

ALEXA Mini

Software Update Packet 5.2

USER MANUAL

08 Dec 2017



Imprint

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Original version.

For further assistance

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG
Tuerkenstr. 89
D-80799 Munich, Germany
E-mail: service@arri.com
www.arri.com/service

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1 For your safety / 为了您的安全

Before use, please ensure that all users read, understand, and follow the instructions in this document fully. 使用前，请确保所有的用户都已经阅读、理解，并遵循本档内的操作说明。

1.1 Risk levels and alert symbols / 危险级别和警示标志

Safety warnings, safety alert symbols, and signal words in these instructions indicate different risk levels:

⚠ DANGER!
<i>DANGER</i> indicates an imminent hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING!
<i>WARNING</i> indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION!
<i>CAUTION</i> indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE
<i>NOTICE</i> explains practices not related to physical injury. No safety alert symbol appears with this signal word.

Note: Provides additional information to clarify or simplify a procedure.

本档内的安全警告、安全警示标志和标识词语指示不同的危险级别：

⚠ 危险
危险表示危急、有危害的情景，若不防范，则会导致死亡或严重的伤害。

⚠ 警告
警告表示有潜在危害的情景，若不防范，则可能会导致死亡或严重的伤害。

⚠ 小心
小心表示有潜在危害的情景，若不防范，则可能会导致中等或较轻的伤害。

提示
注意表示此行为不会导致人身伤害。因此此标识词语中不含警告标志。

注：注意中会提供用于解释或简化工作的额外信息。

1.2 Vital precautions / 重要安全措施

⚠ DANGER!

High voltage! Risk of electric shock and fire!

Short-circuits may entail lethal damage!

Before use, read and follow all valid instructions.

Use solely and exclusively as described in the instructions.

Never open. Never insert objects.

For operation, always use a power source as indicated in the instructions.

Always unplug the power cable by gripping the power plug, not the cable.

Never try to repair. All repair work should be done by a qualified ARRI Service Center.

Never remove or deactivate any safety equipment (incl. warning stickers or paint-marked screws).

Always protect from moisture, cold, heat, dirt, vibration, shock, or aggressive substances.

Never cover any fan openings.

⚠ 危险

高电压！有触电或起火风险！

短路将引起致命危险。

使用之前，请仔细阅读所有未过期的使用说明，并严格遵循。

切勿打开机身。切勿插入任何物体。

操作时，请务必使用说明中指出的电源。

断开电源时请握住电源插头，而不是电线。

切勿尝试自行维修。所有的维修工作必须由具备资质的ARRI维修中心进行。

切勿移除或毁坏任何安全设施（例如警告贴纸或涂漆标示的螺丝）。

务必避免潮湿、寒冷、炎热、多尘、震动、冲击或严酷的使用环境。

切勿覆盖任何风扇开口。

▲ CAUTION!**Condensation! Risk of electric shock and fire!**

Condensation may form on the sensor and electrical connections when exposing the camera to sudden changes of temperature or humidity!

To avoid injury and damage, never operate the camera when condensation occurs.

▲ 小心**冷凝！有触电或火灾风险！**

当将摄影机暴露于温度或湿度迅速变化的环境中时，影像传感器和电子部件连接处可能会产生冷凝。

为了避免受伤或设备损坏，在冷凝发生时切勿操作摄影机。

▲ CAUTION!**Heavy weight! Risk of injury and damage!**

If placed on an unstable surface, the camera can fall and cause serious harm!

Always place the camera on proper support devices. Safely attach it as described in the instructions.

▲ 小心**设备重量较大！有受伤或设备损坏风险！**

若安置于不稳定的位置，则摄影机可能会掉落，并造成严重的伤害。

务必将摄影机安装于适当的支撑设备上。请按照说明中所描述的方法来安全地安装摄影机。

▲ CAUTION!**Hot surfaces! Risk of injury and damage!**

During extended operation or operation in high ambient temperatures, the fan outlet at the camera rear, the CFast drive and the CFast card can get hot.

Never cover, obstruct or block the fan in- or outlets while the camera is powered.

1.3 General precautions / 般安全措施

NOTICE

Even rugged cameras use components sensitive to improper use.

Always unplug the camera from power sources before making changes to the setup or system (in particular: changing cables).

Direct sunlight can result in camera housing temperatures above 60 °C (140 °F). At ambient temperatures above 25 °C (77 °F), protect the camera from direct sunlight.

Protect the optical system and sensor: Never point the camera or viewfinder into direct sunlight.

Avoid permanent sensor damage: Never let any direct light or reflections from high-energy light sources (e.g. laser beams) enter the camera's optical path.

Protect the sensor: Always keep a lens or protective cap on the empty lens mount. Change lenses in dry, dust-free environments only.

Always clean the sensor cover glass according to ARRI instructions. Instructions can be downloaded from the ARRI website in the ALEXA download section.

Only use the tools, materials and procedures recommended in this document. For the correct use of other equipment, see the manufacturer's instructions.

提示

即使本摄影机非常坚固，也是由敏感的组件所组成的，请谨慎使用。

当改变摄影机安装支撑设备或系统时（特别是更换电缆），请务必断开摄影机电源。

注意保护光学系统和影像传感器：切勿将摄影机或取景器直接面朝直射阳光。

避免对影像传感器造成永久性伤害：切勿让任何来自高能量光源（例如激光）的直射光或反射光进入摄影机的光路系统。

注意保护影像传感器：空镜头卡口上务必安装镜头或保护盖。更换镜头时，务必在干燥、无尘的环境中进行。

请完全并仅按照用户手册中所描述的方法来清洁影像传感器保护玻璃。若清洁不成功，请咨询ARRI维修中心。切勿尝试打开保护玻璃。

清洁影像传感器保护玻璃时，务必遵守ARRI说明书中描述的方法。

仅使用本文档中建议使用的工具、材料和操作方法。若要正确地使用其他设备，请参阅其制造商的说明书。

2 Audience and intended use

NOTICE

The product is solely and exclusively available for commercial costumers and shall be used by skilled personnel only. Every user should be trained according to ARRI guidelines.

Use the product only for the purpose described in this document. Always follow the valid instructions and system requirements for all equipment involved.

The ALEXA Mini is a 35 mm digital camera solely and exclusively for recording images at various resolutions suitable for a variety of distribution formats:

- ProRes 422 LT, ProRes 422, ProRes 422 HQ, ProRes 4444, ProRes 4444 XQ, and ARRIRAW* codec
- Rec 709 and Rec 2020 encoding (through use of look files), Log C or ARRIRAW* encoding
- CFast 2.0 card recording
- Up to 200 fps with full image quality
- 35 mm CMOS sensor in 16:9 or 4:3* modes
- EVF with OLED eyepiece
- Fold-away monitor for both live view and user interface access
- Small and lightweight built for high mobility and special applications

* Feature requires licensing.

3 Scope of delivery and warranty

NOTICE

Product and packaging contain recyclable materials. Always store, ship, and dispose of according to local regulations.

ARRI is not liable for consequences from inadequate storage, shipment or disposal.

Delivery

On delivery, please check if package and content are intact. Never accept a damaged/incomplete delivery. A complete delivery includes:

- ALEXA Mini camera with lens mount according to order: titanium PL, AMIRA PL, EF
- Antenna
- USB memory stick
- 3 mm Allen key
- Quick Guide
- Original packaging incl. drying agent

NOTICE

ARRI offers an increasing variety of product bundles and additional accessories.

For details, please consult our website or your local ARRI Service Partner.

Warranty

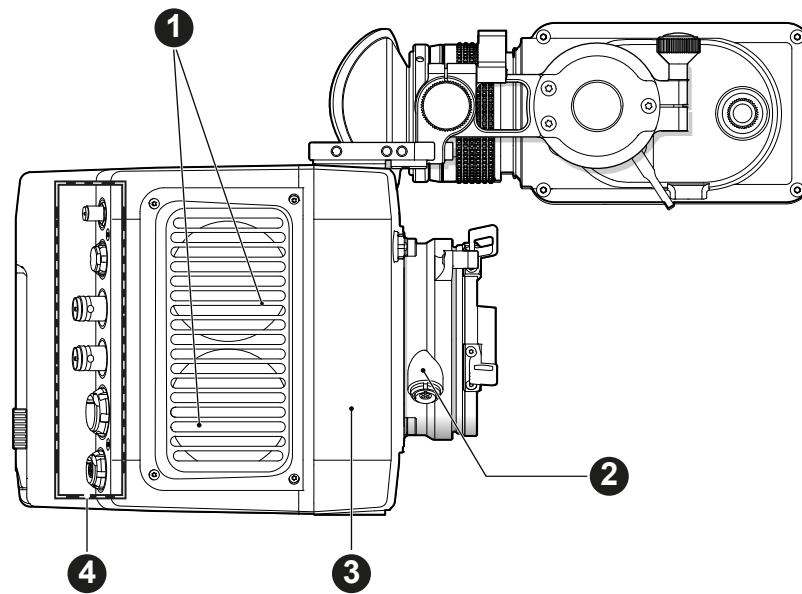
For scope of warranty, please ask your local ARRI Service Partner. ARRI is not liable for consequences from inadequate shipment, improper use, or third-party products.

4 Camera parts and controls

The next section gives you an overview of the parts of the camera and the controls available for operating the camera.

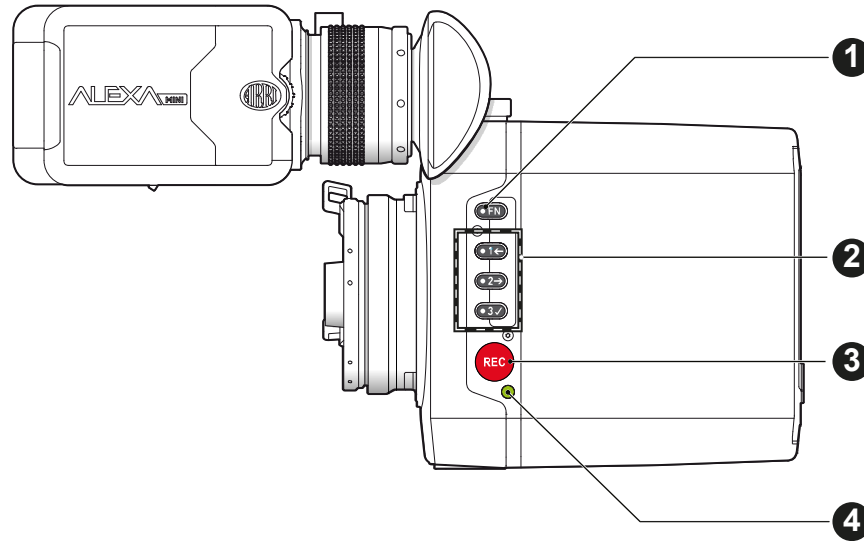
4.1 Camera layout

Right



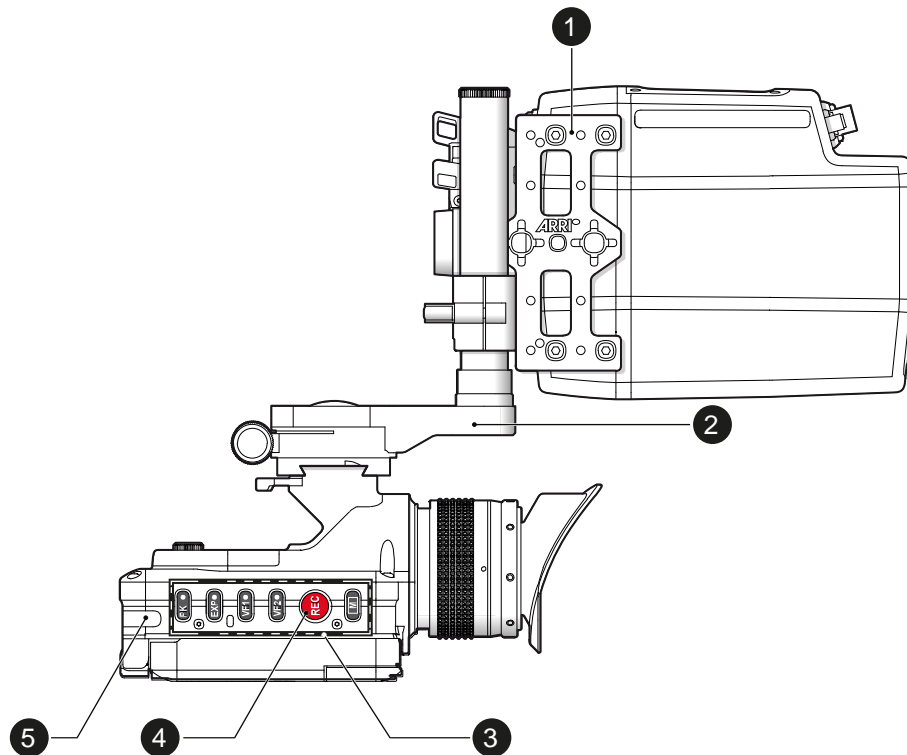
- 1 Fan intake
- 2 LBUS connector
- 3 integrated WiFi antenna
- 4 I/O panel

Left



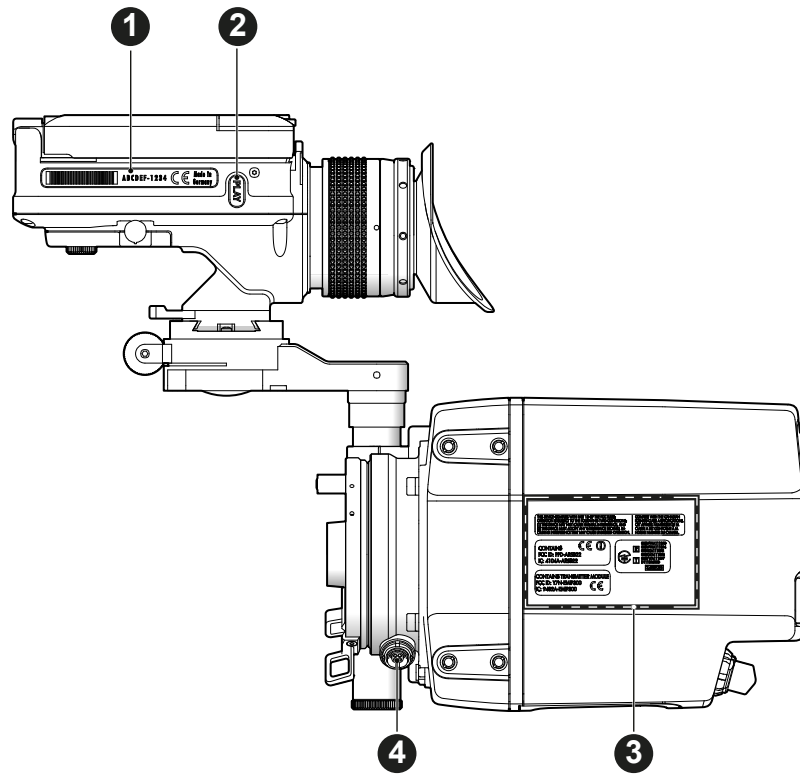
- 1 Function button
- 2 Camera buttons 1-3
- 3 Recording button
- 4 Status LED

Top



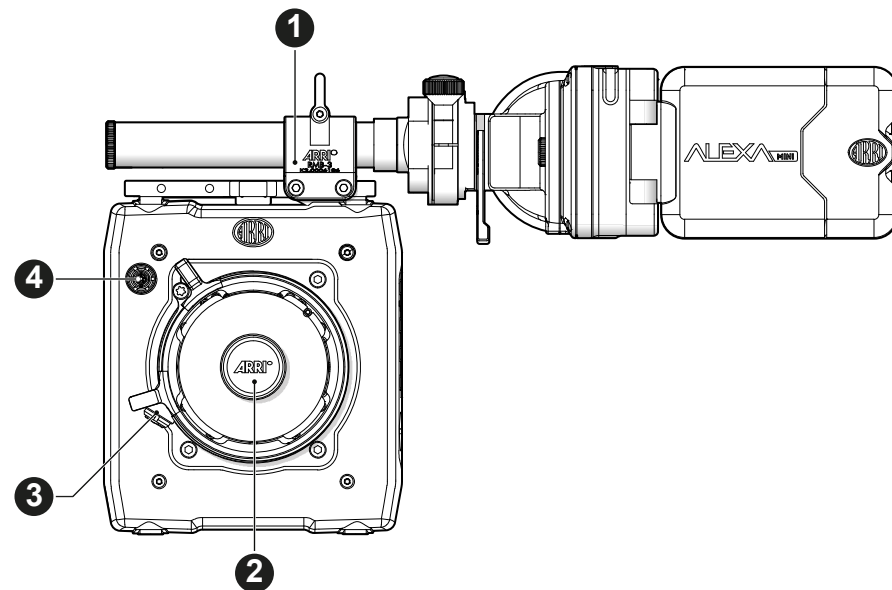
- 1 MAP-1
- 2 MVB-1
- 3 MVF-1 buttons
- 4 Record button
- 5 Tally light

Bottom



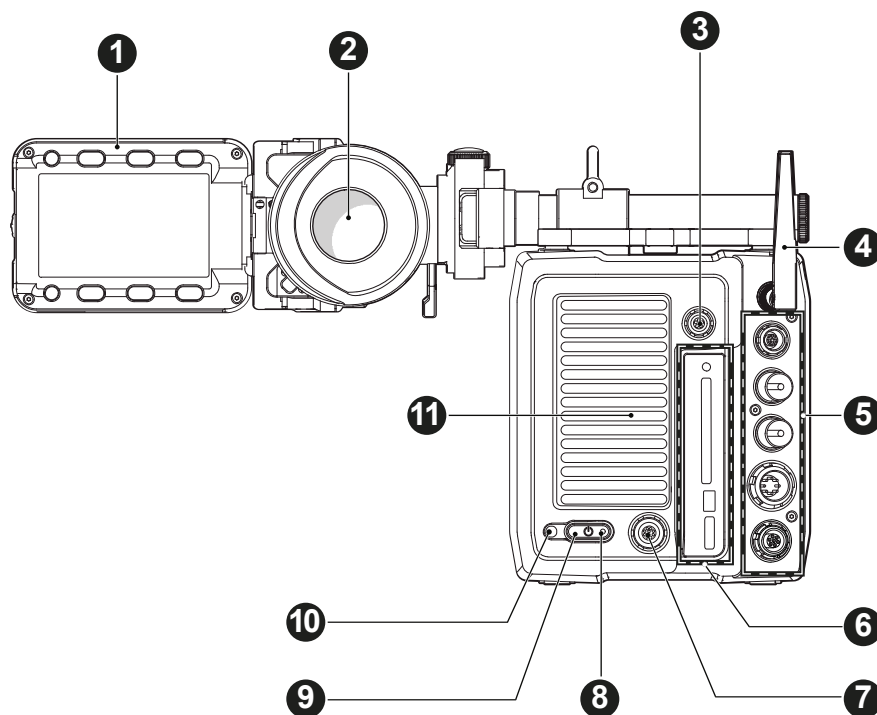
- 1 MVF-1 type label
- 2 PLAY button
- 3 Camera type labels
- 4 LBUS connector

Front



- 1 RMB-3
- 2 Lens mount (here: titanium PL)
- 3 LBUS connector
- 4 Audio connector

Back



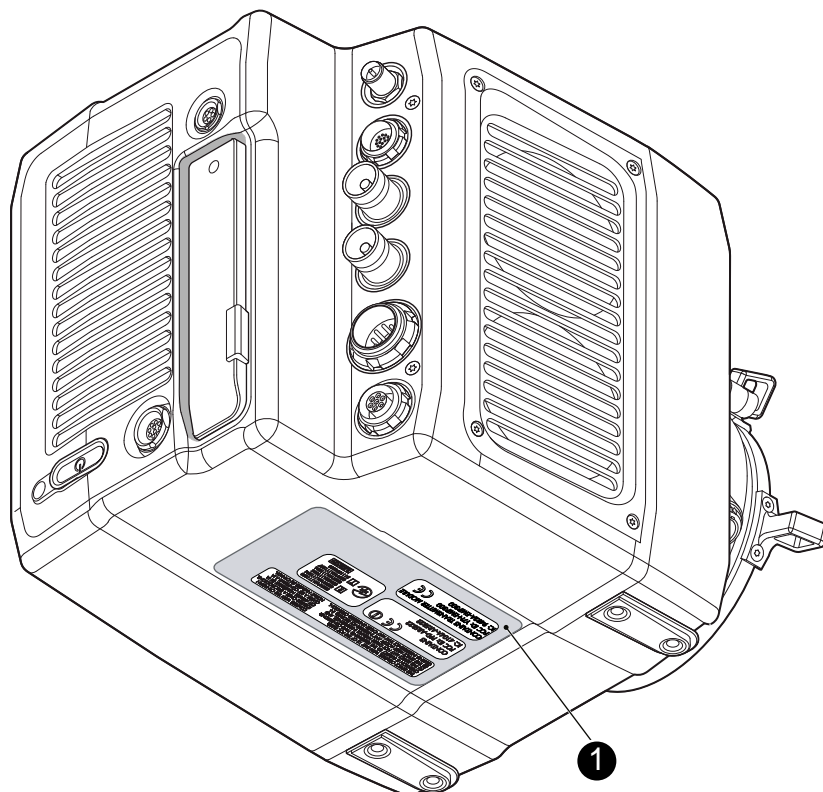
- 1 Fold-away monitor (MVF-1)
- 2 EVF OLED eyepiece
- 3 Timecode connector
- 4 White radio antenna
- 5 I/O panel
- 6 Media panel (CFast 2.0 card slot, USB)
- 7 Ethernet connector
- 8 Boot status LED
- 9 Power button
- 10 Recording status LED
- 11 Fan outlet

⚠ CAUTION!**Hot surfaces! Risk of injury and damage!**

During extended operation or operation in high ambient temperatures, the fan outlet at the camera rear, the CFast drive and the CFast card can get hot.

Never cover, obstruct or block the fan in- or outlets while the camera is powered.

4.2 Product identification



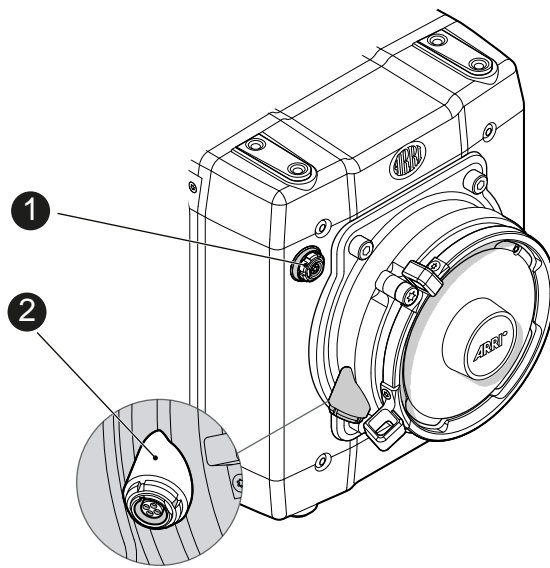
The FCC conformity label and the CE type label with serial number (1) are on the bottom of the camera. The serial number consists of the last 5 digits of the equipment number K1.0003873-XXXXX.

4.3 Connectors

NOTICE

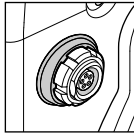
Connecting or disconnecting devices or cables while recording can disturb the audio/image signal due to static electricity.

4.3.1 Front connectors



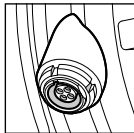
- 1 Audio in
- 2 L-Bus

Audio in (5-pin LEMO)



2-channel +24dBu line level audio input.

LBUS (4-pin LEMO)

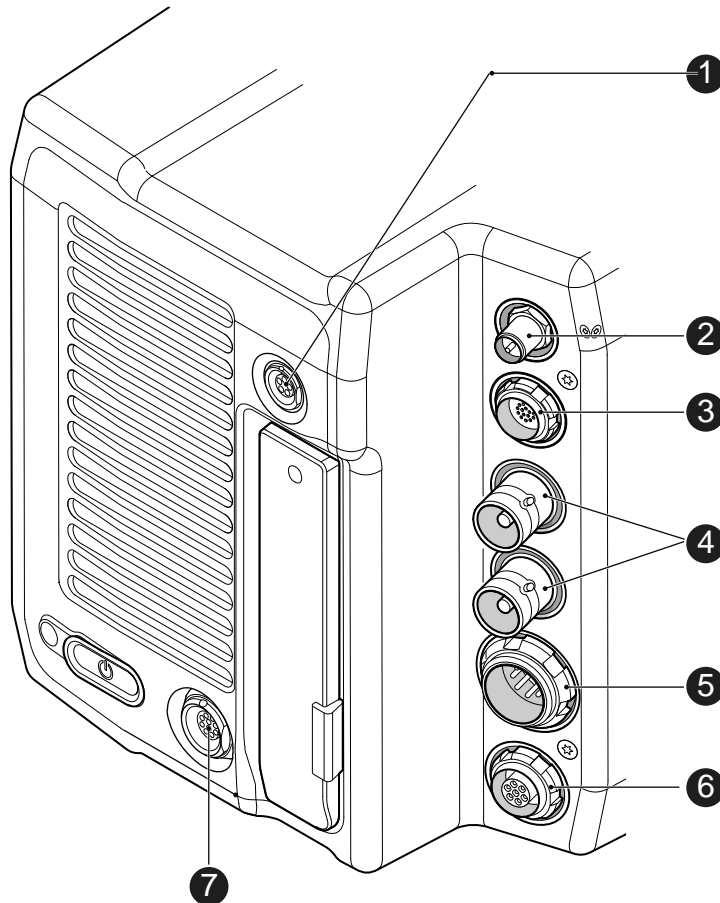


LBUS connector for daisy-chainable LBUS devices such as cforce mini motors, cforce plus motors, ARRI Master Grips and LCUBE CUB-1.

4.3.2 I/O panel

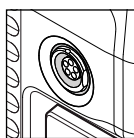
NOTICE

If the power supply is interrupted with the camera switched on, the camera will automatically repower and boot-up on reconnection.



- 1 Timecode connector
- 2 White radio antenna
- 3 MVF-1 or CCP-1
- 4 HD-SDI image out 1 & 2
- 5 BAT main power in
- 6 EXT connector
- 7 Ethernet connector

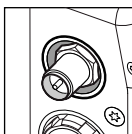
TC (5-pin LEMO)



The TC connector is a 5-pin LEMO socket. It accepts and distributes LTC (Longitudinal Time Code) signals.

Note: The camera has a TC buffer to keep a synced external TC for up to three minutes while camera power is disconnected.

White radio antenna

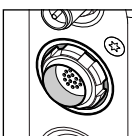


Mounting point for white radio antenna for lens control.

NOTICE

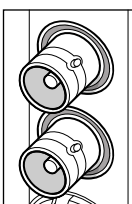
Do not leave the antenna connector open during operation or transport. The radio module inside could be damaged by electrostatic discharge on the open connector. ARRI recommends using the originally supplied antenna only (order number: K2.0001996).

EVF (16-Pin ODU)



Hot swappable interface for MVF-1 or CCP-1.

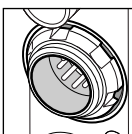
SDI OUT 1 & 2 (BNC)



Both BNC outputs deliver image outputs in 1920 x 1080 (422 1.5G, 422 3G, 444 3G) as well as 3840 x 2160 (DL 422 3G, 422 6G, DL 422 6G).

Through a hardware modification, SDI 2 can be reconfigured to a SYNC IN connector for analog genlock signals (Black burst, Tri-level sync). Please contact an ARRI camera service center for more information.

BAT (8-pin LEMO)



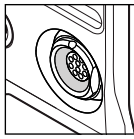
Via cables KC50-S (2 m, straight) and KC50-SP-S (coiled), this main power supply input accepts 10.5 to 34 V DC.

EXT (7-pin LEMO)



A connector for external accessories, carrying two CAN buses and unregulated accessory power output at battery voltage level (1.1 A max.). With an external adapter, R/S functionality is supported.

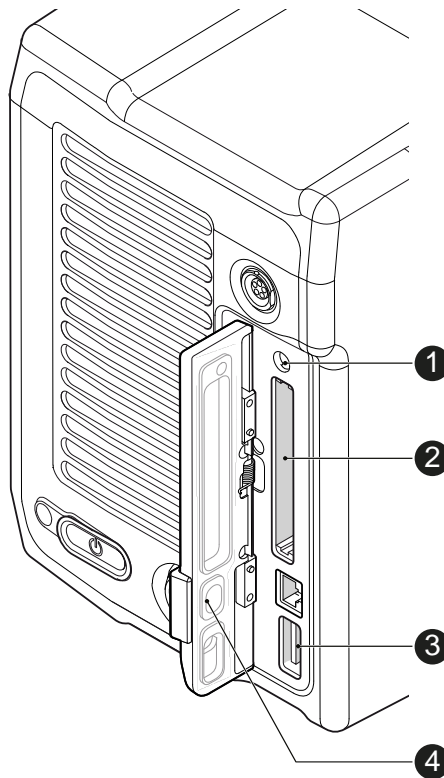
ETH (10-pin LEMO)



Standard Ethernet connectors don't deliver the durability and reliability required by ARRI, so ALEXA Mini uses a 10-pin LEMO connector. A special cable, available from ARRI (model KC-153-S), is required to connect the Ethernet connector to a standard RJ-45 Ethernet connector.

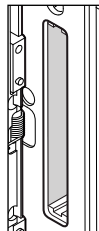
Note: The RCU-4 cannot be used with an ALEXA Mini.

4.4 Media panel



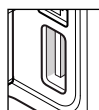
- | | | | |
|---|---------------------|---|-----|
| 1 | Status LED | 3 | USB |
| 2 | CFast 2.0 card slot | 4 | Lid |

Card (CFast 2.0)



Storage media slot for CFast 2.0 recording cards.

USB



Interface for USB memory sticks with FAT file system. Can also be used to charge USB devices. Supplies 5V with a maximum current of 500mA.

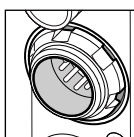
4.5 Power supply

The camera power is supplied by external power sources only. It accepts an input voltage range from 10.5 to 34 V DC. Do not supply power outside the specified voltage range.

NOTICE

If the power supply is interrupted with the camera switched on, the camera will automatically repower and boot-up on reconnection.

Always keep the BAT connector accessible so that the cable can be unplugged quickly in case of emergency.

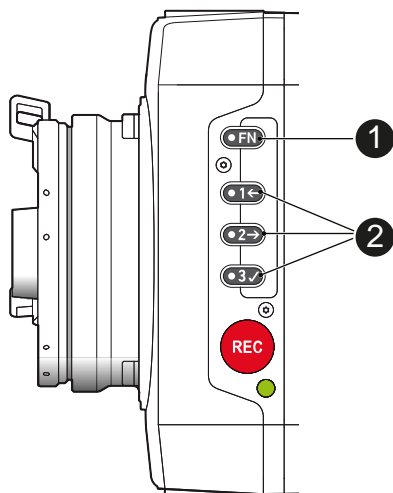


Use the 8-pin LEMO connector and a KC50-S or KC50-SP-S cable to supply the camera with 10.5 to 34 V DC. Do not use cables longer than 4m.

4.6 Camera Controls

The controls of the camera are explained in this chapter.

4.6.1 Function button FN and camera buttons 1-3



The left camera side is equipped with the function button FN (1) and three buttons labelled 1 through 3 and additional icons (2), which can act as regular user buttons or perform common camera functions in combination with the function button.

Camera buttons as user buttons:

By default, the camera buttons 1 to 3 function as user buttons.

For information on how to assign functions to user buttons, see "Assigning functions to camera user buttons", page 133.

Whenever the assigned function is active, the blue LED of the user button is lit.

Camera buttons to control common camera functions:

- Press and hold the function button (1), then press a camera button (2). You can also press the FN button twice within 0.5 seconds to bring the camera buttons into function selection mode for 2 seconds. During these two seconds, pressing a camera button will de-/activate its assigned function.

The LED of the FN button reflects that a camera function is active. An LED on each button reflects the functional status.

The following camera functions can be triggered:

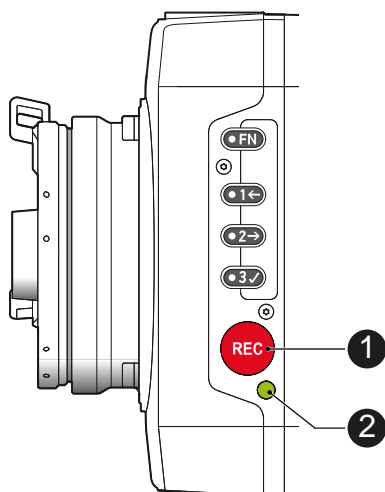
Function button & camera button	Function								
FN + 1	<p>Toggles the overlay menu. In the overlay menu, the camera buttons control the following functions:</p> <table border="1"> <thead> <tr> <th>Camera button</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Select backward</td> </tr> <tr> <td>2</td> <td>Select forward</td> </tr> <tr> <td>3</td> <td>Confirm</td> </tr> </tbody> </table> <p>For more information, see "Overlay menu", page 95.</p>	Camera button	Function	1	Select backward	2	Select forward	3	Confirm
Camera button	Function								
1	Select backward								
2	Select forward								
3	Confirm								
FN + 2	<p>Prepares a card erase and shows a message on EVF, Monitor, and SDI. To confirm the card erase, press camera button 3 twice.</p> <p>Any other button can be pressed to cancel the action. After the erase has finished, press any button to clear the message.</p>								
FN + 3	<p>Starts/stops the playback. During playback, the camera buttons control the following functions:</p> <table border="1"> <thead> <tr> <th>Camera button</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Skip backward</td> </tr> <tr> <td>2</td> <td>Skip forward</td> </tr> <tr> <td>3</td> <td>Play/Pause</td> </tr> </tbody> </table>	Camera button	Function	1	Skip backward	2	Skip forward	3	Play/Pause
Camera button	Function								
1	Skip backward								
2	Skip forward								
3	Play/Pause								

4.6.2 Starting recording via REC button

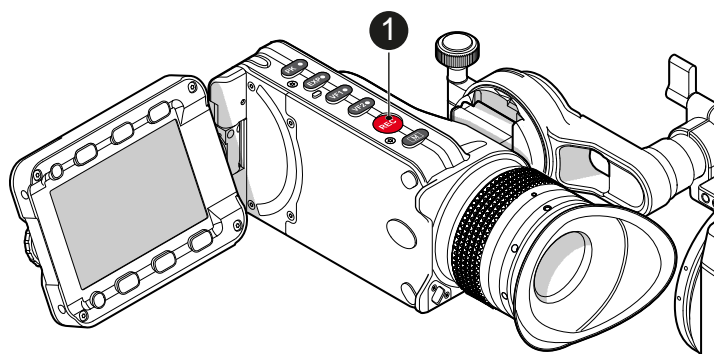
NOTICE

Pressing a recording button returns the MVF-1 user interface to the home screen and disables the menu access.

Recording also disables the home screen buttons for *FPS*, *TC*, *Shutter*, and *Look* settings.



The *REC* button is located on the left side of the camera.
 An additional *REC* button is located on the viewfinder and the Camera Control Panel CCP-1, if mounted.



The run LED next to the *REC* button on the camera body reflects the camera's status.

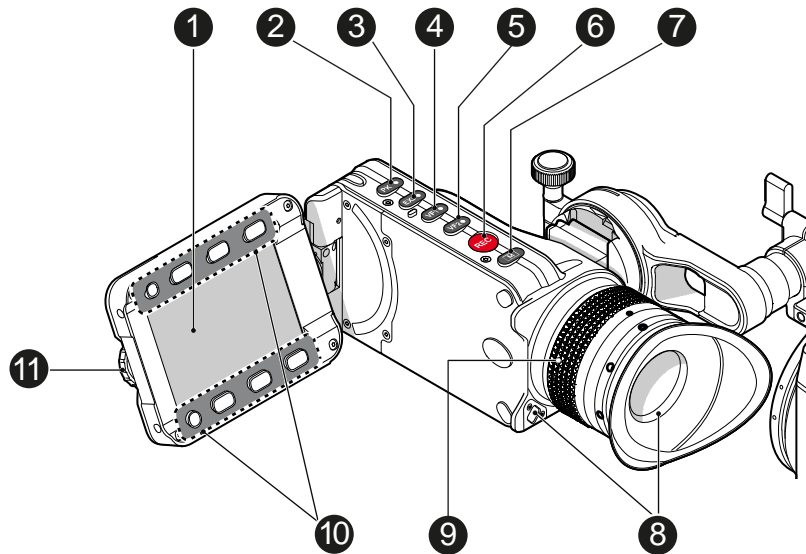
Run LED (2) is...	Camera is...
solid green	ready for recording
solid red	recording
off	not ready for recording. Check if the CFast 2.0 card is valid. For more information, see "Camera preparation", page 34.
flashing green/red	not ready for recording due to an error.

NOTICE

Never change memory cards when recording - this may damage the recorded clip.

NOTICE

Connecting or disconnecting devices or cables while recording can disturb the audio/image signal due to static electricity.

4.6.3 MVF-1 controls and proximity sensor

- | | | | |
|---|----------------------|----|------------------|
| 1 | Monitor (Live & GUI) | 7 | Monitor button |
| 2 | Peaking button | 8 | Proximity sensor |
| 3 | Exposure tool button | 9 | Diopter control |
| 4 | VF-1 user button | 10 | Screen buttons |
| 5 | VF-2 user button | 11 | Jogwheel |
| 6 | Recording button | | |

Proximity sensor

This infrared sensor automatically deactivates the MVF-1's internal OLED panel when you withdraw your eye. The sensor is placed either on the bottom left-hand side of the viewfinder (generation 1), or it is integrated into the eye cup (generation 2).

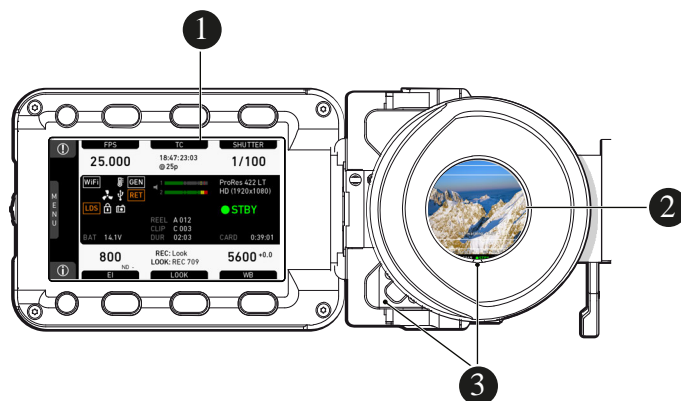
The Alexa Mini MVF-1 contains the generation 2 proximity sensor.

⚠ WARNING!

Constantly covering the proximity sensor of the MVF-1 can cause an irreversible burn-in on the viewfinder OLED display. If you need to cover the viewfinder, please disable the EVF OLED using the EVF power setting:

MENU > Monitoring > EVF/MONITOR > Settings > EVF Power.

4.6.3.1 EVF and Monitor



When you put your eye against the eyepiece, the proximity sensor (3) activates the EVF (2).

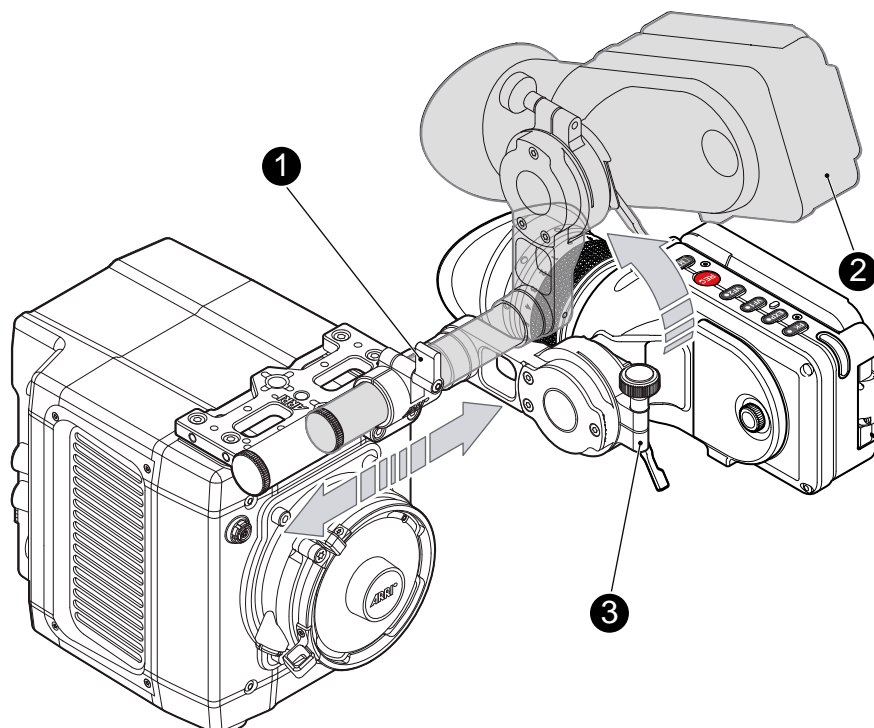
You can configure the camera to show status information on the EVF (2).

When activated, the camera shows essential camera, audio, and recording parameters next to the image.

You can modify/deactivate the status information via the *EVF overlays* and *EVF status components* menu. For more details, see "Status info", page 88.

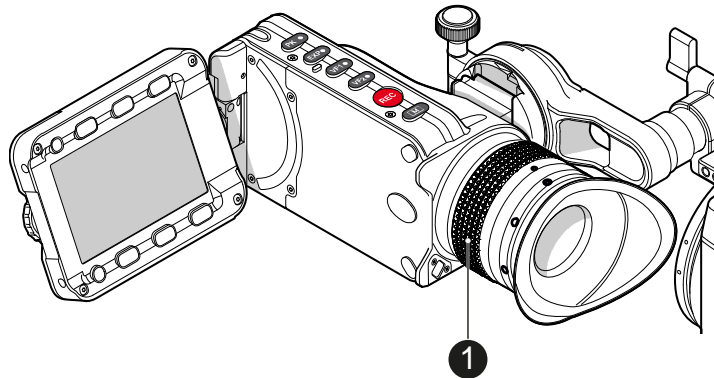
Note: If surround view is active, the surround area is marked by a separating line or a surround mask.

4.6.3.2 Adjusting the MVF-1



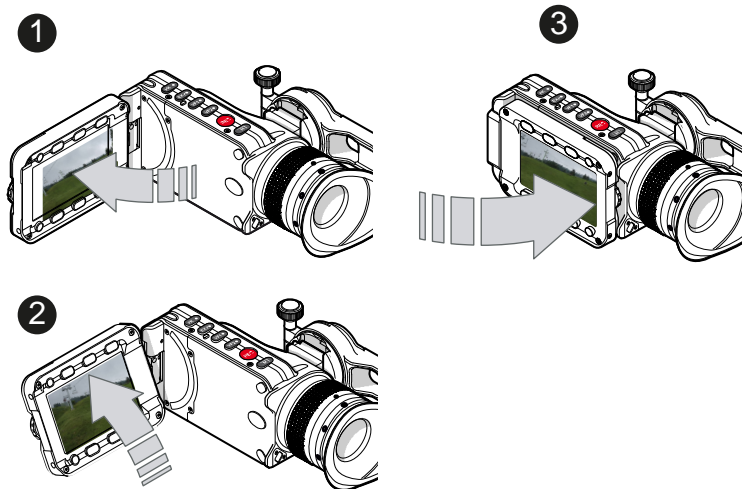
1. Place the camera bottom-down.
2. Slightly loosen the clamp (1) to move the MVF-1 (2) left/right and up/down.
3. Unclamp the hinge (3) to swivel the MVF-1 horizontally.
4. Close all clamps (1, 3) when the MVF-1 is in the desired position (2).

4.6.3.3 Adjusting the diopter



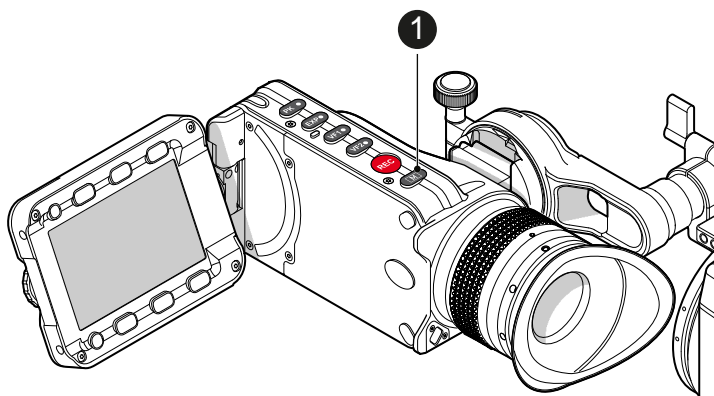
- ▶ Twist the ring left or right for diopter adjustment (1).

4.6.3.4 Adjusting the monitor

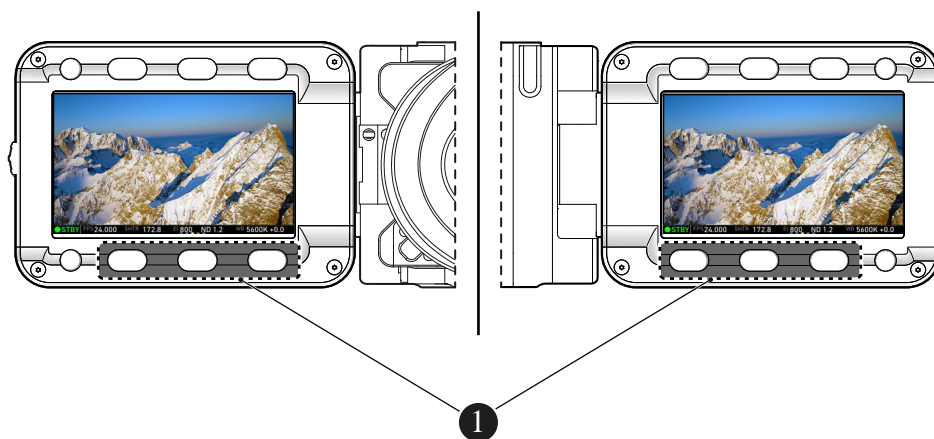


- ▶ Fold out (1), swivel (2) and fold in (3) the monitor to put the display visible in the folded-in position.

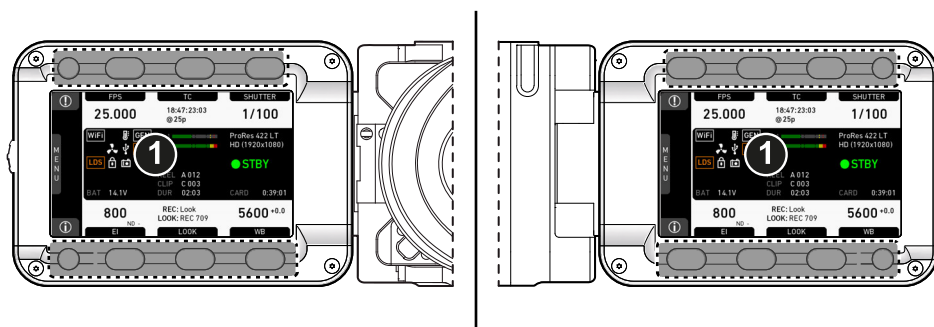
4.6.3.5 Changing the monitor mode



- ▶ Press the *M* button (1) to change the monitor mode between live view and user interface.



- ▶ In live mode, press the lower screen buttons (1) to toggle the status bar content.

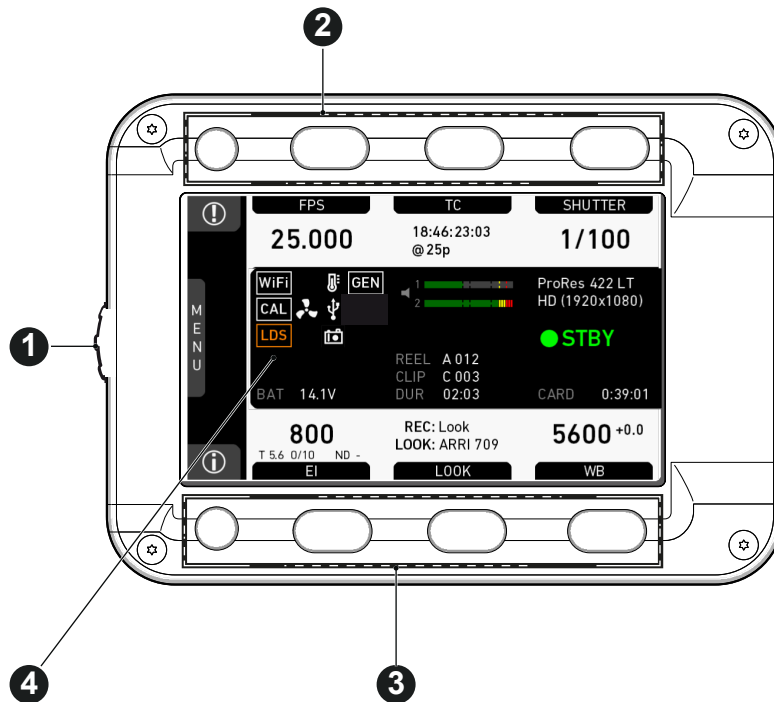


You can disable the location sensor that automatically flips the user interface to match a left or right-side monitor position (3).

- ▶ Choose *Menu > Monitoring > EVF/Monitor > Settings > Monitor flip mode*.

4.6.3.6 User monitor

Screen buttons and jogwheel



There are eight screen buttons, four above (2) and four below (3) the display (4). Their function depends on the screen content (4) and is labeled directly above or below each button.

Unlabeled buttons do not have a function for that screen. A grayed-out label shows that the function is currently not available. Using the jogwheel (1), you can do the following:

- Scroll or navigate through lists and menus.
- Change values (by scrolling up or down).
- Confirm settings (by pressing the jogwheel).

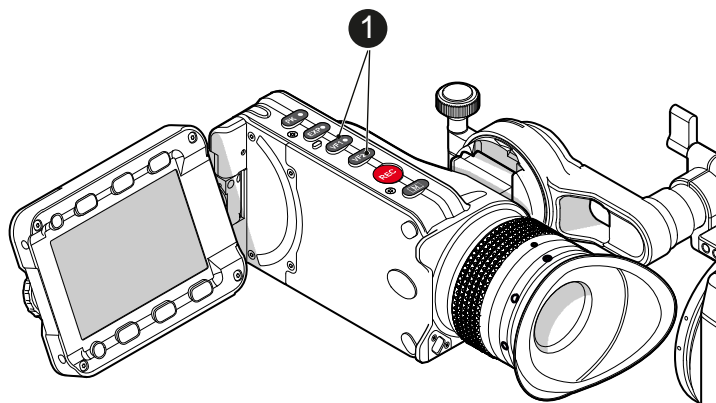
On the home screen (4), press the jogwheel (1) to open the camera menu.

4.6.3.7 Adjusting the monitor brightness

- ▶ Choose **MENU > Monitoring > EVF/Monitor > Settings**.

For more information, see "Defining EVF/Monitor settings", page 104.

4.6.3.8 Assigning a function to VF1 & VF2 user buttons

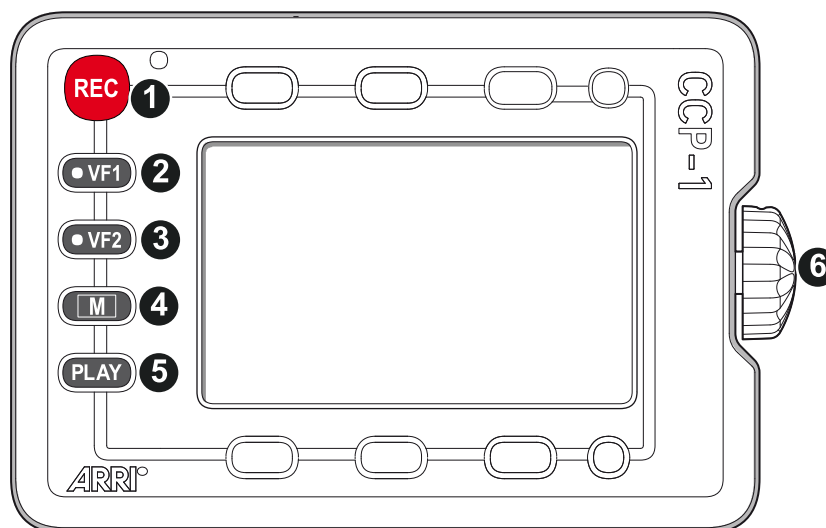


The MVF-1 has two user buttons, VF1 and VF2 (1). You can assign frequently-needed functions to each button.

► For more information, see "Button VF1 and VF2", page 133 .

4.7 CCP-1

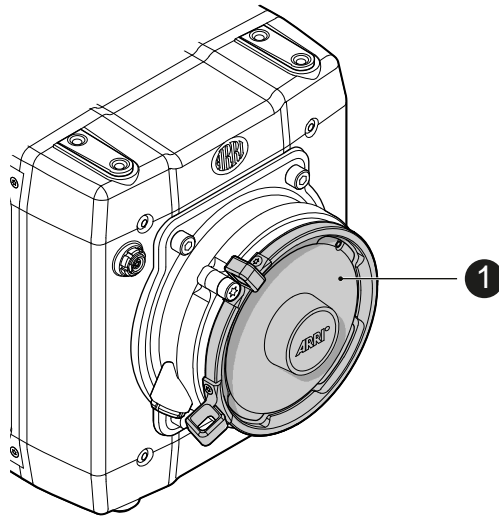
The Camera Control Panel-1 (CCP-1) is a standalone control panel, containing the display and a subset of the buttons of the MVF-1. It shows either the user interface or live view, and the buttons reflect the behavior of the equivalent buttons of the MVF-1. It can be used as the only control panel or with a MVF-1 daisy-chained to it.



- | | | | |
|---|------------------|---|----------------|
| 1 | Recording button | 4 | Monitor button |
| 2 | VF-1 user button | 5 | Play button |
| 3 | VF-2 user button | 6 | Jogwheel |

For more information on connecting the CCP-1 to the camera, see "Connecting the CCP-1", page 39 .

4.8 Lens mount/filters



- 1 Lens mount (here: Titanium PL LDS mount with L-Bus connector)

LDS

The camera supports the ARRI Lens Data System (LDS). Lenses with built-in LDS functionality communicate their focus, iris, and zoom values to the camera where the data is stored as metadata in the recorded files. The lens data can also be displayed as part of the status information. For more information, see "Setting EVF/SDI status info components", page 92.

Cooke /i support

The camera supports the Cooke /i protocol for lenses running firmware versions according to the following table.

Lens type	FW version
S4 /i Prime lens (10-bit)	0.29 or higher
S4 /i Prime lens (12 bit)	0.39 or higher
S4 /i Zoom lens (10 bit)	1.29 or higher
S4 /i Zoom lens (12 bit)	1.39 or higher

The firmware version can be retrieved from the lens with the *Cooke Viewer Lens Display* program. For detailed information, please contact Cooke Optics directly.

4.8.1 Lens iris control

You can control the lens iris with ENG-style lenses (B4 and PL) and EF lenses. You can control the iris via the auto iris feature or manually via user buttons or the menu (EF lenses only).

For more information, see

- "Adjusting the iris (EF lenses) manually", page 69
- "Defining the auto iris calculation", page 69
- "User buttons", page 130
- "EF lens support", page 33

4.8.2 EF lens support

With the EF mount the camera supports a wide range of EF lenses from Canon, Sigma, Zeiss and other manufacturers.

Apart from the common features for controlling lenses, the camera also supports the following features:

- Image stabilization
The lens image stabilizer for EF lenses is supported.
- Iris and focus control
If you are using the Wireless Compact Unit WCU-4 or Master Grips from the ARRI Electronic Control System (ECS) range, you can control EF lenses as follows:

Axis	Master Grip	WCU-4
Iris	X	X
Focus	X	

5 Getting started

The next section gives you information on the basics of how to prepare the camera for use.

5.1 Camera preparation

The following chapters provide information on how to attach commonly used accessories to the camera.

NOTICE

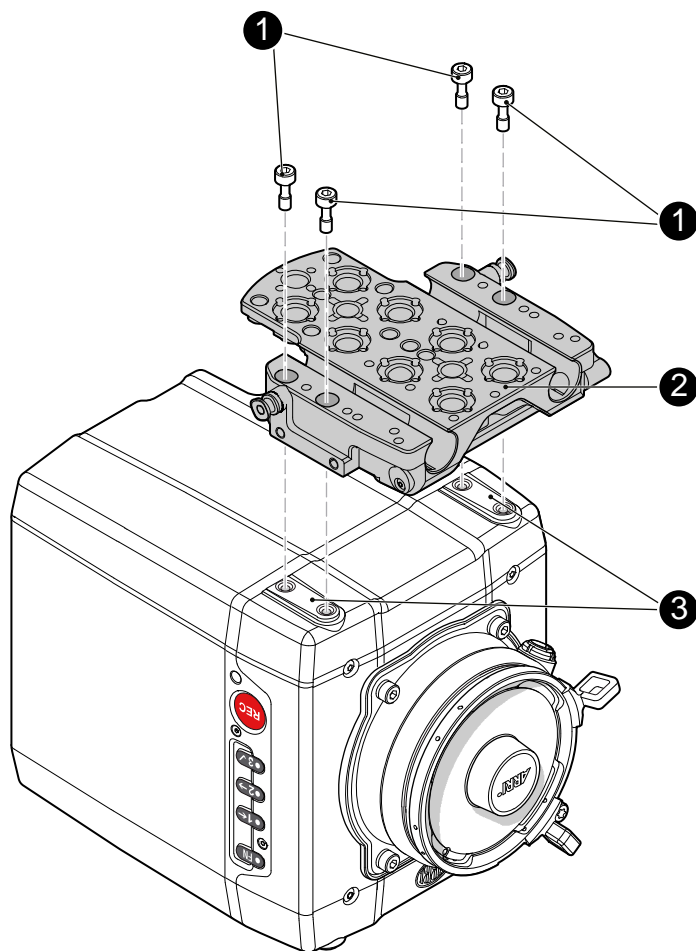
To avoid damage while assembling and retrofitting, always place the camera on a padded, firm, flat and level surface.

Work on an unpowered camera only.

5.1.1 Mounting to a bridge plate

To mount the camera to a bridge plate, you need the following accessories and tools:

Step	Accessory	Mount to	Tool
1	MAP-2	camera (bottom)	3.0 mm Allen key
2	BAP-4	MAP-2	Flat screwdriver (no coin!)
3	BP-8	BAP-4	

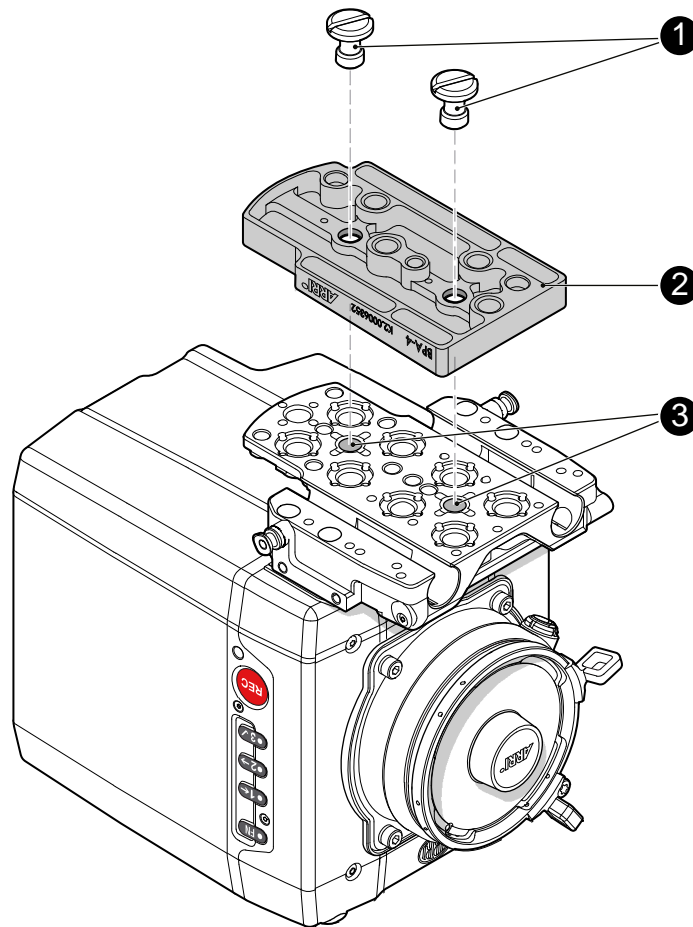
Step 1: Mounting the MAP-2 to the camera

1. Place the camera bottom-up.
2. Place the MAP-2 (2) exactly above the mounting points (3) of the camera.
3. With the Allen key, attach the screws (1) to the camera and tighten.

NOTICE

Always ensure a proper lock.

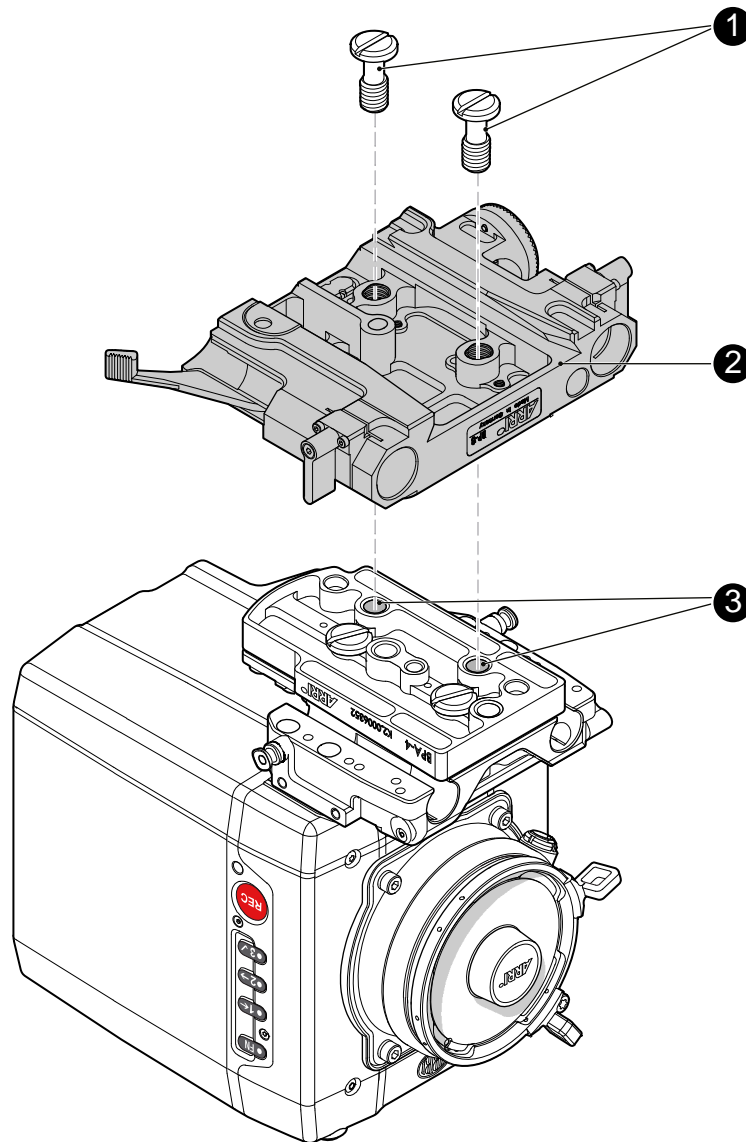
Step 2: Mounting the BAP-4 to the MAP-2



1. Place the BAP-4 (2) exactly above the mounting points (3) of the MAP-2 (2).
2. With a flat screwdriver, attach the screws (1) to the MAP-2 and tighten.

NOTICE

Always use a flat screwdriver to connect the BAP-4 to the MAP-2. Never use a coin. A coin does not deliver enough force to ensure a proper lock.

Step 3: Mounting the BP-8 to the BAP-4

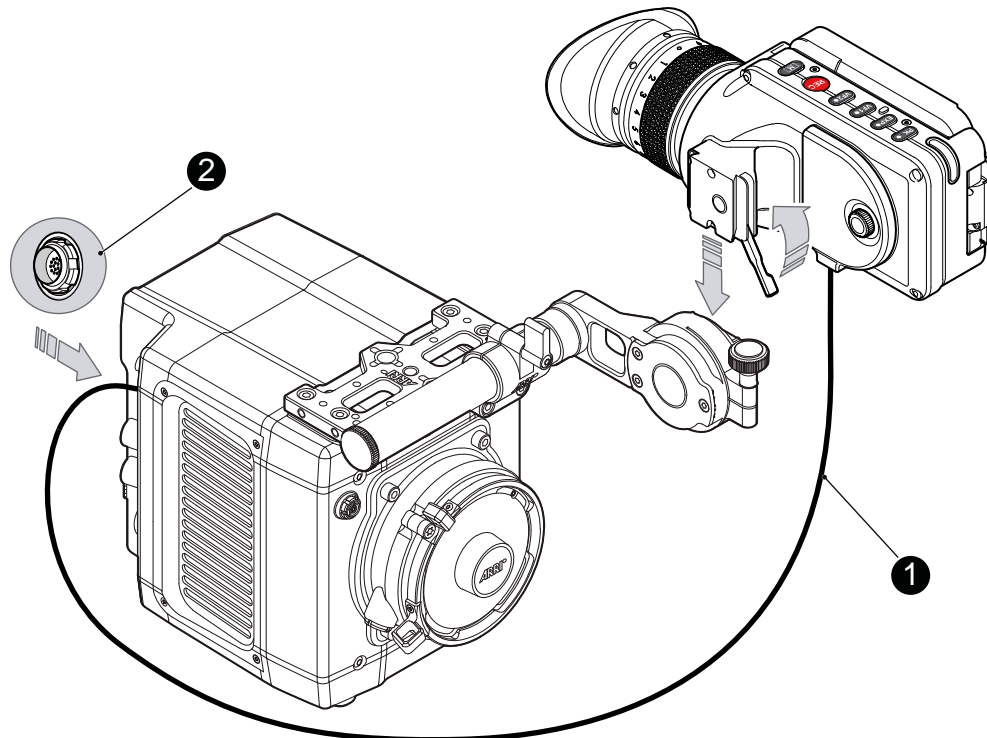
1. Place the BP-8 (2) exactly above the mounting points (3) of the BAP-4 (2).
2. With a flat screwdriver, attach the screws (1) to the BAP-4 and tighten.

NOTICE

Always use a flat screwdriver to connect the BP-8 to the BAP-4. Never use a coin. A coin does not deliver enough force to ensure a proper lock.

5.1.2 Connecting the MVF-1 and EVF cables

Connecting the EVF cable to the camera



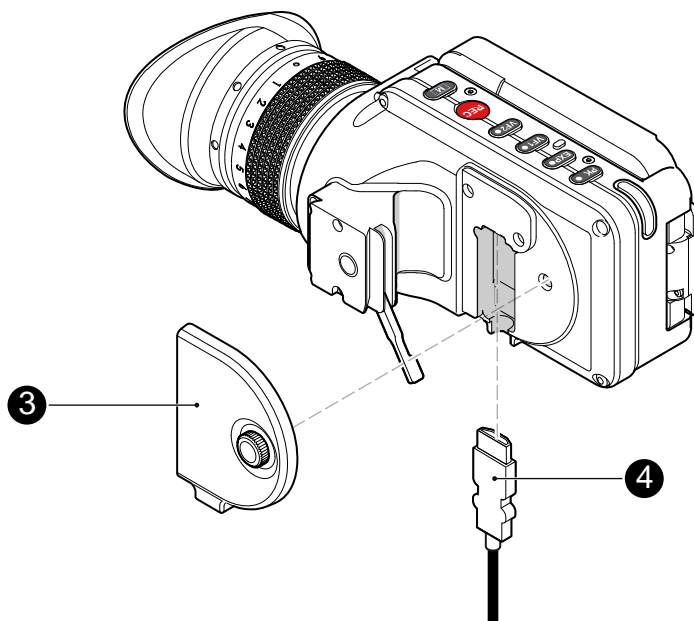
Note: Use original ALEXA Mini-EVF cables only.

- ▶ Connect the EVF cable (1) to the camera (16-pin ODU connector (2) on the I/O panel).

⚠ CAUTION!

Never try to connect the cable to any other connector on the camera than the EVF connector. This may cause permanent damage to both cable and camera connectors.

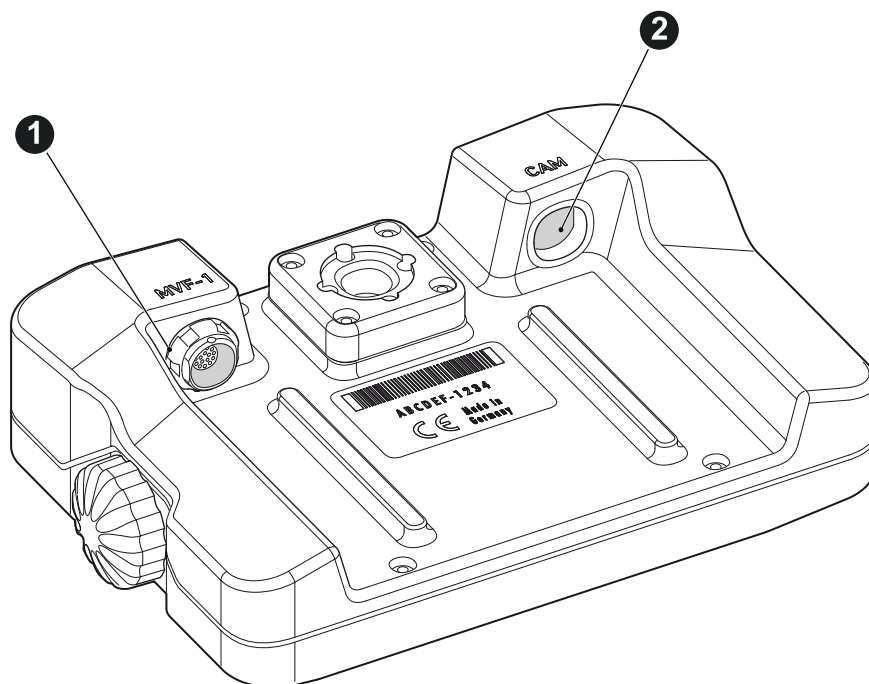
Connecting the EVF cable to the MVF-1



Note: Use original ALEXA Mini-EVF cables only.

1. Switch off; interrupt the power supply.
2. With your fingers, unscrew and remove the MVF-1's lid (1).
3. Connect the cable (2) to the EVF port.
4. Reattach the lid (1).

5.1.3 Connecting the CCP-1



- 1 MVF-1 connector
- 2 CAM connector

Connect CCP-1 to the EVF out port of the camera. For more information, see "I/O panel", page 20.

When it is used alone with the camera, it always shows an image.

When a MVF-1 is daisy-chained to the CCP-1, the MVF-1 will show an image in the EVF, but only one of the two monitors, either of the MVF-1 or the CCP-1 is active.

If the monitor of the MVF-1 is closed, the CCP-1 is activated.

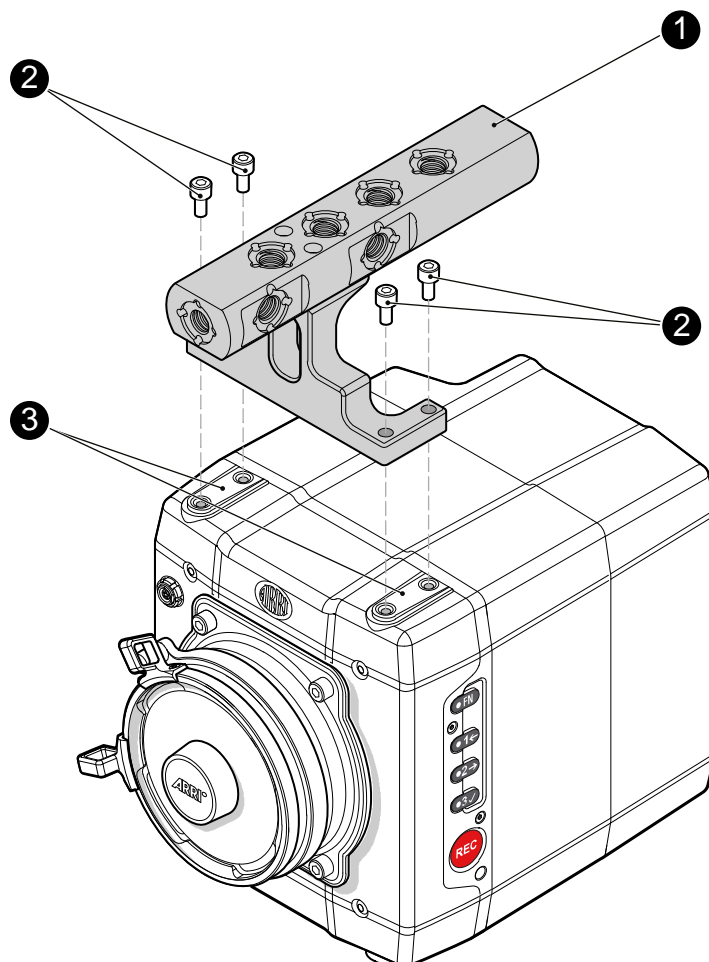
If the monitor of the MVF-1 is opened, the monitor will be activated.

- Activate the MVF-1 by pressing a screen button on the MVF-1.
- Activate the CCP-1 by pressing any button except the *REC* button on the CCP-1.

5.1.4 Mounting the camera center handle CCH-2

Tool needed

- 3.0 mm Allen key



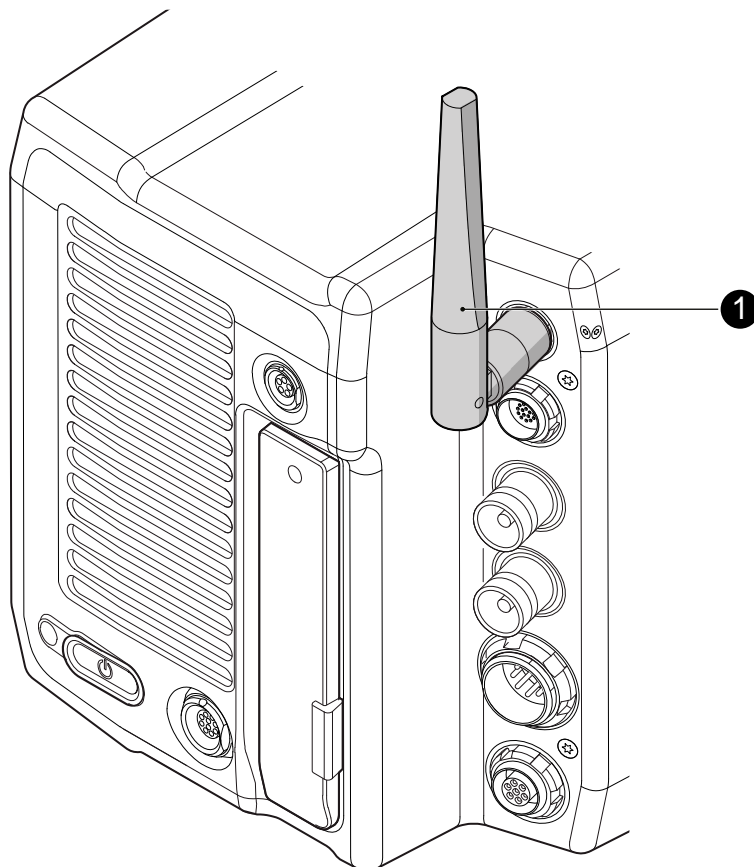
1. Place the camera handle (1) exactly above the mounting points (3) of the camera.
2. With the Allen key, attach the screws (2) to the camera and tighten.

NOTICE

Always ensure a proper lock.

5.1.5 Mounting and unmounting the antenna

Mounting the antenna



- ▶ With your fingers, thread the antenna for white radio (1) onto the camera.

Unmounting the antenna

- ▶ Unthread the antenna (1) with your fingers.

Note: Do not use the white radio module without the antenna attached.

5.1.6 Changing a lens mount

⚠ DANGER!

High voltage! Risk of electric shock and fire!

Short circuits may entail lethal injury and damage!

Use original AMIRA or ALEXA Mini lens mounts only.

Before each lens mount change, always switch the camera off and disconnect all power sources.

Changing the lens mount while the camera is powered may permanently damage the camera and lens mount.

Protect sensor and electrical system: Always store the camera with a lens mount properly installed and capped.

Immediately replace each lens mount after removal.

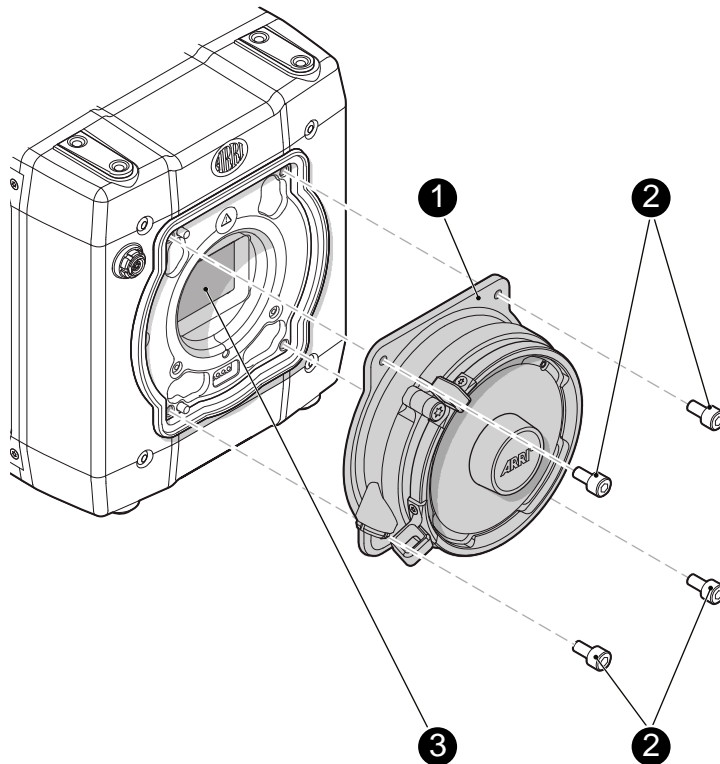
Change lens mounts in dust-free environment only.

NOTICE

After each lens mount change, always check the back focus of the camera.
Have the back focus always corrected by properly skilled personnel.
Back focus correction requires special tools and training that meet ARRI guidelines.
For all back focus issues, contact a qualified ARRI Service Center.

Tools and provisions needed

- 3 mm Allen key
- Switch the camera off
- Disconnect all power sources
- Properly cap, disconnect, and store the lens
- Perform the task with care to protect all optical surfaces

Uninstalling a lens mount (here: PL mount)

1. Crosswise, loosen all four screws (2) with an Allen key.
2. Carefully remove the mount (1).
3. Store the mount in a case for dust protection.
4. **Note:** To protect the sensor (3), immediately install another lens mount.

Installing a lens mount (here: PL mount)

⚠ WARNING!

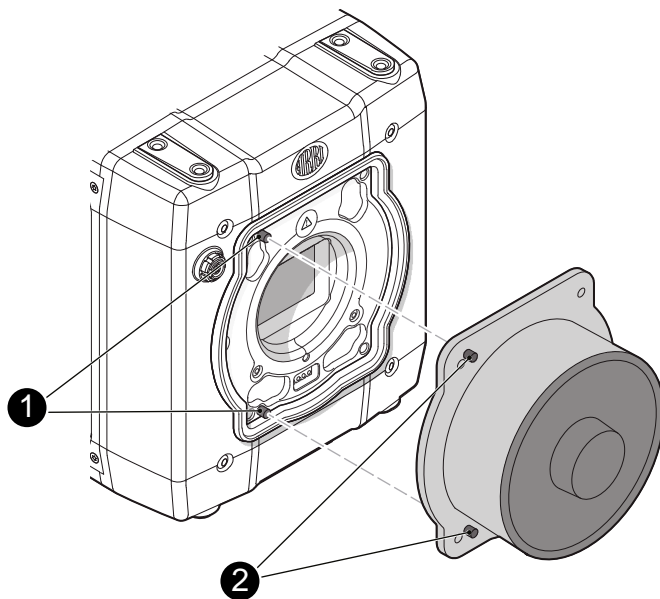
Condensation! Risk of electric shock and damage!

Humidity may ingress due to misinstalled lens mounts!

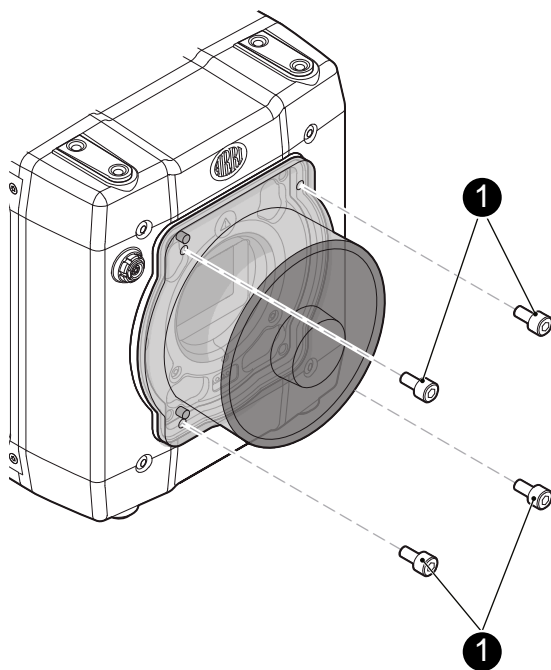
When installing a lens mount, always align and attach properly; never apply force.

Hand-tighten all screws crosswise before final tightening.

Always tighten crosswise with the prescribed tool.



1. Properly align the two guiding pins (1) for correct lens mount fit (2).
2. **Note:** Never apply force, align the guiding pins instead.



3. Crosswise, hand-tighten all four screws (1).
4. Only then, tighten all screws crosswise with an Allen key.
5. **Note:** Always store the camera with a lens mount properly installed and capped.

NOTICE

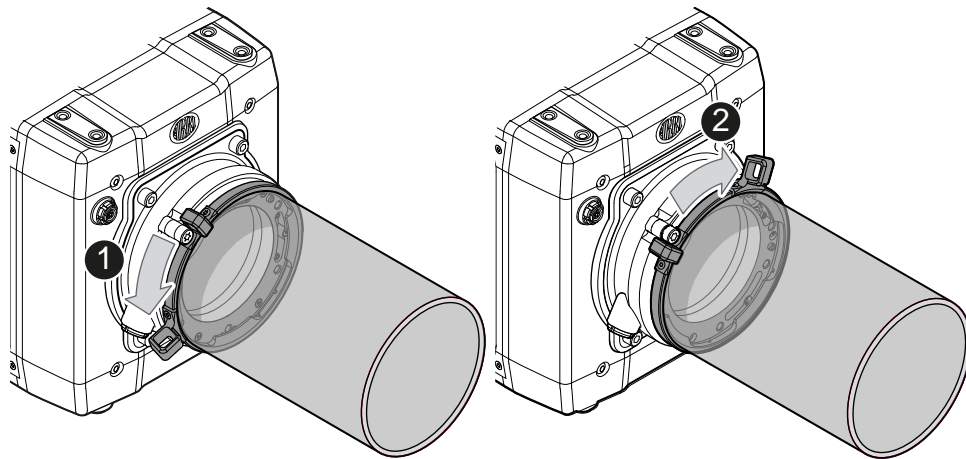
The titanium PL LDS mount with LBUS connector (K2.0003216) does not supply LBUS functionality nor lens data via the LDS contacts when attached to the AMIRA.

5.1.7 Changing a lens

NOTICE

Protect the sensor: Always keep a lens or protective cap on the empty lens mount.
Change lenses in dry, dust-free environments only.
Never exceed the maximum lens dimensions.
Have every lens properly shimmed as prescribed by the manufacturer.

PL mount



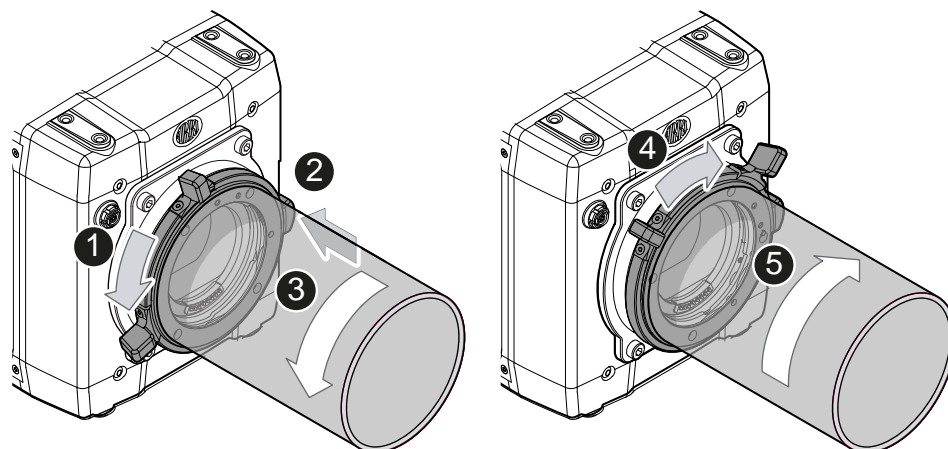
Note: Please use a lens support system for PL lenses above 3 kg/6.6 lbs.

1. Observe maximum lens dimensions.
2. Unlock the lens mount counter-clockwise (1) and remove the lens or cap.

Note: Never touch the sensor.

3. You have the following options:
 - Mount the next lens and lock (2) the lens mount clockwise.
 - **Or:** Always cap and lock (2) an empty lens mount clockwise.

EF mount



Note: Please use a lens support system for EF lenses above 3 kg/6.6 lbs.

1. Observe maximum lens dimensions.
2. Turn the lever counter-clockwise (1) to unlock the mount.
3. You have the following options:
 - Remove the cap.
 - **Or:** Press and hold the button (2) to unlock the lens.
4. Turn the lens (3) counter-clockwise, then remove it.

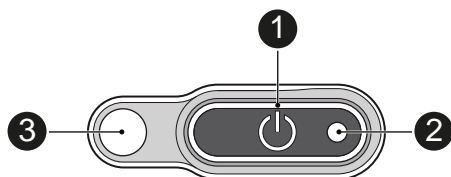
Note: Never touch the sensor.
5. You have the following options:

Mount the next lens:

 - Align the dots of both lens and lens mount.
 - Push the lens into the mount.
 - Turn the lens clockwise (5) until the bayonet locks.
 - Turn the lever clockwise (4) to tighten the lens to the lens mount.

Or: Always cap the empty lens mount.

5.2 Switching on and off



NOTICE

Before switching on, ensure that the camera is connected to an external power source.

The power button background illumination is on when the power is in the valid range.

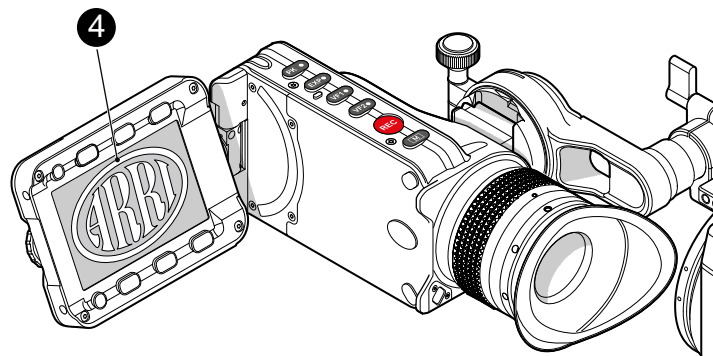
Switching the camera on

- ▶ Press the power button (1).

The camera starts booting. The boot status is indicated as follows:

Boot status LED (2) is...	Camera
flashing blue	is booting
solid blue	has finished the boot process

For mounted MVF-1 (or CCP-1) only: During the boot process, the ARRI logo appears in the monitor of the MVF-1 (4).

**Switching the camera off**

- ▶ Press and hold the power button (1) until the camera has switched off and the boot status LED (2) turns off.

On the monitor (4) of MVF-1 and CCP-1 as well as in the viewfinder, a countdown appears while you press and hold the power button. On reaching zero, the camera switches off.

6 Media usage

The following chapter explains how to insert and remove CFast 2.0 cards and USB sticks.

6.1 Inserting and removing a CFast 2.0 card

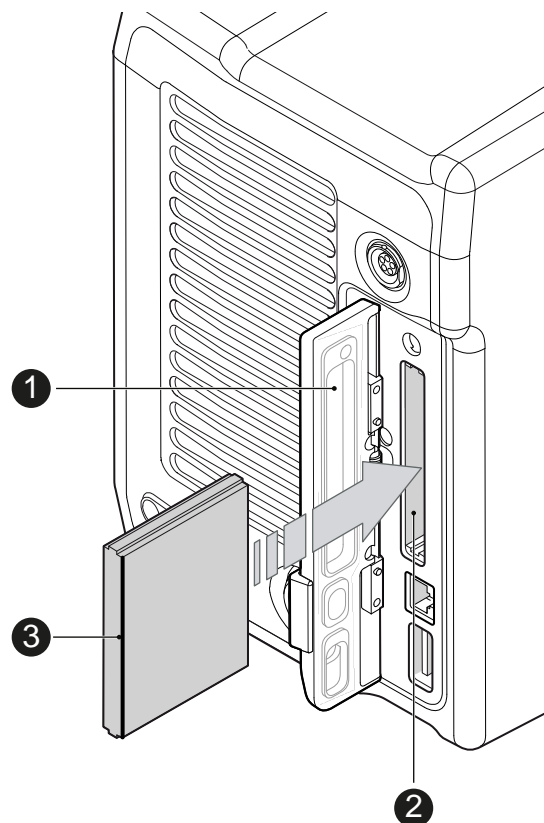
NOTICE

ALEXA Mini does not accept ALEXA-formatted CFast 2.0 cards, and vice versa.

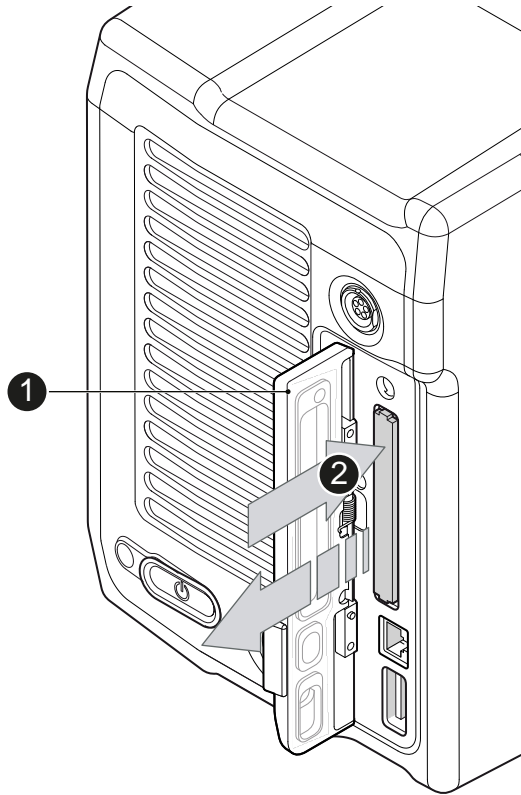
Before using a CFast 2.0 card with ALEXA Mini, you **must** erase it in-camera to create the required file system.

Avoid damage to the contacts of both camera and card. Always insert cards as described in this document.

Never change memory cards when recording - this may damage the recorded clip.

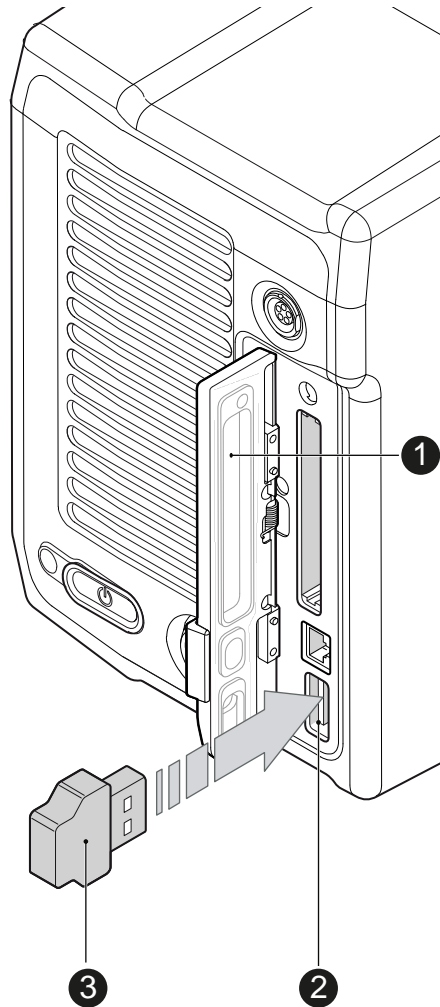


1. To insert the card, open the lid (1).
2. Align the card's positive edge (3) facing the camera rear.
3. With the contact pins first, gently insert the card, until it audibly locks (2).
4. Close the lid gently (1). **Never** force it closed on an unlocked card.



5. To remove the card, open the lid (1).
6. Insert the card until it unlocks audibly (2).
7. Remove the card.

6.2 Inserting and removing USB medium



1. Open the media lid (1).
2. Connect a FAT-formatted USB stick (3) to the camera (2).

The USB memory stick is now ready for use with the camera.

You can remove the stick from the camera without unmounting it.

For information on preparing the USB memory stick for use with the camera, see "Preparing USB medium", page 86.

NOTICE

The camera only supports USB memory sticks or pendrives, FAT-formatted with MBR partition table and with a maximum capacity of 16GB. Hard drives or similar will not be recognized.

6.3 Supported CFast 2.0 cards

List of supported CFast 2.0 cards

Card type	Useable capacity*	Firmware
SanDisk Extreme Pro CFast 2.0 120GB (SDCFSP-120G)	114 GB	HDX 8.03
SanDisk Extreme Pro CFast 2.0 128GB (SDCFSP-128G-xxxA/B)	121 GB	HDX 14.14
SanDisk Extreme Pro CFast 2.0 128GB (SDCFSP-128G-xxxD)	115 GB	HDX 15.01
SanDisk Extreme Pro CFast 2.0 256GB (SDCFSP-256G-xxxD)	243 GB	HDX 15.01 HDX 15.02
SanDisk Extreme Pro CFast 2.0 512GB ARRI Edition (K2.0016648)**	512 GB	CF1502AR
Lexar Professional 3600x CFast 2.0 128GB (LC128Cxxxx3600)	128 GB	20150507
Lexar Professional 3600x CFast 2.0 256GB (LC256Cxxxx3600)	256 GB	20150507
Lexar Professional 3600x CFast 2.0 256GB (LC256Cxxxx3600G2)	256 GB	20150507 20160507

* 1 GB = 10⁹ Byte

** SanDisk Extreme Pro CFast 2.0 512GB card with custom ARRI firmware CF1502AR will be available in 2018

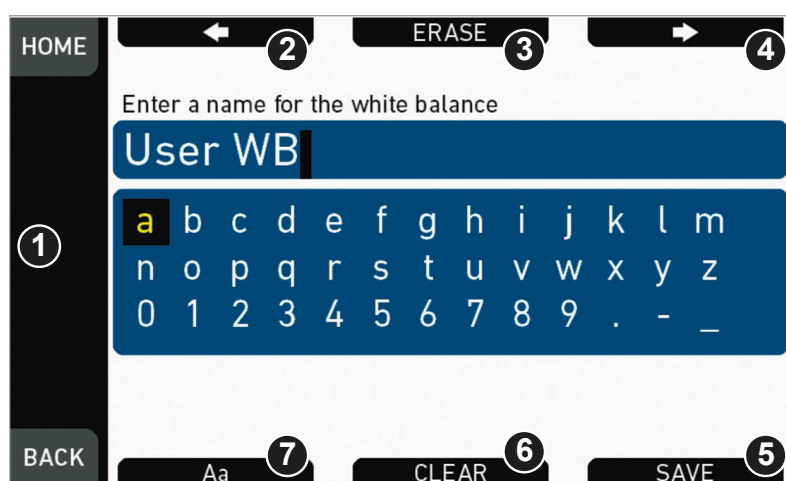
7 Home screen and camera menu

The ALEXA Mini provides many parameters to customize the camera to suit your shooting needs. The most important parameters are shown and can be modified using the home screen. All other parameters can be modified using the menu.

7.1 Using the on-screen keyboard

Typing names

When you are working with textual parameters on the camera, an on-screen keyboard allows you to enter text. You can use the keyboard, for example, to enter the name of a white balance preset.



You have the following options:

- *Jogwheel* (1)
Selects or confirms characters to form a name.
- *Left Arrow* (2)
Moves the cursor backwards.
- *ERASE* (3)
Deletes the character to the left of the cursor.
- *Right Arrow* (4)
Moves the cursor forwards.
- *SAVE* (5)
Saves the entry.
- *CLEAR* (6)
Clears the entire text.
- *Aa* (7)
Toggles between upper and lower case.

7.2 Working with lists

For certain parameters, the camera operates with lists that come with default entries and can be customized to suit your needs. You can add and delete entries so that only the entries relevant for your work are listed.

Some lists contain values that can be directly edited in the camera, while other lists show files that can be imported from or exported to the USB medium. Lists showing values or files installed on the camera have a blue background, lists showing ARRI default files or files on the USB medium are shown with a gray background.

All lists have a maximum number of entries. Whenever a list is full, the *ADD* button is grayed out and a message is shown. You must delete any unnecessary entries to add new ones.

The following parameters work with lists and the values can be edited in the camera:

- *HOME > FPS*
- *HOME > SHUTTER*
- *HOME > WB*

The following parameters work with file-based lists:

- *HOME > LOOK*
- *MENU > Monitoring > Frame lines > Frame line*
- *MENU > Setups > User setups installed*
- *MENU > Electronic Control System (ECS) > Lens data > LDA*

Maximum list sizes

The following table lists the maximum number of entries for each type of list:

List	Maximum entries
FPS	16
Shutter	16
WB	16
Looks	50
Frame lines	100
User setups	20
LDA	200

Adding entries

1. Select one of the parameters listed above.
2. Press *ADD*.
3. For lists with directly editable values:
 - a) Enter the desired value.
 - b) Press *ADD TO LIST*.
4. For lists with files:
 - a) Press *DEFAULTS* to see the default files provided by ARRI.
 - b) Press *USB* to see the files on the USB medium.
 - c) Select the desired file.
 - d) Press the jogwheel to start the import.

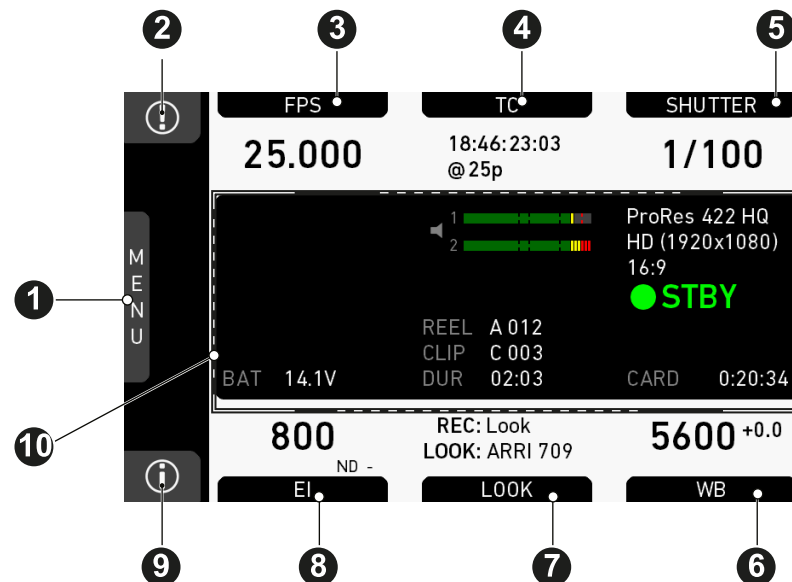
Note: If a file with the same name already exists, the camera asks whether you want to overwrite the existing file.

Deleting entries

1. Select one of the parameters listed above.
2. Press *DELETE*.
The list turns red.
3. Select the entry you want to delete with the jogwheel.
4. Press the jogwheel.
The camera asks if you want to delete the selected entry.
5. Press *CONFIRM* to delete the selected entry or press any other button to cancel.

7.3 Home screen

The home screen gives access to essential camera parameters and statuses. The oval screen buttons and the jogwheel allow quick parameter editing. You can return to the home screen by pressing the **HOME** button.



- | | | | |
|---|----------------------|----|----------------|
| 1 | MENU jogwheel | 6 | WB button |
| 2 | ALERT message button | 7 | LOOK button |
| 3 | FPS button | 8 | EI button |
| 4 | TC button | 9 | INFO button |
| 5 | SHUTTER button | 10 | Status section |

(01) MENU jogwheel

Press the jogwheel to enter the camera menu.

(02) ALERT message button

If red: Alert messages are available (critical to camera functionality). Press the round button to read them.

(03) FPS button

FPS shows the sensor frame rate, allowing adjustments from 0.750 to 200.000.

Note: The maximum frame rate that can be set is dependent on the recording resolution and the codec.

Note: If the sensor fps does not match the project rate, the FPS label turns orange and shows an exclamation mark.

(04) **TC** button

Shows the current timecode values and the active project rate, allows adjustment of timecode format and values.

Note: If timecode is forced to Rec Run, or external timecode is missing, the TC label turns orange and shows an exclamation mark. Enter the timecode screen by pressing the TC button to see more information on the warning.

(05) **SHUTTER** button

Shows shutter settings adjustable either as angle (5.0° to 356.0°) or exposure time (1/25 to 1/8000s).

Shutter angle, sensor fps and exposure time relate as follows:

exposure time = shutter angle / (360 * fps).

The maximum shutter angle is limited by the resulting exposure time (1/25s max).

(06) **WB** button

WB shows the camera's current white balance (i.e. the preadjusted color temperature of a light source).

You can adjust WB from 2,000 to 11,000 Kelvin (here: 5,600) in steps of 10 K for red/blue correction.

You can also color-compensate for green/magenta tints in a range from -16.0 to +16.0. Positive or negative CC color compensation values then appear in superscript (here: +0.0).

For automatic white balance: Assign *Auto WB* to a user button and press it twice in one second.

(07) **LOOK** button

Shows the REC path processing setting and the name of the active look. Opens the look screen, which provides further access to processing settings of all image paths and global look as well as in camera look editing.

(08) **EI** button

Shows the current *EI* rating and active ND filter value. Allows you to set the exposure index in ASA.

Base sensitivity for the ALEXA Mini is 800 ASA. The *EI* rating can be adjusted from 160 to 3200 ASA.

Note: ASA and ISO ratings are identical.

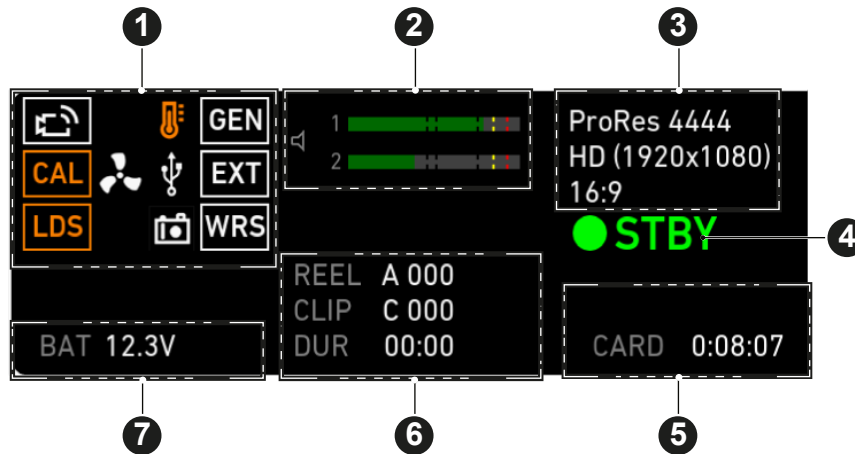
Via *EI*>*ND*, the ND filter can be adjusted.

(09) **INFO** button

Provides access to the camera info screens.

7.3.1 **Status section**




The status section on the home screen shows key data about recording, power supply, remaining media capacity, and more:



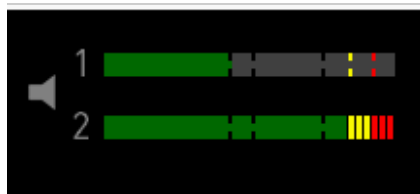
- | | | | |
|---|---------------------------------|---|------------------|
| 1 | Status icons | 5 | Card status |
| 2 | Audio meters | 6 | Recording status |
| 3 | Codec, resolution, aspect ratio | 7 | Battery voltage |
| 4 | Camera status | | |

(1) Status icons

Icon	Description
	If WiFi mode is Host, depicts a small camera. If WiFi mode is Client, shows the signal strength of the WiFi connection.
	Info on lens motor calibration: <ul style="list-style-type: none"> Orange: lens motor calibration required White: lens motor calibration active
	Indicates an error on the LDS interface.
	Alerts on sensor temperature issues: <ul style="list-style-type: none"> Black: warning Orange: error Red: system temperature error (see <i>INFO > System status</i>)
	Icon color shows the fan noise status: <ul style="list-style-type: none"> Gray: about to increase above 20 dBa. Orange: higher than 20 dBa.
	Icon color shows USB memory status: <ul style="list-style-type: none"> White: ready Gray: read only Orange: not usable
	Icon color shows frame grab status: <ul style="list-style-type: none"> White: frame grab is active. Orange: frame grab failed. Typically caused by missing USB.

Icon	Description
	Shows that genlock is activated.
	Shows that EXT sync is activated.
	Shows that the white radio module is activated.

(2) Audio meters



Shows current level of camera audio channel signals. If audio is disabled, the speaker icon is crossed out.


Black markers at signal levels -20, -18, -9 dBFS for reference test tone. Yellow marker at -5 dBFS and red marker at -2 dBFS indicate a signal close to clipping. A red frame around the meter indicates a clipping at the A/D stage.

(3) Codec, resolution, aspect ratio

ProRes 4444
HD (1920x1080)
16:9

Currently active codec, recording resolution, and aspect ratio.

(4) Camera status

HD (1920x1080)
 **STBY**
CARD 0:20:01

STBY: Ready for recording

REC: Recording

PREREC: Prerecording

ERASE: Erasing a CFast 2.0 card. Active erasing disables recording

PLAY: Camera is in playback

None (IDLE): Recording not possible (e. g. no card inserted, card is full)

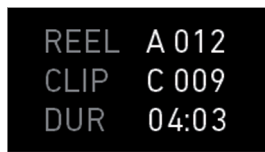
(5) Card status



Remaining capacity of CFast 2.0 card, at current FPS and codec combination, in real time.

When card capacity is less than 2 minutes, capacity values start flashing.

(6) Current clip information



REEL: Current reel (camera index letter and reel number) of active recording medium.

CLIP: Current clip of current reel.

DUR: Duration of currently recorded clip (during REC) or last recorded clip (during STBY).

(7) BAT



Current battery supply level.

7.3.2 Info screens

1. Choose **HOME > i**.

The INFO list is displayed. It offers access to detailed information in various subscreens. You have the following options:

- *Version info*
- *System info*
- *Maximum FPS info*
- *CARD info*
- *USB info*
- *Network info*
- *Lens info*
- *User button info*
- *EXT sync info*
- *Export HW info file*
- *Export logfiles*
- *Export update logfiles*
- *Export user manual*

Version info

- *Software*
Shows the camera software version. The first two parts identify the SUP version.
- *Revision*
Detailed information on software version.
- *FPGA*
Firmware version of currently active FPGA (indicated by number in brackets).
- *MVF-1 software*
Software version of MVF-1 (only shown if connected).
- *CCP-1 software*
Software version of CCP-1 (only shown if connected).
- *Lens mount software*
Software version of lens mount.

System info

- *Time + Date*
Current system time and date of camera.
- *Camera serial no.*
Serial number of camera.
- *Operating hours*
Total operational time of camera in hours:minutes.
- *Sensor temperature*
Current temperature of image sensor.
- *Sensor temp. state*
Rates the sensor temperature according to: *OK, Warning, Error.*
- *Camera temp. state*
Rates the camera temperature according to: *OK, Warning, Error.*

Maximum FPS info

- *Sensor FPS*
Maximum sensor frame rate with the current recording resolution of the camera.
- *Codec FPS*
Maximum sensor frame rate with the camera's current codec setting.
- *Card FPS*
Maximum sensor frame rate supported by the inserted card with the current recording codec and camera's resolution setting.

NOTICE

The lowest value determines the maximum selectable fps value.

Card info

Shows information on the CFast 2.0 card.

- *CARD status:*
Status of card.
- *CARD model*
Name of card model.
- *CARD SN#*
Serial number of card.
- *CARD FW version*
Firmware version of card.

- *CARD size*
Total storage size of card.
- *CARD clip count*
Amount of clips on card.

USB info

- *USB Status*
Status of USB medium.
- *Storage free/total*
Free and total available storage on USB medium in megabyte.
- *Frame line files*
Number of frame line files on USB medium and maximum number of files recognizable by camera.
- *License files*
Number of license files on USB medium and maximum number of files recognizable by camera.
- *Look files*
Number of look files on USB medium and maximum number of files recognizable by camera.
- *Setup files*
Number of user setup files on USB medium and maximum number of files recognizable by camera.
- *SUP files*
Number of SUP (software update package) files on USB medium and maximum number of files recognizable by camera.
- *LDA files*
Number of LDA (Lens Data Archive) files on USB medium and maximum number of files recognizable by camera.

Network info

- *WiFi network*
Name of connected network (client mode)
- *WiFi IP*
IP address of camera via WiFi.
- *LAN IP*
IP address of camera via Ethernet.
- *Web remote*
URL address of camera remote control website.

Lens info

- *Lens status*
Status of lens connected to camera.
- *Model*
Lens model name according to manufacturer.
- *SN#*
Serial number of lens.
- *Focal length*
(Current) focal length of lens in mm.
- *Focus*
Current focus distance value of lens according to user preference setting of distance unit (metric/imperial).
- *Iris*
Current iris value of lens.

- **SETTINGS** button
Quick link to the lens mount settings menu, see "Lens mount settings", page 115.

User button info

Shows functions assigned to user buttons of camera body and MVF-1.

For more information, see "User buttons", page 130.

EXT sync info

Displays the system status of all cameras in the EXT sync setup. You can see the serial number, the camera ID prefix, the battery voltage and the status of the master and the slave camera(s) in the setup.

Export HW info file

HW info files are required to order licenses in the ARRI License Shop or may be requested by camera service to get detailed information on the camera's hardware and components.

After generating, the resulting file will be exported to the USB medium in the ARRI/A-MINI/LICENSES folder.

Export logfiles

Logfiles help camera service to analyze problems. In normal circumstances, logfile export is not required.

Logfiles will be exported to the USB medium in the ARRI/A-MINI/LOG folder .

Export update logfiles

Similar to normal logfiles, update logfiles help camera service to analyze problems that occurred during the update process. In normal circumstances, exporting update logfiles is not required.

Update logfiles will be exported to the USB medium in the ARRI/A-MINI/LOG folder.

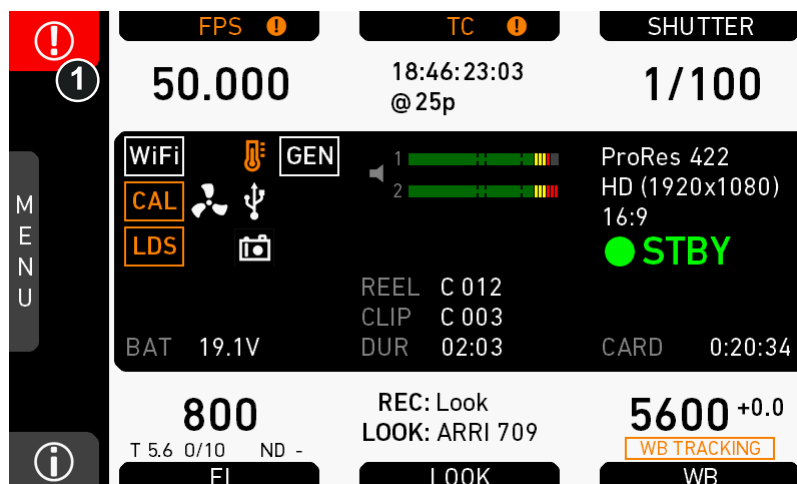
Export user manual

This screen allows you to export the camera quick guide and user manual in .pdf format.

Quick guide and user manual will be exported to the USB medium in the ARRI/A-MINI/MANUAL folder.

7.3.3 ALERT messages screen

ALERT messages communicate critical system states to the user. They require immediate action and remain active until the state returns to normal.



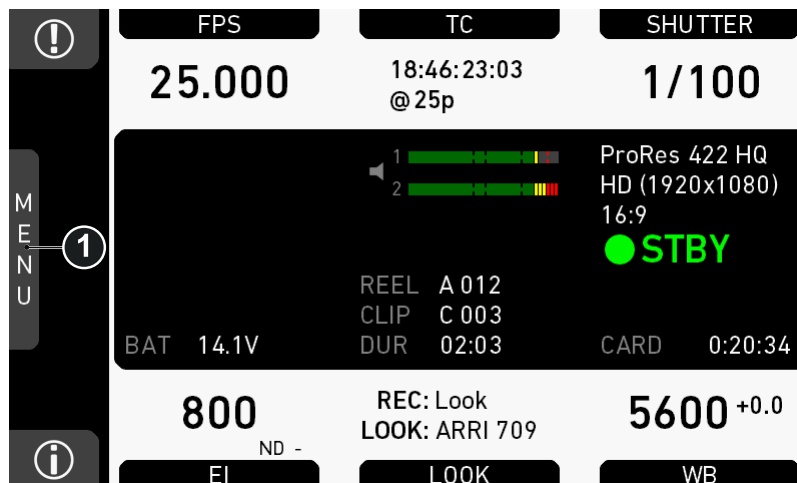
A red exclamation mark, visible on the home screen, the monitor, EVF and SDI overlays (if active) indicates active alert messages.

1. On the home screen, press the button showing the exclamation mark (1) to access the alert messages.

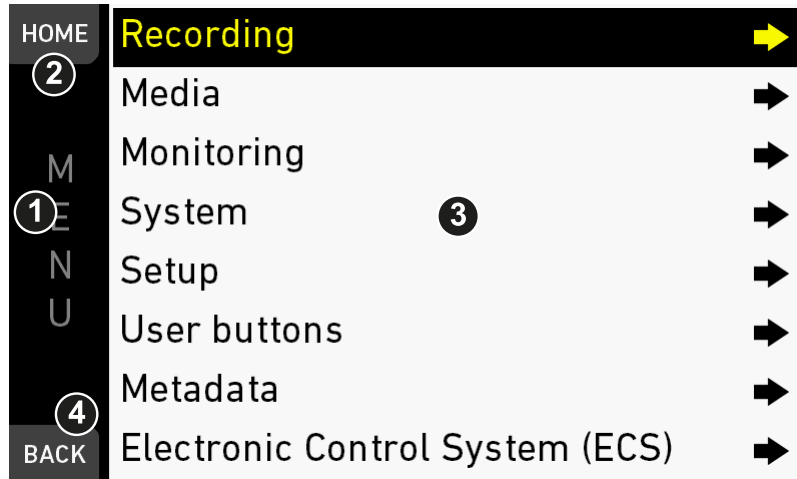
The icon will turn gray, if no alert message is active.

7.4 Camera menu

The camera menu gives access to all camera settings that are not part of the home screen.



- To access the menu: press the jogwheel (1) while the camera is showing the home screen.



1. Via the jogwheel (1), scroll up or down to select the desired entry (3).
2. Entries with an arrow navigate to a lower menu level:
 - To navigate to the submenu: press the jogwheel (1).
 - To return to a higher menu level: press *BACK* (4).
3. Entries with a value allow direct editing:
 - To edit a value: press the jogwheel (1), then turn the jogwheel (1) to select the desired value.
 - To confirm and end editing: press the jogwheel (1).
 - To cancel editing: press *BACK* (4).
4. To leave the menu: press *HOME* (2).

7.5 Camera's main settings

The following chapter lists the most important parameters of the camera. Before starting a production, you will probably have to adjust these parameters to suit your needs.

7.5.1 Selecting the recording codec

1. Choose *Menu > Recording > Recording codec*.

You have the following options:

Recording codec	Color coding	Bit rate (VBR) **
ProRes 422 LT	10 bit YCbCr	90 Mb/s
ProRes 422	10 bit YCbCr	125 Mb/s
ProRes 422 HQ	10 bit YCbCr	185 Mb/s
ProRes 4444	12 bit YCbCr	280 Mb/s
ProRes 4444 XQ	12 bit YCbCr	420 Mb/s
ARRIRAW*		

* Requires ARRIRAW license. **24 fps, 1920x1080

2. Select the desired recording codec.

Note: When the recording codec family is changed, the camera has to perform a partial software reload. A popup shows the settings that are affected by the reload and that may not be available in the new mode. After confirming the popup, the software is reloaded.

7.5.2 Setting the recording resolution

The list of available recording resolutions depends on the recording codec. For information on selecting the recording codec, see "Selecting the recording codec", page 62.

1. Choose **Menu > Recording > Resolution**.

You have the following options:

ProRes codec:

- *S16 HD*: uses a 1600 x 900 sensor center crop and scales it to full HD 1920 x 1080. Records images in 1920x1080 resolution.
- *HD*: records images in 1920x1080 resolution.
- *HD Ana.* *: applies a 2.0 anamorphic desqueeze to the image and records images in 1920x1080 resolution.
- *2K*: records images in 2048x1152 resolution.
- *2.39:1 2K Ana.* *: applies a 2.0 anamorphic desqueeze to the image and records images in 2048x858 resolution.
- *3.2K*: records images in 3200x1800 resolution.
- *4K UHD*: records images in 3840x2160 resolution.
- *4:3 2.8K**: records images in 2944x2160 resolution.

ARRIRAW**:

- *2.8K*: records images in 2880x1620 resolution.
- *Open Gate 3.4K**: records images in 3424x2202 resolution.
- *4:3 2.8K (OG 3.4K)**: records images in 3424x2202 resolution.
- *16:9 HD Ana. (OG 3.4K)**: records images in 3424x2202 resolution.
- *2.39:1 2K Ana. (OG 3.4K)**: records images in 3424x2202 resolution.

* requires 4:3 license. ** requires ARRIRAW license.

2. Select the desired recording resolution.

Note: Changing between recording resolutions may require a software reload. Confirm the reload before it is performed.

A popup shows the settings that are affected by the reload and which may not be available in the new mode. After confirming the popup, the software is reloaded.

S16 HD Resolution

In ProRes codec, the camera can be changed to a recording resolution of S16 HD. This resolution records 1920x1080 image from a 1600x900 sensor pixel count, which allows for using S16 PL mount lenses on the camera such as the ARRI Ultra 16 series. The image circle of the S16 HD mode is 15.1 mm, which is slightly larger than the usual Super 16 image circle of 14.5 mm. For most lenses, this should not introduce vignetting in the recorded image area. But individual testing, covering all lens iris and focus settings is recommended. Be careful when mounting S16 lenses to the camera for the first time. Lenses that reach very deep into the mount may not work

and collide with the cover glass in front of the internal ND filter system. The available depth is 39.5mm. This does cover lenses that fitted into a standard S16 Film camera. When used with lenses intended for S35 sensors, the S16 HD resolution can be used as a digital extender.

7.5.3 Project settings

The project settings menu contains settings that should be configured at the beginning of each project.

- ▶ Choose **Menu > Recording > Project settings**.

7.5.3.1 Setting a project rate

The project rate sets the timecode timebase and the playback frame rate. The timecode timebase determines how many frames the timecode counts per second. The playback frame rate determines the frame rate at which clips will be played back.

1. You have the following options:
 - Choose **Menu > Recording > Project settings > Project rate**.
 - Choose **HOME > TC > PROJ. RATE**.

The following values are available:

Project rate	Scan format	Sensor real-time recording
23.976p	Progressive	23.976 fps
24p	Progressive	24 fps
25p	Progressive	25 fps
29.97p	Progressive	29.97 fps
30p	Progressive	30 fps
48p	Progressive	48 fps
50p	Progressive	50 fps
59.94p	Progressive	59.94 fps
60p	Progressive	60 fps
50i	Interlaced	50 fps
59.94i	Interlaced	59.94 fps
60i	Interlaced	60 fps

2. Select the desired project rate.

NOTICE

- Changing the project rate will match the sensor fps setting to the project rate. A popup will inform you about this. SDI fps should also be checked when changing the project rate.
- Setting the camera to an interlaced project rate requires the sensor to run at an equal frequency to capture real-time images. Therefore, as an example, project rate 50i requires the sensor to be set to 50 fps.
- Interlaced project rates are only available in recording resolutions HD, S16 HD and MPEG-2 HD.

7.5.3.2 Setting the next reel count

Sets the reel number assigned to the next new medium used for internal recording. A new medium is either a blank card or a card with reels of other ALEXA Mini cameras. The camera automatically advances the reel number every time new media is formatted on the camera. The reel number is reflected in clip names and is displayed on the home screen.

- ▶ Choose **MENU > Recording > Project settings > Next reel count**.

7.5.3.3 Setting the camera index

Give each camera a unique camera index so that you can identify the individual camera unit (A, B, C etc.) in clip and reel names. For more information, see "Clip naming".

You can also activate the camera index in the SDI status overlays to easily identify the camera. For more information, see "Setting EVF/SDI status info components", page 92.

- ▶ Choose **MENU > Recording > Project settings > Camera index** to select the camera index in the range from A to Z.

7.5.3.4 Defining the camera ID prefix

You can define the first character of the Camera ID. The Camera ID is a Base36 representation of the camera serial number and part of each clip's name. It allows you to match each clip to a specific camera. You set the camera ID prefix individually on each camera.

- ▶ Choose **MENU > Recording > Project settings > Camera ID prefix** to select the ID prefix in the range from A to Z.

7.5.3.5 Setting the lens squeeze factor

Select to set the squeeze factor of the lens that is in use. This value is written into the metadata of the clip and allows video players and editing software to automatically desqueeze clips that have been shot with anamorphic lenses.

The lens squeeze factor also determines the factor that is used for anamorphic desqueeze on EVF/Monitor and SDI. For information on activating anamorphic desqueeze, see "Activating anamorphic desqueeze for EVF/Monitor and SDI ", page 97.

Supported lens squeeze factors are 1.0x, 1.3x and 2.0x.

1.3x anamorphic desqueeze is supported in recording resolutions

- ProRes 3.2K
- ProRes UHD
- ProRes 4:3 2.8K
- ARRIRAW 16:9 2.8K
- ARRIRAW Open Gate 3.4K
- ARRIRAW 4:3 2.8K (OG 3.4K)

2.0x anamorphic desqueeze is supported in recording resolutions

- ProRes 16:9 HD Ana.
- ProRes 2.39:1 2K Ana.
- ProRes 4:3 2.8K
- ARRIRAW Open Gate 3.4K
- ARRIRAW 4:3 2.8K (OG 3.4K)
- ARRIRAW 16:9 HD Ana. (OG 3.4K)
- ARRIRAW 2.39:1 2K Ana. (OG 3.4K)

Note: With recording resolutions HD Ana. and 2.39:1 Ana., the lens squeeze factor is fixed to 2.0.

► Choose **MENU > Recording > Project settings > Lens squeeze factor**.

7.5.4 Sensor frame rate

NOTICE

Always use CFast 2.0 cards with maximum write rates.

The maximum possible frame rate may be limited by the set recording codec, recording resolution and CFast 2.0 card model. See user manual appendix for a detailed list of fps limits.

7.5.4.1 Setting the sensor frame rate

1. Choose **HOME > FPS**.
The FPS list is displayed.
2. Via jogwheel, scroll to the desired value.
3. Press the jogwheel to activate the value.

7.5.5 SHUTTER settings

You can select your preferred shutter unit:

Shutter angle converts exposure time into the angle of a virtual rotating mirror shutter as in film cameras.

A fixed angle creates varying exposure times with varying frame rates. You can set angles from 5.0 to 356.0 degrees.

Exposure time shows the effective sensor exposure time. With varying frame rates, it remains identical and can be set from 1/1 to 1/8000 seconds.

Note: Maximum exposure time with a given frame rate is 1/fps, with a limit of 1/1 seconds. When the selected exposure time is no longer possible because you changed the frame rate, the camera uses the longest exposure time possible. For example, if you configured 1/25s at 25 fps and you change the sensor fps to 50, the camera will use 1/50s.

Note: The camera sensor is optimized for exposure times shorter than 1/24s and image artifacts like individual overexposed pixels can appear when using longer exposure times.

For a constant exposure time over a range of used frame rates, set it to 1/(highest used frame rate).

7.5.5.1 Selecting the SHUTTER unit

1. Choose **HOME > SHUTTER**.
2. Press **SWITCH UNIT**.
A confirmation screen is displayed.
3. Confirm with **OK** or cancel with any other button.
The camera returns to the home screen. The shutter unit has changed (from time to angle or vice-versa).

7.5.5.2 Setting a *SHUTTER* value

1. Choose *HOME > SHUTTER*.
The shutter list is displayed.
2. Via jogwheel, scroll to the desired value.
3. Press the jogwheel to activate the value.

Adjusting the shutter for filming a monitor

1. Set unit to angle.
2. Go to *SHUTTER > SELECT > ADD*.
3. Select the third digit (single degrees).
4. Adjust the shutter value until the monitor image flickers the least.
5. Select the fourth digit (sub-degrees).
6. Fine-adjust the shutter value until there is no more flicker visible.
7. Press *ADD TO LIST* to add the shutter value to the list.

7.5.6 Exposure index

The Exposure Index (EI) is the applied sensitivity of the camera. The ALEXA Mini has a base sensitivity of 800 ASA. This means that the dynamic range is almost evenly distributed above and below neutral gray with low noise in the shadows and clean, smooth clipping behavior in the highlights. Due to its high dynamic range, the ALEXA Mini's sensitivity can be set from 160 to 3200 ASA in steps of 1/3 stops while maintaining high image quality:

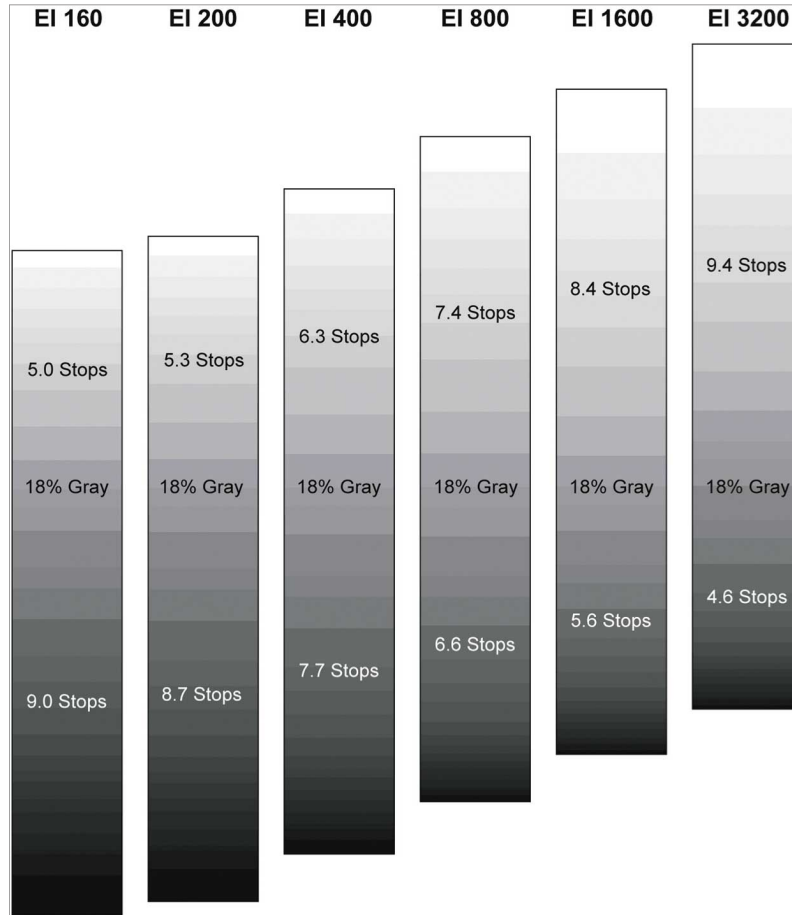
EI 160 ^{+5.0}/_{-9.0} EI 200 ^{+5.3}/_{-8.7} EI 400 ^{+6.3}/_{-7.7} EI 800 ^{+7.4}/_{-6.6} EI 1600 ^{+8.4}/_{-5.6} EI 3200 ^{+9.4}/_{-4.6}

Applying the exposure indexes at the extremes of the range will nonetheless have an influence on the images.

At low exposure indexes, such as 160 ASA, the dynamic range below neutral gray increases, reduces noise even further. At the same time, the dynamic range above neutral gray is slightly reduced.

Highlight clipping itself is not influenced by this, but the shoulder of the processing curve will be slightly steeper, reducing the smoothness of the change from almost overexposed to overexposed.

At high exposure indexes, such as 1600 ASA, the images behave in the opposite way. Noise is increased, which makes it important to judge shadow detail, while there will be even more headroom in the highlights:



7.5.6.1 Setting EI

1. Choose **HOME > EI**.
2. Scroll up or down with the jogwheel to increase or to decrease the EI.
3. Press the jogwheel to confirm or press **BACK** to cancel editing.

7.5.6.2 Selecting the ND filter

NOTICE

ALEXA Mini uses FSND (Full Spectrum Neutral Density) filters, which are linear across the full spectrum of the camera sensor. This prevents artifacts from infrared wavelengths and the need for additional IR filters.

The camera contains an internal ND filter module, consisting of ND 0 (Clear), 0.6, 1.2 and 2.1 filters. The filters can be operated via user buttons, MVF-1, web remote, or WCU-4.

1. Choose **HOME > EI > ND**.

In this screen, you can select the ND filter via the screen buttons. No confirmation is necessary. You have the following options:

- **ND - (Clear)**
- **ND 0.6**
- **ND 1.2**
- **ND 2.1**

7.5.6.3 Adjusting the iris (EF lenses) manually

1. Choose **HOME > EI > IRIS**.

A screen showing the current iris value is displayed.

2. Turn the jogwheel up or down to open or close the iris. Press the jogwheel to toggle between full stops and substops.

Note: Sub-stop precision depends on the lens type and is automatically set by the camera.

Activating iris adjustment on the live screen

- ▶ On the live screen, you can activate and deactivate iris adjustment by short-pressing the lower round button. Keeping the button pressed activates iris adjustment until it is released.

Note: Depending on the orientation of the monitor, the round button may be located on the right.

7.5.6.4 Defining the auto iris calculation

The camera can perform an auto iris calculation and adjust the lens iris automatically, if supported by the mounted lens. The auto iris function can be triggered via a user button. For more information on user buttons, see "User buttons", page 130. The auto iris calculation can be configured with the following settings.

1. Choose **HOME > EI > IRIS > OPTIONS**.

You have the following options:

- *Auto iris mode*
Defines the iris calculation.
 - *Integral*
Iris is calculated based on full image content.
 - *Center*
Iris is calculated with higher priority on image center.
- *Auto iris offset*
Offsets the auto iris calculation result by up to +/- 3 stops in 1/3 stops.

7.5.7 White balance

White Balance (WB) is the color balance of the camera that should be matched to the color temperature of the light in use. There are three methods for setting the white balance:

- white balance presets
- user-defined white balance
- automatic white balance

White balance is a red-blue adjustment of the image. To adjust the green-magenta balance, use the color compensation (CC) adjustment. For example, a fluorescent source will have peaks in its spectrum that cannot be corrected with red-blue white balance alone. The CC shift can correct these peaks up to a full green or full magenta gel. One step of CC shift is equal to 035 Kodak CC values or 1/8 Rosco values.

7.5.7.1 Setting a *WB* value

1. Choose **HOME > WB**.
The WB list is displayed.
2. Via jogwheel, scroll to the desired value.
3. Press the jogwheel to activate the value.

7.5.7.2 *WB* Options

1. Choose **HOME > WB > OPTIONS**.
You have the following options:
 - *Auto WB mode*
Sets the calculation method of auto white balance. Matrix analyzes the full image and uses the image part best suited for WB calculation, while Center uses the image center area only.
 - *WB tracking*
Activates the automatic white balance tracking, where the white balance value is continuously updated based on the image scene.

Note: WB tracking always uses matrix mode for WB calculation.

7.5.8 Timecode

Timecode ensures that every image of recorded media can be identified with a unique value and synced with corresponding media, such as sound or the second camera in a 3D application. When used with other metadata, such as reel names, all recorded media retains its unique identity.

The following are two ways of using timecode on a production:

Free run timecode, time of day

- *Use:* This format is often used on multi-camera productions with sync-sound, i. e. the sensor frame rate matches the project rate, sound and image timecode match and allow for easy syncing in post.
- *Setup:* The sound department acts as the timecode master, and generates timecode which uses the time of day as a value, and a time base matching the project frame rate. Twenty-four hours of time will translate into twenty-four hours of time code. Timecode is fed to the camera via the TC connector. The project fps setting must match both the sensor frame rate and the time base of the external timecode signal.
- The camera can be set to timecode mode jam sync, in which it samples the timecode value once from the timecode connector and then continues counting based on its own high-precision crystal clock. The timecode source can be disconnected from the camera after jamming in jam sync mode. This mode ensures stable timecode with an offset of less than one frame for each eight hours, after which the camera has to be re-jammed.
Alternatively, the camera can be set to timecode mode regenerate (regen). In regen mode, the camera uses the timecode value of the external timecode source. This ensures correct timecode for an infinite duration, but the timecode source must remain connected to the camera. Note that the camera ignores external timecode when recording using its internal clock to avoid timecode jumps, which can occur due to connection problems such as a faulty timecode cable for example.

- *Variations:* If shooting starts close to midnight, the timecode may be started with an offset time of day to prevent a rollover at midnight.
- *Restrictions:* Free run timecode is only possible, if the camera is running at sync-sound speed. If the camera is over- or undercranking, the timecode frame rate will no longer match the sensor framerate, and timecode values would either be duplicated or dropped. To prevent this, the camera will automatically switch to run mode rec run when the sensor frame rate is changed.

Rec run timecode

- *Use:* Rec run timecode is often used on single camera productions that are either MOS or use a dumb slate to sync picture and sound. Record run timecode guarantees continuous timecode on all recorded data. Record runtime code also works with over- and undercranking.
- *Setup:* The timecode run mode must be set to rec run, the mode to regenerate. Timecode counts up only during recording, by one frame for each image generated by the sensor. The timecode counts at the project frame rate set on the camera. Normally, the timecode hour value advances by one hour for each new reel, using only hours 01-20 for reel 1-20, and then restarting at hour 01 for reel 21.
- *Variations:* Rec run timecode might be used for off-speed work on productions that use external timecode sources for all sync sound.
- *Restrictions:* None.

7.5.8.1 Editing the timecode value

Note: *EDIT* is available only when timecode is in preset mode. For information on the mode, see "Setting timecode mode", page 72.

1. Choose **HOME > TC > EDIT**.
2. You have the following options:
 - For TC = 00:00:00:00: Press **RESET**.
 - For TC = current system time: Press **SET TO TIME**.

Via jogwheel, you can change each value. Scroll up or down to increase or decrease the value. Press the jogwheel to select the next digit pair.

3. Press **DONE** to save the changes. Cancel with **BACK**.

7.5.8.2 Changing the project rate

You can change the project rate. You have the following options:

- Choose **HOME > TC > PROJ. RATE**.
- Choose **MENU > Recording > Project settings > Project rate**.

For information on changing the project rate, see "Setting a project rate", page 64.

7.5.8.3 Timecode options

The following sections show the available timecode options.

Setting timecode run mode

1. Choose **HOME SCREEN > TC > Options > Run mode**.

You have the following options:

- *Rec run*
Timecode increases during recording only. The timecode value increases with every frame generated by the sensor while recording.
- *Free run*
Timecode increases with every new frame generated by the sensor, independently from recording.

Note: Free run is only possible if the sensor fps equals the project fps (i.e. shooting sync speed). Otherwise, the camera temporarily switches to rec run. The free run timecode continues to count in the background.

When you set the sensor frame rate back to equal the project frame rate, the timecode will synchronize itself to the free run timecode again.

If you synchronized your camera to an external signal while it was in free run, you can shoot offspeed shots in rec run timecode and return to sync speed afterwards. The camera will return to free run timecode and seamlessly reconnect to the previously synchronized timecode.

Setting timecode mode

- ▶ Choose **HOME > TC > Options > Mode**.

You have the following options:

- *Regen*
Depending on the timecode run mode, regen behaves differently:
Run mode rec run: The camera determines the timecode of the last frame of the last recorded clip and increments it by one for the next clip. This ensures consecutive timecodes for a sequence of clips.
Run mode free run: The timecode source should be connected to the camera permanently. The camera continuously reads the timecode signal at the timecode connector as long as it is present. Upon disconnection or loss of signal, the camera continues counting on its own, but will indicate the missing signal through an orange exclamation mark on the TC button on the home screen. When the external signal is reconnected, the camera uses the value of the external signal again. Regen mode will disable manual editing of the timecode.
- *Preset*
The camera uses its internal counter.
- *Jam sync*
The camera samples the timecode value and simultaneously tunes its internal timecode clock to match the clock of the timecode source. During this procedure, the timecode display on the home screen, on the timecode menu screen as well as on the status overlays is flashing. Jamming has finished when the timecode display stops flashing, then the timecode source can be disconnected. The camera continues counting based on its own high-precision crystal clock now. This mode ensures stable timecode with a drift of less than one frame over eight hours, after which the camera has to be re-jammed.
Note: Due to the tuning mechanism, jamming the camera might take up to 30 seconds and a timeout is issued if tuning could not be completed after 60 seconds.

Note: You can edit timecode in preset mode only.

Viewing the timecode regen source

Based on the timecode run mode, the camera determines the timecode regen (regenerate) source automatically.

If the run mode is set to *Free run*, it regenerates timecode from the timecode input connector. If set to *Rec run*, it regenerates timecode from the last clip of the active recording card by continuing seamlessly from the last active value.

- ▶ Choose **HOME > TC > Options > Regen source**.

The regen source is displayed. The following settings are possible:

- *LTC in*
- *Media*
- EXT (when camera is set to EXT sensor slave or EXT settings slave)

Setting timecode count mode

Sets the preference for how timecode is counted with non-integer project rates 29.97p, 59.94p, 59.94i.

- ▶ Choose **HOME > TC > Options > Count mode**.

You have the following options:

- *Non-Dropframe*
Timecode increases with every frame without compensation, resulting in a 1,001 count for 1,000 frames.
- *Dropframe*
Timecode values are dropped with a defined pattern (frame counts 00 and 01 of every minute, except every 10th minute) to re-adjust for the drift. A semicolon between timecode seconds and frames indicates an active dropframe timecode.

Setting timecode offset

You can apply an offset to LTC input signals to compensate for timecode offsets in external devices.

1. Choose **HOME > TC > Options > TC offset**
2. Adjust the timecode offset in the range of -20 to +20 frames.

7.5.9 LOOK settings

Looks alter the image color in a creative way. Due to a high-quality rendering core, ALEXA Mini is capable of applying looks in production quality, fully in-camera.

The following looks come pre-installed with the camera:

ARRI 709: Renders the video image according to the ITU.R-BT709 standard, for most accurate color reproduction on standard broadcast monitors.

ALEXA Classic 709: Matches the color reproduction of ALEXA Mini to the ARRI ALEXA.

ARRI 2100 PQ 1K 200: HDR look file. Renders an image for a PQ (SMPTE 2084, ITU-R BT.2100) monitor. The maximum luminance is 1000 cd/m², which is a PQ level of 75%. The diffuse scene white (2.5 stops above the gray card) will appear with a luminance of 200 cd/m².

ARRI 2100 HLG 1K 200: HDR look file. Renders an image for a HLG (Hybrid Log Gamma, ITU-R BT.2100) monitor. It is assumed that the monitor has maximum luminance of 1000 cd/m². In this case, the image will look the same as when the PQ look is used with a PQ monitor.

ARRI 709 Multicam: Editable version of ARRI 709 for use with the multicam feature. For more information, see "Multicam", page 116.

Commercial: Renders the image brighter for smoother skin tones.

Landscape: Applies a steeper contrast curve to the image.

LCC 709: Low Contrast Curve look that keeps more details in highlights for color correction purposes.

TV-neutral: An ARRI 709 like look, which is more saturated in colors with slightly lower blacks.

TV-warm: Same as TV neutral, just with a little bit warmer look overall.

Vibrant: Boosts color saturation except for red and yellow (skintone protection).

For information on the ARRI Look Library, see "Use of the ARRI Look Library", page 79.

To create look files for the camera, download the free Mac OS utility ARRI Color Tool from the ARRI website:

https://www.ari.com/camera/amira/tools/arri_color_tool/

NOTICE

When using HDR look files, we recommend to record in Log C and not to burn in the HDR look into the recorded footage, in order to maintain all technical and artistic options for post production.

7.5.9.1 Selecting a *Look* file

1. Choose **HOME > LOOK**.

The Look list is displayed.

2. Via jogwheel, scroll to the desired value.
3. Press the jogwheel to activate the value.

7.5.9.2 Configuring processing and color spaces

1. Choose **HOME > LOOK > CONFIG**.

The processing settings and color spaces for the different image paths are displayed.

2. Select and confirm the required processing or color space for each image path. You have the following options:
 - *Recording processing*
 - *Log C*
 - *Look*

Note: For recording coding ARRIRAW, this codec is set and cannot be changed.
 - *EVF/Mon proc.*
 - *Log C*
 - *Look*
 - *ALEXA Classic 709*
 - *SDI 1 processing*
 - *Log C*
 - *Look*
 - *ALEXA Classic 709*

- *SDI 2 processing*
 - *Log C*
 - *Look*
 - *ALEXA Classic 709*
- *SDI 1 color space*
 - *REC 709*
 - *REC 2020*
- *SDI 2 color space*
 - *REC 709*
 - *REC 2020*

Log C

Based on the Cineon format for output to film print or digital intermediate, this logarithmic processing requires color-grading in postproduction.

On standard broadcast monitors, Log C images appear flat and desaturated. Proper display, dailies and editing proxies require a conversion look-up table (LUT).

Create preview LUTs with the ARRI LUT Generator at www.arrydigital.com.

LOOK

Applies a video display processing to camera images. The default *ARRI 709* look complies with the ITU.R-BT709 standard for display on standard broadcast monitors.

ALEXA Classic 709

Creates a Rec 709 equivalent image in the same way that it is processed in the ALEXA Classic product line. This setting may be used when the selected Look file alters the image too drastically, but a Log C image would be too flat for monitoring.

REC 709

Material recorded in Rec 709 (short for ITU-Recommendation BT.709) has a display specific encoding. The purpose of a display specific encoding is to immediately provide a visually correct representation of the camera material, when it is screened on a certain display device. This is achieved by mapping the actual contrast range of the scene into the contrast range that a display device can reproduce. Examples of display specific encodings are Rec 709 for HDTV screens or DCI P3 for Digital Cinema Projectors. On the downside, a display specific encoding puts some limits on the options for a colorist.

REC 2020

Rec 2020 is a wider color space than Rec 709, which is the current industry standard for HD. Rec 2020 promises more brilliant images, though only new display technology is able to show these. Traditional Rec 709 displays (like TVs or ordinary computer displays) can not display Rec 2020.

While Rec 709 is the encoding color space for HDTV, Rec 2020 is the encoding color space for UHD. The primary colors lie on the spectral locus and it is thus possible to have more saturated colors in images. It does not mean, however, that all colors look more saturated. When properly converted, a Rec 709 image will look exactly the same when displayed on a Rec 2020 display. Rec 2020 is an encoding standard. A TV or display may not support the full gamut. Nevertheless, it will correctly display the colors within its physical gamut. To get the “Premium” logo of the UHD Alliance, for example, a TV needs to support a minimum of 90% of the P3 gamut.

7.5.9.3 Duplicating a *Look* file

By duplicating a *Look* file, you can create a new *Look* file based on an existing one. To create a new *Look* file within the camera, duplicate Rec 709 and edit its parameters. Except for Rec 709, you can rename all *look* files.

1. Choose **HOME > LOOK > EDIT**.

The list of installed looks is displayed.

2. Via jogwheel, scroll to the desired file.
3. Press **DUPLICATE**.

A file name editor opens. For information on using the on-screen keyboard, see "Using the on-screen keyboard", page 51.

4. Enter the name of the new *Look* file.
5. Press **SAVE**.

Note: You cannot save a file with an existing name.

You have now created a copy of the original *Look* file.

7.5.9.4 *Look* parameters

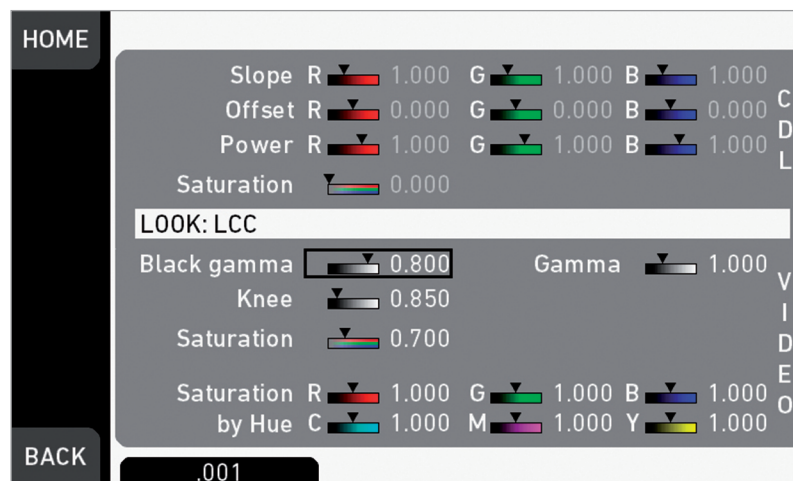
A *Look* file contains different parameters for altering the image. The *Look* parameters screen shows the values of the different parameters and allows you to edit them directly in the camera, if the *Look* file is modifiable.

NOTICE

User-defined looks may contain a non-editable 3D LUT instead of video parameters.

- Choose **HOME > LOOK > LOOK PARAM**.

The *Look* parameters screen is displayed.



- *Slope, Offset, Power, Saturation*
Affect ASC CDL images under Log C.
- *Black Gamma, Gamma, Knee, Saturation, Saturation by Hue*
Affect VIDEO images.
- ASC CDL parameters
Are applied to the image before VIDEO parameters. Please refer to the ARRI white paper on color parameters (for download at www.arri.com).

Note: All look transforms, including ASC CDL, are applied in the conversion from Log C to Video color space. When you choose Log C as gamma for an image path, the clean Log C image is routed to this path.

ASC CDL transforms

The American Society of Cinematographers has specified a set of transforms that have become standard in postproduction. They are determined by slope, offset, power and saturation (applied in that order).

All these parameters are based on simple color manipulations (multiplying with a factor, adding an offset, raising to an exponent). Noted as "Color Decision List" (ASC CDL), they offer an exchange format for basic look transformations between color correction systems and editing tools by different manufacturers.

The ALEXA Mini image processing applies ASC CDL transforms to the Log C encoded image. This allows manipulations such as exposure correction or bringing down highlights, before the picture is converted to the display color space with its steeper contrast curve.

Slope

The linear section of the Log C curve is equivalent to the processing of a negative film stock. The Log C curve has a default processing of approximately 0.51 (adjustable via slope parameter).

A slope value of 1.2 will have a similar effect as using negative stock with a processing of 0.6 ($= 1.2 * 0.5$). A value below 1.0 will lower the processing accordingly.

Offset

This most intuitive CDL parameter has a similar effect as increasing the exposure index on the camera. If you are familiar with the motion picture print film process, it's the same as printer lights.

Power

Via power you can adjust the mid tones, similar to the processing parameter in video color grading. A power value below 1.0 will increase, a value above 1.0 will decrease the mid tone brightness.

(Log) Saturation

This parameter affects the saturation of all color components in the Log domain. A value of 1.0 represents the default saturation.

3D LUT and video look parameters

Via a 3D LUT (lookup table), the camera generates a Rec 709 video image from Log C data. Next to the ASC CDL parameters, which apply to the Log C image, the camera also offers a set of video look parameters (VLP) for tone mapping and color transformation of the rendering 3D LUT.

VLPs determine knee, black processing and the processing of the tone map curve, which qualify the contrast of the output image. They also include values for saturation and the saturation by hue for six color vectors (green, yellow, red, magenta, blue, cyan).

Knee

The knee parameter controls the transition of mid-tones into highlights. Values below 0.5 (default) produce harder highlights, higher values soften them. Knee is applied to all channels equally (master control). It has no effect on the mid gray level.

Black gamma

The black gamma controls the shadow detail in the image. Values below 0.5 (default) bring down, higher values brighten the blacks. Black gamma is applied as master control. It only affects the mid gray level for very high values.

Gamma

This setting can be used to brighten or darken the mid tones, while leaving the black and white level unchanged. Values below 1.0 (default) will darken; higher values will brighten the image.

(Video) Saturation

The VLP set also includes a saturation control, with a similar effect as the ASC saturation control. A value of 1.0 represents the default saturation.

Saturation by Hue

This parameter set allows you to control the saturation for six color vectors (red, yellow, green, cyan, blue, magenta) independently.

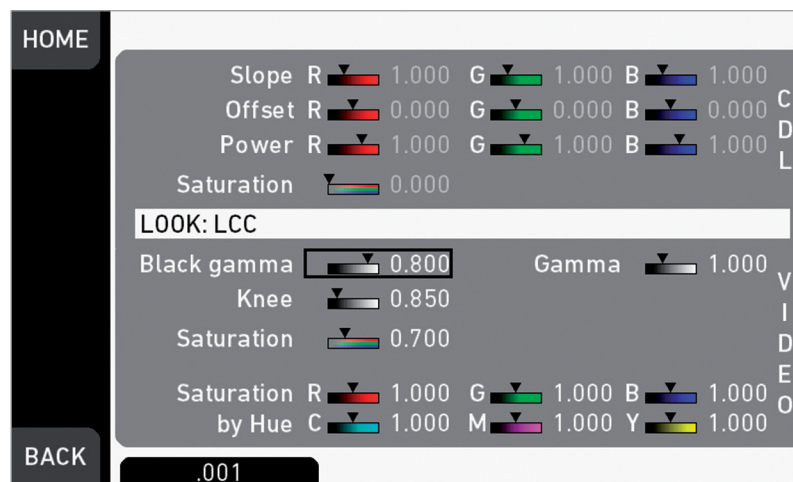
7.5.9.5 Editing Looks

NOTICE

Editing will overwrite an existing look file and its values. To prevent this, duplicate the look first, and then edit the duplicate. Some looks like ARRI 709 as well as all ARRI Look Library looks are read-only and cannot be edited directly, please create a duplicate and edit the duplicate if you want to edit read-only looks.

1. Choose **HOME > LOOK**.
2. Press **LOOK PARAM**.

The Look parameters screen is displayed.

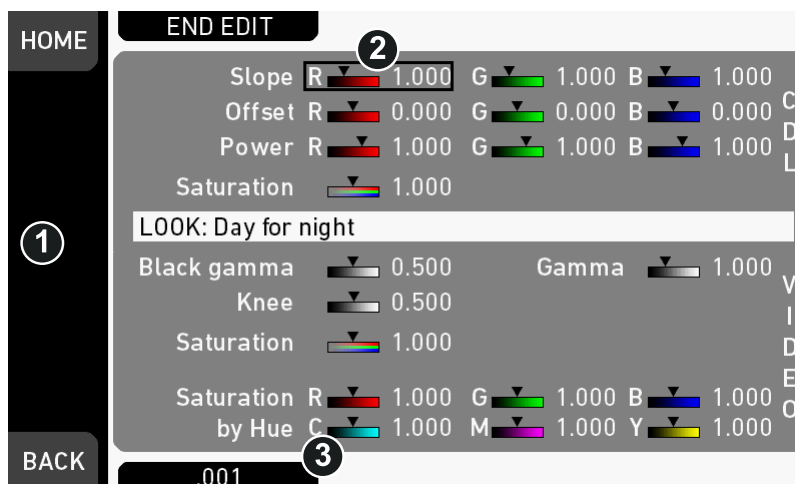


NOTE: Look files with a 3D-LUT offer no VIDEO parameters.

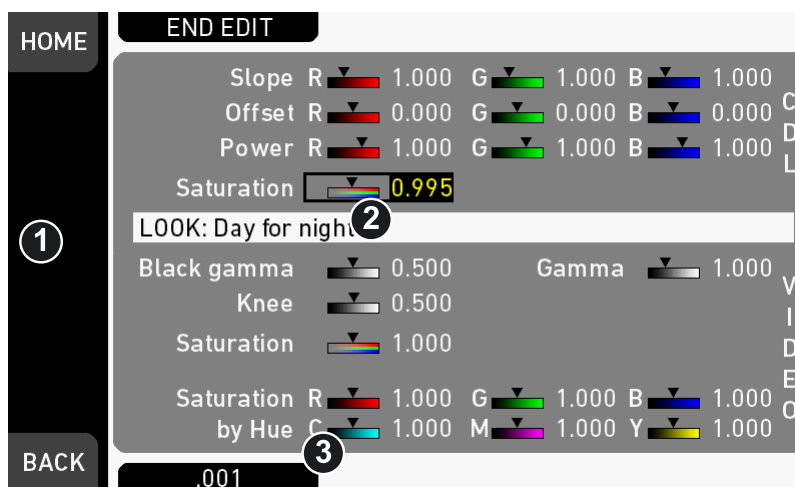
3. Press **EDIT**.

A warning on file overwriting is displayed.

- Press *OK* to confirm the warning.
The Look editor becomes active.



- Via jogwheel (1), scroll to the desired parameter.
A black frame (2) marks your selection.
- Press the lower right screen button (3) to toggle the edit step size between 0.001, 0.01, and 0.1.
- Press the jogwheel (1) to start editing the selected value.



A yellow-on-black font (3) marks the edit mode.

- Confirm the new value by pressing the jogwheel (1).
- Edit more parameters if required.
- After editing: Press *SAVE*.
- To revert all changes: Press *UNDO CHANGES*.

Note: When you start a recording while the Look editor is active, the camera will save all changes automatically.

7.5.9.6 Use of the ARRI Look Library

The ARRI Look Library is a comprehensive set of predefined looks with an advanced look management. It provides a set of high quality looks and offers a basic repertoire of color responses like film stocks and filters did for film cameras.

It offers 87 looks in 3 different intensities for Rec 709 color spaces (standard dynamic range). It uses a numbering scheme, for example 3110 film 01 or 5110 dayfornight 01. The numbering scheme is used to identify looks and covers common themes, for example film emulations, beauty or tinted looks.

For further information about the ARRI Look Library, please visit

http://www.arri.com/camera/alexa_mini/tools/arri_look_library/

http://www.arri.com/camera/alexa_mini/learn/arri_look_library_faq/

The ARRI Look Library is installed on the camera and can be unlocked by installing the ARRI Look Library license, which can be purchased online at the ARRI License Shop.

Note: The ARRI Look Library license is included in ALEXA Mini cameras shipped from May 2017 onwards.

Adding a LOOK file from the Look Library

1. Choose **HOME > LOOK > EDIT > ADD > LOOK LIB.**

The ARRI Look Library is displayed. The target color space of the currently selected look file is also displayed, e.g. Rec 709.

2. Select the desired look file and press **SELECT.**

You are prompted to select the strength. You have the following options:

- o *Low (1)*
- o *Medium (2)*
- o *High (3)*

3. Select the strength and press **SELECT.**

When the look file is imported successfully, a message is displayed.

4. Press **BACK.**

The imported look file is highlighted in the SET LOOK list and can be activated. For more information, see "Selecting a Look file", page 74.

Modifying an ARRI Look Library Look

Look files from the ARRI Look Library cannot be edited directly. You can, however, duplicate the Look file and change the CDL parameters of the duplicated file instead. This prevents the original ARRI Look Library files from being changed accidentally.

For information on how to duplicate a Look file, see "Duplicating a Look file", page 76.

Note: If you duplicate or rename a Look file based on the ARRI Look Library, the ARRI Look Library identifier is set as prefix of the new file name and cannot be deleted.

Note: Look files from the ARRI Look Library or derivatives thereof cannot be exported to USB. Look files starting with the same name prefix as files from the ARRI Look Library (XXXX-X...) cannot be imported from USB.

7.6 Recording

ALEXA Mini supports a wide range of recording codecs, resolutions and project settings to fit your needs.

Available menu items like codecs, resolution/frame rates etc. depend on the installed camera license.

7.6.1 ARRIRAW

ARRIRAW data delivers unencrypted, uncompressed and uncompromised image quality from an ALEXA camera. It offers the highest achievable resolution, the camera's natural color response and great exposure latitude as uncompressed and unprocessed sensor data. ARRIRAW images have only one channel. A color

reconstruction algorithm calculates the missing components of each pixel based on the type and position of the array of colored filters (Bayer pattern) on the camera sensor.

ARRIRAW de-bayering is available through the ARRIRAW SDK or custom processing, which is implemented in most of the major post production tools for dailies processing and mastering.

ARRIRAW is used for cinema production, visual effects and high quality TV. It is the best format for creative color correction and visual effects work.

The frames are recorded in an MXF (Material eXchange Format) container. An MXF container file can "wrap" different types of video and audio material along with associated metadata. The internal structure of MXF files is defined by the Operational Patterns (OP).

- The OP1a MXF format packages picture, sound and metadata in a single file.
- The OP1a is a streaming format, which means that even incomplete files can be played.
- The OP-Atom MXF format places picture and sound into individual MXF files. Audio is written after video.
- The OP1a MXF files are the primary acquisition and archiving format for many broadcasters.

7.6.2 4:3 Recording

With the additional 4:3 license, the ALEXA Mini allows to record with other sensor aspect ratios than 16:9.

The additional recording resolutions are:

ProRes	HD Ana. 2.39:1 2K Ana. 4:3 2.8K
ARRIRAW*	Open Gate 3.4K 4:3 2.8K (OG 3.4K) 16:9 HD Ana. (OG 3.4K) 2.39:1 2K Ana. (OG 3.4K)

* Requires additional ARRIRAW license.

The recording resolutions with Ana. in their name are intended for recording with anamorphic lenses with a squeeze factor of 2.0. The respective ProRes resolutions perform a de-squeeze on the recorded material. The respective ARRIRAW resolutions are recorded as-is, only anamorphic de-squeeze is enabled per default on the viewing paths.

Note: While the image resolution for 4:3 2.8K is 2880 x 2160 the recorded resolution is 2944 x 2160. The additional border is due to the ALEXA Mini's ProRes encoder that handles multiples of 128 more efficiently. The remaining 32-pixel boundary left and right to the image is filled with black pixels.

7.6.3 Record mode

The record mode determines the way in which the camera records images.

- ▶ Choose **Menu > Recording > Record mode > Record mode**.

You have the following options:

- Normal
 - For more information, see "Normal mode", page 82.

- Interval recording
For more information, see "Interval recording", page 82.
- Stop motion
For more information, see "Stop motion", page 83.

7.6.3.1 Normal mode

The camera records all consecutive images with the configured sensor frame rate for the duration of the recording.

7.6.3.2 Interval recording

The camera captures only short bursts of images after waiting a defined duration (i.e. the interval length) during recording. This mode is used to create a time lapse effect.

Setting the interval length

- ▶ Choose **Menu > Recording > Record mode > Interval length** and set the length in *hours:minutes:seconds*. Maximum interval length is 2:00:00 h.
This setting configures the duration the camera waits between every burst of images that it captures.

Setting the burst length

- ▶ Choose **Menu > Recording > Record mode > Burst length** and set the number of frames. The maximum number of frames is 2000.
This setting configures the number of frames that are captured by the camera for each burst.

Setting the duration mode

1. Choose **Menu > Recording > Record mode > Duration mode**.
You have the following options:
 - *Manual*
The recording is started and stopped with the *REC* button.
 - *Preset*
The recording is started with the *REC* button and runs for the duration of the set recording. Additionally, it can be stopped with the *REC* button before the set duration of the recording has ended.
2. If you have set the duration mode to *Preset*, set the recording duration and resulting clip length. For more information, see "Setting the recording duration", page 82 and "Setting the resulting clip length", page 83.

Setting the recording duration

NOTE: Only available in duration mode *Preset*. For more information, see "Setting the duration mode", page 82.

NOTE: When changing the recording duration, the camera automatically updates the resulting clip length.

- ▶ Choose **Menu > Recording > Record mode > Recording duration** and set the time in *hours:minutes:seconds*. The maximum recording duration is 99:59:59 h.
This setting configures the duration of the interval recording in real-time after start.

Setting the resulting clip length

NOTE: Only available in duration mode *Preset*. For more information, see "Setting the duration mode", page 82.

NOTE: When changing the resulting clip length, the camera automatically updates the recording duration.

- ▶ Choose **MENU > Recording > Record mode > Resulting clip length** and set the time in *hours:minutes:seconds*.

This setting configures the duration of the resulting clip.

7.6.3.3 Stop motion

The camera captures only single images after receiving a trigger from a user button during the recording. This mode is often used with motion control systems.

To initialize the stop motion mode, press the *REC* button. To record frames, press the user button *Stop motion trigger*.

For information on how to assign user buttons, see "User buttons", page 130.

Activating the stop motion beeper

NOTE: Only available in record mode *Stop motion*.

- ▶ Choose **MENU > Recording > Record mode > Stop motion beeper** .

7.6.4 Prerecording

NOTICE

Prerecording requires the assignation of a user button to activate.

Prerecording internally buffers images for up to 20 seconds of real-time instead of recording them directly to the CFast 2.0 cards.

When prerecording is activated, pressing REC writes the buffered images to the CFast 2.0 card. This ensures the capture of unpredictable events without wasting media capacity.

Maximum prerecording duration is determined by the set combination of sensor fps and recording codec, and can also be limited by the user.

Pressing REC during prerecording stores all buffered images to the CFast 2.0 card at maximum write rate. After that, regular recording continues.

Sensor FPS can be changed during prerecording via **Home > FPS**. This will clear the image buffer at the time of switching, causing the previously buffered images to be lost irreversibly.

7.6.4.1 Activating prerecording

1. To activate prerecording, you have the following options:
 - Choose **MENU > User buttons > Button VF1 / VF2 > Prerecording**
 - Choose **MENU > User buttons > Camera user buttons > Button X > Prerecording**
2. Assign the prerecording functionality to a user button. For more information, see "User buttons".
3. To activate buffering: Press the assigned user button.

Note: While prerecording is active, *TC*, *Shutter*, *Look* and *MENU* settings cannot be accessed. Playback is also not possible. FPS can be changed during prerecording, but this will clear the image buffer.
4. Start/stop recording by pressing the *REC* button.

5. To end buffering: Press the assigned user button again.

Note: When ending prerecording, the image buffer is cleared and all remaining images in the buffer are discarded.

7.6.4.2 Setting the prerecording maximum duration

Technical limitations may reduce the actual buffer duration below the set value.

To activate and de-activate prerecording, assign prerecording to a user button. For more information, see "Activating prerecording", page 83.

- Choose **MENU > Recording > Prerecording max. duration**. Set the maximum duration of buffering used for pre-recording in a range from 1 to 20 seconds. The actual buffer duration is shown below the menu entry.

	HD	4K UHD
25 fps	20 s	5 / 7.6 / 11 s
29.97 fps	16 s	4.1 / 6.3 / 9.1 s
100 fps	5.0 s	2.0 / 3.1 / 4.5 s (at maximum frame rate of 60 fps)
200 fps	2.4 s	-

ProRes 422 LT/422/422 HQ buffer durations

	HD	4K UHD
25 fps	13 s	3.2 s
29.97 fps	11 s	2.7 s
100 fps	3.3 s	1.5 s (at maximum frame rate of 60 fps)
200 fps	1.6 s	-

ProRes 4444 buffer durations

	HD	4K UHD
25 fps	9.0 s	2.1 s
29.97 fps	7.5 s	1.7 s
100 fps	2.1 s	0.8 s (at maximum frame rate of 60 fps)
200 fps	1.8 s (at maximum frame rate of 120 fps)	-

ProRes 4444 XQ buffer durations

7.6.5 Setting audio recording

1. Choose **MENU > Recording > Audio recording**. You have the following options:
 - *Audio recording*
Sets audio recording on or off.
 - *Channel 1/2 control*
Sets control mode of channel to *Manual*, *Manual+Limiter* or *Auto*. For technical information on limiter and auto gain functionality, see "Technical data", page 145.
 - *Channel 1/2 gain*
Sets gain of channel in *Manual* and *Manual+Limiter* control mode between 0 and +30 dB.
 - *Channel 1/2 level*
Shows current level of channel signal in dBFS.
 - *Test tone*
Sets 1kHz sine test tone on all channels and outputs to off, -9 dBFS, -18 dBFS or -20 dBFS.

7.6.6 Activating rec beeper and tally

1. Choose **MENU > Recording > Rec beeper/tally**.
You have the following options:
 - *Rec start beeper*
Acoustic indication for start of recording.
 - *Rec stop beeper*
Acoustic indication for stop of recording.
 - *Card full beeper*
Acoustic indication for stopping recording due to full card. Has a different sound pattern than start/stop beeper for better distinction.
 - *Tally front*
Sets the tally light on the viewfinder front end.

Note: If Multicam mode is on, only an external trigger can activate camera tallies. If Multicam mode is off, only the internal recording can activate camera tallies.

Note: On recording, the tally light turns red.

7.7 Media

In the media menu, you can erase the CFast 2.0 card, delete footage and prepare the required folder structure on USB memory sticks.

NOTICE

A maximum of 400 clips can be recorded on a CFast 2.0 card. When the maximum of 400 clips is reached, the card will be declared as full and further recording onto the card is not possible.

NOTICE

A CFast 2.0 card may need to be reformatted in the event of a sudden power loss while the camera is writing to the card. The camera will indicate the error with an alert message. Please follow the alert instructions to avoid damage to the card or further recordings. No action is required if no alert is displayed.

7.7.1 Erasing a CFast 2.0 card

NOTICE

This action irreversibly erases all data from the CFast 2.0 card. Ejecting a card or interrupting the camera power supply during erasing may render the card unusable.

1. Choose **MENU > Media > Erase CARD**.
A confirmation screen is displayed.
2. Press **ERASE**.
A progress bar indicates the progress.
3. After erasing has finished, press any button to return to the menu.

7.7.2 Deleting the last clip

You can delete the last **recorded** clip (not necessarily the last listed) on the CFast 2.0 card.

Note: On a card recorded with different cameras, the last recorded clip might be listed in the middle of the clip table.

1. Choose **MENU > Media > Delete last clip**.
A list with clips to be deleted is displayed. The last clip is highlighted.
2. Confirm by pressing the jogwheel.
A confirmation screen is displayed.
3. Press **CONFIRM**.

7.7.3 Preparing USB medium

NOTICE

You can add files only from a correctly prepared USB memory stick with the required folder structure. Preparing the folder structure on the USB medium within the camera will not alter existing folders and files on the USB medium.

Prepare all USB media as described in this document before using them with the camera.

For information on connecting the USB medium, see "Inserting and removing USB medium", page 49.

1. Choose **Menu > Media > Prepare USB medium**.
Note: To avoid file corruption, never remove the USB medium during writing access.
2. Press **CONFIRM** to prepare the folder structure.
The USB memory stick is now ready for use with the camera. You can remove the USB medium from the camera without unmounting.

The required folder structure for use in the camera is listed below:

ARRI / A-MINI /

- FRAMELINES: for frame line imports to camera
- GRABS: for grabbed still frames
- LDA: for lens data archive imports/exports
- LICENSES: for license file installation
- LOG: for exported camera and update logfiles
- LOOKFILES: for look file imports/exports
- MANUAL: for user manual exports from camera
- SENSOR: for import/export of User Pixel Mask files and export of framegrabs for UPM creation
- SETUPS: for imports/exports of user camera setup files
- SUP: for update file installation

7.8 Monitoring

The monitoring menu covers all settings related to EVF, Monitor and SDI as well as frame lines and other overlays on these outputs.

- ▶ Choose **MENU > Monitoring** and select the settings you want to change.

7.8.1 Status info




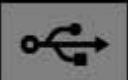



EVF and SDI

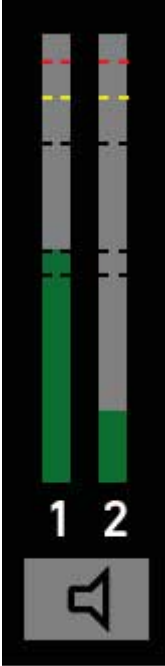






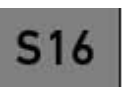





- | | | | |
|----|----------------------|----|----------------------------------|
| 1 | Sensor FPS | 13 | Reel and clip info |
| 2 | SHUTTER value | 14 | BAT level/status |
| 3 | IRIS value | 15 | Focal length |
| 4 | EI Exposure index | 16 | Alert and temperature status |
| 5 | Internal ND filter | 17 | Camera settings |
| 6 | WB White balance | 18 | EVF/SDI status |
| 7 | Camera index letter | 19 | Frame lines |
| 8 | Status icons | 20 | Center mark (here: cross) |
| 9 | Audio status | 21 | Important camera warnings |
| 10 | Timecode | 22 | Record Mode |
| 11 | CARD capacity/status | 23 | Electronic horizon/Roll and tilt |
| 12 | Camera status | 24 | Focus value |



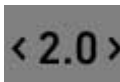
The following table explains the status info displayed for EVF and SDI:

Status info	Description
(1) Sensor FPS FPS 24.000	Shows the current sensor frame rate.
(2) SHUTTER SHUTTER 172.8	Shows the current shutter angle.
(3) IRIS IRIS T 5.6 4/10	Shows the current value for the IRIS.
(4) EI Exposure index EI 800	Shows the current value for the exposure index.

Status info	Description
(5) Internal ND filter 	Shows the current setting for the ND filter.
(6) WB White balance 	Shows the current value for the white balance.
(7) Camera index letter	Shows the camera index letter.
(8) LDS status 	Shows that the LDS interface has been disabled manually.
(8) USB status 	Shows a connected USB medium. If orange: The camera has detected a problem with the USB medium. You can find more information on the USB info screen.
(8) Lens motor calibration request 	If orange: The camera requires a lens motor calibration.
(8) WiFi 	If WiFi mode is Host, depicts a small camera. If WiFi mode is Client, shows the signal strength of the WiFi connection.
(8) WRS 	Show an active white radio.

Status info	Description
<p>(9) Audio status</p> 	<p>Shows the current level of camera audio channel signals. If audio is currently not possible, an orange speaker icon with a small x is shown.</p> <p>Black markers at signal levels -20, -18, -9 dBFS for reference test tone. Yellow marker at -5 dBFS and red marker at -2 dBFS indicate a signal close to clipping. A red frame around the meter indicates a clipping at the A/D stage.</p>
<p>(10) Timecode</p> <p>TC 13:37:24:05</p>	<p>Shows the current Timecode values and the active project rate, allows adjustment of TC formats and values.</p>
<p>(11) CARD</p> <p>CARD 0:08 h</p>	<p>Shows the remaining capacity of CFast 2.0 card at current FPS and codec combination in real time. When card capacity is less than two minutes, capacity values starts flashing orange.</p>
<p>(12) Camera status</p> <p>● STBY</p>	<p>Shows the camera status:</p> <ul style="list-style-type: none"> • STBY: Ready for recording • REC: Recording • ERASE: Erasing a CFast 2.0 card. Active erasure disables recording. • FULL: Card full • ERROR: Card error • None: Recording not possible (no card inserted)
<p>(13) Reel and clip info</p> <p>A001 C069</p>	<p>Shows the reel (A001) and clip (C069) info.</p>
<p>(14) BAT level status</p> <p>BAT 12.3V</p>	<p>Shows the current battery supply level. If the level is below the configured warning level, the value is flashing orange.</p>
<p>(15) Focal length info</p> <p>FCL 35.0mm</p>	<p>Shows the focal length of the connected lens.</p>

Status info	Description
(16) Alert status 	Indicates that the camera has detected an error.
(16) Temperature warning 	Indicates that the camera temperature is outside of its optimal range.
(17) Recording resolution 	Shows the current recording resolution.
(17) Processing 	Shows the processing of the respective output.
(17) S16 mode 	Shows that Super 16 mode is active.
(17) Iris 	Shows that auto iris is active.
(17) GEN 	Indicates that Genlock is activated. If orange: Genlock signal is missing or not usable.
(17) EXT 	Indicates that EXT sync mode is activated.
(17) Fan icon 	Shows that the camera needs to increase the fan speed to cool the camera properly.
(18) EVF/SDI processing 	Indicates the processing of the respective output, in this case ARRI Look 2 file.

Status info	Description
(18) Exposure tool 	Shows that the exposure tool is active. If dark gray: Shows that the selected exposure tool cannot be used currently.
(18) Peaking 	Indicates that peaking is active on the respective output.
(18) Anamorphic desqueeze 	Shows that anamorphic desqueeze is active and which lens squeeze factor is selected.
(19) Center cross	Marks the center of the image.
(20) Frame lines	Help to choose the right framing for different aspect ratios.
(21) Important camera warnings	Warnings that may interfere with camera operation are shown in the middle of the screen, e.g. low power supply, remaining card capacity less than 15 seconds.
(22) Record mode	Shows the record mode if set to Interval or Stop motion recording.
(23) Electronic horizon/Roll and tilt	Shows the electronic horizon or numeric roll and tilt values.
(24) Focus	Shows the focus and UDM value.

7.8.1.1 Setting EVF/SDI status info components

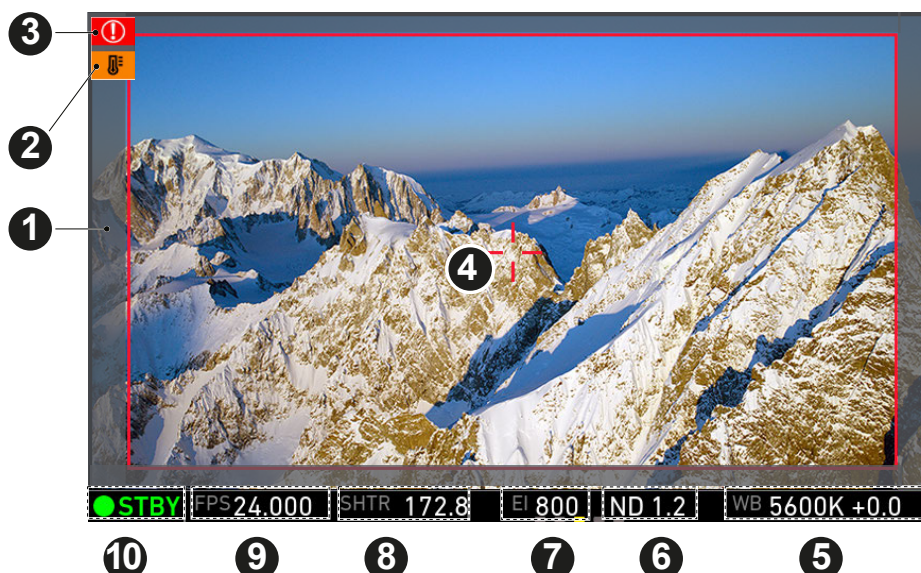
You can configure which parts of the status information should be displayed.

1. You have the following options:
 - Choose **MENU > Monitoring > EVF/Monitor > EVF overlays > Status components**.
 - Choose **MENU > Monitoring > SDI > SDI processing > Overlays > Status components**.
2. You have the following options:
 - *Info 1*
Enables/disables the status areas above and below the image.
 - *Info 2*
Enables/disables the status icons on the left and right side of the image.
 - *Timecode*
Enables/disables display of the timecode on the bottom right of the image.
 - *Audio*
Enables/disables display of the audio levels located on the lower right side of the image.

- *Lens data*
Enables/disables iris and focal length readings. Also available for monitor (in Monitor overlays menu screen).
- *Lens focus distance*
Sub-option of lens data setting. Enables/disables display of focus distance readings, located on the lower left corner of the image.
- UDM
Sub-option of lens focus distance setting. Enables/disables display of distance readings from the Ultrasonic Distance Measure UDM-1 (in combination with LCUBE CUB-1). Located above the lens focus distance overlay.
- *Camera index letter*
Displays the camera index letter in the top right corner of the image. Helps to identify camera image output when shooting with multiple cameras.
Note: Only available for SDI.
- *Electronic horizon*
Displays an horizon overlay representing the roll and tilt of the camera measured by the camera's position sensor. This sensor can be reset, if it appears to have an offset. For information on resetting the camera's position sensor, see "Resetting the electronic horizon", page 126.
- *Show numeric values*
Sub-option of Electronic horizon. Shows the tilt and roll of the camera in degrees as measured by the camera's position sensor.

7.8.1.2 Live monitor

The fold-out monitor of the MVF-1 shows slightly different overlays than the EVF and the SDI output. Below the camera live image, the live screen shows image and camera status. You can toggle the bar's content with the left or right oval button below. The center oval button returns you to the main camera parameters.



- | | | | |
|---|---|----|--|
| 1 | Surround mask | 6 | ND filter |
| 2 | Camera temperature (orange: warning, red: critical) | 7 | Exposure index |
| 3 | ALERT message | 8 | Shutter value (shutter angle or exposure time) |
| 4 | Center mark | 9 | Sensor frame rate |
| 5 | White balance | 10 | Camera status (here: Standby) |

Surround mask

If surround view is active, the non-recorded area is masked. Style options for the mask are: Black line, colored line, or semitransparent mask.

Center mark

Marks the image center. Can be set to *Off*, *Cross*, *Dot* or *Small Dot*.

7.8.2 Setting EVF/Monitor/SDI status overlays

- ▶ You have the following options:
 - Choose **MENU > Monitoring > EVF/Monitor > EVF overlays**.
 - Choose **MENU > Monitoring > EVF/Monitor > Monitor overlays**.
 - Choose **MENU > Monitoring > SDI > SDI processing > SDI overlays**.

You have the following options:

 - *Frame lines*
Sets frame lines on or off. Used as a framing reference tool with typically an image frame, a center mark and aspect ratio. For information on setting frame lines, see "Setting frame lines", page 96.
 - *Center mark*
Sets the center mark for use with frame lines between *Off*, *Small Dot*, *Dot*, or *Cross*.
 - *Surround mask*
Sets the type of overlay to mark the surround view area of the active image. Either as black line, colored line, or semi transparent with 25, 50 or 75 percent opacity (opacity selection not available for monitor). The surround view area helps with framing and is not recorded.
 - *Status info*
Only for EVF and SDI. Sets camera status overlays between *Off*, *Overlay* (status on the active image), or *Safe* (status outside the active image).
Note: In Overlay mode, frame lines up to an aspect ratio of 1.94:1 are not displayed because they are covered by the status info.
 - *Status components*
Only for EVF and SDI. Configures the status info overlay components. For more information, see "Setting EVF/SDI status info components", page 92.

7.8.3 Setting EVF/Monitor/SDI surround view

The surround view shows the outer edges of the sensor image which are not recorded. It allows you to spot and avoid unwanted objects before they enter the image.

1. You have the following options:
 - Choose **MENU > Monitoring > EVF/Monitor > Surround view**.
 - Choose **MENU > Monitoring > SDI > SDI processing > Surround view**.
2. Set the surround view on or off.

7.8.4 Overlay menu

The overlay menu offers a set of camera parameters for adjustment. When activated, it is visible in the top section of the image on the MVF-1 monitor and EVF and on any SDI output which has SDI processing activated. The overlay menu is a quick way to change the following camera settings:

- Sensor FPS
- Shutter (Shutter Angle / Exposure Time)
- Exposure Index
- ND filter
- White Balance

Sensor FPS, Shutter and White Balance cannot be changed manually, but in the range of their user predefined lists. ND filter is changed instantly and requires no additional confirmation step.

A white frame marks the selected parameter. A yellow font indicates active edit mode.

For detailed instructions on how to activate and operate the overlay menu, see the following sections.

Activation and control using the camera buttons

1. Activate the overlay menu by pressing FN + 1.
2. Select a parameter with buttons 1 or 2.
3. Start editing the parameter by pressing button 3.
4. Select the new parameter value with buttons 1 or 2.
5. Confirm the new value by pressing button 3.
6. If required, repeat steps 2-5 for other parameters.
7. Exit the overlay menu by pressing FN + 1.

Activation and control using a user button

1. Assign a user button to "Overlay menu".
2. Activate the overlay menu by pressing the user button.
3. Select a parameter with the jogwheel of the MVF-1.
4. Start editing the parameter by pressing the jogwheel.
5. Change the value of the parameter with the jogwheel.
6. Confirm the new value by pressing the jogwheel.
7. If required, repeat steps 3-6 for other parameters.
8. Exit the overlay menu by pressing the user button.

MVF-1 and CCP-1

When the overlay menu is activated, the monitor of the MVF-1 and CCP-1 always shows the overlay menu. Using the home screen or the menu simultaneously is not possible.

7.8.5 Frame lines

You can configure which frame line the camera should show and how it should be displayed. You can also configure up to two user rectangles which allow you to mark a rectangular area on the image, e.g. for marking an area that you need to keep clear during shooting for later VFX insertion.

- Choose **MENU > Monitoring > Frame lines**.

NOTICE

The camera contains a set of default frame lines with standard aspect ratios. You can also import external frame lines in XML format.

You can create custom frame lines with the ARRI Frameline Composer on the ARRI webpage.

7.8.5.1 Setting frame lines

1. Choose **MENU > Monitoring > Frame lines > Frame line**.

A list of installed frame lines is displayed.

2. Select the desired frame line and confirm by pressing the jogwheel.

You can activate the frame line in overlays. For more information, see "Setting EVF/Monitor/SDI status overlays", page 94.

7.8.5.2 Setting frame line color

You choose the color in which the following elements are displayed:

- frame line
- center mark
- user rectangle
- surround mask (if mask is set to Colored line)

- ▶ Choose **MENU > Monitoring > Frame lines > Frame line colors** .

You have the following options:

- *Red*
- *Green*
- *Blue*
- *Cyan*
- *Magenta*
- *Yellow*
- *Black*
- *White*

7.8.5.3 Setting frame line intensity

You can set the brightness of the frame line, center cross and user rectangles.

- ▶ Choose **MENU > Monitoring > Frame lines > Frame line intensity** and set the intensity. The value range is from 1 to 4.

7.8.5.4 Activating user rectangles

You can activate up to two user rectangles.

- ▶ Choose **MENU > Monitoring > Frame lines > User rectangles**. You have the following options:
 - *Off*
 - *Rect 1*
 - *Rect 2*
 - *Rect 1 + 2*

7.8.5.5 Configuring and resetting user rectangle 1 and 2

You can configure *width*, *height* and *offset* (i.e. position from left and top screen edge) in per mill. You can also reset all settings.

1. Choose **MENU > Monitoring > Frame lines > User rectangle 1** or **MENU > Monitoring > Frame lines > User rectangle 2**.

You have the following options:

- *Width*
 - *Height*
 - *Offset left*
 - *Offset top*
 - *Reset all*
2. Configure the rectangle according to your needs.
 3. To reset the configuration, press *Reset all*.

You can activate the display of user rectangles. For more information, see "Activating user rectangles", page 96.

7.8.6 Activating anamorphic desqueeze for EVF/Monitor and SDI

When you are working with anamorphic lenses, you can activate anamorphic desqueeze on EVF/Monitor and SDI so that the image is displayed with the correct aspect ratio.

Note: Anamorphic desqueeze is available only for the lens squeeze factors 1.3 and 2.0. For more information on setting the lens squeeze factor, see "Setting the lens squeeze factor", page 65.

Anamorphic desqueeze is only available with the following recording codecs and resolutions:

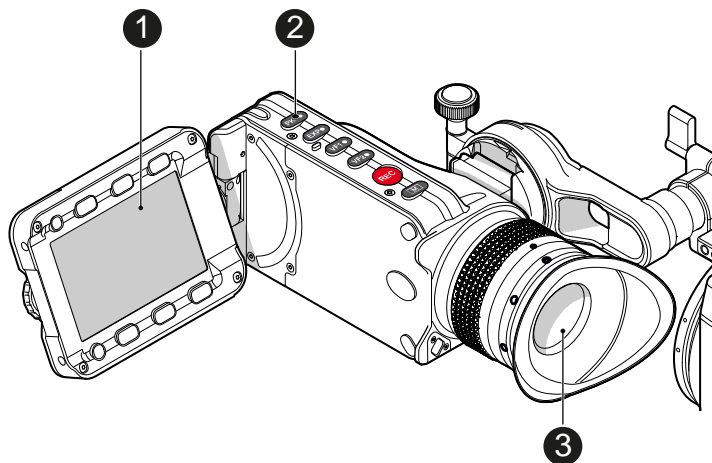
- ProRes 16:9 HD Ana.
- ProRes 2.39:1 2K Ana.
- ProRes 3.2K
- ProRes UHD
- ProRes 4:3 2.8K
- ARRIRAW 16:9 2.8K
- ARRIRAW Open Gate 3.4K
- ARRIRAW 4:3 2.8K (OG)
- ARRIRAW 16:9 HD (OG 3.4K)
- ARRIRAW 2.39 2K (OG 3.4K)

1. You have the following options:
 - Choose **MENU > Monitoring > EVF/Monitor > Anamorphic desqueeze**.
 - Choose **MENU > Monitoring > SDI > Anamorphic desqueeze**.
2. Enable or disable anamorphic desqueeze for the EVF/Monitor or SDI outputs.

7.8.7 Peaking

7.8.7.1 Activating peaking on EVF/Monitor

Peaking highlights the image parts that are in focus for better focus judgement.



- ▶ Press *PK* (2).

You have activated peaking for both Monitor (1) and EVF (3).

For information on peaking settings, see "Defining peaking for EVF/Monitor/SDI", page 98.

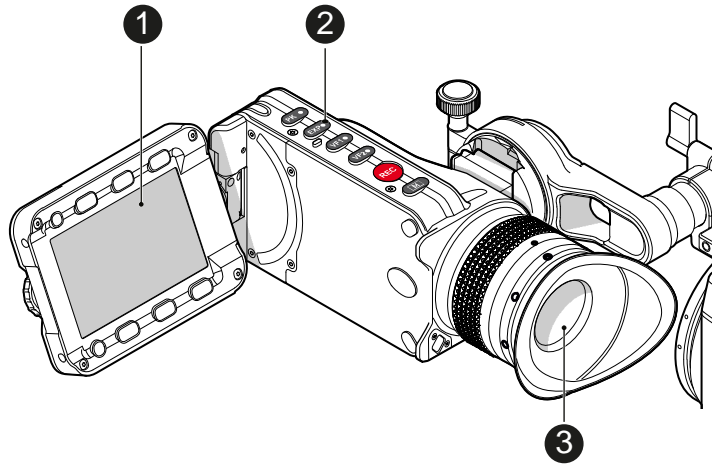
7.8.7.2 Defining peaking for EVF/Monitor/SDI

Peaking highlights in-focus image sectors for better focus judgement. You can activate peaking via the menu, via user button or by pressing *PK* on the viewfinder (only for EVF/Monitor).

1. You have the following options:
 - Choose **MENU > Monitoring > EVF/Monitor > EVF/Monitor Processing > Peaking**.
 - Choose **MENU > Monitoring > SDI > SDI Processing > Peaking**.
2. You have the following options:
 - *Peaking*
Activates Peaking.
 - *Peaking mode*
Toggles between *Color* and *Aperture*. Select color peaking to overlay in-focus areas with a color, and select aperture peaking to enhance object edges only.
 - *Peaking level*
Sets a peaking strength in range from 1 (minimum) to 20 (maximum).
 - *Peaking offset shift*
Adjusts the threshold for color peaking to become active, relative to the peaking level. **Note:** A negative offset shift, in particular with high ASA ratings, can increase the peaking results.
 - *Color*
You have the following options: *Red, Green, Blue, Cyan, Magenta, Yellow, White*.

7.8.8 Exposure tools

7.8.8.1 Activating the exposure tool



The *EXP* button (2) activates the configured exposure tool on the Monitor (1) and EVF (3). Use the exposure tool for evaluation of the image exposure levels. An activated exposure tool lights up the button (2).

For more information, see "Selecting the exposure tool", page 99.

7.8.8.2 Selecting the exposure tool

You can select which exposure tool you want to use to evaluate the image exposure. You can activate it with the user button or by pressing *EXP* on the viewfinder.

Note: *Zebra* is not available on image paths with processing set to Log C. Please use *False Color* or the waveform display to check the image exposure on image paths with processing set to Log C.

► Choose **MENU > Monitoring > Exposure tools**.

You have the following options:

- *Select EVF/Mon. exp. tool*
False Color marks predefined luminance ranges of the viewfinder image, as described below, and turns the remaining image parts black and white. In *Zebra* mode, the camera overlays up to two luminance ranges with diagonal stripes. *High zebra* ranges above, *Mid zebra* around the user-defined luminance value.
- *Select SDI exp. tool*
False Color and *Zebra*, as described above.

- *False color mode*
The result of activating false color can be varied to either *Monitoring-based* or *Log C-based*. This choice is global and will be valid for all viewing outputs.

Monitoring-based

When choosing *Monitoring-based* false color and false color is activated (with the EXP button on the viewfinder, for example), false color is calculated based on the video signal of the respective monitoring output. In other words, whatever is seen on the image path is the basis for calculating false color. This is the same behavior as in SUPs up to version 4.1.

If you have a monitor output or the viewfinder configured to show Log C, false color levels will be calculated based on the Log C signal.

If you have a monitor output or the viewfinder configured to LOOK or ALEXA Classic 709, false color levels will be calculated based on the image with the look applied or the ALEXA Classic 709 image respectively.

Monitoring-based false color makes most sense when baking a look file into the recorded image. It allows you to monitor the exposure levels of the signal you are recording. Looking at *Log C-based* false color makes no sense in this case, as you are not recording the Log C signal and will therefore not have the Log C image available in post.

Log C-based

When choosing *Log C-based* false color, false color is always calculated based on the Log C image. When false color is activated (with the EXP button on the viewfinder, for example), the respective monitoring output is switched to Log C processing, false color levels are calculated based on the Log C signal and false color is activated. When de-activating false color, the image path is switched back to its previous processing and false color is switched off. This setting makes most sense for projects that record Log C images. While your monitoring image paths can be set to show Rec 709 or a look to provide a preview for all, you will want to know the exposure levels of the signal you are actually recording (Log C) when checking false color. *Log C-based* false color mode is mandatory when using HDR ALF-2 files.

NOTICE

When a HDR ALF-2 look file is loaded and activated in the camera, false color mode automatically switches to 'Log C-based'. This is because HDR look files do not generate video signals over 75%, which means that overexposure might not be indicated correctly in 'Monitoring-based false color' mode.

When you are using a Look file that does not utilize the full signal level range and you activate false color on a monitoring path where Look processing is active, false color will not indicate over- or underexposure. This specifically applies to Rec 2100 PQ Look files, as they level out at a maximum signal level of 75%.

When using look files with extreme color grading, it is possible for 'Monitoring-based' false color to show an inaccurate result.







For more information on monitoring processing, see "Configuring processing and color spaces", page 74.

- *Zebra setup*
For more information, see "Setting up zebra", page 101.
- *EVF waveform*
Sets waveform overlay on EVF on or off.
- *EVF waveform size*
Sets size of EVF waveform overlay to small or large.

- *Monitor waveform*
Sets waveform overlay on monitor on or off.
- *Monitor waveform size*
Sets size of monitor waveform overlay to small or large. **Note:** Waveform is a luminance waveform from a 0-100% signal level, calculated from the EVF and monitor image signals for each path.

False color

Activating false color converts the image to black-and-white, and replaces luminances with the following colors:

What	Signal Level	Color	Color
White clipping	100% - 99%	red	
Just below white clipping	99% - 97%	Yellow	
One stop over medium gray (Caucasian skin)	56% - 52%	pink	
18% medium gray	42% - 38%	green	
Just above black clipping	4.0% - 2.5%	blue	
Black clipping	2.5% - 0.0%	purple	

Setting up zebra

- ▶ Choose **MENU > Monitoring > Exposure tools > Zebra setup.**

You have the following options:

- *Zebra mode*
Sets the zebra mode to High, Mid, or both.
- *High zebra level*
Sets the exposure level (in %) above which high zebra is active.
- *High zebra color*
Sets the pattern color.
- *Mid zebra range*
Sets the active range (in %) around a mid zebra level.
- *Mid zebra color*
Sets the pattern color.

7.8.9 Setting the EVF zoom position

You can zoom into the image e.g. to judge focus better. The camera offers 3x3 patches that can be selected as zoom positions, and an additional position called eye level, which are between top center and mid center.

While zoom is activated, the zoom position can also be changed by using the jogwheel or the soft buttons on MVF-1, if it is showing the live image.

Note: Zoom needs to be activated by a user button. For information on assigning user buttons, see "User buttons", page 130.

- ▶ Choose **MENU > Monitoring > EVF/Monitor > Zoom position.**

7.8.10 SDI configuration

You can configure the *SDI* outputs. The following combinations of formats, frame rates and scan formats are available:

Format	Resolution	Sampling	Frame rates
422 1.5G	1920x1080	4:2:2 YCbCr	23.976p, 24p, 25p, 29.97p, 30p, 50i, 59.94i, 60i, 23.976psf, 24psf, 25psf, 29.97psf, 30psf
422 3G	1920x1080	4:2:2 YCbCr	48p**, 50p, 59.94p, 60p
444 3G	1920x1080	4:4:4 RGB	23.976p, 24p, 25p, 29.97p, 30p
DL 422 3G*	3840x2160	4:2:2 YCbCr	23.976p, 24p, 25p, 29.97p, 30p
422 6G*	3840x2160	4:2:2 YCbCr	23.976p, 24p, 25p, 29.97p, 30p
DL 422 6G*	3840x2160	4:2:2 YCbCr	48p**, 50p, 59.94p, 60p

* only available in 3.2K/4K UHD recording resolution.

**48p may not be supported by some SDI devices, as this is not a defined frame rate according to the SMPTE standard.

Note: Status overlays are not available when using UHD (3840x2160) resolution.

7.8.10.1 Configuring SDI processing

You can configure the SDI processing elements.

- ▶ Choose **MENU > Monitoring > SDI > SDI processing**. You have the following options:
 - *Surround view*
Activates or deactivates surround view.
 - *Exposure tool*
Activates or deactivates the exposure tool. For more information, see "Selecting the exposure tool", page 99.
 - *Peaking*
Configures peaking for SDI. For more information, see "Defining peaking for EVF/Monitor/SDI", page 98.
 - *Overlays*
Configures the SDI overlays. For more information, see "Setting EVF/Monitor/SDI status overlays", page 94.

7.8.10.2 Setting SDI 1/2 format

You can toggle the SDI signal between different formats:

- 422 1.5G HD
- 422 3G HD
- 444 3G HD
- 422 6G UHD**

- *DL 422 3G UHD***
- *DL 422 6G UHD***

** only in 3.2K and 4K UHD.

For information on the combination of formats, frame rates and scan formats, see "SDI configuration", page 101.

- ▶ Choose **MENU > Monitoring > SDI > SDI 1 format** or **MENU > Monitoring > SDI > SDI 2 format** and select the desired format.

Note: When you select a dual link (DL) format, the settings for SDI 2 become unavailable.

7.8.10.3 Setting SDI 1/2 frame rate

You can set the frame rate together with the scan format on the SDI output. If the frame rate is lower than the sensor fps, frame drops will occur. If it is higher, duplicate frames will be output.

- ▶ Choose **MENU > Monitoring > SDI > SDI 1 frame rate** or **MENU > Monitoring > SDI > SDI 2 frame rate** and select the desired frame rate.

Possible scan formats

- *Progressive (p)*: Transmits images line by line starting at the top-left pixel.
- *Progressive segmented frame (psf)*: Splits progressive images into fields (odd lines and even lines). Transmits these (all odd before all even) line by line.
- *Interlaced (i)*: Creates two fields from two adjacent progressive frames (odd lines from the first; even lines from the second frame)

For information on combinations of formats, frame rates and scan formats, see "SDI configuration", page 101.

7.8.10.4 Setting SDI 1/2 3G level

For the single link 3G SDI formats, you can choose whether to use 3G level A or B. Refer to the manual of your connected devices to decide which 3G level to choose.

- ▶ Choose **MENU > Monitoring > SDI > SDI 1 3G level** or **MENU > Monitoring > SDI > SDI 2 3G level** and select the desired 3G level.

7.8.10.5 Setting SDI 1/2 image

The SDI image setting determines how images are output over SDI:

Clean images are identical to the images that the camera records internally. They do not contain any overlays and do not show any surround view.

Processed images may contain overlays and show surround view.

SDI 1 and 2 cannot be configured completely independently from each other in reference to the image setting. The SDI 1 setting determines the available options for SDI 2.

The following combinations are possible:

SDI 1	SDI 2
clean	clean
clean	processed
processed	clean

If both SDI 1 and 2 are supposed to show processed images, SDI 2 needs to be configured as SDI 1 clone. See "Cloning SDI 1 settings to SDI 2", page 104 for more information.

- ▶ Choose **MENU > Monitoring > SDI > SDI 1 image** or **MENU > Monitoring > SDI > SDI 2 image**.

7.8.10.6 Cloning SDI 1 settings to SDI 2

You can set SDI 2 as a clone of SDI 1. SDI 2 will inherit all settings from SDI 1. The configuration options for SDI 2 are grayed out while it is configured as a clone of SDI 1. If you change a value for SDI 1, the same value becomes active for SDI 2 as well.

- ▶ Choose **MENU > Monitoring > SDI > SDI 2: clone SDI 1**.

7.8.11 Defining EVF/Monitor settings

- ▶ Choose **MENU > Monitoring > EVF/Monitor > Settings**.

You have the following options:

- **EVF brightness**
Brightness of the EVF from 1 (minimum) to 10 (maximum).
- **EVF gamma**
Select between EVF gamma settings *Standard* and *Lifted*. *Standard* equals the EVF gamma of up to SUP 4.1 while setting *Lifted* uses an 1.3x increased gamma as introduced with SUP 5.0 to e.g. better control lighting in dark areas. The default setting is *Lifted*.
- **EVF power**
Select between *Auto* and *Off*. Allows you to switch the EVF off permanently so that it stays off even when the proximity sensor is covered e.g. by a rain cover.
- **Monitor brightness**
Brightness of the monitor from 1 (minimum) to 10 (maximum).
- **Monitor flip mode**
For either *Normal*, *Flipped*, or *Auto* monitor orientation. *Auto* flips the monitor display automatically depending on its orientation.

7.8.12 Activating color bars

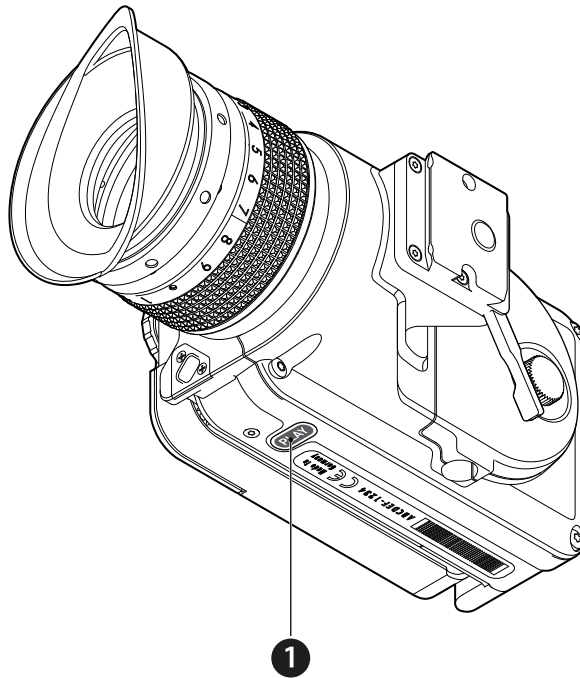
You can activate a SMPTE color bar on the SDI outputs.

Note: Recording deactivates the color bar.

- ▶ Choose **MENU > Monitoring > Color bars** and set the bars on or off.

7.9 Playback

7.9.1 Starting playback via the *PLAY* button



1. Press *PLAY* (1) for one second to see the last recorded clip on the CFast 2.0 card. The camera enters playback on Monitor, EVF and on SDI.
2. You may toggle between play and pause by briefly pressing *PLAY* (1) again.
3. To exit playback: Press *PLAY* (1) for one second.
4. For more information on playback control, see "Playback", page 105.

7.9.2 Playback screen controls



- When starting playback, the camera loads the last recorded clip (paused on the first frame).
- **PLAY/PAUSE (6)** button:
Toggles between play and pause.
Play/pause can also be toggled by pressing the play button at the bottom of the viewfinder or by pressing on the jogwheel. The jogwheel can also be used to shuttle through a clip:
 - While in pause:
Use the jogwheel to shuttle through the clip frame by frame
 - While playing:
Use the jogwheel to increase or decrease the playback speed up to 512x forwards or backwards.
- **SKIP FWD (4)** button:
Loads the next clip in the cliplist.
- **SKIP REV (2)** button:
Loads the previous clip in the cliplist.
- **CLIPLIST (7)** button:
Select another clip for playback from a list of all clips on the inserted card.
- **WAVEFORM (3)** button:
Enable/disable the waveform overlay on monitor.
- **OPTIONS (5)** button:
Allow to set the clip end action.
- **ARROW (8)** button:
Hides/shows button overlays.
- **EXIT (1)** button:
Ends playback.

Note: When playing back clips with project rates of 48 fps or greater that were recorded in ARRIRAW or with ProRes resolutions of 3.2K or 4K UHD, the camera only plays back every second frame to ensure smooth playback. When stepping through single frames, however, every frame is shown.

CLIPLIST

1. On the playback screen, press **CLIPLIST** to open the cliplist. The list shows the clip names and their resolution.
 - Note:** Clips may be grayed out, if they cannot be played back because their recording resolution is not compatible with the currently set recording resolution.
2. Via jogwheel, scroll to the desired clip.

3. For the selected clip, clip properties are displayed below the cliplist:
 - *Codec*: Recording codec of clip.
 - *Resolution*: Recording resolution of clip.
 - *Duration*: Clip duration at playback speed.
 - *Rec FPS*: Sensor frame rate the clip was recorded with.
 - *Project rate*: Playback frame rate of clip.
 - *TC*: Start timecode of the clip.
4. To load the selected clip: Press the jogwheel.
5. To return to the play screen without loading a new clip: Press *BACK*.
6. To end playback: Press *EXIT*.

OPTIONS

- ▶ Press the *OPTIONS* button to open the playback options screen.

You have the following options:

- *Play end mode*
Define the playback behavior at the end of a clip.
 - *Pause on end*
Playback pauses at the end of the clip.
 - *Pause on start*
Playback pauses at the beginning of the clip.
 - *Loop*
Playback continues from the beginning of the same clip again.
 - *Play next clip*
Playback continues with the next clip in the cliplist.
 - *Exit playback*
Camera exits playback.
- *Monitor waveform*
Sets the waveform overlay on monitor to *On* or *Off*.

7.10 System

The system menu organizes the general camera setup.

- ▶ Choose ***MENU > System***.

7.10.1 Sensor

7.10.1.1 Adjusting the image sharpness

You can adjust the image sharpness ranging from -5 to +5 (default = 0). The image sharpness influences the image detail. For more information, see "Adjusting the image detail set/active", page 108

- ▶ Choose ***MENU > System > Sensor > Image sharpness set/active***.

7.10.1.2 Adjusting the image detail set/active

You can adjust the maximum detail frequency influenced by the sharpness setting ranging from -5 to +5 (default = 0).

- ▶ Choose **MENU > System > Sensor > Image detail set/active**.

7.10.1.3 Setting image denoising

Image denoising reduces the amount of noise in dark image areas. It reduces the noise in a very organic way and preserves the character and texture of the image.

Note: *Strong* may result in image artifacts with fast moving objects.

There is no impact on image sharpness. You can set the image denoising in S16, 3.2K, 4K UHD and 4:3 2.8K mode only.

- ▶ Choose **Menu > System > Sensor > Image denoising** and select your setting. You have the following options:
 - *Off*
 - *Normal*
 - *Strong*

7.10.1.4 EXT sync mode

Up to 16 ALEXA Mini cameras can be synchronized for various applications requiring sensor synchronization. One camera is set as the master camera and the other cameras function as slave cameras. Cameras can be connected to each other via the EXT connector, using the MINI-EXT-sync cable (K2.0009051) and the EXT distribution box EDB-2 (K2.0013145).

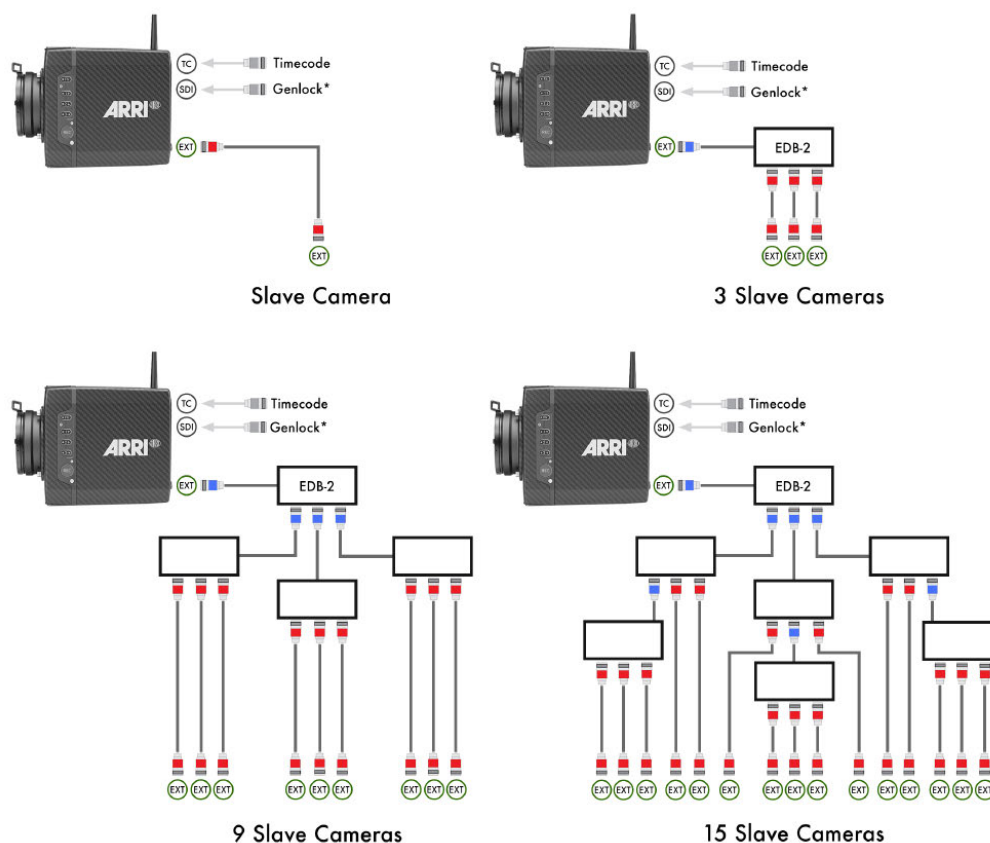
When synchronized,

- images are captured from each camera's sensor at precisely the same time.
- recording starts and stops simultaneously on all cameras.
- recorded clips have identical start and end timecode.
- SDI outputs of all cameras are synchronized.

NOTICE

- Synchronizing sensors is possible at sensor frame rates between 20 fps and 200 fps.
- Prerecord, interval recording and stop motion recording are not available with EXT sync mode.
- The master camera does not distribute look files or frame line files. If custom look files or frame lines are used, the files need to be imported manually on each camera.

The following images show some sample configurations:



*SDI 2 needs to be rewired in order to be used as a genlock input.

Setting the EXT sync mode

One camera is functioning as the master camera and the other camera(s) as slave camera(s). A slave camera can be a sensor slave (only sensor sync) or a settings slave (sensor and settings sync).

1. Connect the cameras via their EXT connector using the MINI-EXT-sync cable(s) and the EXT distribution box EDB-2.

Note: One EDB-2 or more are needed, if the cluster consists of more than two cameras.

2. ► Choose **MENU > System > Sensor > EXT sync** and select a setting.
3. **Note:** First set all slave cameras and master camera last.

You have the following options:

- *Off*
Default value.
- *EXT master*
Configures the camera as the master camera. The camera has control over one or more slave cameras. The sensors of all slave cameras will be synchronized to this camera's sensor. All slave cameras will inherit the timecode from this camera.
The master camera can be supplied with external timecodes and can be synchronized to an external source, for example, genlock.
- *EXT sensor slave*
Configures the camera as a sensor slave. The sensor is synchronized with the master camera. The SDI outputs of the slave camera are synchronized with the master camera. The slave camera inherits the timecode from the master camera. Recording starts and stops simultaneously on all cameras.

- *EXT settings slave*

Configure the camera as a settings slave. The sensor is synchronized with the master camera. The SDI outputs of the slave camera are synchronized with the master camera. The slave camera inherits the timecode from the master camera. Recording starts and stops simultaneously on all cameras. To ensure an identical clip naming, the slave camera inherits the camera ID from the master camera.

Settings synchronized parameter:

Project rate	Next reel count	SDI exposure tool
Sensor fps	Lens squeeze factor	SDI peaking
Shutter and shutter unit	EVF processing	SDI overlays
Exposure index	EVF exposure tool	Exposure tool settings
White balance*	EVF peaking	Frame line settings
ND filter	EVF overlays	Focus unit
Recording codec	SDI processing	Image sharpness
Recording resolution	SDI format	Image detail
Recording processing	SDI color space	Image denoise
Active look	SDI frame rate	EF iris value

* White balance: Whenever it is changed on the master camera, the slave cameras will inherit the new setting. The setting inherited from the master camera can anytime be overridden on slave camera(s) by either setting a new value or by executing auto white balance.

Note: Settings synchronized parameters can only be applied from the master camera.

4. On the master camera in an EXT sync cluster, you need to define the amount of cameras used in the cluster. The master camera monitors the connection to each slave camera.

- ▶ On the master camera, choose **MENU > System > Sensor > EXT sync camera count** and choose the number of cameras used in your cluster (including the master camera, up to 16 cameras).

5. When using settings slaves, each camera in the setup needs to use an individual camera ID prefix.

- ▶ Choose **MENU > Recording > Project settings > Camera ID prefix** and select a prefix individually for each camera (usually giving the master camera the camera ID prefix "A")

For more information, see "Clip naming", page 111.

NOTICE

- If one camera in the cluster is not ready to record, the entire cluster will go into idle state. Use the EXT sync info screen to troubleshoot.

Monitoring the EXT sync cluster

Card status with EXT sync



In EXT sync mode, you can use recording media with different capacities in a cluster. The master camera calculates the overall remaining recording time based on the medium with the lowest capacity in the cluster. The overall remaining recording time is displayed prefixed with **EXT** on the home screen and in the status info on the master camera.

EXT sync info screen

► Choose HOME > i > EXT sync info to access the EXT sync info screen.

The EXT sync info screen displays the system status of all cameras in the EXT sync cluster. Information on the camera serial numbers, the camera ID prefixes, the battery voltages and the main status of all cameras are shown.

Note: The EXT sync info screen lists the cameras sorted after the camera ID prefix.

Erasing cards via EXT sync

In EXT sync mode, you can simultaneously erase the cards of all cameras in the cluster:

1. On the master camera, choose **MENU > Media > Erase EXT sync cards**.
A confirmation screen is displayed.
2. Press **ERASE**.
A progress bar indicates the progress of the master camera (only).
3. After erasing has finished, press any button to return to the menu.

NOTICE

Delete last clip is not available when in EXT sync mode.

Clip naming

When working in EXT sync mode and the slave cameras are configured as settings slaves, clip naming is identical to the use of a single camera.

When working in EXT sync mode and using settings sync, the slave cameras inherit the camera ID of the master camera, so clip file names are identical. To distinguish the clip files from several cameras, the Camera ID prefix is used. For this reason, each camera must use an individual camera ID prefix.

Set the camera ID prefix of each camera in **MENU > Recording > Project settings > Camera ID prefix**.

Note: The master camera will issue an alert in case duplicate camera ID prefixes are used within the setup.

Below is a clip name example for a four camera setup, with three clips recorded. The camera ID prefix is marked in red, the master camera ID is marked in blue. It is recommended to use the same camera index (green) on all cameras.

```

A001_AH8B
  A001C001_170313_AH8B
  A001C002_170313_AH8B
  A001C003_170313_AH8B
A001_BH8B
  A001C001_170313_BH8B
  A001C002_170313_BH8B
  A001C003_170313_BH8B
A001_CH8B
  A001C001_170427_CH8B
  A001C002_170427_CH8B
  A001C003_170427_CH8B
A001_DH8B
  A001C001_170427_DH8B
  A001C002_170427_DH8B
  A001C003_170427_DH8B

```

NOTICE

Do not mix sensor and settings slaves as this will cause inconsistencies in clip naming.

For more information on the camera ID prefix, see "Defining the camera ID prefix", page 65.

7.10.1.5 Setting genlock sync

You can synchronize the camera sensor to external sync sources.

1. Choose **MENU > System > Sensor > Genlock sync** and select a setting. You have the following options:
 - *Off*
 - *SYNC IN*
The camera requires a black burst or tri-level sync signal running at sensor fps for the SYNC IN BNC connector.
Note: ALEXA Mini does not offer a SYNC IN connector by default. Syncing to a black burst or tri-level signal via SYNC IN requires a hardware modification of the camera to function. Either SDI1 or SDI2 output needs to be rewired to function as SYNC IN. Contact ARRI service for more information.
 - *TC IN*
The camera requires a timecode signal running at sensor fps for the TC connector.
2. The camera will display a genlock icon on the HOME screen as well as in status info.

NOTICE

Syncing to HD-SDI signals is only possible using 422 1.5G signals. 3G, 6G or 12G HD-SDI signals are not supported to be used as sync source.

7.10.1.6 Setting the sync shift

Sync shift (+ 0.000 μ s): Offset applied to the genlock signal at the input. Minimum stepsize is 52 ns, maximum possible correction is up to +/- 20 ms (= 384000 steps), depending on the sensor frame rate.

- ▶ Choose **MENU > System > Sensor > Sync shift**.

7.10.1.7 Mirroring the sensor image

You can mirror the sensor image in horizontal and vertical directions.

- ▶ Choose **MENU > System > Sensor > Mirror image**.

You have the following options:

- *Off*
Mirroring is inactive.
- *V*
Vertically mirrored.
- *H*
Horizontally mirrored.
- *V+H*
Vertically and horizontally mirrored (i.e. rotated by 180°).

7.10.1.8 Working with a user pixel mask

All sensors exhibit a certain number of defect pixels, and ARRI cameras have two mechanisms to catch and correct them: one is a static pixel correction based on a pixel mask created during manufacturing, and the other is a dynamic pixel correction that continuously evaluates each frame and masks defect pixels that are not caught by the static pixel mask. In very few cases, we have observed some pixels that are not corrected by either method; for those cases we have User Pixel Masking. User Pixel Masking works in combination with the ARRIRAW Converter (ARC) from ARC version 3.0 onwards.

NOTE: When shooting ARRIRAW, it is not necessary to load the User Pixel Mask into the camera. Instead, it can be applied to the ARRIRAW files in post using the ARRIRAW converter software or any third party software that has implemented the User Pixel Mask feature through our ARRIRAW SDK.

NOTE: The User Pixel Mask will remain intact during a factory reset and during a software update. It can be manually removed or overwritten with a new one at any time.

NOTICE

User pixel masks can be created with the ARRIRAW Converter for Mac and Windows, available for download from the ARRI website. Please refer to the ARRI website and the ARRIRAW Converter documentation for additional information.

- Choose **MENU > System > Sensor > User pixel masking**.

You have the following options:

- *User pixel mask active:*
Shows whether a User Pixel Mask is currently active in the camera.
- *Install user pixel mask:*
Select to install a User Pixel Mask from USB memory stick.
- *Export user pixel mask:*
Select to backup the currently installed User Pixel Mask onto USB memory stick.
- *Delete user pixel mask:*
Select to uninstall a User Pixel Mask.
- *Grab raw image:*
Stores an ARRIRAW frame grab on the USB memory stick.

To use User Pixel Masking for all Output and Recording Formats

1. Insert an USB memory stick into camera.
2. Use **MENU > System > Sensor > User pixel masking > Grab raw frame** to grab an ARRIRAW frame. The ARRIRAW frame grab is stored on the USB memory stick in folder ARRI/A-MINI/SENSOR.
Alternatively, you can record a short ARRIRAW sequence and use that material for marking defect pixels.
3. Import the ARRIRAW frame grab into the ARRIRAW Converter.
4. Use the ARC software to mark defect pixels. The marked pixel coordinates are stored in an XML file called the User Pixel Mask. Please note that it is advisable to mark the least number of pixels necessary, as too many marked pixels can be counter productive.
5. Save the User Pixel Mask to the USB memory stick in folder ARRI/A-MINI/SENSOR and load it into the camera with **MENU > System > Sensor > User pixel masking > Install user pixel mask**
6. After a restart of the camera, the marked pixels will be masked using information from surrounding pixels. This masking is applied to the images delivered from the sensor, before any other processing takes place, and thus becomes active on all outputs.
7. Carefully check the end result by visually inspecting the areas where you have marked pixels; if too many pixels are marked too close to each other, or if pixels are marked close to other pixels that are already marked in the static pixel mask, the result could be uncorrectable clusters, which are more visible than the original defect pixels.

As an added service, it is possible to send the User Pixel Mask to ARRI Service at service@arri.de for verification. We strongly recommend that you take advantage of this free service, as sometimes, clusters are difficult to spot depending on the background. Please note, however, that in the end, it is the responsibility of the person creating the User Pixel Mask to verify that no clusters are formed.

7.10.2 Setting the fan mode

You can set the camera cooling for different shooting situations.

- ▶ Choose **MENU > System > Fan mode**.

You have the following options:

- *Regular*
Holds a balance between fan noise and camera temperature.
- *Rec low*
Increases fan speed during standby to pre-cool the camera. Minimizes fan speed/noise during recording.
Note: Ideal in an environment warmer than 25 °C (77 °F).
- *Low Noise*
Minimizes fan noise during standby and recording.
Note: With data rates above 100 MB/s (due to fps/codec setting), the fan speed automatically increases to prevent CFast 2.0 cards from overheating.

7.10.3 Power warnings for batteries

You can configure low battery warning.

- ▶ Choose **MENU > System > Power** and change the configuration.

7.10.3.1 Setting the BAT in warning voltage level

You can set the voltage level that triggers a power warning for external batteries on the BAT connector.

- ▶ Choose **MENU > System > Power > BAT in warning** and set the voltage level.

7.10.4 Lens mount settings

You can enable/disable the LDS contacts of the lens mount and set your preferred focus unit.

- ▶ You have the following options:
 - Choose **MENU > SYSTEM > Lens mount settings**.
 - Choose **HOME > i > Lens info > Settings**.
 - Choose **MENU > Electronic Control System (ECS) > Lens data > LENS INFO > SETTINGS**.

The lens mount settings screen is displayed.

You have the following options:

- **Focus unit**
Select the unit for display of the lens focus distance. You have the following options:
 - Lens default*
 - Imperial*
 - Metric*
- **Enable lens mount**
Allows you to deactivate the LDS contacts of a PL lens mount.
Allows you to deactivate the electronic contacts of an EF mount.

NOTICE

Please note that as soon as an LDA table is activated, the LDS contacts of the lens mount are switched off. There is no need to switch the mount off manually when using LDA.

7.10.5 Adjusting system time and date

You can adjust system time and date.

- ▶ Choose **MENU > System > System time + date** to set the system time and date.
Note: *Timezone* and *Daylight savings time* do not change time and date settings. They are stored as metadata in the recorded clips.

7.10.6 Buttons and display

You can configure the display style and the brightness of the camera buttons.

- ▶ Choose **MENU > System > Buttons + display** and select the configuration you want to change.

7.10.6.1 Setting the display style

- ▶ Choose **MENU > System > Buttons + display > Display style** and select your setting. You have the following options:

- Day mode
- Night mode

The brightness of display and buttons changes according to the selected mode.

7.10.6.2 Setting the button brightness

- ▶ Choose **MENU > System > Buttons + display > Button brightness** and set the brightness in a range from 0 to 3.

The button illumination changes according to the selected value.

7.10.7 Multicam

The Multicam feature allows you to use the camera in a multi-camera production environment. When activated, the camera can be controlled with a range of Sony RCPs using the Sony Simple Camera Protocol (SSCP), communicating via the camera's Ethernet port.

Additional information on the Multicam feature can be found in the Multicam white paper available on the ARRI website.

7.10.7.1 Required hardware

In addition to the camera, the following hardware is required to allow remote controlling the camera by a RCP:

- Sony RCP (models supported by SSCP devices)
- SSCP device: Sony CNA-1 or DTS1840 ethernet remote interface or equivalent
- Ethernet connection cables

For a serial connection between RCP and SSCP device:

- Serial cable for connecting RCP and SSCP device

For an ethernet connection between RCP and SSCP device:

- Ethernet switch supporting PoE (or PoE injector for powering SSCP device and RCP)

Optional components:

- If you are using SUP 5.0 (or higher) with the single or dual 6G output for UHD up to 60p, please make sure to update your camera at an ARRI service station with the latest SDI output board (IAOX Rev. H) to ensure best 6G or dual 6G performance.
- Camera on-board monitor with optional yoke for camera top back mounting position (the on-board monitor is not an essential requirement, but typically used for a studio-like setup, where the operator is located behind the camera and controls zoom and focus with rear camera controls).
- Lens controls for zoom and focus, depending on the used lens type, or ARRI Master Grips.

7.10.7.2 Supported RCP parameters

The following list contains the RCP parameters supported by the camera:

- Iris control:
 - ENG style PL lenses and ENG style B4 lenses via the Hirose 12/20 pin connection
 - EF lenses via the lens contact on the mount
 - Cinestyle lenses using the CMotion Broadcast camin as interface between the Hirose connector and the lens motor
- Auto Iris
- Black R/G/B
- Master Black
- White R/G/B
- 5600K Override
- Auto White Balance
- ND filter selection
- Detail
- Master Gain
- Gamma R/G/B
- Master Gamma
- Master Black Gamma
- Master Knee
- Saturation
- Scene Files (up to 5)
- Call
- Color Bars
- Shutter
- ECS Shutter
- White Balance

Specific behavior for Auto White Balance:

In the color processing signal flow, the „Auto White Balance“ function is processed before the RGB white or black processing. This is different to typical 2/3' cameras, and needs to be considered when using „Auto White Balance“ for „neutralizing“ the image. With ALEXA Mini, after performing „Auto White Balance“, the RGB setting still is maintained.

Look support:

With ALEXA Mini in multicam mode, the look functions are part of the image parameter remote control of the RCP. Starting with SUP 5.0, other looks than the default Rec 709 can be used.

7.10.7.3 Multicam setup and configuration

General settings

Genlock

To synchronize the HD-SDI outputs to the studio clock, choose *MENU > System > Sensor > Genlock sync* and set the genlock source. Use *Genlock Shift* to compensate for a phase shift between the studio clock and the HD-SDI outputs. Please also see "Setting genlock sync".

SDI Configuration

Go to *MENU > Monitoring > SDI* and ensure the HD-SDI outputs to be configured according to your setup. Please also see "SDI configuration".

Image processing

Choose *HOME > LOOK > Config* to configure image processing for each image path. Set SDI processing to *LOOK* for the color adjustments by the RCP to be baked in into the HD-SDI output signals. Set REC processing to *LOOK* if you want the color adjustments by the RCP to be baked in into the internal recordings on the CFast card. Set *REC processing* to Log C for recordings without the Looks being baked into the signal, but look parameter adjustments are carried in the metadata. For more information see "Configuring processing and color spaces".

Look settings

In multicam mode, the look functions are part of the image parameter remote control of the RCP. Starting with SUP 5.0, other looks than the default Rec 709 can be used, typically *ARRI 709 Multicam*. Please also see "LOOK settings".

NOTE: Please make sure you have a look loaded which is editable (e.g. ARRI 709 Multicam), some default looks included in the camera are write protected, these looks cannot be edited. Duplicate a look (in the LOOK screen of the camera menu) or use an individual look, and set this as active look. Otherwise the RCP controls affecting the look (all color or gamma related) will not change the parameters.

Frame rate and shutter

Select *HOME > FPS* to set the desired sensor frame rate, and *HOME > SHUTTER* to set the desired shutter angle or exposure time. Make sure the SDI frame rates are set accordingly.

Activating multicam mode

1. Connect the camera to the SSCP device via ethernet.
2. Choose *MENU > System > Multicam*.
3. Set the IP address of the SSCP device.
4. Set the port of the SSCP device.
5. Activate *Multicam* by checking the box.

NOTICE

With Multicam enabled, access to the camera user interface screens FPS, SHUTTER, EI and WB is disabled.

Camera IP configuration

To establish communication between camera and SSCP device the camera's LAN needs to be configured to use a static IP address within the same range as the SSCP device.

1. Choose *MENU > System > Network/WiFi > LAN IP mode*.
2. Set LAN IP mode to *Static*.
3. Choose *MENU > System > Network/WiFi > LAN static IP*.
4. Enter IP address and confirm.
5. Choose *MENU > System > Network/WiFi > LAN static subnet*.
6. Enter subnet and confirm.

MENU > SYSTEM > NETWORK / WIFI > LAN static IP

Web remote

It may be useful to have a computer connected to the ethernet network. This allows using the web remote interface (with a web browser) of each camera to check and modify camera parameters, and to e.g. trigger internal recording on cameras. The web remote can be accessed with a web browser by entering the IP address of the camera.

Camera remote control by CAP

The camera can be remote controlled with the Camera Access Protocol (CAP) interface communicating through ethernet or WiFi connection. Amongst other functions, CAP supports the tally command and the return switch trigger. Please contact ARRI service or an ARRI sales representative for further information.

7.10.7.4 Tally control

In addition to controlling image parameters via a Sony RCP, the camera can also receive tally information e.g. from an image switcher. The ALEXA Mini displays an active tally by lighting up the integrated tally lights on the EVF, and by showing an overlay in the EVF and on the SDI outputs (SDI processed).

To control tally the camera provides a telnet interface on port 40000 that can be accessed via ethernet or WiFi. The command *tallyengage* *<parameter>* controls the tally output on the camera, where *<parameter>* may be **1** to activate red tally, **2** to activate green tally and **0** to deactivate tally.

As an example, the communication with an ALEXA Mini with IP address 192.168.0.104 is given below. The bold texts are entered by the commanding system, the regular texts show the responses sent by the camera. In the example green tally is switched on, followed by red tally and the switched off.

```
$ telnet 192.168.0.104 40000
Trying 192.168.0.104...
Connected to 192.168.0.104.
tallyengage 2
Response: TallyEngage
Result: 0 "Done."
tallyengage 1
Response: TallyEngage
Result: 0 "Done."
tallyengage 0
Response: TallyEngage
Result: 0 "Done."
```

A tally injector can be easily made: just connect the inputs of an Arduino or Raspberry Pie with the outputs of the mixer, program some lines of code for the telnet command triggering the camera tally (see details above, please contact ARRI if you need more information), and use the ethernet network to send the command to the camera.

NOTICE

The Tally command is also included in the Camera Access Protocol (CAP) protocol, starting with SUP 5.2. CAP is a protocol interface for remote access to the camera, and it is available through the ARRI Partner Program.

7.10.8 Camera access protocol (CAP)

The camera access protocol is an IP based API that allows for control of look file parameters as well as operational parameters:

- CAP can be used to send and receive color grading information to and from ARRI cameras via network connection and modify the CDL parameters of the currently active Look file. Modifications to the Look file become immediately effective on all image paths with the processing configured to Look.
- Control of basic camera parameters

For more information, contact the ARRI Partner program:

http://www.arri.com/corporate/about_arri/partner_program/

- ▶ Choose **MENU > System > Camera access protocol** .

7.10.8.1 Activating CAP server

- ▶ Choose **MENU > System > Camera access protocol (CAP)** and set the CAP server on.

Third party software can access the camera to remotely modify the currently active ARRI Look File 2 file.

7.10.8.2 Setting CAP server password

1. Choose **MENU > System > Camera access protocol (CAP) > Cap server password**.
2. Enter a password and press **DONE**.

7.10.8.3 Displaying CAP client list

- ▶ Choose **MENU > System > Camera access protocol (CAP) > CAP client list**.
The CAP client list is displayed.

7.10.9 Network / WiFi

- ▶ Choose **MENU > System > Network / WiFi**.

7.10.9.1 Activating camera WiFi power

- ▶ Choose **MENU > System > Network / WiFi > WiFi power** and set WiFi power on or off.

7.10.9.2 Setting WiFi mode

- ▶ Choose **MENU > System > Network / WiFi > WiFi mode** and set the mode. You have the following options:
 - *Client*
The camera can connect to a WiFi network.
 - *Host*
The camera acts as an access-point.

7.10.9.3 Setting the WiFi host password

You can only set the WiFi host password if the WiFi mode is set to *Host*. For more information, see "Setting WiFi mode", page 120.

1. Choose **MENU > System > Network / WiFi > WiFi host password**.
A screen is displayed to set your password.

2. Enter a password. The WiFi password must be between 8 and 32 characters long. For information on using the on-screen keyboard, see "Using the on-screen keyboard", page 51.

Note: The default password is: *arriarri*

7.10.9.4 Selecting the WiFi network

You can select a WiFi network, if you have activated the WiFi power and when the WiFi mode is set to *Client*. The camera allows you to join networks with WPA2 encryption or without encryption.

1. Choose **MENU > System > Network/WiFi > WiFi network**.
The list of available WiFi networks is displayed.
2. With the jogwheel, select the desired WiFi network.
If the selected WiFi network uses encryption, you are prompted to enter the password.
3. Enter the password and press **CONNECT**.
For information on using the on-screen keyboard, see "Using the on-screen keyboard", page 51.

Connecting to a WiFi network by QR code

You can use a QR code to connect to a WiFi network. The WiFi credentials need to be provided in the following format:

```
WiFi:S:my-ssid;T:[WEP|WPA|WPA2];P:my-password;;
```

where the italic parts need to be replaced with your network credentials.

1. Choose **MENU > System > Network/WiFi > WiFi network > SCAN QR**.
2. Hold the QR-Code in front of the lens so that it fills the frame and is in focus.
A popup with QR-Code data is displayed.
3. Press **CONNECT**.
The camera connects with the network. The name of the network is displayed in the *WiFi NETWORKS AVAILABLE* list.

Connecting to a WiFi network manually

If the desired network is not displayed in the *WiFi NETWORKS AVAILABLE* list, you can enter the name of the network you want to join manually. The network is displayed as long as you are connected.

1. Choose **MENU > System > Network/WiFi > WiFi network > OTHER**.
A screen for entering the network name is displayed.
2. Enter the name of the network and press **NEXT**.
You are prompted to enter your password.
3. Type your password and press **CONNECT**.

For information on using the on-screen keyboard, see "Using the on-screen keyboard", page 51.

Disconnecting from a WiFi network

1. Choose **MENU > System > Network/WiFi > WiFi network**.
2. Press **DISCONNECT**.
If the network you were connected to is hidden, it will disappear from the network list shortly after.

7.10.9.5 Setting the region of the wireless function

⚠ CAUTION!

Wireless region settings specify where the wireless function can be used in compliance with local regulations. It may be illegal to use the wireless function in a region other than specified in the setting. Please ensure that the region is configured correctly, e. g., when traveling.

- ▶ Choose **MENU > System > Network / WiFi > Wireless region setting** and select the region. You have the following options:
 - *Europe*
 - *USA*
 - *Japan*
 - *South Korea*
 - *World*

7.10.9.6 Setting LAN IP mode

- ▶ Choose **MENU > System > Network / WiFi > LAN IP mode** and set the mode. You have the following options:
 - *Static*
Select for manually entering an IP address and subnet mask.
 - *DHCP*
Select to let the camera accept a dynamically assigned IP address from an DHCP server.

7.10.9.7 Setting LAN static IP and subnet

Setting the static IP

1. Choose **MENU > System > Network / WiFi > Lan static IP**.
2. With the jogwheel, change the static IP.

Setting the LAN static subnet

1. Choose **MENU > System > Network / WiFi > Lan static subnet**.
2. With the jogwheel, change the static subnet.

7.10.10 Licensing

You can further enhance the camera's capabilities through licensed features available from the ARRI license shop at <http://alshop.arri.de>.

License keys are linked to the camera's serial number and cannot be transferred from one camera to another.

The ARRI license webshop requires a hardware info file to identify the individual camera.

Before ordering a license key, you must export the *HW INFO* file from the camera to a USB memory stick for upload during purchase.

The active camera license model (incl. contained features) is available under: *Menu > System > Licensed feature*.

7.10.10.1 Exporting *HW INFO* from the camera

1. Prepare a USB memory stick. For more information, see "Preparing USB medium", page 86.
2. Open the media lid and connect the USB memory stick to the camera.
3. Choose **Menu > System > Licensed features**.
4. Press **HW INFO**.
5. A screen is displayed. Press **CONFIRM**.
6. The file is saved in the USB folder *ARRI/A-MINI/LICENSES*.
File name is *A-MINI-HW-#####-YYMMDD-HHMM.json**
7. Copy the file from the USB memory stick to a computer, easily accessible when ordering licenses.

* ##### = camera serial number. YYMMDD-HHMM = date/time stamp.

7.10.10.2 Installing a license file

NOTICE

Keep backup copies of all license files in case a license deleted from the camera must be re-installed.

Installed licenses remain on the camera, independent of USB memory stick, and across the installation of SUP software update packages.

All installed licenses are displayed at *MENU > System > Licensed features > FEATURES*.

1. Copy the license file into the *ARRI/A-MINI/LICENSES* folder on a correctly prepared USB stick. For more information, see "Preparing USB medium", page 86.
2. Open the media lid and connect the USB memory stick to the camera.
3. Choose **Menu > System > Licensed features > ADD**.
A list is displayed.
4. Use the jogwheel to scroll to the required file.
5. Confirm by pressing the jogwheel (1).
6. Wait for the file to install.
7. Reboot the camera afterwards.
8. If required: Repeat for other license files.

7.10.10.3 Displaying licensed features

- ▶ Choose **MENU > System > Licensed features > FEATURES**.

7.10.10.4 Deleting a license

Installed licenses can be deleted in the license menu. This will remove the corresponding functions from the camera. To re-install a license, the appropriate license key for this individual camera needs to be reloaded. If a camera set was purchased including a preinstalled license, the license key can be found on the USB memory stick delivered with the camera. If a license was purchased from the ARRI license web shop, please use the license provided there.

1. Choose **MENU > Systems > Licensed features > DELETE**.
A list with licenses is displayed.

2. Select the license you want to delete.
A confirmation screen is displayed.
3. Press *CONFIRM*.
If the licence was successfully deleted, a green message is displayed.

7.10.11 Updating the camera

You can update the camera, camera components and LBUS devices.

- ▶ Choose **MENU > System > Update**.

For more information on updating the camera, see "Updating the camera via USB memory stick", page 124.

7.10.11.1 Updating the camera via USB memory stick

Before update, create the folder structure on a FAT 32 USB memory stick. For more information, see "Preparing USB medium", page 86.

NOTICE

Power the camera with a fully charged battery or a power supply to avoid power loss during the update. The update procedure takes about ten minutes.

After the update, the camera reboots. Never shut down or unpower the camera during reboot. Check the MVF-1 for the update status. A popup message is displayed after the update finished successfully.

Preconditions

- ALEXA Mini with connected MVF-1
- Fully charged camera battery or power supply
- Computer with internet access and USB interface
- USB memory stick (FAT 32 file format), prepared with the folder structure for the use with your camera

Downloading the software to the USB memory stick

The camera supports the installation of SUP software update packages. Check www.arri.com for the latest available SUP version.

1. Via computer, download the software update package (SUP) from www.arri.com.
2. Double-click on the downloaded file (*.zip) to unpack it:
 - Update file (*.SUP)
 - Update key (*.lic)
 - Release notes
3. Read the release notes carefully.
4. Copy the update file (*.SUP) to the ARRI/A-MINI/SUP folder on the USB stick.
5. Copy the update key (*.lic) to ARRI/A-MINI/LICENSES on the USB stick.
6. Safely remove the USB memory stick from the computer.

Connecting the USB memory stick to the camera

7. Open the media lid and connect the USB memory stick to the camera.
8. Remove the CFast 2.0 card from the camera.
9. Switch on the camera with a full battery.

Updating the software on the camera

Note: An update is only possible with the CFast 2.0 card removed from the camera.

1. Choose **MENU > System > Update**.
2. Scroll to the required update file and press the jogwheel.
3. Press **CONFIRM** to start the update. **Cancel** with **BACK**.

Note: Never shut down the camera or unplug power during the update.

4. Check the MVF-1 for the update progress.
5. Wait for the update process to finish and the camera to reboot.

After a successful update and reboot, the camera monitor displays a success message.

6. Press **CLOSE** to start using your updated camera.
7. **Note:** After an update, the timezone and daylight saving time settings of the camera are reset. Please set them accordingly. Choose **MENU > System > System time + date**.

For more information, see "Adjusting system time and date", page 115.

NOTE: A failed update produces a red warning message. However, previous camera software remains intact. Press **CLOSE**, restart the camera and start the update again.

7.10.11.2 Updating camera components

You can update camera components (MVF-1, CCP-1 or lens mount) via the camera. The camera will issue a message if the software version of a camera component is outdated.

1. Choose **MENU > System > Update > Components**.
A screen is displayed. You have the following options:
 - o *Update MVF-1*
 - o *Update lens mount*
 - o *Update CCP-1*
2. Select the component you want to update, and press the jogwheel.
A confirmation screen is displayed.
3. Press **CONFIRM**.

7.10.11.3 Updating LBUS devices

You can update LBUS devices (CForce mini motors, CForce Plus motors, ARRI Master Grips and ARRI LCUBE) via the camera.

1. Copy the LBUS device update file onto an USB memory stick in folder ARRI/ECS/
2. Connect the LBUS device to the LBUS connector of the lens mount.
3. Choose **MENU > System > Update > LBUS**.
4. Select the LBUS device you want to update and press the jogwheel.
A confirmation screen is displayed.

5. Press **CONFIRM** to start the update. Cancel with **BACK**.

7.10.12 Resetting the electronic horizon

- ▶ Choose **MENU > System > Reset electronic horizon**.

A screen showing the roll and tilt values is displayed. You are prompted to place the camera on a level surface and to press **RESET**.

NOTICE

A message is displayed if either the roll, the tilt or both values exceed the calibration range and resetting is not possible.

7.10.13 Setting the system language

1. Choose **MENU > System > Language**. You have the following options:
 - *English*
 - *Chinese (simplified)*You can toggle between the languages.
2. Select the language.

The system language on the user interface changes immediately.

7.11 Setup

You can save and load full camera configurations as well as parts of it on the camera. You can also import user setups into the camera from a USB medium and export user setups to a USB medium. For more information, see "Loading setups", page 127.

- ▶ Choose **MENU > Setup**.

7.11.1 Saving user setup

You can save the current setup configuration in the camera or on the USB medium.

1. You have the following options:
 - Choose **MENU > Setup > User setups installed > SAVE**.
 - Choose **MENU > Setup > User setups on USB > SAVE**.

A screen for entering the file name is displayed.

2. Type in a name for the user setup and press **SAVE**.

For information on using the on-screen keyboard, see "Using the on-screen keyboard", page 51.

A screen is displayed to select parameter blocks. You have the following options:

- *General*
- *Format*
- *Scene*
- *Lens*
- *User*

For information on the parameter blocks, see "User setup parameter blocks", page 127.

3. Select one or more options and press *CONFIRM*.

The camera stores the user setup.

4. Press *BACK*.

7.11.2 Loading setups

You can load user setups stored on the camera or on a USB medium.

In case you are using the ARRI WCU-4 unit, you can trigger the loading of internally stored setups from there.

1. You have the following options:
 - Choose ***MENU > Setup > User setups installed***
 - Choose ***MENU > Setup > User setups on USB***

A list of user setups is displayed.

2. Select a user setup, and with the jogwheel, press *LOAD*.

A popup with the parameter blocks of this user setup is displayed.

3. Press *CONFIRM*.

The camera loads the selected user setup and shows a result popup. The popup highlights the parameters that you should check in case certain parameters could not be loaded.

7.11.3 User setup parameter blocks

The camera allows you to store a full camera configuration by selecting all parameter blocks, or only parts of the configuration by de-/selecting the desired blocks. The parameter blocks have been chosen to allow for maximum flexibility while keeping coherent sets of parameters and minimizing the amount of potential conflicts by loading partial setups.

GENERAL

Groups the general camera configuration and basic project settings.

MENU > RECORDING > PROJECT SETTINGS >	Project Rate
HOME > TC > OPTIONS >	Timecode Options (All Settings)
MENU > RECORDING > AUDIO RECORDING >	Audio (All Settings)
HOME > LOOK > CONFIG >	Recording Processing
HOME > LOOK > EDIT >	Installed Look Files
HOME > LOOK > CONFIG >	SDI 1&2 color space
MENU > MONITORING > FRAME LINES > FRAME LINE >	Installed Frame Line Files
HOME > FPS >	Sensor FPS table
HOME > SHUTTER >	Shutter table
HOME > WB >	WB table
MENU > METADATA >	Metadata (All Settings)
MENU > MONITORING > SDI >	SDI 1&2 Format
MENU > MONITORING > SDI >	SDI 1&2 Frame Rate

MENU > MONITORING > SDI >	SDI 1&2 Image
MENU > MONITORING > SDI >	SDI 1&2 3G Level
MENU > MONITORING > SDI >	SDI2: Clone SDI1
MENU > MONITORING > SDI >	Anamorphic Desqueeze
MENU > SYSTEM > SENSOR >	Image sharpness/detail
MENU > SYSTEM > SENSOR >	Image denoising
MENU > SYSTEM > SENSOR >	Mirror Image
MENU > SYSTEM > SENSOR >	EXT Sync
MENU > SYSTEM > SENSOR >	EXT sync camera count
MENU > SYSTEM > SENSOR >	Genlock Sync
MENU > SYSTEM > SENSOR >	Sync Shift
MENU > SYSTEM > SENSOR >	Mirror Image
MENU > SYSTEM >	Fan Mode
MENU > SYSTEM >	Multicam Settings
MENU > SYSTEM >	CAP Settings
MENU > SYSTEM >	Network Settings
MENU > ECS > RADIO >	ECS Power
MENU > ECS > RADIO >	ECS Radio Channel
MENU > RECORDING >	Prerecording max. duration

FORMAT

Allows for easy switching between recording formats.

MENU > RECORDING >	Recording Codec
MENU > RECORDING >	Resolution
MENU > RECORDING >	Record Mode (All Settings)
MENU > MONITORING > FRAME LINES >	Active frame line*
	*if not found in list, load NONE

SCENE

Allows you to change quickly between different shooting situations.

HOME > FPS	Sensor FPS
HOME > SHUTTER	Shutter
HOME > EI	Exposure Index
HOME > WB	White Balance

HOME > EI > ND (MINI)	ND Filter
HOME > LOOK	Active Look* *if not found in list, then load ARRI709
HOME > EI > IRIS	EF Iris Value
LENS	
Allows you to change quickly between different lens setups.	
MENU > RECORDING > PROJECT SETTINGS >	Lens squeeze factor
MENU > ECS > LENS DATA >	Active LDA table
MENU > ECS > LENS DATA > LDA >	Installed LDA tables
MENU > ECS > LENS DATA > FAVORITES >	Favorite LDA tables
MENU > ECS > LBUS LENS MOTOR CONFIG >	Focus Lens motor direction, torque + teeth count
MENU > ECS > LBUS LENS MOTOR CONFIG >	Iris Lens motor direction, torque + teeth count
MENU > ECS > LBUS LENS MOTOR CONFIG >	Zoom Lens motor direction, torque + teeth count
MENU > SYSTEM > LENS MOUNT SETTINGS >	Focus unit
USER	
Stores all parameters for camera personalization.	
HOME > LOOK > CONFIG >	EVF/Mon. Processing
HOME > LOOK > CONFIG >	SDI processing
MENU > MONITORING > EVF / Monitor >	Surround View
MENU > MONITORING > EVF / Monitor >	Zoom Position
MENU > MONITORING > EVF / Monitor >	Peaking Settings
MENU > MONITORING > EVF / Monitor >	Settings (all, except EVF power)
MENU > MONITORING > EVF / Monitor >	EVF Overlays (all settings)
MENU > MONITORING > EVF / Monitor >	Monitor Overlays (all settings)
MENU > MONITORING > SDI > SDI PROCESSING >	Surround View
MENU > MONITORING > SDI > SDI PROCESSING >	Exposure Tool
MENU > MONITORING > SDI > SDI PROCESSING >	Peaking (all settings)
MENU > MONITORING > SDI > SDI PROCESSING >	Overlays (all settings)
MENU > MONITORING >	Exposure Tools (all settings)
MENU > USER BUTTONS >	User Buttons (all settings)

MENU > SYSTEM > POWER >	Power (all settings)
MENU > SYSTEM > BUTTONS + DISPLAY >	Buttons, Display Style
PLAY > OPTIONS >	Play End mode
HOME > WB >	WB options
HOME > EI > IRIS >	Iris options
MENU > RECORDING > RECORD MODE >	Stop Motion Beeper
MENU > RECORDING > REC BEEPER / TALLY >	Rec Beeper + Tally

7.11.4 Resetting to factory defaults

You can reset the camera to the ARRI factory default values.

1. Choose **MENU > Setup > Factory reset**.

You are asked to confirm the reset.

2. Press **RESET**.

7.12 User buttons

You can customize the user buttons. Some user button functions support smart behavior. For these, a short press (i.e. less than half a second) toggles the function, while a long press (i.e. longer than half a second) activates the function only temporarily.

User button smart behavior

Assume a user button is configured with EVF zoom:

Long press EVF zoom: EVF zoom function is activated while you are pressing the button, release of the button deactivates zoom.

Short press EVF zoom: EVF zoom is activated and stays activated. Press again to deactivate.

To customize the user buttons, you have the following options:

- Choose **MENU > User buttons** and select the buttons you want to customize.

User button functions	
<i>Off</i>	Disables the user buttons.
<i>EVF Status Info</i>	Switches status info on or off.
<i>EVF Waveform</i>	Switches EVF waveform overlay on or off. Supports smart behavior.
<i>EVF+Mon. Check Log C</i>	Temporarily set EVF/Monitor processing to Log C.
<i>EVF+Mon. Desqueeze</i>	* Toggles anamorphic desqueeze on EVF and Monitor.
<i>EVF+Mon. Exp. Tool</i>	* Switches the exposure tool on or off. Supports smart behavior.
<i>EVF+Mon. Frame Lines</i>	* Switches frame lines on or off. Supports smart behavior.
<i>EVF+Mon. Peaking</i>	* Switches peaking on or off. Supports smart behavior.

User button functions	
<i>EVF+Mon. Surround</i>	* Switches surround view on or off. Supports smart behavior.
<i>EVF+Mon. Zebra/FC</i>	* Toggles the exposure tool between Zebra and False Color.
<i>EVF+Mon. Zoom</i>	* Switches the viewfinder zoom function on or off. Supports smart behavior. Note: Zoom image is monochrome.
<i>Monitor Waveform</i>	Switches Monitor waveform overlay on or off. Supports smart behavior.
<i>Flip Monitor</i>	Toggles the Monitor between normal and flipped mode. Note: To return to automatic operation, press and hold the user button for two seconds.
<i>SDI Check Log C</i>	Temporarily set SDI processing to Log C.
<i>SDI Exp. Tool</i>	Switches the exposure tool on or off. Supports smart behavior.
<i>SDI Frame Lines</i>	Switches frame lines on or off. Supports smart behavior.
<i>SDI Peaking</i>	Switches peaking on or off. Supports smart behavior.
<i>SDI Status info</i>	Switches status info on or off.
<i>SDI Desqueeze</i>	Toggles anamorphic desqueeze on SDI (not active in 16:9 modes).
<i>SDI Surround</i>	Switches surround view on or off. Supports smart behavior.
<i>SDI Zebra/FC</i>	Toggles the exposure tool between Zebra and False Color.
<i>EI Increase</i>	Selects the next value from the EI list.
<i>EI Decrease</i>	Selects the previous value from the EI list.
<i>FPS Increase</i>	Selects the next value from the FPS list.
<i>FPS Decrease</i>	Selects the previous value from the FPS list.
<i>ND Increase</i>	Selects the next value from the ND list.
<i>ND Decrease</i>	Selects the previous value from the ND list.
<i>Shutter Increase</i>	Selects the next value from the Shutter list.
<i>Shutter Decrease</i>	Selects the previous value from the Shutter list.
<i>WB Increase</i>	Selects the next value from the WB list. Note: User button skips the Auto WB entry of the WB list.
<i>WB Decrease</i>	Selects the previous value from the WB list. Note: User button skips the Auto WB entry of the WB list.
<i>Audio Ch1 Increase</i>	Increases gain of audio channel 1 in 1dB steps. Note: User button is only functional with channel 1 control set either to <i>Manual</i> or <i>Manual (+L)</i> .

User button functions	
<i>Audio Ch1 Decrease</i>	Decreases gain of audio channel 1 in 1dB steps. Note: User button is only functional with channel 1 control set either to <i>Manual</i> or <i>Manual (+L)</i> .
<i>Audio Ch1+2 Increase</i>	Increases gain of audio channels 1+2 simultaneously in 1dB steps. Note: User button is only functional with channel 1 and channel 2 control set either to <i>Manual</i> or <i>Manual (+L)</i> .
<i>Audio Ch1+2 Decrease</i>	Decreases gain of audio channels 1+2 simultaneously in 1dB steps. Note: User button is only functional with channel 1 and channel 2 control set either to <i>Manual</i> or <i>Manual (+L)</i> .
<i>Auto WB</i>	First press arms auto white balance for one second, second press triggers AWB.
<i>Check Last Clip</i>	Plays the last five seconds of the last recorded clip.
<i>Color Bars</i>	Turns color bar on or off. Activation works only during Stby.
<i>Frame Grab</i>	Grabs a still frame in .JPG and .DPX format and saves it to the USB stick in the GRABS directory. Frame grabs can be stored when the camera is in STBY, REC, or PLAY. Note: Framegrabs are taken from the clean SDI image path (including SDI settings such as processing, active look and anamorphic desqueeze) and cropped to the active image area (without black borders).
<i>Frame Line Color</i>	Changes the frame line color.
<i>Iris Auto</i>	** Triggers automatic iris compensation.
<i>Iris Close</i>	** Closes the iris of a lens. Short press closes by 1/x stop (step size depending on lens), long press closes by 1 stop per 0.5 seconds.
<i>Iris Open</i>	** Opens the iris of a lens. Short press opens by 1/x stop (step size depending on lens), long press opens by 1 stop per 0.5 seconds.
<i>Button FN</i>	Behaves identically to FN button on camera body. Note: Only available for GPIO box and Master Grip user buttons.
<i>Button 1 to Button 3</i>	Behaves identically to button 1, button 2 or button 3 on camera body. Note: Only available for GPIO box and Master Grip user buttons.
<i>Overlay Menu</i>	Activates or deactivates the overlay menu on MVF-1 EVF, monitor and SDI (when SDI processing is activated).
<i>Playback</i>	Behaves identically to the PLAY button on MVF-1.
<i>Prerecording</i>	Switches prerecording on or off.
<i>Record Start/Stop</i>	Behaves identically to the record button.
<i>Return In</i>	Outputs a metadata flag via SDI that can be used by external equipment, e. g. to switch inputs for monitoring. Supports smart behavior. While multicam is enabled, only toggles temporarily.

User button functions	
<i>Stop Motion Trigger</i>	Triggers the capture of a single frame during recording in recording mode Stop Motion.
<i>WiFi Power</i>	Toggles WiFi power On and Off.

* Affects both viewfinder and monitor settings.

** Requires EF lens mount and a suitable EF lens.

*** Requires advanced license or higher.

For more information on camera buttons, see "Camera Controls", page 23.

7.12.1 Button VF1 and VF2

You can set the function of the VF1 and VF2 buttons on the viewfinder.

- ▶ Choose **MENU > User buttons > Button VF1** or **MENU > User buttons > Button VF2** and assign the desired function.

For information on user button functionalities, see "User buttons", page 130.

7.12.2 Assigning functions to camera user buttons

You can assign functions to the camera user buttons 1 to 8.

1. Choose **MENU > User buttons > Camera user buttons**.
2. Button 1 to 3: Set the functions of user buttons 1 to 8 on the left camera side, plus buttons 5 to 8, available via web remote.

For information on user button functionalities, see "User buttons", page 130.

7.12.3 Assigning functions to WCU user buttons

You can assign functions to the WCU-4 user buttons.

Note: Configuration valid for WCU-4 connected to ALEXA Mini via UMC-4. WCU-4 requires software version 2.1 or later to support smart behavior of buttons.

- ▶ Choose **MENU > User buttons > WCU user buttons**.

For information on user button functionalities, see "User buttons", page 130.

7.12.4 Assigning functions to Master Grip user buttons

You can assign functions to the Master Grip user buttons. 12 buttons are available.

- ▶ Choose **MENU > User buttons > Master Grip user buttons**.

For information on user button functionalities, see "User buttons", page 130.

7.12.5 Assigning functions to GPIO user buttons

The ARRI GPIO box (GPB-1, K.2.0007642) can be used as an interface to the camera for external user buttons. It connects to the camera via the EXT connector and has a 37-pin D-Sub connector carrying 14 GPI (General purpose input) connections plus 2 outputs (camera power status and camera recording status). For additional information, please refer to the user manual of the GPB-1.

You can assign functions to GPIO user buttons. The buttons are connected via a GPIO box.

- ▶ Choose **MENU > User buttons > GPIO user buttons**.

For information on user button functionalities, see "User buttons", page 130.

7.12.6 Assigning functions to lens RET user buttons

You can assign a camera function to the RET button of ENG lens. If the lens does not support this, a disconnected plug is shown behind the menu entry.

- ▶ Choose **MENU > User buttons > Lens RET**.

For information on user buttons functionalities, see "User buttons", page 130.

7.13 Entering metadata

You can enter production metadata to the recorded Quicktime files.

1. Choose **MENU > Metadata**.
2. Select the metadata field you want to edit. You have the following options:
 - *Production*
 - *Prod. Company*
 - *Director*
 - *Cinematographer*
 - *Camera operator*
 - *Location*
 - *Scene*
 - *Take*
 - *User info 1 & 2*

7.14 Electronic Control System (ECS)

- ▶ Choose **MENU > Electronic Control System (ECS)**.

7.14.1 Radio functions configuration and display

You can set the functions of the white radio power module.

- ▶ Choose **MENU > Electronic Control System (ECS) > Radio**.

7.14.1.1 Activating the white radio module power

- ▶ Choose **MENU > Electronic Control System (ECS) > Radio > Power** and set the power on or off.

7.14.1.2 Setting the channel of the white radio module

- ▶ Choose **MENU > Electronic Control System (ECS) > Radio > Channel** and select the channel.

7.14.1.3 Viewing the status of the white radio module

- ▶ Choose **MENU > Electronic Control System (ECS) > Radio > Status**.

The status of the radio module is displayed.

7.14.1.4 Viewing the number of connected ECS devices

- ▶ Choose **MENU > Electronic Control System (ECS) > Radio > Connected devices**.

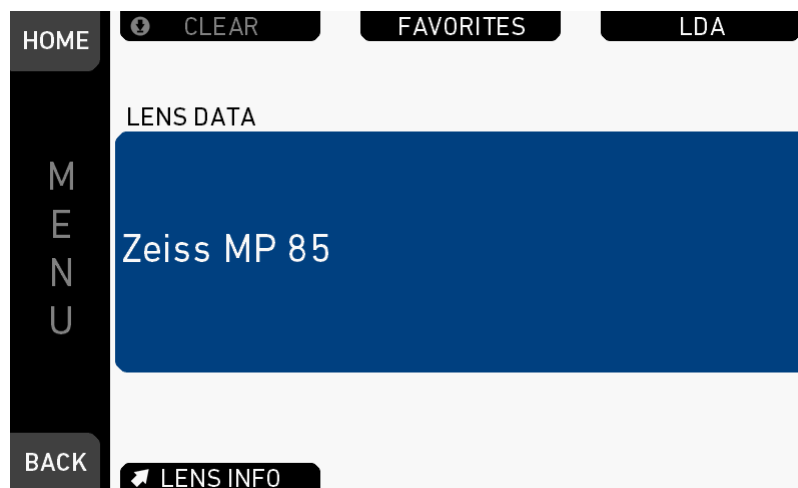
The number of connected devices is displayed.

7.14.2 Lens data

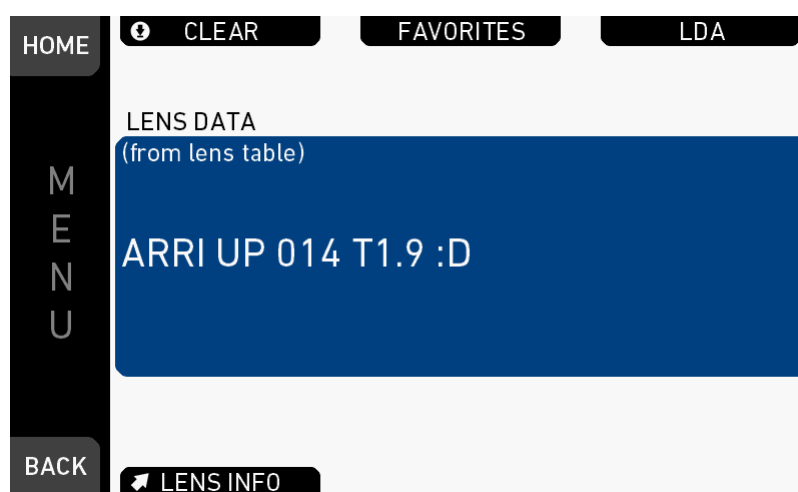
Lens data can be provided in two different ways, depending on the type of lens:

- **LDS lenses**
These lenses contain an integrated electronic interface that sends information about focus, iris and zoom directly to the camera.
- **Non-LDS lenses**
These lenses do not have an LDS interface, hence information about focus, iris and zoom need to be gathered from lens motors and translated into sensible values with the help of lens tables. These lens tables are stored in the camera internal Lens Data Archive (LDA).

Example: LDS lens



Example: Non-LDS lens



Lens data archive (LDA)

The LDA contains lens tables which offer lens data functionality with non-LDS lenses in connection with lens motors. It is possible to add or delete lens tables from the lens data archive. You can transmit LDA files that are stored on the SD card of the WCU-4 wirelessly to the camera. There is no need to copy the files from the WCU-4 SD card to USB and then to the camera.

You can import lens tables into the camera from a USB medium anyway. For more information, see "Working with lists", page 51.

For information on creating the required folder structure on your USB memory stick, see "Preparing USB medium", page 86.

Note: It is possible to load a lens table even when an LDS lens is attached. The LDA values calculated from motor positions and lens tables take precedence over the values communicated by the lens itself. This can be necessary, if the lens data from the lens is faulty or imprecise.

NOTICE

Please note that as soon as a LDA table is activated, the LDS contacts of the lens mount are switched off. There is no need to switch the mount off manually when using LDA.

Cooke /i support

The camera supports the Cooke /i protocol for lenses running firmware versions according to the following table.

Lens type	FW version
S4 /i Prime lens (10-bit)	0.29 or higher
S4 /i Prime lens (12 bit)	0.39 or higher
S4 /i Zoom lens (10 bit)	1.29 or higher
S4 /i Zoom lens (12 bit)	1.39 or higher

The firmware version can be retrieved from the lens with the *Cooke Viewer Lens Display* program. For detailed information, please contact Cooke Optics directly.

7.14.2.1 Adding lens tables from lens data archive (LDA)

1. Choose **MENU > Electronic Control System (ECS) > Lens data > LDA**.
A list with lens tables is displayed.
2. Press **USB** or **DEFAULTS** to select a lens table from the included lens tables.
Note: Only lens tables created with WCU-4 software version 2.22.22 or later are supported.
A list with lens tables is displayed.
3. Some lens tables contain different scale classes for the same model. The scale class of an individual lens is engraved on the housing. **If required:** To select a scale class, press the jogwheel.
4. To add the selected lens table to favorites without activating the lens table, press **ADD TO FAV**.
5. Add the selected lens table to favorites and activate it by pressing **FAV.+USE**.
6. Activate the selected lens table without adding it to favorites by pressing **USE**.

7.14.2.2 Choosing a lens from the favorites list

The favorites list shows all lenses that have been added before, including the selected scale class.

1. Choose **MENU > Electronic Control System (ECS) > Lens data > FAVORITES**.
A list with favorite lens data is displayed.

2. Select a lens, and with the jogwheel press *SET*.

7.14.2.3 Viewing lens data and info

1. Choose **MENU > Electronic Control System (ECS) > Lens data**.

The lens data is displayed.

2. Select a lens and press **LENS INFO**.

The following information is displayed:

- *Lens type*
- *Model*
- *Serial no.*
- *Focal length*
- *Focus*
- *Iris*

Enabling lens mount

- ▶ Choose **MENU > Electronic Control System (ECS) > Lens data > LENS INFO > SETTINGS**.

For more information, see "Lens mount settings", page 115.

7.14.3 Calibrating all lens motors

NOTICE

Do not trigger a calibration unless all connected motors are attached to the lens.

- ▶ Choose **MENU > Electronic Control System (ECS) > Calibrate all motors**.

7.14.4 Setting the LBUS lens motor configuration

1. Choose **MENU > Electronic Control System (ECS) > LBUS lens motor configuration**.
2. Set the values for the lens motor. You have the following options:
 - *Focus/Iris/ Zoom motor torque*
Available values in the range of 1 (lowest) to 4 (highest).
 - *Focus/Iris/Zoom motor direction*
Available values are *Left* and *Right*.
 - *Focus/Iris/Zoom motor teeth count*
Selects the number of teeth of the motor. Available values are *Auto*, *40t*, *50t*, and *60t*.

You may have to change the direction of the Focus, Iris, and Zoom-axis motor depending on the mounting position of the motor (left/right side or top/bottom).

8 Web remote

ALEXA Mini has a web remote function for full remote control of the camera with a browser. It requires a connection to the camera via WiFi or Ethernet (with ALEXA Ethernet/RJ-45 Cable KC-153-S, K2.72021.0).

By default, WiFi is active. If WiFi is inactive, enable WiFi via the MVF-1, by navigating to *MENU>System*. Without the MVF-1, the web remote must first be used via a cabled ethernet connection to enable WiFi.

The web remote has been tested with the following platforms and browsers:

Desktop browsers	Google Chrome 45 Mozilla Firefox 44
iOS	Safari 9.2.1
Android	Google Chrome Mobile 45

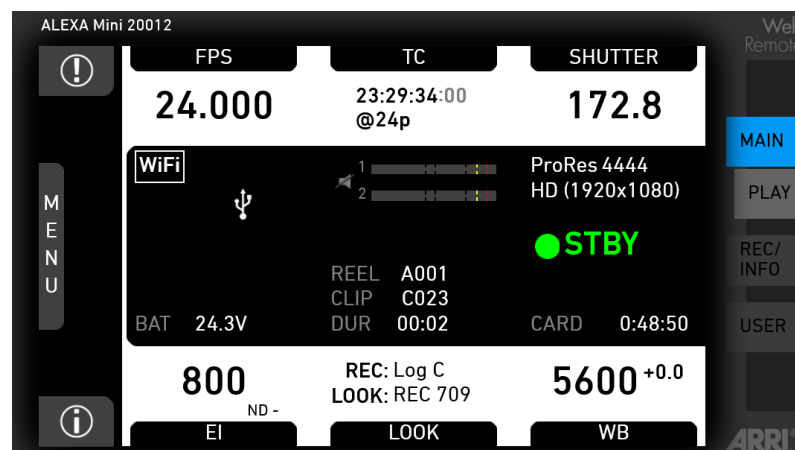
Open a web browser and enter the URL: <http://mini-xxxxx.local> (replace xxxxx with your camera's 5-digit serial number).

NOTICE

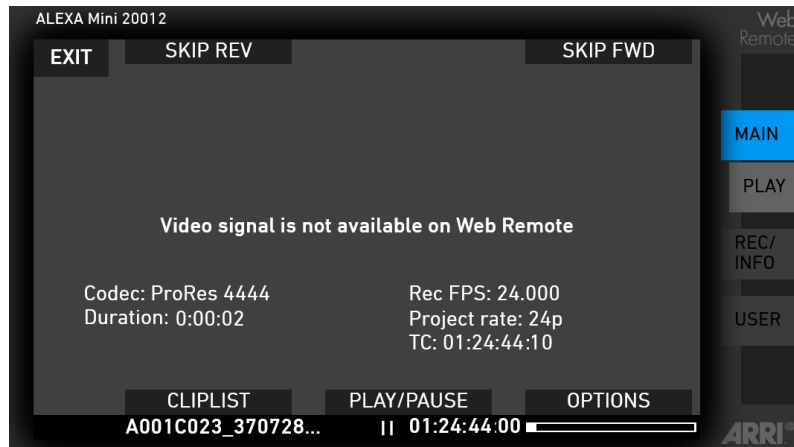
To use the web remote function via this URL, the device must support zero-configuration networking (zeroconf), e.g. through Apple Bonjour. Without zeroconf, the webremote can be reached via the network's IP address (WiFi or LAN IP). The WiFi IP is fixed to 192.168.153.1. The LAN IP can be either assigned from a DHCP server or configured manually, and can be checked with an MVF-1 via the INFO > Network info screen.

MAIN, PLAY, REC INFO and USER

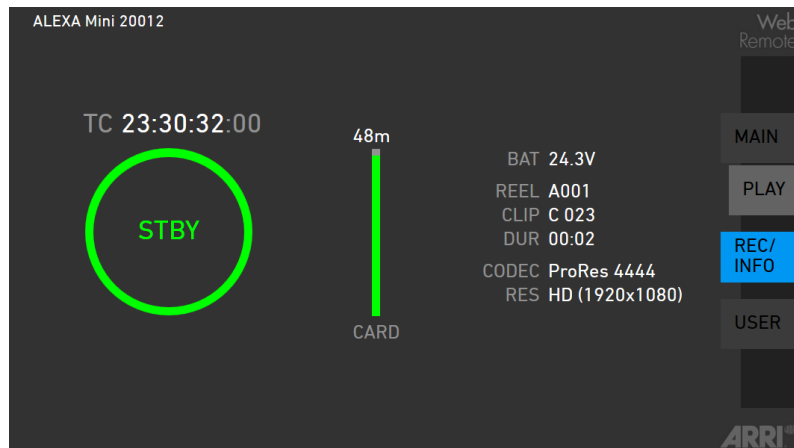
The web remote is divided into the following four sections:



MAIN: Contains the same UI as the camera monitor, except the live screen. Click/tap the screen button tabs to enter a screen/trigger a function. Menu items can be clicked/tapped directly.

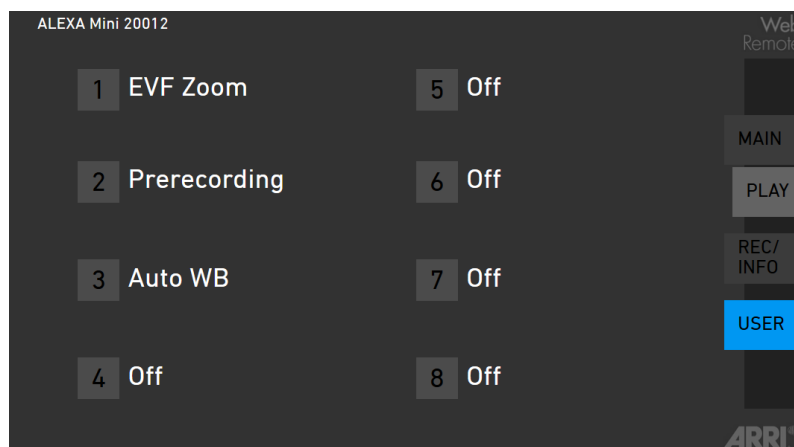


PLAY: Starts playback on the camera. Provides the same controls as the MVF-1, but does not show a video signal.



REC INFO: Contains info on the main recording relevant parameters, plus a **REC** button. Click the big circle icon to start/stop recording.

Note: Rec status and timecode may respond slightly delayed depending on the network's speed.



USER: Shows configuration of user buttons and allows you to trigger them. Press the number icons to trigger the user buttons.

NOTICE

Frequent reloading of the web remote camera interface connected with WiFi indicates a limited WiFi range. Please place the device closer to the camera or connect via ethernet. You may also consider to use the WiFi client mode which allows to connect the camera to a WiFi network.

9 Transvideo StarliteHD5-ARRI Monitor

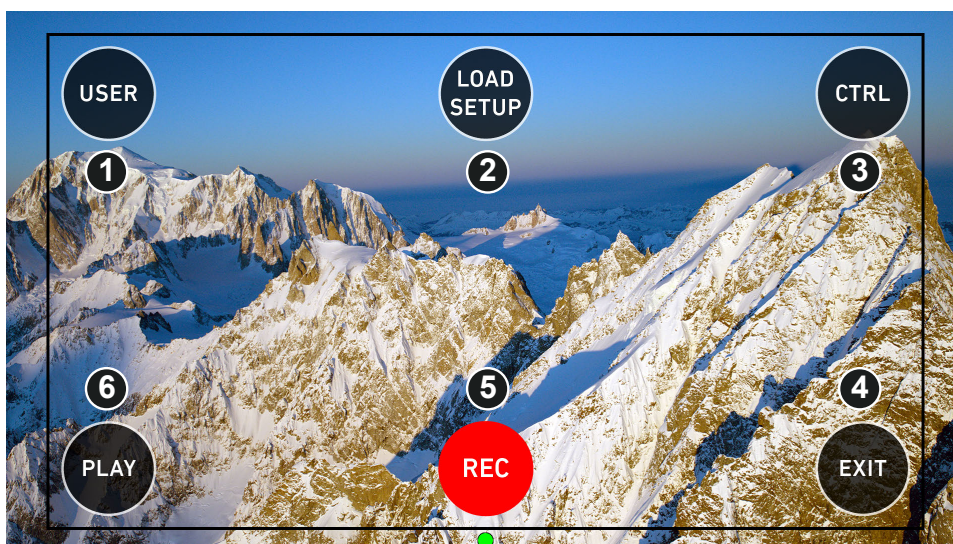
The Transvideo Starlite HD5-ARRI monitor (K2.0006960) is a 5" 3G-SDI Oled monitor with an integrated H.264 recorder, a touchscreen and a special ARRI bus interface to communicate with the camera. It allows basic operation of the camera.

All overlays required for touch operation are generated by the camera and transferred to the Starlite monitor via HD-SDI. For this reason, monitors daisy-chained to the Starlite will show the overlays as well.

The standard functionality of the Starlite monitor is not available when the ARRI menu is active.

1. Connect the monitor to an SDI output of the camera. Make sure the SDI image of the output is configured to "Processed", not "Clean". For more information, see "Setting SDI 1/2 image", page 103.
2. Connect the bus interface cable to the EXT port of the camera.
3. Activate the ARRI menu by pressing the blue "A" touch icon on the monitor.

Main menu



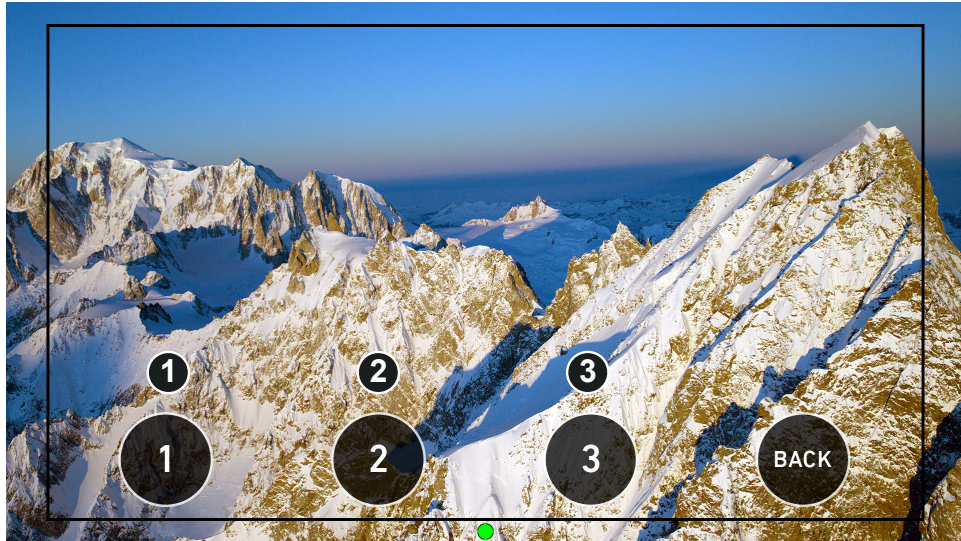
The main screen opens up.

- ▶ Press "USER" (1) to access the user button menu.
- ▶ Press "LOAD SETUP" (2) to load a user setup from the list of installed user setups on the camera.
- ▶ Press "CTRL" (3) to activate the overlay menu.
- ▶ Press "PLAY" (6) to start playback.
- ▶ Press "REC" (5) to start or stop recording.
- ▶ Press "EXIT" (4) to exit the ARRI menu and to return to the standard Starlite mode.

All overlays disappear after a few seconds of inactivity.

User button menu

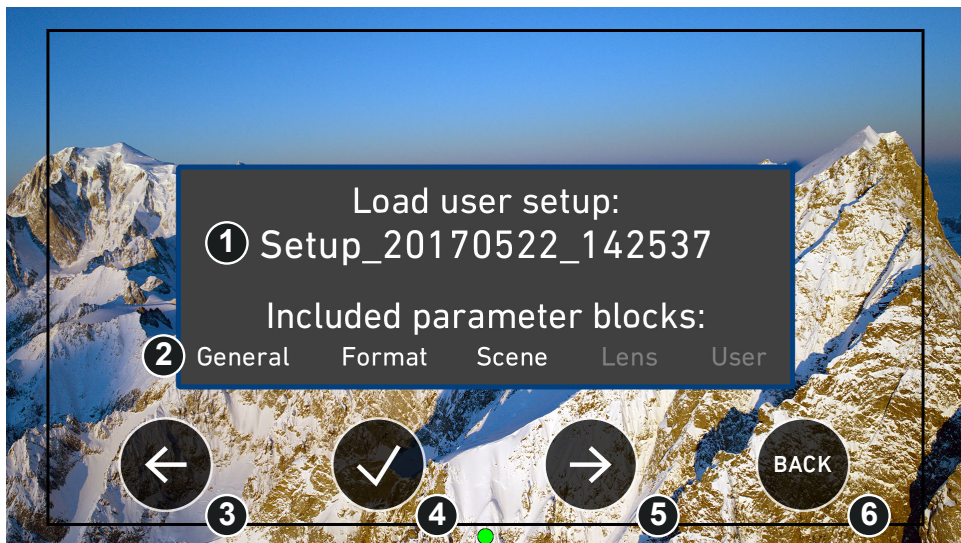
In the user button menu, the same functions are available as with the camera user buttons (1) to (3).



- ▶ A gray button indicates an active user function.
- ▶ Return to the main menu by pressing the "BACK" touch icon on the monitor.

User setup menu

In the load user setup menu, you can load user setup files that have been stored on the camera.



- ▶ Select the user setup file to be loaded (1) with the left (3) and right (5) arrow buttons.
The camera shows the included parameter blocks in the lower part of the dialog (2). For more information on user setup parameter blocks, see "User setup parameter blocks", page 127.
- ▶ Confirm the selection of the user setup file by pressing the checkmark (4).
- ▶ Cancel user setup loading and return to the main menu by pressing "BACK" (6).

Note: The user setup menu is not available during recording.

Control menu

In the control menu, camera parameters can be edited similar to the overlay menu. For more information, see "Overlay menu", page 95.

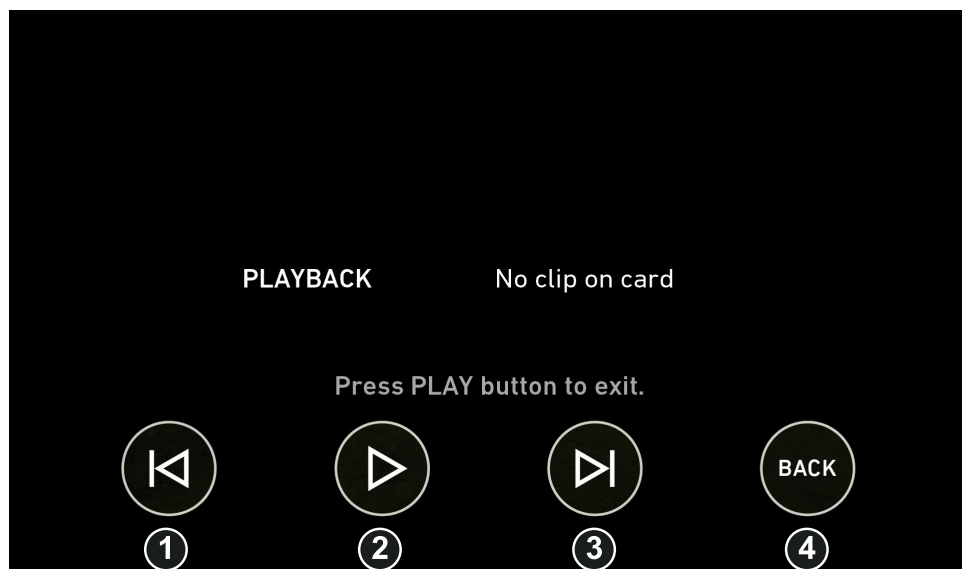


- ▶ Choose a parameter by pressing the touch icon (1) or (3) on the monitor to move the selection rectangle left or right.
- ▶ Select the parameter by pressing the touch icon (2) on the monitor. The parameter can be edited.
- ▶ Edit the parameter by pressing the touch icon (1) or (3).
- ▶ End editing by pressing the touch icon (2) on the monitor.
- ▶ Exit the control menu by pressing the "BACK" (4) touch icon on the monitor.

Note: The control menu is not available during playback.

Playback menu

In the playback menu, recorded clips can be played or paused (2) and skipped to previous (1) or next (3) clip. You can also change the playback speed.



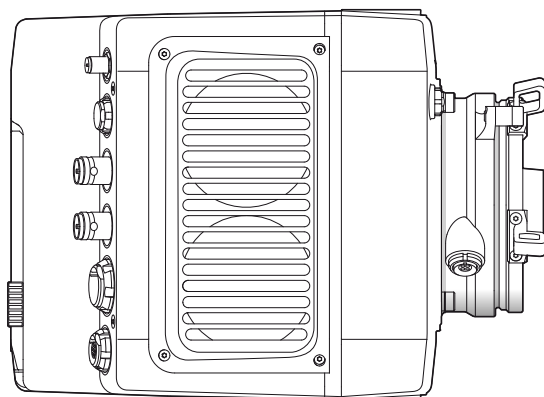
- ▶ Play or pause a clip by pressing the "Play" (2) touch icon on the monitor.
- ▶ Skip to previous or to next clip by pressing the "Skip previous" (1) or "Skip next" (3) touch icon on the monitor.

- ▶ While playback is running, press "Fast backward" (1) or "Fast forward" (3) to decrease or increase playback speed.
- ▶ Exit playback and return to the main menu by pressing the "BACK" (3) touch icon on the monitor.

Note: The playback menu is not available during recording.

10 Appendix

10.1 Technical data



Camera info

Dimensions	Length	185 mm
	Height	140 mm
	Width	125 mm
Weight	2.3 kg / 5 lbs (camera body with titanium PL mount)	
Sensor	35 mm format ARRI ALEV III CMOS with Bayer pattern color filter array	
Sensor photo sites	ProRes:	Resolution:
	S16 HD	1600x900
	HD	2880x1620
	HD Ana.	1920x2160
	2K	2867x1613
	2.39:1 2K Ana.	2560x2145
	3.2K	3200x1800
	4K UHD	3200x1800
	4:3 2.8K	2880x2160
	ARRIRAW:	
	2.8K	2880x1620
	Open Gate 3.4K	3424x2202
	4:3 2.8K (OG 3.4K)	2880x2160
	16:9 HD Ana. (OG 3.4K)	1920x2160
2.39:1 2K Ana. (OG 3.4K)	2560x2145	

Shutter	Electronic shutter, 5.0°-356.0°
Exposure latitude	14+ stops over the entire sensitivity range from EI 160 to EI 3200 as measured with the ARRI Dynamic Range Test Chart (DRTC-1)
Exposure index	adjustable from EI 160-3200 in 1/3 stops EI 800 base sensitivity
ND filters	Built-in motorized ND filters 0.6, 1.2, 2.1
Supported lens mounts	Steel PL mount with ENG connector and LDS Titanium PL mount with L-Bus connector and LDS EF mount, PL mount with Hirose connector and LDS B4 mount with Hirose connector
Recording media	CFast 2.0 memory cards
Sound level	< 20 dB(A) at standard frame rates
Operating temperatures	-20 to +45 °C (-4 to +113 °F) @ 95% r.h. non-condensing
Environmental	Splash and dust-proof through sealed electronics
Wireless interfaces	Built-in WiFi and white radio modules

Recording info

Target resolutions	ProRes:	Resolution:
	S16 HD	1920x1080
	HD	1920x1080
	HD Ana.	1920x1080
	2K	2048x1152
	2.39:1 2K Ana.	2048x858
	3.2K	3200x1800
	4K UHD	3840x2160
	4:3 2.8K	2944x2160
	ARRIRAW:	
	2.8K	2880x1620
	OpenGate 3.4K	3424x2202
	4:3 2.8K (OG 3.4K)	3424x2202
	16:9 HD Ana. (OG 3.4K)	3424x2202
2.39:1 2K Ana. (OG 3.4K)	3424x2202	
Recording codecs	ProRes 422 LT, 422, 422 HQ, 4444, 4444 XQ ARRIRAW	

Maximum recording frame rates

Camera settings		Maximum frame rate in fps
Resolution	Codec	CFAST 2.0 128 GB
S16 HD	ProRes 422 LT	200
	ProRes 422	200
	ProRes 422 HQ	200
	ProRes 4444	200
	ProRes 4444 XQ	120
HD	ProRes 422 LT	200
	ProRes 422	200
	ProRes 422 HQ	200
	ProRes 4444	200
	ProRes 4444 XQ	120

HD Ana.	ProRes 422 LT	120
	ProRes 422	120
	ProRes 422 HQ	120
	ProRes 4444	120
	ProRes 4444 XQ	120
2K	ProRes 422 LT	200
	ProRes 422	200
	ProRes 422 HQ	200
	ProRes 4444	200
	ProRes 4444 XQ	120
2.39:1 2K Ana.	ProRes 422 LT	120
	ProRes 422	120
	ProRes 422 HQ	120
	ProRes 4444	120
	ProRes 4444 XQ	120
3.2K	ProRes 422 LT	60
	ProRes 422	60
	ProRes 422 HQ	60
	ProRes 4444	60
	ProRes 4444 XQ	30
4K UHD	ProRes 422 LT	60
	ProRes 422	60
	ProRes 422 HQ	60
	ProRes 4444	60
	ProRes 4444 XQ	30
4:3 2.8K	ProRes 422 LT	50
	ProRes 422	50
	ProRes 422 HQ	50
	ProRes 4444	50
	ProRes 4444 XQ	50
2.8K	ARRIRAW	48
OpenGate 3.4K	ARRIRAW	30
4:3 2.8K (OG 3.4K)	ARRIRAW	30
16:9 HD Ana. (OG 3.4K)	ARRIRAW	30
2.39:1 2K Ana. (OG 3.4K)	ARRIRAW	30

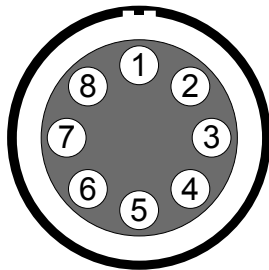
Electrical data

DC power input 10.5 to 34 V

Audio cable K2.0006171

ARRI offers a cable with a matching connector to create audio adapters. The following table shows the wire assignments of this cable.

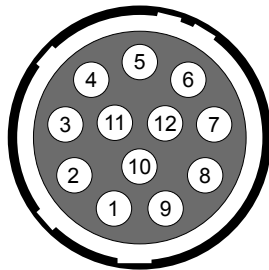
Function	Wire (old)	Wire (new)
Gnd	Shield	Shield
Line 1 (+)	White with blue ring	White
Line 1 (-)	Blue with white ring	Black
Line 2 (+)	White	Red
Line 2 (-)	Blue	Blue



BAT

Connector ID: LEMO EEJ.2B.308

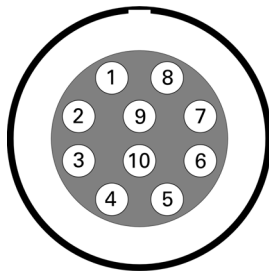
1	Batcom
2	Powergnd
3	Powergnd
4	Powergnd
5	Batcom Gnd
6	Batplus
7	Batplus
8	Batplus



ENG (on PL lens mount steel)

Connector ID: Hirose HR10-10R-12S(73)

1	-/-
2	-/-
3	Gnd
4	-/-
5	-/-
6	12 V
7	-/-
8	-/-
9	-/-
10	-/-
11	RXD (Mount to Lens)
12	TXD (Lens to Mount)

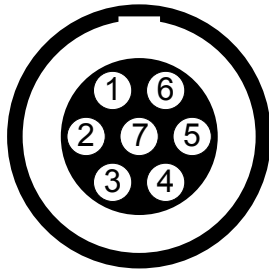


Ethernet

Connector ID: LEMO EEG.1B.310

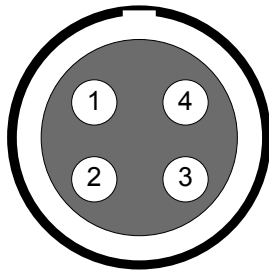
1	MX-1P CTS (white-orange)
2	MX-1N DTR (orange)
3	MX-2P GND (white-green)
4	MX-2N DCD (green)
5	MX-3P TXD (blue)
6	MX-3N RXD (white-blue)
7	MX-4P DSR (white-brown)
8	MX-4N RTS (brown)
9	Gnd
10	Proprietary - do not use

EXT



Connector ID: LEMO EEG.1B.307

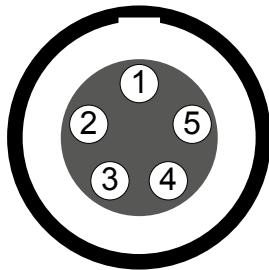
- | | |
|---|-----------------|
| 1 | Can1 H |
| 2 | Can1 L |
| 3 | Can2 H |
| 4 | Can2 L |
| 5 | VBat (1.1A max) |
| 6 | Gnd |
| 7 | R/S |



LBUS (on PL lens mount titanium)

Connector ID: LEMO EEG.0B.304

- | | |
|---|-------|
| 1 | Gnd |
| 2 | Can L |
| 3 | VBat |
| 4 | Can H |



Timecode

Connector ID: LEMO EEG.0B.305

- | | |
|---|---------------|
| 1 | Gnd |
| 2 | LTC in |
| 3 | - (no tuning) |
| 4 | - (no tuning) |
| 5 | LTC out |

10.4 Declarations of conformity

EU Declaration of Conformity

The product ALEXA Mini conforms to the specifications of the following European directives:

For cameras delivered before 13 June 2016:

- DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity
- DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)

For cameras delivered from 13 June 2016:

- DIRECTIVE 2014/53/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment
- DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)

FCC Compliance Statement

Class A Statement: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Note: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- **WiFi:** FCC ID: PPD-AR5B22
- **ECS transceiver module:** FCC ID: Y7N-EMIP300

Industry Canada Compliance Statement

Complies with the Canadian ICES-003 Class A specifications.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

This device complies with RSS-210 of Industry Canada.

Cet appareil est conforme à CNR-210 d' Industrie Canada.

This Class A device meets all the requirements of the Canadian interference-causing equipment regulations

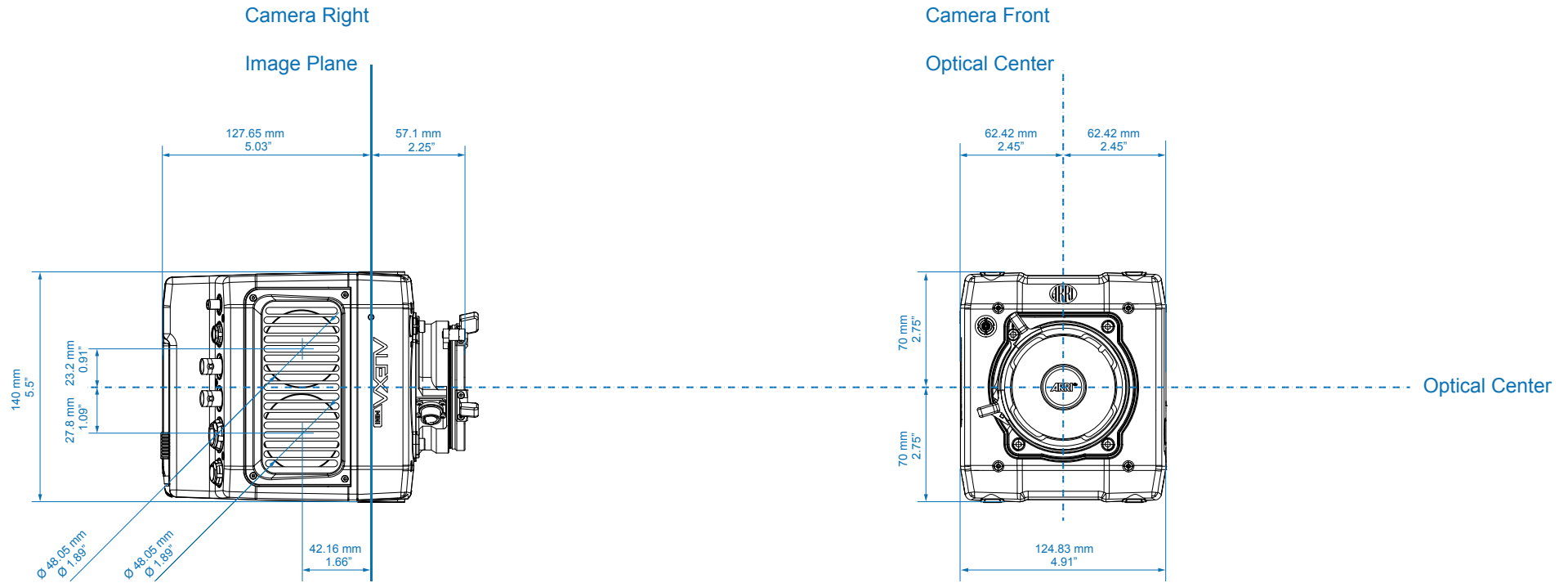
Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

- **WiFi:** IC ID: 4104A-AR5B22
- **ECS transceiver module:** IC ID: 9482A-EMIP300

India WPC Compliance Statement

This product contains the following radio modules:

- **WiFi:** ETA-1661/2011/WRLO
- **ECS transceiver module:** ETA-1180/2017/ERLO



ALEXA Mini

Length

Width

Height

Weight

ALEXA Mini (camera body with titanium PL lens mount)

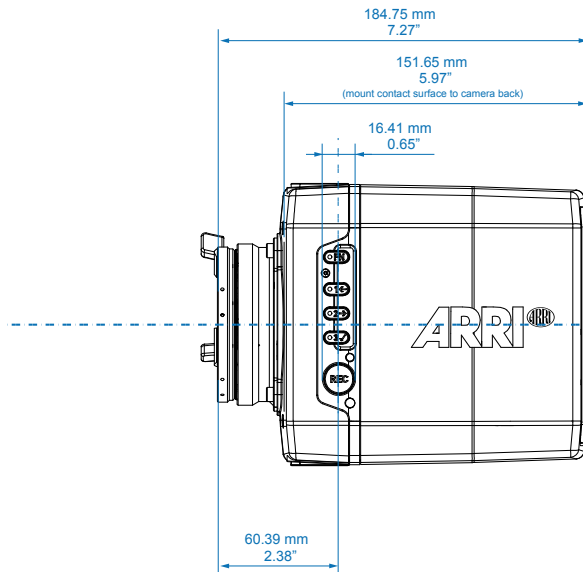
184.75 mm - 7.27"

124.83 mm - 4.91"

140 mm - 5.5"

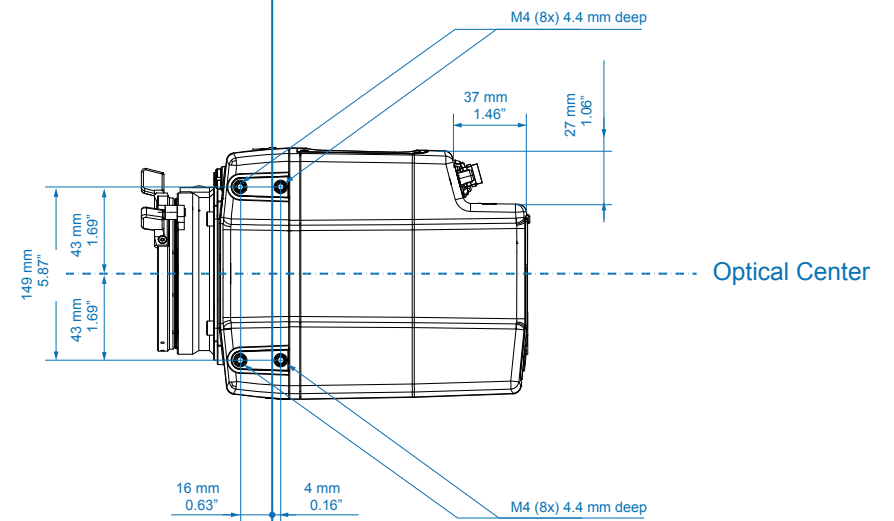
~ 2.3 kg/5 lbs

Camera Left



Camera Top

Image Plane



ALEXA Mini

Length

Width

Height

Weight

ALEXA Mini (camera body with titanium PL lens mount)

184.75 mm - 7.27"

124.83 mm - 4.91"

140 mm - 5.5"

~ 2.3 kg/5 lbs