)
- Consumption: 38-42W typical, 45-47W maximum
  (Note: does not include power draw from 2-pin output connector)
- Output: 2-pin power output connector, 10W recommended maximum

Environment

- Safe Operating Temperature Range: 5C to 40C
- Safe Storage Temperature Range (power OFF): -20C to 60C
- Operating Altitude: <3,000 meters (<10,000 feet)

2 Year Warranty

AJA Video warrants that CION will be free from defects in materials and workmanship for a period of two years from the date of purchase.

About AJA Video Systems, Inc.

Since 1993, AJA Video has been a leading manufacturer of video interface and conversion solutions, bringing high quality, cost effective digital video products to the professional, broadcast and postproduction markets. AJA products are designed and manufactured at our facilities in Grass Valley, California, and sold through an extensive sales channel of resellers and systems integrators around the world. For further information, please see our website at **www.aja.com**

AJA Video Systems, Inc.
Grass Valley, California
www.aja.com • sales@aja.com • support@aja.com

B e c a u s e   i t   m a t t e r s . ®